Packages and Features

Release 10.1

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CONTENTS

CHAPTER

ONE

STANDARD PACKAGES

The Sage distribution includes most programs and libraries on which Sage depends. It installs them automatically if it does not find equivalent system packages.

- *_prereq: Represents system packages required for installing SageMath from source*
- *alabaster: Default theme for the Sphinx documentation system*
- *appdirs: A small Python module for determining appropriate platform-specific dirs, e.g. a "user data dir".*
- *appnope: Disable App Nap on macOS >= 10.9*
- *arb: Arbitrary-precision floating-point ball arithmetic*
- *argon2_cffi: The secure Argon2 password hashing algorithm*
- *argon2_cffi_bindings: Low-level CFFI bindings for Argon2*
- *asttokens: Annotate AST trees with source code positions*
- *attrs: Decorator for Python classes with attributes*
- *babel: Internationalization utilities for Python*
- *backcall: Specifications for callback functions*
- *backports_zoneinfo: Backport of the standard library zoneinfo module*
- *beautifulsoup4: Screen-scraping library*
- *beniget: Extract semantic information about static Python code*
- *bleach: An HTML-sanitizing tool*
- *boost_cropped: Portable C++ libraries (subset needed for Sage)*
- *brial: Boolean Ring Algebra implementation using binary decision diagrams*
- *bzip2: High-quality data compressor*
- *cddlib: Double description method for polyhedral representation conversion*
- *certifi: Python package for providing Mozilla's CA Bundle*
- *cffi: Foreign Function Interface for Python calling C code*
- *charset_normalizer: The Real First Universal Charset Detector. Open, modern and actively maintained alternative to Chardet.*
- *cliquer: Routines for clique searching*
- *cmake: A cross-platform build system generator*
- *combinatorial_designs: Data from the Handbook of Combinatorial Designs*

- *contourpy: Python library for calculating contours of 2D quadrilateral grids*
- *conway_polynomials: Tables of Conway polynomials over finite fields*
- *cppy: C++ headers for C extension development*
- *curl: Multiprotocol data transfer library and utility*
- *cvxopt: Python software for convex optimization*
- *cycler: Composable cycles*
- *cypari2: Python interface to the number theory library libpari*
- *cysignals: Interrupt and signal handling for Cython*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *dateutil: Extensions to the standard Python module datetime*
- *decorator: Python library providing decorators*
- *defusedxml: Addresses vulnerabilities of XML parsers and XML libraries*
- *deprecation: A library to handle automated deprecations*
- *distlib: Distribution utilities*
- *docutils: Processing plaintext documentation into useful formats, such as HTML or LaTeX*
- *ecl: An implementation of the Common Lisp language*
- *eclib: Enumerating and computing with elliptic curves defined over the rational numbers*
- *ecm: Elliptic curve method for integer factorization*
- *editables: Editable installations*
- *elliptic_curves: Databases of elliptic curves*
- *entrypoints: Discover and load entry points from installed Python packages*
- *executing: Get the currently executing AST node of a frame, and other information*
- *fastjsonschema: Fastest Python implementation of JSON schema*
- *fflas_ffpack: Dense linear algebra over word-size finite fields*
- *filelock: A platform independent file lock*
- *flint: Fast Library for Number Theory*
- *flit_core: Distribution-building parts of Flit. See flit package for more information*
- *fonttools: Tools to manipulate font files*
- *fplll: Lattice algorithms, including LLL with floating-point orthogonalization*
- *fpylll: Python interface for FPLLL*
- *freetype: A free, high-quality, and portable font engine*
- *furo: A clean customizable Sphinx documentation theme*
- *gap: Groups, Algorithms, Programming - a system for computational discrete algebra*
- *gast: Python AST that abstracts the underlying Python version*
- *gc: The Boehm-Demers-Weiser conservative garbage collector*
- *gcc: The GNU Compiler Collection or other suitable C and C++ compilers*

- *gengetopt: getopt_long parser generator*
- *gf2x: Fast arithmetic in GF(2)[x] and searching for irreducible/primitive trinomials*
- *gfan: Groebner fans and tropical varieties*
- *gfortran: Fortran compiler from the GNU Compiler Collection*
- *giac: A general purpose computer algebra system*
- *givaro: C++ library for arithmetic and algebraic computations*
- *glpk: GNU Linear Programming Kit*
- *gmp: Library for arbitrary precision arithmetic*
- *gmpy2: Python interface to GMP/MPIR, MPFR, and MPC*
- *gnulib: Modules imported from Gnulib*
- *graphs: A database of combinatorial graphs*
- *gsl: The GNU Scientific Library*
- *hatch_fancy_pypi_readme: Fancy PyPI READMEs with Hatch*
- *hatch_nodejs_version: Hatch plugin for versioning from a package.json file*
- *hatch_vcs: Hatch plugin for versioning with your preferred VCS*
- *hatchling: Modern, extensible Python build backend*
- *html5lib: An HTML parser*
- *iconv: Library for language/country-dependent character encodings*
- *idna: Internationalized Domain Names in Applications (IDNA)*
- *imagesize: Parser for image file metadata*
- *iml: Integer Matrix Library*
- *importlib_metadata: Library to access the metadata for a Python package*
- *importlib_resources: Read resources from Python packages*
- *info: stand-alone Info documentation reader*
- *ipykernel: IPython Kernel for Jupyter*
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *ipython_genutils: Vestigial utilities from IPython*
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*
- *jedi: Static analysis tool providing IDE support for Python*
- *jinja2: General purpose template engine for Python*
- *jmol: Java viewer for chemical structures in 3D*
- *jsonschema: Python implementation of JSON Schema*
- *jupyter_client: Jupyter protocol implementation and client libraries*
- *jupyter_core: Jupyter core package*
- *jupyter_jsmol: JSmol viewer widget for Jupyter*
- *jupyter_packaging: Jupyter Packaging Utilities*

- *jupyter_sphinx: Jupyter Sphinx Extension*
- *jupyterlab_pygments: Pygments theme using JupyterLab CSS variables*
- *jupyterlab_widgets: Jupyter interactive widgets for JupyterLab*
- *kiwisolver: An implementation of the Cassowary constraint solving algorithm*
- *lcalc: L-function calculator*
- *libatomic_ops: Access hardware-provided atomic memory update operations*
- *libbraiding: Computing with braids*
- *libffi: A portable foreign-function interface library*
- *libgd: Dynamic graphics generation tool*
- *libhomfly: Compute the homfly polynomial of knots and links*
- *liblzma: General-purpose data compression software*
- *libpng: Bitmap image support*
- *linbox: Linear algebra with dense, sparse, structured matrices over the integers and finite fields*
- *lrcalc: Littlewood-Richardson calculator*
- *lrcalc_python: Littlewood-Richardson calculator*
- *m4ri: fast arithmetic with dense matrices over GF(2)*
- *m4rie: Arithmetic with dense matrices over GF(2^e)*
- *markupsafe: Safely add untrusted strings to HTML/XML markup*
- *mathjax: A JavaScript library for displaying mathematical formulas*
- *matplotlib: Python 2D plotting library*
- *matplotlib_inline: Inline Matplotlib backend for Jupyter*
- *maxima: System for manipulating symbolic and numerical expressions*
- *memory_allocator: An extension class to allocate memory easily with Cython*
- *meson: A high performance build system*
- *meson_python: Meson Python build backend (PEP 517)*
- *mistune: A markdown parser in pure Python*
- *mpc: Arithmetic of complex numbers with arbitrarily high precision and correct rounding*
- *mpfi: Multiple precision interval arithmetic library based on MPFR*
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *mpmath: Pure Python library for multiprecision floating-point arithmetic*
- *nauty: Find automorphism groups of graphs, generate non-isomorphic graphs*
- *nbclient: A client library for executing notebooks. Formerly nbconvert's ExecutePreprocessor.*
- *nbconvert: Converting Jupyter Notebooks*
- *nbformat: Base implementation of the Jupyter notebook format*
- *ncurses: Classic terminal output library*
- *nest_asyncio: Patch asyncio to allow nested event loops*

- *networkx: Python package for complex networks*
- *ninja_build: A build system with a focus on speed*
- *notebook: Jupyter notebook, a web-based notebook environment for interactive computing*
- *ntl: A library for doing number theory*
- *numpy: Package for scientific computing with Python*
- *openblas: An optimized implementation of BLAS (Basic Linear Algebra Subprograms)*
- *openssl: Implementation of the SSL and TLS protocols*
- *packaging: Core utilities for Python packages*
- *palp: A package for Analyzing Lattice Polytopes*
- *pandocfilters: A Python module for writing pandoc filters*
- *pari: Computer algebra system for fast computations in number theory*
- *pari_galdata: PARI data package needed to compute Galois groups in degrees 8 through 11*
- *pari_seadata_small: PARI data package needed by ellap for large primes (small version)*
- *parso: A Python parser*
- *patch: Applies diffs and patches to files*
- *patchelf: A small utility to modify the dynamic linker and RPATH of ELF executables*
- *pathspec: Utility library for gitignore style pattern matching of file paths.*
- *pexpect: Python module for controlling and automating other programs*
- *pickleshare: A 'shelve' like datastore with concurrency support*
- *pillow: Python Imaging Library*
- *pip: Tool for installing and managing Python packages*
- *pkgconf: An implementation of the pkg-config spec*
- *pkgconfig: Python interface to pkg-config*
- *planarity: Planarity-related graph algorithms*
- *platformdirs: A small Python module for determining appropriate platform-specific dirs, e.g. a "user data dir".*
- *pluggy: plugin and hook calling mechanisms for python*
- *ply: Python Lex & Yacc*
- *poetry_core: Poetry PEP 517 Build Backend*
- *polytopes_db: Databases of 2- and 3-dimensional reflexive polytopes*
- *ppl: Parma Polyhedra Library*
- *pplpy: Python interface to the Parma Polyhedra Library*
- *pplpy_doc: Python interface to the Parma Polyhedra Library (documentation)*
- *primecount: Algorithms for counting primes*
- *primecountpy: Cython interface for C++ primecount library*
- *primesieve: CLI program and C/C++ library for generating primes*
- *prometheus_client: Python client for the systems monitoring and alerting toolkit Prometheus*

- *prompt_toolkit: Interactive command lines for Python*
- *ptyprocess: Python interaction with subprocesses in a pseudoterminal*
- *pure_eval: Safely evaluate AST nodes without side effects*
- *py: library with cross-python path, ini-parsing, io, code, log facilities*
- *pybind11: Create Python bindings to C++ code*
- *pycparser: Parser of the C language in Python*
- *pycygwin: Python bindings for Cygwin's C API*
- *pygments: Generic syntax highlighter*
- *pyparsing: A Python parsing module*
- *pyproject_metadata: PEP 621 metadata parsing*
- *pyrsistent: Persistent data structures in Python*
- *python3: The Python programming language*
- *pythran: Ahead of Time compiler for numeric kernels*
- *pytz: Timezone definitions for Python*
- *pytz_deprecation_shim: Shims to make deprecation of pytz easier*
- *pyzmq: Python bindings for the zeromq networking library*
- *qhull: Compute convex hulls, Delaunay triangulations, Voronoi diagrams*
- *readline: Command line editing library*
- *requests: An HTTP library for Python*
- *rpy2: Python interface to R*
- *rw: Compute rank-width and rank-decompositions*
- *sage_conf: Configuration module for the SageMath library (distributable version)*
- *sage_docbuild: Build system of the Sage documentation*
- *sage-setup: Build system of the SageMath library*
- *sagenb_export: Convert legacy SageNB notebooks to Jupyter notebooks and other formats*
- *sagetex: Embed code, results of computations, and plots from Sage into LaTeX documents*
- *scipy: Scientific tools for Python*
- *send2trash: Send file to trash natively under Mac OS X, Windows and Linux*
- *setuptools: Build system for Python packages*
- *setuptools_scm: Python build system extension to obtain package version from version control*
- *setuptools_scm_git_archive: setuptools_scm plugin for git archives*
- *setuptools_wheel: Build the setuptools package as a wheel*
- *simplegeneric: Simple single-dispatch generic functions for Python*
- *singular: Computer algebra system for polynomial computations, algebraic geometry, singularity theory*
- *six: Python 2 and 3 compatibility utilities*
- *snowballstemmer: Stemmer algorithms for natural language processing in Python*

- *soupsieve: A modern CSS selector implementation for Beautiful Soup.*
- *sphinx: Python documentation generator*
- *sphinx_basic_ng: A modern skeleton for Sphinx themes.*
- *sphinx_copybutton: Add a copy button to each of your code cells.*
- *sphinxcontrib_applehelp: Sphinx extension which outputs Apple help book*
- *sphinxcontrib_devhelp: Sphinx extension which outputs Devhelp documents*
- *sphinxcontrib_htmlhelp: Sphinx extension which outputs HTML help book*
- *sphinxcontrib_jsmath: Sphinx extension which renders display math in HTML via JavaScript*
- *sphinxcontrib_qthelp: Sphinx extension which outputs QtHelp documents*
- *sphinxcontrib_serializinghtml: Sphinx extension which outputs serialized HTML files*
- *sphinxcontrib_websupport: Sphinx API for Web apps*
- *sqlite: An SQL database engine*
- *stack_data: Extract data from python stack frames and tracebacks for informative displays*
- *suitesparse: A suite of sparse matrix software*
- *symmetrica: Library for representation theory*
- *sympow: Computes special values of symmetric power elliptic curve L-functions*
- *sympy: Python library for symbolic mathematics*
- *tachyon: A ray tracing system*
- *terminado: Tornado websocket backend for the term.js Javascript terminal emulator library*
- *threejs: JavaScript library to display 3D graphics in the browser*
- *tinycss2: A tiny CSS parser*
- *toml: Python Library for Tom's Obvious, Minimal Language*
- *tomli: A lil' TOML parser*
- *tomlkit: Style preserving TOML library*
- *tornado: Python web framework and asynchronous networking library*
- *tox: tox is a generic virtualenv management and test command line tool*
- *traitlets: Traitlets Python configuration system*
- *typing_extensions: Backported and Experimental Type Hints for Python 3.5+*
- *tzdata: Provider of IANA time zone data*
- *tzlocal: Python timezone information for the local timezone*
- *urllib3: HTTP library with thread-safe connection pooling, file post, and more.*
- *vcversioner: Python build system extension to obtain package version from version control*
- *virtualenv: Virtual Python Environment builder*
- *wcwidth: Measures the displayed width of unicode strings in a terminal*
- *webencodings: Character encoding aliases for legacy web content*
- *wheel: A built-package format for Python*

- *widgetsnbextension: Jupyter notebook extension for interactive HTML widgets*
- *xz: General-purpose data compression software*
- *zeromq: A modern networking library*
- *zipp: A pathlib-compatible zipfile object wrapper*
- *zlib: Data compression library*

CHAPTER

TWO

OPTIONAL PACKAGES

For additional functionality, you can install some of the following optional packages.

- *4ti2: Algebraic, geometric and combinatorial problems on linear spaces*
- *_bootstrap: Represents system packages required for running the top-level bootstrap script*
- *_develop: Represents system packages recommended for development*
- *_recommended: Represents system packages recommended for additional functionality*
- *_sagemath: Downstream package of Sage in distributions*
- *admcycles: Computation in the tautological ring of the moduli space of curves*
- *antic: Algebraic Number Theory In C*
- *auditwheel_or_delocate: Repair wheels on Linux or macOS*
- *benzene: Generate fusenes and benzenoids with a given number of faces*
- *biopython: Tools for computational molecular biology*
- *bliss: Computing automorphism groups and canonical forms of graphs*
- *buckygen: Efficient generation of nonisomorphic fullerenes*
- *cbc: COIN-OR branch and cut solver for mixed-integer programs*
- *ccache: A compiler cache*
- *coxeter3: Library for Coxeter groups, Bruhat ordering, Kazhdan-Lusztig polynomials*
- *cryptominisat: A SAT solver*
- *csdp: Solver for semidefinite programs*
- *cunningham_tables: List of the prime numbers occuring in the Cunningham table*
- *cvxpy: A domain-specific language for modeling convex optimization problems in Python.*
- *cylp: A Python interface for CLP, CBC, and CGL*
- *d3js: JavaScript library for manipulating documents based on data*
- *database_cremona_ellcurve: Database of elliptic curves*
- *database_cubic_hecke: Ivan Marin's representations of the cubic Hecke algebra*
- *database_jones_numfield: Table of number fields*
- *database_knotinfo: Content of the KnotInfo and LinkInfo databases as lists of dictionaries*
- *database_kohel: Database of modular and Hilbert polynomials*

- *database_mutation_class: Database of exceptional mutation classes of quivers*
- *database_odlyzko_zeta: Table of zeros of the Riemann zeta function*
- *database_stein_watkins: Database of elliptic curves (full version)*
- *database_stein_watkins_mini: Database of elliptic curves (small version)*
- *database_symbolic_data: Database from the SymbolicData project*
- *debugpy: An implementation of the Debug Adapter Protocol for Python*
- *dot2tex: Create PGF/TikZ commands from Graphviz output*
- *dsdp: Semidefinite programming solver*
- *e_antic: Real embedded number fields*
- *ecos_python: Embedded Cone Solver (Python wrapper)*
- *ffmpeg: ffmpeg video converter*
- *fricas: A general purpose computer algebra system*
- *frobby: Computations on monomial ideals*
- *gap_jupyter: Jupyter kernel for GAP*
- *gap_packages: A collection of GAP packages*
- *git: Version control system*
- *github_cli: Command-line interface for GitHub*
- *gitpython: GitPython is a python library used to interact with Git repositories*
- *glucose: A SAT solver*
- *gp2c: A compiler for translating GP routines to C*
- *graphviz: Graph visualization software*
- *igraph: A library for creating and manipulating graphs*
- *ImageMagick: A collection of tools and libraries for many image file formats*
- *ipympl: Matplotlib Jupyter Extension*
- *isl: Sets and relations of integer points bounded by affine constraints*
- *jupymake: A Python wrapper for the polymake shell*
- *jupyterlab: An extensible environment for interactive and reproducible computing*
- *kenzo: Construct topological spaces and compute homology groups*
- *kissat: SAT solver*
- *latte_int: Count lattice points, compute volumes, and integrate over convex polytopes*
- *libgraphviz: Graph visualization software (callable library)*
- *libnauty: Find automorphism groups of graphs, generate non-isomorphic graphs (callable library)*
- *libogg: Library for the Ogg multimedia container format*
- *libsemigroups: Library for semigroups and monoids*
- *libxml2: XML parser and toolkit*
- *lidia: A library for computational number theory*

- *llvm: The LLVM Compiler Infrastructure, including the Clang C/C++/Objective-C compiler*
- *lrslib: Reverse search algorithm for vertex enumeration and convex hull problems*
- *mathics: A general-purpose computer algebra system*
- *mathics_scanner: Character Tables and Tokenizer for Mathics and the Wolfram Language.*
- *mcqd: An exact algorithm for finding a maximum clique in an undirected graph*
- *meataxe: Library for computing with modular representations*
- *p_group_cohomology: Modular cohomology rings of finite groups*
- *mpfrcx: Arithmetic of univariate polynomials over arbitrary precision real or complex numbers*
- *msolve: Multivariate polynomial system solver*
- *nibabel: Access a multitude of neuroimaging data formats*
- *nodeenv: A tool to create isolated node.js environments*
- *nodejs: A JavaScript runtime built on Chrome's V8 JavaScript engine*
- *normaliz: Computations in affine monoids, vector configurations, lattice polytopes, and rational cones*
- *notedown: Create IPython notebooks from markdown*
- *onetbb: oneAPI Threading Building Blocks*
- *ore_algebra: Ore algebra*
- *osqp_python: The Operator Splitting QP Solver (Python wrapper)*
- *p_group_cohomology: Modular cohomology rings of finite groups*
- *palettable: Color palettes for Python*
- *pandoc: A document converter*
- *pandoc_attributes: A parser and generator for pandoc block attributes*
- *papilo: Parallel presolve for integer and linear optimization*
- *pari_elldata: PARI data package for elliptic curves*
- *pari_galpol: PARI data package for polynomials defining Galois extensions of the rationals*
- *pari_jupyter: A Jupyter kernel for PARI/GP*
- *pari_nftables: PARI data package for number fields*
- *pari_seadata: PARI data package needed by ellap for large primes (full version)*
- *pdf2svg - PDF to SVG convertor*
- *perl_cpan_polymake_prereq: Represents all Perl packages that are prerequisites for polymake*
- *perl_mongodb: A prerequisite for polymake's PolyDB feature*
- *perl_term_readline_gnu: Perl extension for the GNU Readline/History libraries*
- *phitigra: A graph editor for SageMath/Jupyter*
- *pint: Physical quantities module*
- *plantri: Generate non-isomorphic sphere-embdedded graphs*
- *polymake: Computations with polyhedra, fans, simplicial complexes, matroids, graphs, tropical hypersurfaces*
- *polytopes_db_4d: Database of 4-dimensional reflexive polytopes*

- *pybtex: A BibTeX-compatible bibliography processor in Python*
- *pycosat: SAT solver picosat with Python bindings*
- *pycryptosat: Python module of cryptominisat*
- *pygraphviz: Python interface to Graphviz*
- *pynormaliz: Python bindings for the normaliz library*
- *pyppeteer: Headless chrome/chromium automation library*
- *pyscipopt: Python interface and modeling environment for SCIP*
- *pysingular: A basic Python interface to Singular*
- *pytest: Simple powerful testing with Python*
- *pytest_mock: Thin-wrapper around the mock package for easier use with pytest*
- *pytest_xdist: pytest xdist plugin for distributed testing and loop-on-failing modes*
- *python_build: A simple, correct PEP517 package builder*
- *python_igraph: Python bindings for igraph*
- *pyx: Generate PostScript, PDF, and SVG files in Python*
- *qdldl_python: QDLDL, a free LDL factorization routine (Python wrapper)*
- *r: A free software environment for statistical computing and graphics*
- *retrolab: JupyterLab Distribution with a retro look and feel*
- *rst2ipynb: Convert reStructuredText files to Jupyter notebooks*
- *rubiks: Programs for Rubik's cube*
- *saclib: Computations with real algebraic numbers*
- *sage_flatsurf: computation with flat surfaces*
- *sage_numerical_backends_coin: COIN-OR backend for Sage MixedIntegerLinearProgram*
- *sage_numerical_backends_cplex: Cplex backend for Sage MixedIntegerLinearProgram*
- *sage_numerical_backends_gurobi: Gurobi backend for Sage MixedIntegerLinearProgram*
- *sage_sws2rst: Translate legacy Sage worksheet files (.sws) to reStructuredText (.rst) files*
- *scip: Mixed integer programming solver*
- *scip_sdp: Mixed integer semidefinite programming plugin for SCIP*
- *scs: Splitting conic solver*
- *singular_jupyter: Jupyter kernel for Singular*
- *sirocco: Compute topologically certified root continuation of bivariate polynomials*
- *slabbe: Sébastien Labbé's Research code*
- *snappy: Topology and geometry of 3-manifolds, with a focus on hyperbolic structures*
- *soplex: Linear optimization solver using the revised simplex method*
- *sqlalchemy: A database abstraction library*
- *surface_dynamics: dynamics on surfaces (measured foliations, interval exchange transformation, Teichmüller flow, etc)*

- *symengine: A C++ symbolic manipulation library*
- *tdlib: Algorithms for computing tree decompositions*
- *texlive: A comprehensive TeX system*
- *texttable: Python module for creating simple ASCII tables*
- *tides: Integration of ODEs*
- *topcom: Compute triangulations of point configurations and oriented matroids*

CHAPTER

THREE

FEATURES

3.1 Testing for features of the environment at runtime

A computation can require a certain package to be installed in the runtime environment. Abstractly such a package describes a *Feature* which can be tested for at runtime. It can be of various kinds, most prominently an *Executable* in the PATH, a *PythonModule*, or an additional package for some installed system such as a *GapPackage*.

AUTHORS:

- Julian Rüth (2016-04-07): Initial version
- Jeroen Demeyer (2018-02-12): Refactoring and clean up

EXAMPLES:

Some generic features are available for common cases. For example, to test for the existence of a binary, one can use an *Executable* feature:

```
sage: from sage.features import Executable
sage: Executable(name="sh", executable="sh").is_present()
FeatureTestResult('sh', True)
```

Here we test whether the grape GAP package is available:

```
sage: from sage.features.gap import GapPackage
sage: GapPackage("grape", spkg="gap_packages").is_present()  # optional - gap_packages
FeatureTestResult('gap_package_grape', True)
```

Note that a *FeatureTestResult* acts like a bool in most contexts:

```
sage: if Executable(name="sh", executable="sh").is_present(): "present."
'present.'
```

When one wants to raise an error if the feature is not available, one can use the `require` method:

```
sage: Executable(name="sh", executable="sh").require()

sage: Executable(name="random", executable="randomOochoz6x", spkg="random", url="http://
↪rand.om").require() # optional - sage_spkg
Traceback (most recent call last):
...
FeatureNotPresentError: random is not available.
Executable 'randomOochoz6x' not found on PATH.
```

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```
...try to run...sage -i random...
Further installation instructions might be available at http://rand.om.
```

As can be seen above, features try to produce helpful error messages.

class sage.features.**CythonFeature**(**args*, ***kwds*)

Bases: `Feature`

A `Feature` which describes the ability to compile and import a particular piece of Cython code.

To test the presence of `name`, the cython compiler is run on `test_code` and the resulting module is imported.

EXAMPLES:

```
sage: from sage.features import CythonFeature
sage: fabs_test_code = '''
....: cdef extern from "<math.h>":
....:     double fabs(double x)
....:
....: assert fabs(-1) == 1
....: '''
sage: fabs = CythonFeature("fabs", test_code=fabs_test_code,                    #␣
↪needs sage.misc.cython
....:                      spkg="gcc", url="https://gnu.org",
....:                      type="standard")
sage: fabs.is_present()                                                         #␣
↪needs sage.misc.cython
FeatureTestResult('fabs', True)
```

Test various failures:

```
sage: broken_code = '''this is not a valid Cython program!'''
sage: broken = CythonFeature("broken", test_code=broken_code)
sage: broken.is_present()
FeatureTestResult('broken', False)
```

```
sage: broken_code = '''cdef extern from "no_such_header_file": pass'''
sage: broken = CythonFeature("broken", test_code=broken_code)
sage: broken.is_present()
FeatureTestResult('broken', False)
```

```
sage: broken_code = '''import no_such_python_module'''
sage: broken = CythonFeature("broken", test_code=broken_code)
sage: broken.is_present()
FeatureTestResult('broken', False)
```

```
sage: broken_code = '''raise AssertionError("sorry!")'''
sage: broken = CythonFeature("broken", test_code=broken_code)
sage: broken.is_present()
FeatureTestResult('broken', False)
```

class sage.features.**Executable**(**args*, ***kwds*)

Bases: `FileFeature`

A feature describing an executable in the PATH.

In an installation of Sage with SAGE_LOCAL different from SAGE_VENV, the executable is searched first in SAGE_VENV/bin, then in SAGE_LOCAL/bin, then in PATH.

Note: Overwrite *is_functional()* if you also want to check whether the executable shows proper behaviour.

Calls to is_present() are cached. You might want to cache the *Executable* object to prevent unnecessary calls to the executable.

EXAMPLES:

```
sage: from sage.features import Executable
sage: Executable(name="sh", executable="sh").is_present()
FeatureTestResult('sh', True)
sage: Executable(name="does-not-exist", executable="does-not-exist-xxxxyxyyxyy").is_
↪present()
FeatureTestResult('does-not-exist', False)
```

absolute_filename()

The absolute path of the executable as a string.

EXAMPLES:

```
sage: from sage.features import Executable
sage: Executable(name="sh", executable="sh").absolute_filename()
'/...bin/sh'
```

A *FeatureNotPresentError* is raised if the file cannot be found:

```
sage: Executable(name="does-not-exist", executable="does-not-exist-xxxxyxyyxyy
↪").absolute_path()
Traceback (most recent call last):
...
sage.features.FeatureNotPresentError: does-not-exist is not available.
Executable 'does-not-exist-xxxxyxyyxyy' not found on PATH.
```

is_functional()

Return whether an executable in the path is functional.

This method is used internally and can be overridden in subclasses in order to implement a feature test. It should not be called directly. Use *Feature.is_present()* instead.

EXAMPLES:

The function returns True unless explicitly overwritten:

```
sage: from sage.features import Executable
sage: Executable(name="sh", executable="sh").is_functional()
FeatureTestResult('sh', True)
```

class sage.features.**Feature**(**args*, ***kwds*)

Bases: *TrivialUniqueRepresentation*

A feature of the runtime environment

INPUT:

- name – (string) name of the feature; this should be suitable as an optional tag for the Sage doctester, i.e., lowercase alphanumeric with underscores (_) allowed; features that correspond to Python modules/packages may use periods (.)
- spkg – (string) name of the SPKG providing the feature
- description – (string) optional; plain English description of the feature
- url – a URL for the upstream package providing the feature
- type – (string) one of 'standard', 'optional' (default), 'experimental'

Overwrite _is_present() to add feature checks.

EXAMPLES:

```
sage: from sage.features.gap import GapPackage
sage: GapPackage("grape", spkg="gap_packages")  # indirect doctest
Feature('gap_package_grape')
```

For efficiency, features are unique:

```
sage: GapPackage("grape") is GapPackage("grape")
True
```

hide()

Hide this feature. For example this is used when the doctest option --hide is set. Setting an installed feature as hidden pretends that it is not available. To revert this use *unhide()*.

EXAMPLES:

Benzene is an optional SPKG. The following test fails if it is hidden or not installed. Thus, in the second invocation the optional tag is needed:

```
sage: from sage.features.graph_generators import Benzene
sage: Benzene().hide()
sage: len(list(graphs.fusenes(2)))                                          #␣
↪needs sage.graphs
Traceback (most recent call last):
...
FeatureNotPresentError: benzene is not available.
Feature `benzene` is hidden.
Use method `unhide` to make it available again.

sage: Benzene().unhide()
sage: len(list(graphs.fusenes(2)))  # optional - benzene, needs sage.graphs
1
```

is_optional()

Return whether this feature corresponds to an optional SPKG.

EXAMPLES:

```
sage: from sage.features.databases import DatabaseCremona,␣
↪DatabaseConwayPolynomials
sage: DatabaseCremona().is_optional()
True
sage: DatabaseConwayPolynomials().is_optional()
False
```

is_present()

Return whether the feature is present.

OUTPUT:

A *FeatureTestResult* which can be used as a boolean and contains additional information about the feature test.

EXAMPLES:

```
sage: from sage.features.gap import GapPackage
sage: GapPackage("grape", spkg="gap_packages").is_present()  # optional - gap_
↪packages
FeatureTestResult('gap_package_grape', True)
sage: GapPackage("NOT_A_PACKAGE", spkg="gap_packages").is_present()
FeatureTestResult('gap_package_NOT_A_PACKAGE', False)
```

The result is cached:

```
sage: from sage.features import Feature
sage: class TestFeature(Feature):
....:     def _is_present(self):
....:         print("checking presence")
....:         return True
sage: TestFeature("test").is_present()
checking presence
FeatureTestResult('test', True)
sage: TestFeature("test").is_present()
FeatureTestResult('test', True)
sage: TestFeature("other").is_present()
checking presence
FeatureTestResult('other', True)
sage: TestFeature("other").is_present()
FeatureTestResult('other', True)
```

is_standard()

Return whether this feature corresponds to a standard SPKG.

EXAMPLES:

```
sage: from sage.features.databases import DatabaseCremona,␣
↪DatabaseConwayPolynomials
sage: DatabaseCremona().is_standard()
False
sage: DatabaseConwayPolynomials().is_standard()
True
```

joined_features()

Return a list of features that `self` is the join of.

OUTPUT:

A (possibly empty) list of instances of *Feature*.

EXAMPLES:

```
sage: from sage.features.graphviz import Graphviz
sage: Graphviz().joined_features()
[Feature('dot'), Feature('neato'), Feature('twopi')]
sage: from sage.features.sagemath import sage__rings__function_field
sage: sage__rings__function_field().joined_features()
[Feature('sage.rings.function_field.function_field_polymod'),
Feature('sage.libs.singular'),
Feature('sage.libs.singular.singular'),
Feature('sage.interfaces.singular')]
sage: from sage.features.interfaces import Mathematica
sage: Mathematica().joined_features()
[]
```

require()

Raise a *FeatureNotPresentError* if the feature is not present.

EXAMPLES:

```
sage: from sage.features.gap import GapPackage
sage: GapPackage("ve1EeThu").require()                                    #␣
↪needs sage.libs.gap
Traceback (most recent call last):
...
FeatureNotPresentError: gap_package_ve1EeThu is not available.
`TestPackageAvailability("ve1EeThu")` evaluated to `fail` in GAP.
```

resolution()

Return a suggestion on how to make *is_present()* pass if it did not pass.

OUTPUT:

A string.

EXAMPLES:

```
sage: from sage.features import Executable
sage: Executable(name="CSDP", spkg="csdp", executable="theta", url="https://
↪github.com/dimpase/csdp").resolution()  # optional - sage_spkg
'...To install CSDP...you can try to run...sage -i csdp...Further installation␣
↪instructions might be available at https://github.com/dimpase/csdp.'
```

unhide()

Revert what *hide()* does.

EXAMPLES:

Polycyclic is a standard GAP package since 4.10 (see github issue #26856). The following test just fails if it is hidden. Thus, in the second invocation no optional tag is needed:

```
sage: from sage.features.gap import GapPackage
sage: Polycyclic = GapPackage("polycyclic", spkg="gap_packages")
sage: Polycyclic.hide()
sage: libgap(AbelianGroup(3, [0,3,4], names="abc"))                       #␣
↪needs sage.libs.gap
Traceback (most recent call last):
```

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```
...
FeatureNotPresentError: gap_package_polycyclic is not available.
Feature `gap_package_polycyclic` is hidden.
Use method `unhide` to make it available again.

sage: Polycyclic.unhide()
sage: libgap(AbelianGroup(3, [0,3,4], names="abc"))                    #␣
↪needs sage.libs.gap
Pcp-group with orders [ 0, 3, 4 ]
```

exception sage.features.**FeatureNotPresentError**(*feature*, *reason=None*, *resolution=None*)

Bases: RuntimeError

A missing feature error.

EXAMPLES:

```
sage: from sage.features import Feature, FeatureTestResult
sage: class Missing(Feature):
....:     def _is_present(self):
....:         return False

sage: Missing(name="missing").require()
Traceback (most recent call last):
...
FeatureNotPresentError: missing is not available.
```

property resolution

Initialize self. See help(type(self)) for accurate signature.

class sage.features.**FeatureTestResult**(*feature*, *is_present*, *reason=None*, *resolution=None*)

Bases: object

The result of a *Feature.is_present()* call.

Behaves like a boolean with some extra data which may explain why a feature is not present and how this may be resolved.

EXAMPLES:

```
sage: from sage.features.gap import GapPackage
sage: presence = GapPackage("NOT_A_PACKAGE").is_present(); presence  # indirect␣
↪doctest
FeatureTestResult('gap_package_NOT_A_PACKAGE', False)
sage: bool(presence)
False
```

Explanatory messages might be available as reason and resolution:

```
sage: presence.reason                                                  #␣
↪needs sage.libs.gap
'`TestPackageAvailability("NOT_A_PACKAGE")` evaluated to `fail` in GAP.'
sage: bool(presence.resolution)
False
```

If a feature is not present, `resolution` defaults to `feature.resolution()` if this is defined. If you do not want to use this default you need explicitly set `resolution` to a string:

```
sage: from sage.features import FeatureTestResult
sage: package = GapPackage("NOT_A_PACKAGE", spkg="no_package")
sage: str(FeatureTestResult(package, True).resolution)  # optional - sage_spkg
'...To install gap_package_NOT_A_PACKAGE...you can try to run...sage -i no_package..
↪.'
sage: str(FeatureTestResult(package, False).resolution) # optional - sage_spkg
'...To install gap_package_NOT_A_PACKAGE...you can try to run...sage -i no_package..
↪.'
sage: FeatureTestResult(package, False, resolution="rtm").resolution
'rtm'
```

property resolution

Initialize self. See help(type(self)) for accurate signature.

class sage.features.**FileFeature**(**args*, ***kwds*)

Bases: *Feature*

Base class for features that describe a file or directory in the file system.

A subclass should implement a method *absolute_filename()*.

EXAMPLES:

Two direct concrete subclasses of *FileFeature* are defined:

```
sage: from sage.features import StaticFile, Executable, FileFeature
sage: issubclass(StaticFile, FileFeature)
True
sage: issubclass(Executable, FileFeature)
True
```

To work with the file described by the feature, use the method *absolute_filename()*. A *FeatureNotPresentError* is raised if the file cannot be found:

```
sage: Executable(name="does-not-exist", executable="does-not-exist-xxxxyxyyxyy").
↪absolute_path()
Traceback (most recent call last):
...
sage.features.FeatureNotPresentError: does-not-exist is not available.
Executable 'does-not-exist-xxxxyxyyxyy' not found on PATH.
```

A *FileFeature* also provides the `is_present()` method to test for the presence of the file at run time. This is inherited from the base class *Feature*:

```
sage: Executable(name="sh", executable="sh").is_present()
FeatureTestResult('sh', True)
```

absolute_filename()

The absolute path of the file as a string.

Concrete subclasses must override this abstract method.

absolute_path()

Deprecated alias for *absolute_filename()*.

Deprecated to make way for a method of this name returning a `Path`.

EXAMPLES:

```
sage: from sage.features import Executable
sage: Executable(name="sh", executable="sh").absolute_path()
doctest:warning...
DeprecationWarning: method absolute_path has been replaced by absolute_filename
See https://github.com/sagemath/sage/issues/31292 for details.
'/...bin/sh'
```

class sage.features.**PythonModule**(**args*, ***kwds*)

Bases: *Feature*

A *Feature* which describes whether a python module can be imported.

EXAMPLES:

Not all builds of python include the `ssl` module, so you could check whether it is available:

```
sage: from sage.features import PythonModule
sage: PythonModule("ssl").require()  # not tested - output depends on the python
↪build
```

class sage.features.**StaticFile**(**args*, ***kwds*)

Bases: *FileFeature*

A *Feature* which describes the presence of a certain file such as a database.

EXAMPLES:

```
sage: from sage.features import StaticFile
sage: StaticFile(name="no_such_file", filename="KaT1aihu", search_path=("/",), spkg=
↪"some_spkg", url="http://rand.om").require()  # optional - sage_spkg
Traceback (most recent call last):
...
FeatureNotPresentError: no_such_file is not available.
'KaT1aihu' not found in any of ['/']...
To install no_such_file...you can try to run...sage -i some_spkg...
Further installation instructions might be available at http://rand.om.
```

absolute_filename()

The absolute path of the file as a string.

EXAMPLES:

```
sage: from sage.features import StaticFile
sage: from sage.misc.temporary_file import tmp_dir
sage: dir_with_file = tmp_dir()
sage: file_path = os.path.join(dir_with_file, "file.txt")
sage: open(file_path, 'a').close() # make sure the file exists
sage: search_path = ( '/foo/bar', dir_with_file ) # file is somewhere in the
↪search path
sage: feature = StaticFile(name="file", filename="file.txt", search_path=search_
↪path)
sage: feature.absolute_filename() == file_path
True
```

A *FeatureNotPresentError* is raised if the file cannot be found:

```
sage: from sage.features import StaticFile
sage: StaticFile(name="no_such_file", filename="KaT1aihu",\
                 search_path=(), spkg="some_spkg",\
                 url="http://rand.om").absolute_filename()  # optional - sage_
↪spkg
Traceback (most recent call last):
...
FeatureNotPresentError: no_such_file is not available.
'KaT1aihu' not found in any of []...
To install no_such_file...you can try to run...sage -i some_spkg...
Further installation instructions might be available at http://rand.om.
```

class sage.features.**TrivialClasscallMetaClass**

Bases: type

A trivial version of sage.misc.classcall_metaclass.ClasscallMetaclass without Cython dependencies.

class sage.features.**TrivialUniqueRepresentation**(**args*, ***kwds*)

Bases: object

A trivial version of UniqueRepresentation without Cython dependencies.

sage.features.**package_systems**()

Return a list of *PackageSystem* objects representing the available package systems.

The list is ordered by decreasing preference.

EXAMPLES:

```
sage: from sage.features import package_systems
sage: package_systems()    # random
[Feature('homebrew'), Feature('sage_spkg'), Feature('pip')]
```

3.2 Join features

class sage.features.join_feature.**JoinFeature**(**args*, ***kwds*)

Bases: *Feature*

Join of several *Feature* instances.

This creates a new feature as the union of the given features. Typically these are executables of an SPKG. For an example, see *Rubiks*.

Furthermore, this can be the union of a single feature. This is used to map the given feature to a more convenient name to be used in optional tags of doctests. Thus you can equip a feature such as a *PythonModule* with a tag name that differs from the systematic tag name. As an example for this use case, see *Meataxe*.

EXAMPLES:

```
sage: from sage.features import Executable
sage: from sage.features.join_feature import JoinFeature
sage: F = JoinFeature("shell-boolean",
```

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```
....:                     (Executable('shell-true', 'true'),
....:                      Executable('shell-false', 'false')))
sage: F.is_present()
FeatureTestResult('shell-boolean', True)
sage: F = JoinFeature("asdfghjkl",
....:                     (Executable('shell-true', 'true'),
....:                      Executable('xxyyyy', 'xxyyyy-does-not-exist')))
sage: F.is_present()
FeatureTestResult('xxyyyy', False)
```

hide()

Hide this feature and all its joined features.

EXAMPLES:

```
sage: from sage.features.sagemath import sage__groups
sage: f = sage__groups()
sage: f.hide()
sage: f._features[0].is_present()
FeatureTestResult('sage.groups.perm_gps.permgroup', False)

sage: f.require()
Traceback (most recent call last):
...
FeatureNotPresentError: sage.groups is not available.
Feature `sage.groups` is hidden.
Use method `unhide` to make it available again.
```

is_functional()

Test whether the join feature is functional.

This method is deprecated. Use *Feature.is_present()* instead.

EXAMPLES:

```
sage: from sage.features.latte import Latte
sage: Latte().is_functional()  # optional - latte_int
doctest:warning...
DeprecationWarning: method JoinFeature.is_functional; use is_present instead
See https://github.com/sagemath/sage/issues/33114 for details.
FeatureTestResult('latte_int', True)
```

unhide()

Revert what *hide()* does.

EXAMPLES:

```
sage: from sage.features.sagemath import sage__groups
sage: f = sage__groups()
sage: f.hide()
sage: f.is_present()
FeatureTestResult('sage.groups', False)
sage: f._features[0].is_present()
FeatureTestResult('sage.groups.perm_gps.permgroup', False)
```

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```
sage: f.unhide()
sage: f.is_present()    # optional sage.groups
FeatureTestResult('sage.groups', True)
sage: f._features[0].is_present() # optional sage.groups
FeatureTestResult('sage.groups.perm_gps.permgroup', True)
```

3.3 Enumeration of all defined features

sage.features.all.**all_features**()

Return an iterable of all features.

EXAMPLES:

```
sage: from sage.features.all import all_features
sage: sorted(all_features(), key=lambda f: f.name)  # random
[...Feature('sage.combinat')...]
```

sage.features.all.**module_feature**(*module_name*)

Find a top-level Feature that provides the Python module of the given module_name.

Only features known to *all_features()* are considered.

INPUT:

- module_name – string

OUTPUT: a Feature or None.

EXAMPLES:

```
sage: from sage.features.all import module_feature
sage: module_feature('sage.combinat.tableau')                                 #␣
↪needs sage.combinat
Feature('sage.combinat')
sage: module_feature('sage.combinat.posets.poset')                            #␣
↪needs sage.graphs
Feature('sage.graphs')
sage: module_feature('sage.schemes.toric.variety')                            #␣
↪needs sage.geometry.polyhedron
Feature('sage.geometry.polyhedron')
sage: module_feature('scipy')                                                 #␣
↪needs scipy
Feature('scipy')
sage: print(module_feature('sage.structure.element'))
None
sage: print(module_feature('sage.does_not_exist'))
None
```

sage.features.all.**name_feature**(*name*, *toplevel=None*)

Find a top-level Feature that provides the top-level name.

Only features known to *all_features()* are considered.

INPUT:

- `name` – string
- `toplevel` – a module or other namespace

OUTPUT: a `Feature` or `None`.

EXAMPLES:

```
sage: from sage.features.all import name_feature
sage: name_feature('QuadraticField')                                    #␣
↪needs sage.rings.number_field
Feature('sage.rings.number_field')
sage: name_feature('line')                                              #␣
↪needs sage.plot
Feature('sage.plot')
sage: print(name_feature('ZZ'))
None
sage: print(name_feature('does_not_exist'))
None
```

3.4 Features for testing the presence of Python modules in the Sage library

All of these features are present in a monolithic installation of the Sage library, such as the one made by the SageMath distribution.

The features are defined for the purpose of separately testing modularized distributions such as *sagemath-categories* and *sagemath-repl*.

Often, doctests in a module of the Sage library illustrate the interplay with a range of different objects; this is a form of integration testing. These objects may come from modules shipped in other distributions. For example, `sage.structure.element` (shipped by *sagemath-objects*, one of the most fundamental distributions) contains the doctest:

```
sage: G = SymmetricGroup(4)                                             #␣
↪needs sage.groups
sage: g = G([2, 3, 4, 1])                                               #␣
↪needs sage.groups
sage: g.powers(4)                                                       #␣
↪needs sage.groups
[(), (1,2,3,4), (1,3)(2,4), (1,4,3,2)]
```

This test cannot pass when the distribution *sagemath-objects* is tested separately (in a virtual environment): In this situation, `SymmetricGroup` is not defined anywhere (and thus not present in the top-level namespace). Hence, we conditionalize this doctest on the presence of the feature *sage.groups*.

`sage.features.sagemath.`**`all_features`**`()`

Return features corresponding to parts of the Sage library.

These features are named after Python packages/modules (e.g., `sage.symbolic`), not distribution packages (**sagemath-symbolics**).

This design is motivated by a separation of concerns: The author of a module that depends on some functionality provided by a Python module usually already knows the name of the Python module, so we do not want to force the author to also know about the distribution package that provides the Python module.

Instead, we associate distribution packages to Python modules in *sage.features.sagemath* via the spkg parameter of *Feature*.

EXAMPLES:

```
sage: from sage.features.sagemath import all_features
sage: list(all_features())
[...Feature('sage.combinat'), ...]
```

class sage.features.sagemath.**sage__combinat**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of sage.combinat.

EXAMPLES:

Python modules that provide elementary combinatorial objects such as sage.combinat.subset, sage.combinat.composition, sage.combinat.permutation are always available; there is no need for an # optional/needs tag:

```
sage: Permutation([1,2,3]).is_even()
True
sage: Permutation([6,1,4,5,2,3]).bruhat_inversions()
[[0, 1], [0, 2], [0, 3], [2, 4], [2, 5], [3, 4], [3, 5]]
```

Use # needs sage.combinat for doctests that use any other Python modules from sage.combinat, for example sage.combinat.tableau_tuple:

```
sage: TableauTuple([[[7,8,9]],[],[[1,2,3],[4,5],[6]]]).shape()                    #␣
↪needs sage.combinat
([3], [], [3, 2, 1])
```

Doctests that use Python modules from sage.combinat that involve trees, graphs, hypergraphs, posets, quivers, combinatorial designs, finite state machines etc. should be marked # needs sage.combinat sage.graphs:

```
sage: L = Poset({0: [1], 1: [2], 2:[3], 3:[4]})                                   #␣
↪needs sage.combinat sage.graphs
sage: L.is_chain()                                                                 #␣
↪needs sage.combinat sage.graphs
True
```

Doctests that use combinatorial modules/algebras, or root systems should use the tag # needs sage.combinat sage.modules:

```
sage: # needs sage.combinat sage.modules
sage: A = SchurAlgebra(QQ, 2, 3)
sage: a = A.an_element(); a
2*S((1, 1, 1), (1, 1, 1)) + 2*S((1, 1, 1), (1, 1, 2))
 + 3*S((1, 1, 1), (1, 2, 2))
sage: L = RootSystem(['A',3,1]).root_lattice()
sage: PIR = L.positive_imaginary_roots(); PIR
Positive imaginary roots of type ['A', 3, 1]
```

Doctests that use lattices, semilattices, or Dynkin diagrams should use the tag # needs sage.combinat sage.graphs sage.modules:

```
sage: L = LatticePoset({0: [1,2], 1: [3], 2: [3,4], 3: [5], 4: [5]})          #␣
↪needs sage.combinat sage.graphs sage.modules
sage: L.meet_irreducibles()                                                    #␣
↪needs sage.combinat sage.graphs sage.modules
[1, 3, 4]
```

class sage.features.sagemath.**sage__geometry__polyhedron**(**args*, ***kwds*)

Bases: `JoinFeature`

A `Feature` describing the presence of `sage.geometry.polyhedron`.

EXAMPLES:

Doctests that use polyhedra, cones, geometric complexes, triangulations, etc. should use the tag `# needs sage.geometry.polyhedron`:

```
sage: co = polytopes.truncated_tetrahedron()                                   #␣
↪needs sage.geometry.polyhedron
sage: co.volume()                                                              #␣
↪needs sage.geometry.polyhedron
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```

Some constructions of polyhedra require additional tags:

```
sage: # needs sage.combinat sage.geometry.polyhedron sage.rings.number_field
sage: perm_a3_reg_nf = polytopes.generalized_permutahedron(
....:     ['A',3], regular=True, backend='number_field'); perm_a3_reg_nf
A 3-dimensional polyhedron in AA^3 defined as the convex hull of 24 vertices
```

class sage.features.sagemath.**sage__graphs**(**args*, ***kwds*)

Bases: `JoinFeature`

A `Feature` describing the presence of `sage.graphs`.

EXAMPLES:

Doctests that use anything from `sage.graphs` (`Graph`, `DiGraph`, ...) should be marked `# needs sage.graphs`. The same applies to any doctest that uses a `Poset`, cluster algebra quiver, finite state machines, abelian sandpiles, or Dynkin diagrams:

```
sage: g = graphs.PetersenGraph()                                               #␣
↪needs sage.graphs
sage: r, s = g.is_weakly_chordal(certificate=True); r                          #␣
↪needs sage.graphs
False
```

Also any use of tree classes defined in `sage.combinat` (`BinaryTree`, `RootedTree`, ...) in doctests should be marked the same.

By way of generalization, any use of `SimplicialComplex` or other abstract complexes from `sage.topology`, hypergraphs, and combinatorial designs, should be marked `# needs sage.graphs` as well:

```
sage: X = SimplicialComplex([[0,1,2], [1,2,3]])                                #␣
↪needs sage.graphs
sage: X.link(Simplex([0]))                                                     #␣
↪needs sage.graphs
```

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```
Simplicial complex with vertex set (1, 2) and facets {(1, 2)}

sage: IncidenceStructure([[1,2,3],[1,4]]).degrees(2)                          #␣
↪needs sage.graphs
{(1, 2): 1, (1, 3): 1, (1, 4): 1, (2, 3): 1, (2, 4): 0, (3, 4): 0}
```

On the other hand, matroids are not implemented as posets in Sage but are instead closely tied to linear algebra over fields; hence use `# needs sage.modules` instead:

```
sage: # needs sage.modules
sage: M = Matroid(Matrix(QQ, [[1, 0, 0, 0, 1, 1, 1],
....:                         [0, 1, 0, 1, 0, 1, 1],
....:                         [0, 0, 1, 1, 1, 0, 1]]))
sage: N = M / [2] \ [3, 4]
sage: sorted(N.groundset())
[0, 1, 5, 6]
```

However, many constructions (and some methods) of matroids do involve graphs:

```
sage: # needs sage.modules
sage: W = matroids.Wheel(3)     # despite the name, not created via graphs
sage: W.is_isomorphic(N)           # goes through a graph isomorphism test      #␣
↪needs sage.graphs
False
sage: K4 = matroids.CompleteGraphic(4)    # this one is created via graphs      #␣
↪needs sage.graphs
sage: K4.is_isomorphic(W)                                                      #␣
↪needs sage.graphs
True
```

class `sage.features.sagemath.`**`sage__groups`**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of `sage.groups`.

EXAMPLES:

Permutations and sets of permutations are always available, but permutation groups are implemented in Sage using the *GAP* system and require the tag `# needs sage.groups`:

```
sage: p = Permutation([2,1,4,3])
sage: p.to_permutation_group_element()                                         #␣
↪needs sage.groups
(1,2)(3,4)
```

class `sage.features.sagemath.`**`sage__libs__ecl`**(**args*, ***kwds*)

Bases: *PythonModule*

A *Feature* describing the presence of `sage.libs.ecl`.

EXAMPLES:

```
sage: from sage.features.sagemath import sage__libs__ecl
sage: sage__libs__ecl().is_present()                          # optional - sage.libs.
```

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```
↪ecl
FeatureTestResult('sage.libs.ecl', True)
```

class sage.features.sagemath.**sage__libs__flint**(**args*, ***kwds*)

Bases: *JoinFeature*

A *sage.features.Feature* describing the presence of `sage.libs.flint` and other modules depending on FLINT and arb.

In addition to the modularization purposes that this tag serves, it also provides attribution to the upstream project.

class sage.features.sagemath.**sage__libs__gap**(**args*, ***kwds*)

Bases: *JoinFeature*

A *sage.features.Feature* describing the presence of `sage.libs.gap` (the library interface to *GAP*) and `sage.interfaces.gap` (the pexpect interface to GAP). By design, we do not distinguish between these two, in order to facilitate the conversion of code from the pexpect interface to the library interface.

See also:

`Features for GAP packages`

class sage.features.sagemath.**sage__libs__ntl**(**args*, ***kwds*)

Bases: *JoinFeature*

A *sage.features.Feature* describing the presence of `sage.libs.ntl` and other modules depending on NTL and arb.

In addition to the modularization purposes that this tag serves, it also provides attribution to the upstream project.

class sage.features.sagemath.**sage__libs__pari**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of `sage.libs.pari`.

SageMath uses the *PARI* library (via *cypari2*) for numerous purposes. Doctests that involves such features should be marked `# needs sage.libs.pari`.

In addition to the modularization purposes that this tag serves, it also provides attribution to the upstream project.

EXAMPLES:

```
sage: R.<a> = QQ[]
sage: S.<x> = R[]
sage: f = x^2 + a; g = x^3 + a
sage: r = f.resultant(g); r                                            #␣
↪needs sage.libs.pari
a^3 + a^2
```

class sage.features.sagemath.**sage__libs__singular**(**args*, ***kwds*)

Bases: *JoinFeature*

A *sage.features.Feature* describing the presence of `sage.libs.singular` (the library interface to Singular) and `sage.interfaces.singular` (the pexpect interface to Singular). By design, we do not distinguish between these two, in order to facilitate the conversion of code from the pexpect interface to the library interface.

See also:

`Feature singular`

class sage.features.sagemath.**sage__modular**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of `sage.modular`.

class sage.features.sagemath.**sage__modules**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of `sage.modules`.

EXAMPLES:

All uses of implementations of vector spaces / free modules in SageMath, whether `sage.modules.free_module.FreeModule`, `sage.combinat.free_module.CombinatorialFreeModule`, `sage.tensor.modules.finite_rank_free_module.FiniteRankFreeModule`, or additive abelian groups, should be marked `# needs sage.modules`.

The same holds for matrices, tensors, algebras, quadratic forms, point lattices, root systems, matrix/affine/Weyl/Coxeter groups, matroids, and ring derivations.

Likewise, all uses of `sage.coding`, `sage.crypto`, and `sage.homology` in doctests should be marked `# needs sage.modules`.

class sage.features.sagemath.**sage__numerical__mip**(**args*, ***kwds*)

Bases: *PythonModule*

A *Feature* describing the presence of `sage.numerical.mip`.

class sage.features.sagemath.**sage__plot**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of `sage.plot`.

class sage.features.sagemath.**sage__rings__complex_double**(**args*, ***kwds*)

Bases: *PythonModule*

A *Feature* describing the presence of `sage.rings.complex_double`.

class sage.features.sagemath.**sage__rings__finite_rings**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of `sage.rings.finite_rings`; specifically, the element implementations using the *PARI* library.

class sage.features.sagemath.**sage__rings__function_field**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of `sage.rings.function_field`.

EXAMPLES:

Rational function fields are always available:

```
sage: K.<x> = FunctionField(QQ)
sage: K.maximal_order()
Maximal order of Rational function field in x over Rational Field
```

Use the tag `# needs sage.rings.function_field` whenever extensions of function fields (by adjoining a root of a univariate polynomial) come into play:

```
sage: R.<y> = K[]
sage: L.<y> = K.extension(y^5 - (x^3 + 2*x*y + 1/x)); L                   #␣
↪needs sage.rings.function_field
Function field in y defined by y^5 - 2*x*y + (-x^4 - 1)/x
```

Such extensions of function fields are implemented using Gröbner bases of polynomial rings; Sage makes essential use of the *Singular* system for this. (It is not necessary to use the tag `# needs sage.libs.singular`; it is implied by `# needs sage.rings.function_field`.)

class sage.features.sagemath.**sage__rings__number_field**(**args*, ***kwds*)

Bases: `JoinFeature`

A `Feature` describing the presence of `sage.rings.number_field`.

Number fields are implemented in Sage using a complicated mixture of various libraries, including *arb*, *FLINT*, *GAP*, *MPFI*, *NTL*, and *PARI*.

EXAMPLES:

Rational numbers are, of course, always available:

```
sage: QQ in NumberFields()
True
```

Doctests that construct algebraic number fields should be marked `# needs sage.rings.number_field`:

```
sage: # needs sage.rings.number_field
sage: K.<cuberoot2> = NumberField(x^3 - 2)
sage: L.<cuberoot3> = K.extension(x^3 - 3)
sage: S.<sqrt2> = L.extension(x^2 - 2); S
Number Field in sqrt2 with defining polynomial x^2 - 2 over its base field

sage: # needs sage.rings.number_field
sage: K.<zeta> = CyclotomicField(15)
sage: CC(zeta)
0.913545457642601 + 0.406736643075800*I
```

Doctests that make use of the algebraic field `QQbar`, the algebraic real field `AA`, or the universal cyclotomic field should be marked likewise:

```
sage: # needs sage.rings.number_field
sage: AA(-1)^(1/3)
-1
sage: QQbar(-1)^(1/3)
0.500000000000000? + 0.866025403784439?*I

sage: # needs sage.rings.number_field
sage: UCF = UniversalCyclotomicField(); UCF
Universal Cyclotomic Field
sage: E = UCF.gen
sage: f = E(2) + E(3); f
2*E(3) + E(3)^2
sage: f.galois_conjugates()
[2*E(3) + E(3)^2, E(3) + 2*E(3)^2]
```

class sage.features.sagemath.**sage__rings__padics**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of sage.rings.padics.

class sage.features.sagemath.**sage__rings__polynomial__pbori**(**args*, ***kwds*)

Bases: *JoinFeature*

A *sage.features.Feature* describing the presence of sage.rings.polynomial.pbori.

class sage.features.sagemath.**sage__rings__real_double**(**args*, ***kwds*)

Bases: *PythonModule*

A *Feature* describing the presence of sage.rings.real_double.

EXAMPLES:

The Real Double Field is basically always available, and no # optional/needs tag is needed:

```
sage: RDF.characteristic()
0
```

The feature exists for use in doctests of Python modules that are shipped by the most fundamental distributions.

class sage.features.sagemath.**sage__rings__real_mpfr**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of sage.rings.real_mpfr.

class sage.features.sagemath.**sage__sat**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of sage.sat.

class sage.features.sagemath.**sage__schemes**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of sage.schemes.

class sage.features.sagemath.**sage__symbolic**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of sage.symbolic.

EXAMPLES:

The symbolics subsystem of Sage will be provided by the distribution sagemath-symbolics, in preparation at github issue #35095. If it is not installed, Sage will be able to provide installation advice:

```
sage: from sage.features.sagemath import sage__symbolic
sage: print(sage__symbolic().resolution())                          #␣
↪optional - sage_spkg, not tested
...To install sagemath_symbolics...you can try to run...
pip install sagemath-symbolics
...
```

class sage.features.sagemath.**sagemath_doc_html**(**args*, ***kwds*)

Bases: *StaticFile*

A *Feature* which describes the presence of the documentation of the Sage library in HTML format.

Developers often use `make build` instead of `make` to avoid the long time it takes to compile the documentation. Although commands such as `make ptest` build the documentation before testing, other test commands such as `make ptestlong-nodoc` or `./sage -t --all` do not.

All doctests that refer to the built documentation need to be marked `# needs sagemath_doc_html`.

3.5 Features for testing the presence of package systems `sage_spkg`, `conda`, `pip`, `debian`, `fedora` etc.

class sage.features.pkg_systems.**PackageSystem**(**args*, ***kwds*)

Bases: *Feature*

A *Feature* describing a system package manager.

EXAMPLES:

```
sage: from sage.features.pkg_systems import PackageSystem
sage: PackageSystem('conda')
Feature('conda')
```

spkg_installation_hint(*spkgs*, *prompt*, *feature*)

Return a string that explains how to install `feature`.

EXAMPLES:

```
sage: from sage.features.pkg_systems import PackageSystem
sage: homebrew = PackageSystem('homebrew')
sage: homebrew.spkg_installation_hint('openblas')  # optional - SAGE_ROOT
'To install openblas using the homebrew package manager, you can try to run:\n!
↪brew install openblas'
```

class sage.features.pkg_systems.**PipPackageSystem**(**args*, ***kwds*)

Bases: *PackageSystem*

A *Feature* describing the Pip package manager.

EXAMPLES:

```
sage: from sage.features.pkg_systems import PipPackageSystem
sage: PipPackageSystem()
Feature('pip')
```

class sage.features.pkg_systems.**SagePackageSystem**(**args*, ***kwds*)

Bases: *PackageSystem*

A *Feature* describing the package manager of the SageMath distribution.

EXAMPLES:

```
sage: from sage.features.pkg_systems import SagePackageSystem
sage: SagePackageSystem()
Feature('sage_spkg')
```

3.6 Features for testing the presence of `bliss`

class sage.features.bliss.**Bliss**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* which describes whether the `sage.graphs.bliss` module is available in this installation of Sage.

EXAMPLES:

```
sage: from sage.features.bliss import Bliss
sage: Bliss().require()  # optional - bliss
```

class sage.features.bliss.**BlissLibrary**(**args*, ***kwds*)

Bases: *CythonFeature*

A *Feature* which describes whether the *Bliss library* is present and functional.

EXAMPLES:

```
sage: from sage.features.bliss import BlissLibrary
sage: BlissLibrary().require()  # optional - libbliss
```

sage.features.bliss.**all_features**()

3.7 Feature for testing the presence of `csdp`

class sage.features.csdp.**CSDP**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* which checks for the `theta` binary of *CSDP*.

EXAMPLES:

```
sage: from sage.features.csdp import CSDP
sage: CSDP().is_present()  # optional - csdp
FeatureTestResult('csdp', True)
```

is_functional()

Check whether `theta` works on a trivial example.

EXAMPLES:

```
sage: from sage.features.csdp import CSDP
sage: CSDP().is_functional()  # optional - csdp
FeatureTestResult('csdp', True)
```

sage.features.csdp.**all_features**()

3.8 Features for testing the presence of various databases

class sage.features.databases.**DatabaseConwayPolynomials**(**args*, ***kwds*)

Bases: *StaticFile*

A *Feature* which describes the presence of *Frank Luebeck's database of Conway polynomials*.

EXAMPLES:

```
sage: from sage.features.databases import DatabaseConwayPolynomials
sage: DatabaseConwayPolynomials().is_present()
FeatureTestResult('conway_polynomials', True)
```

class sage.features.databases.**DatabaseCremona**(**args*, ***kwds*)

Bases: *StaticFile*

A *Feature* which describes the presence of *John Cremona's database of elliptic curves*.

INPUT:

- name – either 'cremona' (the default) for the full large database or 'cremona_mini' for the small database.

EXAMPLES:

```
sage: from sage.features.databases import DatabaseCremona
sage: DatabaseCremona('cremona_mini').is_present()
FeatureTestResult('database_cremona_mini_ellcurve', True)
sage: DatabaseCremona().is_present()                                    # optional -
↪ database_cremona_ellcurve
FeatureTestResult('database_cremona_ellcurve', True)
```

class sage.features.databases.**DatabaseCubicHecke**(**args*, ***kwds*)

Bases: *PythonModule*

A *Feature* which describes the presence of the *Cubic Hecke algebra database package*.

The home of this database is the web-page Cubic Hecke algebra on 4 strands of Ivan Marin.

EXAMPLES:

```
sage: from sage.features.databases import DatabaseCubicHecke
sage: DatabaseCubicHecke().is_present()  # optional - database_cubic_hecke
FeatureTestResult('database_cubic_hecke', True)
```

class sage.features.databases.**DatabaseJones**(**args*, ***kwds*)

Bases: *StaticFile*

A *Feature* which describes the presence of *John Jones's tables of number fields*.

EXAMPLES:

```
sage: from sage.features.databases import DatabaseJones
sage: bool(DatabaseJones().is_present())  # optional - database_jones_numfield
True
```

class sage.features.databases.**DatabaseKnotInfo**(**args*, ***kwds*)

Bases: *PythonModule*

A *Feature* which describes the presence of the *package providing the KnotInfo and LinkInfo databases*.

The homes of these databases are the web-pages KnotInfo and LinkInfo.

EXAMPLES:

```
sage: from sage.features.databases import DatabaseKnotInfo
sage: DatabaseKnotInfo().is_present()  # optional - database_knotinfo
FeatureTestResult('database_knotinfo', True)
```

class sage.features.databases.**DatabaseReflexivePolytopes**(**args*, ***kwds*)

Bases: *StaticFile*

A *Feature* which describes the presence of the *PALP databases of reflexive three-dimensional* and *four-dimensional lattice polytopes*.

EXAMPLES:

```
sage: from sage.features.databases import DatabaseReflexivePolytopes
sage: bool(DatabaseReflexivePolytopes().is_present())
↪# optional - polytopes_db
True
sage: bool(DatabaseReflexivePolytopes('polytopes_db_4d', 'Hodge4d').is_present())
↪# optional - polytopes_db_4d
True
```

sage.features.databases.**all_features**()

3.9 Feature for testing the presence of dvipng

sage.features.dvipng.**all_features**()

class sage.features.dvipng.**dvipng**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of dvipng

EXAMPLES:

```
sage: from sage.features.dvipng import dvipng
sage: dvipng().is_present()             # optional - dvipng
FeatureTestResult('dvipng', True)
```

3.10 Feature for testing the presence of `ffmpeg`

class sage.features.ffmpeg.**FFmpeg**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of *ffmpeg*.

EXAMPLES:

```
sage: from sage.features.ffmpeg import FFmpeg
sage: FFmpeg().is_present()  # optional - ffmpeg
FeatureTestResult('ffmpeg', True)
```

is_functional()

Return whether command `ffmpeg` in the path is functional.

EXAMPLES:

```
sage: from sage.features.ffmpeg import FFmpeg
sage: FFmpeg().is_functional()   # optional - ffmpeg
FeatureTestResult('ffmpeg', True)
```

sage.features.ffmpeg.**all_features**()

3.11 Features for testing the presence of `4ti2`

class sage.features.four_ti_2.**FourTi2**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of all *4ti2* executables.

EXAMPLES:

```
sage: from sage.features.four_ti_2 import FourTi2
sage: FourTi2().is_present()  # optional - 4ti2
FeatureTestResult('4ti2', True)
```

class sage.features.four_ti_2.**FourTi2Executable**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* for the *4ti2* executables.

sage.features.four_ti_2.**all_features**()

3.12 Features for testing the presence of the SageMath interfaces to gap and of GAP packages

class `sage.features.gap.`**`GapPackage`**(**args*, ***kwds*)

Bases: *Feature*

A *Feature* describing the presence of a GAP package.

See also:

`Feature sage.libs.gap`

EXAMPLES:

```
sage: from sage.features.gap import GapPackage
sage: GapPackage("grape", spkg="gap_packages")
Feature('gap_package_grape')
```

`sage.features.gap.`**`all_features`**()

3.13 Features for testing the presence of graph generator programs benzene, buckygen, plantri

class `sage.features.graph_generators.`**`Benzene`**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* which checks for the *benzene* binary.

EXAMPLES:

```
sage: from sage.features.graph_generators import Benzene
sage: Benzene().is_present()  # optional - benzene
FeatureTestResult('benzene', True)
```

`is_functional`()

Check whether `benzene` works on trivial input.

EXAMPLES:

```
sage: from sage.features.graph_generators import Benzene
sage: Benzene().is_functional()  # optional - benzene
FeatureTestResult('benzene', True)
```

class `sage.features.graph_generators.`**`Buckygen`**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* which checks for the *buckygen* binary.

EXAMPLES:

```
sage: from sage.features.graph_generators import Buckygen
sage: Buckygen().is_present()  # optional - buckygen
FeatureTestResult('buckygen', True)
```

is_functional()

Check whether `buckygen` works on trivial input.

EXAMPLES:

```
sage: from sage.features.graph_generators import Buckygen
sage: Buckygen().is_functional()  # optional - buckygen
FeatureTestResult('buckygen', True)
```

class sage.features.graph_generators.**Plantri**(**args*, ***kwds*)

Bases: `Executable`

A `Feature` which checks for the *plantri* binary.

EXAMPLES:

```
sage: from sage.features.graph_generators import Plantri
sage: Plantri().is_present()  # optional - plantri
FeatureTestResult('plantri', True)
```

is_functional()

Check whether `plantri` works on trivial input.

EXAMPLES:

```
sage: from sage.features.graph_generators import Plantri
sage: Plantri().is_functional()  # optional - plantri
FeatureTestResult('plantri', True)
```

sage.features.graph_generators.**all_features**()

3.14 Features for testing the presence of `graphviz`

class sage.features.graphviz.**Graphviz**(**args*, ***kwds*)

Bases: `JoinFeature`

A `Feature` describing the presence of the `dot`, `neato`, and `twopi` executables from the *graphviz* package.

EXAMPLES:

```
sage: from sage.features.graphviz import Graphviz
sage: Graphviz().is_present()  # optional - graphviz
FeatureTestResult('graphviz', True)
```

sage.features.graphviz.**all_features**()

class sage.features.graphviz.**dot**(**args*, ***kwds*)

Bases: `Executable`

A `Feature` describing the presence of `dot`.

class sage.features.graphviz.**neato**(**args*, ***kwds*)

Bases: `Executable`

A `Feature` describing the presence of `neato`.

class sage.features.graphviz.**twopi**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of `twopi`.

3.15 Feature for testing the presence of `imagemagick`

Currently we only check for the presence of `convert`. When needed, other commands like `magick`, `magick-script`, `convert`, `mogrify`, `identify`, `composite`, `montage`, `compare`, etc. could be also checked in this module.

class sage.features.imagemagick.**Convert**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of `convert`.

EXAMPLES:

```
sage: from sage.features.imagemagick import Convert
sage: Convert().is_present()  # optional - imagemagick
FeatureTestResult('convert', True)
```

is_functional()

Return whether command `convert` in the path is functional.

EXAMPLES:

```
sage: from sage.features.imagemagick import Convert
sage: Convert().is_functional()   # optional - imagemagick
FeatureTestResult('convert', True)
```

class sage.features.imagemagick.**ImageMagick**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of *ImageMagick*

Currently, only the availability of the `convert` program is checked.

EXAMPLES:

```
sage: from sage.features.imagemagick import ImageMagick
sage: ImageMagick().is_present()  # optional - imagemagick
FeatureTestResult('imagemagick', True)
```

sage.features.imagemagick.**all_features**()

3.16 Features for testing whether interpreter interfaces to `magma`, `maple`, `mathematica` etc. are functional

class sage.features.interfaces.**InterfaceFeature**(**args*, ***kwds*)

Bases: *Feature*

A *Feature* describing whether an `Interface` is present and functional.

class sage.features.interfaces.**Macaulay2**(**args*, ***kwds*)

Bases: *InterfaceFeature*

A *Feature* describing whether sage.interfaces.macaulay2.Macaulay2 is present and functional.

EXAMPLES:

```
sage: from sage.features.interfaces import Macaulay2
sage: Macaulay2().is_present()  # random
FeatureTestResult('macaulay2', False)
```

class sage.features.interfaces.**Magma**(**args*, ***kwds*)

Bases: *InterfaceFeature*

A *Feature* describing whether sage.interfaces.magma.Magma is present and functional.

EXAMPLES:

```
sage: from sage.features.interfaces import Magma
sage: Magma().is_present()  # random
FeatureTestResult('magma', False)
```

class sage.features.interfaces.**Maple**(**args*, ***kwds*)

Bases: *InterfaceFeature*

A *Feature* describing whether sage.interfaces.maple.Maple is present and functional.

EXAMPLES:

```
sage: from sage.features.interfaces import Maple
sage: Maple().is_present()  # random
FeatureTestResult('maple', False)
```

class sage.features.interfaces.**Mathematica**(**args*, ***kwds*)

Bases: *InterfaceFeature*

A *Feature* describing whether sage.interfaces.mathematica.Mathematica is present and functional.

EXAMPLES:

```
sage: from sage.features.interfaces import Mathematica
sage: Mathematica().is_present()  # not tested
FeatureTestResult('mathematica', False)
```

class sage.features.interfaces.**Matlab**(**args*, ***kwds*)

Bases: *InterfaceFeature*

A *Feature* describing whether sage.interfaces.matlab.Matlab is present and functional.

EXAMPLES:

```
sage: from sage.features.interfaces import Matlab
sage: Matlab().is_present()  # random
FeatureTestResult('matlab', False)
```

class sage.features.interfaces.**Octave**(**args*, ***kwds*)

Bases: *InterfaceFeature*

A *Feature* describing whether sage.interfaces.octave.Octave is present and functional.

EXAMPLES:

```
sage: from sage.features.interfaces import Octave
sage: Octave().is_present()  # random
FeatureTestResult('octave', False)
```

class sage.features.interfaces.**Scilab**(**args*, ***kwds*)

Bases: *InterfaceFeature*

A *Feature* describing whether sage.interfaces.scilab.Scilab is present and functional.

EXAMPLES:

```
sage: from sage.features.interfaces import Scilab
sage: Scilab().is_present()  # random
FeatureTestResult('scilab', False)
```

sage.features.interfaces.**all_features**()

Return features corresponding to interpreter interfaces.

EXAMPLES:

```
sage: from sage.features.interfaces import all_features
sage: list(all_features())
[Feature('magma'),
 Feature('matlab'),
 Feature('mathematica'),
 Feature('maple'),
 Feature('macaulay2'),
 Feature('octave'),
 Feature('scilab')]
```

3.17 Feature for testing if the Internet is available

class sage.features.internet.**Internet**(**args*, ***kwds*)

Bases: *Feature*

A *Feature* describing if Internet is available.

Failure of connecting to the site "https://www.sagemath.org" within a second is regarded as internet being not available.

EXAMPLES:

```
sage: from sage.features.internet import Internet
sage: Internet()
Feature('internet')
```

sage.features.internet.**all_features**()

3.18 Feature for testing the presence of kenzo

class sage.features.kenzo.**Kenzo**(**args*, ***kwds*)

Bases: *Feature*

A *Feature* describing the presence of *Kenzo*.

EXAMPLES:

```
sage: from sage.features.kenzo import Kenzo
sage: Kenzo().is_present()  # optional - kenzo
FeatureTestResult('kenzo', True)
```

sage.features.kenzo.**all_features**()

3.19 Features for testing the presence of latex and equivalent programs

class sage.features.latex.**LaTeX**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of `latex`

EXAMPLES:

```
sage: from sage.features.latex import latex
sage: latex().is_present()             # optional - latex
FeatureTestResult('latex', True)
```

is_functional()

Return whether `latex` in the path is functional.

EXAMPLES:

```
sage: from sage.features.latex import latex
sage: latex().is_functional()             # optional - latex
FeatureTestResult('latex', True)
```

When the feature is not functional, more information on the reason can be obtained as follows:

```
sage: result = latex().is_functional()    # not tested
sage: print(result.reason)                # not tested
Running latex on a sample file
(with command='latex -interaction=nonstopmode tmp_wmpos8ak.tex')
returned non-zero exit status='1' with stderr=''
and stdout='This is pdfTeX,
...
Runaway argument?
{document
! File ended while scanning use of \end.
...
No pages of output.
Transcript written on tmp_wmpos8ak.log.'
```

class sage.features.latex.**LaTeXPackage**(**args*, ***kwds*)

Bases: *TeXFile*

A *sage.features.Feature* describing the presence of a LaTeX package (`.sty` file).

EXAMPLES:

```
sage: from sage.features.latex import LaTeXPackage
sage: LaTeXPackage('graphics').is_present()  # optional - latex
FeatureTestResult('latex_package_graphics', True)
```

class sage.features.latex.**TeXFile**(**args*, ***kwds*)

Bases: *StaticFile*

A *sage.features.Feature* describing the presence of a TeX file

EXAMPLES:

```
sage: from sage.features.latex import TeXFile
sage: TeXFile('x', 'x.tex').is_present()  # optional - latex
FeatureTestResult('x', True)
```

absolute_filename()

The absolute path of the file.

EXAMPLES:

```
sage: from sage.features.latex import TeXFile
sage: feature = TeXFile('latex_class_article', 'article.cls')
sage: feature.absolute_filename()  # optional - latex
'.../latex/base/article.cls'
```

sage.features.latex.**all_features**()

class sage.features.latex.**dvips**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of `dvips`

EXAMPLES:

```
sage: from sage.features.latex import dvips
sage: dvips().is_present()             # optional - dvips
FeatureTestResult('dvips', True)
```

class sage.features.latex.**latex**(**args*, ***kwds*)

Bases: *LaTeX*

A *Feature* describing the presence of `latex`

EXAMPLES:

```
sage: from sage.features.latex import latex
sage: latex().is_present()             # optional - latex
FeatureTestResult('latex', True)
```

class sage.features.latex.**lualatex**(**args*, ***kwds*)

Bases: *LaTeX*

A *Feature* describing the presence of `lualatex`

EXAMPLES:

```
sage: from sage.features.latex import lualatex
sage: lualatex().is_present()             # optional - lualatex
FeatureTestResult('lualatex', True)
```

class sage.features.latex.**pdflatex**(**args*, ***kwds*)

Bases: *LaTeX*

A *Feature* describing the presence of `pdflatex`

EXAMPLES:

```
sage: from sage.features.latex import pdflatex
sage: pdflatex().is_present()             # optional - pdflatex
FeatureTestResult('pdflatex', True)
```

class sage.features.latex.**xelatex**(**args*, ***kwds*)

Bases: *LaTeX*

A *Feature* describing the presence of `xelatex`

EXAMPLES:

```
sage: from sage.features.latex import xelatex
sage: xelatex().is_present()             # optional - xelatex
FeatureTestResult('xelatex', True)
```

3.20 Features for testing the presence of `latte_int`

class sage.features.latte.**Latte**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of excecutables from *LattE integrale*.

EXAMPLES:

```
sage: from sage.features.latte import Latte
sage: Latte().is_present()  # optional - latte_int
FeatureTestResult('latte_int', True)
```

class sage.features.latte.**Latte_count**(**args*, ***kwds*)

Bases: *Executable*

Feature for the executable `count` from *LattE integrale*.

class sage.features.latte.**Latte_integrate**(**args*, ***kwds*)

Bases: *Executable*

Feature for the executable `integrate` from *LattE integrale*.

sage.features.latte.**all_features**()

3.21 Feature for testing the presence of lrslib

class sage.features.lrs.**Lrs**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of the lrs binary which comes as a part of lrslib.

EXAMPLES:

```
sage: from sage.features.lrs import Lrs
sage: Lrs().is_present()  # optional - lrslib
FeatureTestResult('lrs', True)
```

is_functional()

Test whether lrs works on a trivial input.

EXAMPLES:

```
sage: from sage.features.lrs import Lrs
sage: Lrs().is_functional()  # optional - lrslib
FeatureTestResult('lrs', True)
```

class sage.features.lrs.**LrsNash**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of the lrsnash binary which comes as a part of lrslib.

EXAMPLES:

```
sage: from sage.features.lrs import LrsNash
sage: LrsNash().is_present()  # optional - lrslib
FeatureTestResult('lrsnash', True)
```

is_functional()

Test whether lrsnash works on a trivial input.

EXAMPLES:

```
sage: from sage.features.lrs import LrsNash
sage: LrsNash().is_functional()  # optional - lrslib
FeatureTestResult('lrsnash', True)
```

class sage.features.lrs.**Lrslib**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of the executables *lrs* and *lrsnash* provided by the *lrslib* package.

EXAMPLES:

```
sage: from sage.features.lrs import Lrslib
sage: Lrslib().is_present()  # optional - lrslib
FeatureTestResult('lrslib', True)
```

sage.features.lrs.**all_features**()

3.22 Features for testing the presence of mcqd

class sage.features.mcqd.**Mcqd**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of the mcqd module, which is the SageMath interface to the *mcqd* library

EXAMPLES:

```
sage: from sage.features.mcqd import Mcqd
sage: Mcqd().is_present()  # optional - mcqd
FeatureTestResult('mcqd', True)
```

sage.features.mcqd.**all_features**()

3.23 Feature for testing the presence of meataxe

class sage.features.meataxe.**Meataxe**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of the Sage modules that depend on the *meataxe* library.

EXAMPLES:

```
sage: from sage.features.meataxe import Meataxe
sage: Meataxe().is_present()  # optional - meataxe
FeatureTestResult('meataxe', True)
```

sage.features.meataxe.**all_features**()

3.24 Features for testing the presence of MixedIntegerLinearProgram backends

class sage.features.mip_backends.**COIN**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing whether the MixedIntegerLinearProgram backend COIN is available.

class sage.features.mip_backends.**CPLEX**(**args*, ***kwds*)

Bases: *MIPBackend*

A *Feature* describing whether the MixedIntegerLinearProgram backend CPLEX is available.

class sage.features.mip_backends.**CVXOPT**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing whether the MixedIntegerLinearProgram backend CVXOPT is available.

class sage.features.mip_backends.**Gurobi**(**args*, ***kwds*)

Bases: *MIPBackend*

A *Feature* describing whether the MixedIntegerLinearProgram backend Gurobi is available.

class sage.features.mip_backends.**MIPBackend**(**args*, ***kwds*)

Bases: *Feature*

A *Feature* describing whether a MixedIntegerLinearProgram backend is available.

sage.features.mip_backends.**all_features**()

3.25 Feature for testing the presence of pynormaliz

class sage.features.normaliz.**PyNormaliz**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of the Python package *PyNormaliz*.

EXAMPLES:

```
sage: from sage.features.normaliz import PyNormaliz
sage: PyNormaliz().is_present()                      # optional - pynormaliz
FeatureTestResult('pynormaliz', True)
```

sage.features.normaliz.**all_features**()

3.26 Feature for testing the presence of pandoc

class sage.features.pandoc.**Pandoc**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of *pandoc*.

EXAMPLES:

```
sage: from sage.features.pandoc import Pandoc
sage: Pandoc().is_present()  # optional - pandoc
FeatureTestResult('pandoc', True)
```

sage.features.pandoc.**all_features**()

3.27 Feature for testing the presence of pdf2svg

sage.features.pdf2svg.**all_features**()

class sage.features.pdf2svg.**pdf2svg**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of *pdf2svg*.

EXAMPLES:

```
sage: from sage.features.pdf2svg import pdf2svg
sage: pdf2svg().is_present()             # optional - pdf2svg
FeatureTestResult('pdf2svg', True)
```

3.28 Feature for testing the presence of `jupymake`, the Python interface to polymake

class sage.features.polymake.**JuPyMake**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of the *JuPyMake* module, a Python interface to the *polymake* library.

EXAMPLES:

```
sage: from sage.features.polymake import JuPyMake
sage: JuPyMake().is_present()  # optional - jupymake
FeatureTestResult('jupymake', True)
```

sage.features.polymake.**all_features**()

3.29 Features for testing the presence of `rubiks`

class sage.features.rubiks.**Rubiks**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of the *cu2*, *cubex*, *dikcube*, *mcube*, *optimal*, and *size222* programs from the *rubiks* package.

EXAMPLES:

```
sage: from sage.features.rubiks import Rubiks
sage: Rubiks().is_present()  # optional - rubiks
FeatureTestResult('rubiks', True)
```

sage.features.rubiks.**all_features**()

class sage.features.rubiks.**cu2**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of `cu2`.

EXAMPLES:

```
sage: from sage.features.rubiks import cu2
sage: cu2().is_present()  # optional - rubiks
FeatureTestResult('cu2', True)
```

class sage.features.rubiks.**cubex**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of `cubex`.

EXAMPLES:

```
sage: from sage.features.rubiks import cubex
sage: cubex().is_present()  # optional - rubiks
FeatureTestResult('cubex', True)
```

class sage.features.rubiks.**dikcube**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of dikcube.

EXAMPLES:

```
sage: from sage.features.rubiks import dikcube
sage: dikcube().is_present()  # optional - rubiks
FeatureTestResult('dikcube', True)
```

class sage.features.rubiks.**mcube**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of mcube.

EXAMPLES:

```
sage: from sage.features.rubiks import mcube
sage: mcube().is_present()  # optional - rubiks
FeatureTestResult('mcube', True)
```

class sage.features.rubiks.**optimal**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of optimal.

EXAMPLES:

```
sage: from sage.features.rubiks import optimal
sage: optimal().is_present()  # optional - rubiks
FeatureTestResult('optimal', True)
```

class sage.features.rubiks.**size222**(**args*, ***kwds*)

Bases: *Executable*

A *Feature* describing the presence of size222.

EXAMPLES:

```
sage: from sage.features.rubiks import size222
sage: size222().is_present()  # optional - rubiks
FeatureTestResult('size222', True)
```

3.30 Features for testing the presence of tdlib

class sage.features.tdlib.**Tdlib**(**args*, ***kwds*)

Bases: *JoinFeature*

A *Feature* describing the presence of the SageMath interface to the *tdlib* library.

sage.features.tdlib.**all_features**()

CHAPTER

FOUR

DISTRIBUTION PACKAGES OF THE SAGE LIBRARY

- *sagemath_bliss: Graph (iso/auto)morphisms with bliss*
- *sagemath_categories: Sage categories and basic rings*
- *sagemath_coxeter3: Coxeter groups, Bruhat ordering, Kazhdan-Lusztig polynomials with coxeter3*
- *sagemath_doc_html: SageMath documentation in HTML format*
- *sagemath_doc_pdf: SageMath documentation in PDF format*
- *sagemath_environment: System and software environment*
- *sagemath_mcqd: Finding maximum cliques with mcqd*
- *sagemath_meataxe: Matrices over small finite fields with meataxe*
- *sagemath_objects: Sage objects, elements, parents, categories, coercion, metaclasses*
- *sagemath_repl: IPython kernel, Sage preparser, doctester*
- *sagemath_sirocco: Certified root continuation with sirocco*
- *sagemath_tdlib: Tree decompositions with tdlib*

CHAPTER

FIVE

EXPERIMENTAL PACKAGES

Some packages that provide additional functionality are marked as “experimental”. Developers are needed in order to improve the integration of these packages into the Sage distribution.

- *awali: Computation of/with finite state machines*
- *barvinok: Projections of integer point sets of parametric polytopes*
- *cocoalib: Computations in commutative algebra*
- *deformation: Count points on hypersurfaces using the deformation method*
- *gambit: Computations on finite, noncooperative games*
- *gap3: A minimal distribution of GAP 3 containing packages that have no equivalent in GAP 4*
- *gdb: The GNU Project debugger*
- *libtheora: Library for the Theora video codec*
- *lie: Library for the representation theory of complex semisimple Lie groups and algebras*
- *modular_decomposition: A modular decomposition algorithm*
- *polylib: Operations on unions of polyhedra*
- *qepcad: Quantifier elimination by partial cylindrical algebraic decomposition*
- *r_jupyter: Jupyter kernel for R*
- *surf: Visualization of algebraic curves, algebraic surfaces and hyperplane sections of surfaces*
- *symengine_py: Python wrappers for SymEngine*
- *valgrind: Memory error detector, call graph generator, runtime profiler*

CHAPTER

SIX

ALL EXTERNAL PACKAGES

6.1 Details of external packages

Packages are in alphabetical order.

6.1.1 4ti2: Algebraic, geometric and combinatorial problems on linear spaces

Description

A software package for algebraic, geometric and combinatorial problems on linear spaces. Available at https://4ti2.github.io/.

License

4ti2 is released under a GPL v2 license.

Upstream Contact

- https://4ti2.github.io/
- Raymond Hemmecke, TU Munich, Germany
- Matthias Köppe, UC Davis, CA, USA

Type

optional

Dependencies

- *zlib: Data compression library*
- $(MP_LIBRARY)
- *glpk: GNU Linear Programming Kit*

Version Information

package-version.txt:

```
1.6.10
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  4ti2
```

conda:

```
$ conda install  4ti2
```

cygwin:

```
$ apt-cyg install lib4ti2_0 lib4ti2-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  4ti2
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  4ti2
```

freebsd:

```
$ sudo pkg install math/4ti2
```

gentoo:

```
$ sudo emerge sci-mathematics/4ti2
```

opensuse:

```
$ sudo zypper install 4ti2 4ti2-devel
```

See https://repology.org/project/4ti2/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.2 _bootstrap: Represents system packages required for running the top-level bootstrap script

Description

This optional script package represents the requirements (system packages) that are needed in addition to those represented by the `_prereq` package in order to run the top-level `bootstrap` script.

Type

optional

Dependencies

Version Information

Equivalent System Packages

arch:

```
$ sudo pacman -S  autoconf automake libtool pkg-config
```

conda:

```
$ conda install  autoconf automake libtool pkg-config
```

cygwin:

```
$ apt-cyg install autoconf automake libtool
```

Debian/Ubuntu:

```
$ sudo apt-get install  autoconf automake libtool pkg-config
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  autoconf automake libtool pkg-config
```

freebsd:

```
$ sudo pkg install autoconf automake libtool pkg-config
```

gentoo:

```
$ sudo emerge sys-devel/autoconf sys-devel/automake sys-devel/libtool
```

homebrew:

```
$ brew install autoconf automake libtool pkg-config
```

nix:

```
$ nix-env --install autoconf automake libtool pkg-config
```

opensuse:

```
$ sudo zypper install autoconf automake libtool pkgconfig
```

slackware:

```
$ sudo slackpkg install autoconf automake libtool pkg-config
```

void:

```
$ sudo xbps-install  autoconf automake libtool xtools mk-configure pkg-config
```

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.3 _develop: Represents system packages recommended for development

Description

Script package representing a list of system packages recommended for developers.

Type

optional

Dependencies

- *_bootstrap: Represents system packages required for running the top-level bootstrap script*
- *git: Version control system*
- *pytest: Simple powerful testing with Python*
- *pytest_xdist: pytest xdist plugin for distributed testing and loop-on-failing modes*
- *github_cli: Command-line interface for GitHub*

Version Information

Equivalent System Packages

alpine: install the following packages: gnupg-gpgconf openssh-client

arch:

```
$ sudo pacman -S  gnupg openssh
```

conda:

```
$ conda install  openssh pycodestyle esbonio
```

cygwin:

```
$ apt-cyg install gnupg2
```

Debian/Ubuntu:

```
$ sudo apt-get install  gpgconf openssh-client
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gnupg2 openssh
```

freebsd:

```
$ sudo pkg install security/gnupg security/openssh-portable
```

gentoo:

```
$ sudo emerge app-crypt/gnupg net-misc/openssh
```

homebrew:

```
$ brew install gnupg
```

macports: install the following packages: gnupg2

nix:

```
$ nix-env --install gnupg openssh
```

opensuse:

```
$ sudo zypper install gpg2 openssh
```

slackware:

```
$ sudo slackpkg install gnupg2 openssh
```

void:

```
$ sudo xbps-install  gnupg2 openssh
```

See https://repology.org/project/gnupg/versions, https://repology.org/project/openssh/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.4 _prereq: Represents system packages required for installing SageMath from source

Description

This dummy package represents the minimal requirements (system packages) for installing SageMath from source.

In addition to standard POSIX utilities and the bash shell, the following standard command-line development tools must be installed on your computer:

- **make**: GNU make, version 3.80 or later. Version 3.82 or later is recommended.
- **m4**: GNU m4 1.4.2 or later (non-GNU or older versions might also work).
- **perl**: version 5.8.0 or later.
- **ar** and **ranlib**: can be obtained as part of GNU binutils.
- **tar**: GNU tar version 1.17 or later, or BSD tar (as provided on macOS).
- **python**: Python 3.4 or later, or Python 2.7. (This range of versions is a minimal requirement for internal purposes of the SageMath build system, which is referred to as `sage-bootstrap-python`.)

Other versions of these may work, but they are untested.

On macOS, suitable versions of all of these tools are provided by the Xcode Command Line Tools. To install them, open a terminal window and run `xcode-select --install`; then click "Install" in the pop-up window. If the Xcode Command Line Tools are already installed, you may want to check if they need to be updated by typing `softwareupdate -l`.

On Linux, `ar` and `ranlib` are in the binutils package. The other programs are usually located in packages with their respective names.

On Redhat-derived systems not all perl components are installed by default and you might have to install the `perl-ExtUtils-MakeMaker` package.

To check if you have the above prerequisites installed, for example `perl`, type:

```
$ command -v perl
```

or:

```
$ which perl
```

on the command line. If it gives an error (or returns nothing), then either `perl` is not installed, or it is installed but not in your PATH.

Type

standard

Dependencies

Version Information

Equivalent System Packages

arch:

```
$ sudo pacman -S  binutils make m4 perl python tar bc gcc which
```

conda:

```
$ conda install  compilers make m4 perl python tar bc
```

cygwin:

```
$ apt-cyg install binutils make m4 python39-urllib3 python39 perl perl-ExtUtils-
↪MakeMaker tar gcc-core gcc-g++ findutils which libcrypt-devel libiconv-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  binutils make m4 perl python3 tar bc gcc g++ ca-certificates
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  binutils make m4 python3 perl perl-ExtUtils-MakeMaker tar gcc gcc-
↪c++ findutils which diffutils perl-IPC-Cmd
```

freebsd:

```
$ sudo pkg install gmake automake bash dash python
```

gentoo:

```
$ sudo emerge sys-devel/binutils sys-libs/binutils-libs sys-devel/make dev-scheme/guile␣
↪dev-libs/libffi app-arch/tar sys-devel/gcc dev-libs/mpc sys-libs/glibc sys-kernel/
↪linux-headers dev-lang/perl sys-devel/m4 sys-devel/bc dev-lang/python sys-devel/flex␣
↪app-misc/ca-certificates dev-libs/libxml2 sys-apps/findutils sys-apps/which sys-apps/
↪diffutils
```

homebrew:

nix:

```
$ nix-env --install binutils gnumake gnum4 perl python3 gnutar bc gcc bash
```

opensuse:

```
$ sudo zypper install binutils make m4 perl python3 tar bc which glibc-locale-base gcc␣
↪gcc-c++ ca-certificates gzip findutils diffutils
```

slackware:

```
$ sudo slackpkg install binutils make guile gc libffi "gcc-[0-9]" gcc-11 gcc-g++ gcc-g++-
↪11 libmpc glibc kernel-headers perl m4 bc python-2.7 python3 flex ca-certificates␣
↪libxml2 cyrus-sasl
```

void:

```
$ sudo xbps-install  bc binutils gcc libgomp-devel m4 make perl python3 tar which
```

If the system package is installed, ./configure will check whether it can be used.

6.1.5 _recommended: Represents system packages recommended for additional functionality

Description

Script package representing a list of system packages recommended to be installed for additional functionality.

Type

optional

Dependencies

- *pandoc: A document converter*
- *ffmpeg: ffmpeg video converter*
- *ImageMagick: A collection of tools and libraries for many image file formats*
- *texlive: A comprehensive TeX system*
- *git: Version control system*

Version Information

Equivalent System Packages

Debian/Ubuntu:

```
$ sudo apt-get install  default-jdk libavdevice-dev
```

homebrew:

```
$ brew install texinfo
```

macports: install the following packages: texinfo

If the system package is installed, ./configure will check whether it can be used.

6.1.6 _sagemath: Downstream package of Sage in distributions

SageMath is available from various distributions and can be installed by package managers.

This dummy package records the names of the system packages that should be installed to provide a standard installation of SageMath, including documentation and Jupyter.

Downstream Contact

See Trac wiki page Distribution

Type

optional

Dependencies

Version Information

Equivalent System Packages

arch:

```
$ sudo pacman -S  sagemath sagemath-doc
```

conda:

```
$ conda install  sage
```

Debian/Ubuntu:

```
$ sudo apt-get install  sagemath sagemath-doc-en sagemath-jupyter
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  sagemath
```

freebsd:

```
$ sudo pkg install math/sage
```

homebrew:

```
$ brew install sage
```

nix:

```
$ nix-env --install sage
```

void:

```
$ sudo xbps-install  sagemath
```

See https://repology.org/project/sagemath/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.7 admcycles: Computation in the tautological ring of the moduli space of curves

Description

The SageMath package admcycles offers the possibility to compute in the tautological ring of the Deligne-Mumford compactification of the moduli space of curves. Construction for standard generators are provided (psi, kappa and lambda classes) as well as more advanced algebraic construction (double ramification cycle, strata of differentials).

License

GPLv2+

Upstream Contact

https://pypi.org/project/admcycles/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
admcycles
```

Equivalent System Packages

(none known)

6.1.8 alabaster: Default theme for the Sphinx documentation system

Description

Alabaster is a visually (c)lean, responsive, configurable theme for the Sphinx documentation system. It is Python 2+3 compatible.

It began as a third-party theme, and is still maintained separately, but as of Sphinx 1.3, Alabaster is an install-time dependency of Sphinx and is selected as the default theme.

Live examples of this theme can be seen on paramiko.org, fabfile.org and pyinvoke.org.

Upstream Contact

https://alabaster.readthedocs.io/en/latest/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.7.12
```

install-requires.txt:

```
alabaster >=0.7.12
```

Equivalent System Packages

conda:

```
$ conda install  alabaster
```

opensuse:

```
$ sudo zypper install python3-alabaster
```

void:

```
$ sudo xbps-install  python3-alabaster
```

See https://repology.org/project/alabaster/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.9 antic: Algebraic Number Theory In C

Description

Algebraic Number Theory In C

License

LGPL 2.1

Upstream Contact

https://github.com/wbhart/antic

Type

optional

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *flint: Fast Library for Number Theory*

Version Information

package-version.txt:

```
0.2.5
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  antic
```

conda:

```
$ conda install  antic
```

Debian/Ubuntu:

```
$ sudo apt-get install  libantic-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  antic-devel
```

freebsd:

```
$ sudo pkg install math/antic
```

opensuse:

```
$ sudo zypper install antic-devel
```

See https://repology.org/project/antic/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.10 appdirs: A small Python module for determining appropriate platform-specific dirs, e.g. a "user data dir".

Description

A small Python module for determining appropriate platform-specific dirs, e.g. a "user data dir".

License

MIT

Upstream Contact

https://pypi.org/project/appdirs/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.4.4
```

install-requires.txt:

```
appdirs
```

Equivalent System Packages

conda:

```
$ conda install  appdirs
```

void:

```
$ sudo xbps-install  python3-appdirs
```

If the system package is installed, ./configure will check whether it can be used.

6.1.11 appnope: Disable App Nap on macOS >= 10.9

Description

Disable App Nap on macOS >= 10.9

License

BSD

Upstream Contact

https://pypi.org/project/appnope/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.1.3
```

install-requires.txt:

```
appnope >=0.1.0
```

Equivalent System Packages

conda:

```
$ conda install  appnope
```

macports: install the following packages: py-appnope

See https://repology.org/project/python:appnope/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.12 arb: Arbitrary-precision floating-point ball arithmetic

Description

Arb is a C library for arbitrary-precision floating-point ball arithmetic, developed by Fredrik Johansson (fredrik.johansson@gmail.com). It supports efficient high-precision computation with polynomials, power series, matrices and special functions over the real and complex numbers, with automatic, rigorous error control.

License

GNU General Public License v2+

Upstream Contact

- Fredrik Johansson: fredrik.johansson@gmail.com
- https://arblib.org/
- http://github.com/fredrik-johansson/arb/

Type

standard

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *flint: Fast Library for Number Theory*

Version Information

package-version.txt:

```
2.22.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  arb
```

conda:

```
$ conda install  arb
```

Debian/Ubuntu:

```
$ sudo apt-get install  libflint-arb-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  arb arb-devel
```

freebsd:

```
$ sudo pkg install math/arb
```

gentoo:

```
$ sudo emerge sci-mathematics/arb
```

homebrew:

```
$ brew install arb
```

nix:

```
$ nix-env --install arb
```

opensuse:

```
$ sudo zypper install arb-devel
```

void:

```
$ sudo xbps-install  arb-devel
```

See https://repology.org/project/arb-fp/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.13 argon2_cffi: The secure Argon2 password hashing algorithm

Description

The secure Argon2 password hashing algorithm.

License

MIT

Upstream Contact

https://pypi.org/project/argon2-cffi/

Type

standard

Dependencies

- $(PYTHON)
- *argon2_cffi_bindings: Low-level CFFI bindings for Argon2*
- $(PYTHON_TOOLCHAIN)
- *flit_core: Distribution-building parts of Flit. See flit package for more information*

Version Information

package-version.txt:

```
21.3.0
```

install-requires.txt:

```
argon2-cffi
```

Equivalent System Packages

conda:

```
$ conda install  argon2-cffi
```

macports: install the following packages: py-argon2-cffi

void:

```
$ sudo xbps-install  python3-argon2
```

See https://repology.org/project/argon2-cffi/versions, https://repology.org/project/python:argon2-cffi/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.14 argon2_cffi_bindings: Low-level CFFI bindings for Argon2

Description

Low-level CFFI bindings for Argon2

License

MIT

Upstream Contact

https://pypi.org/project/argon2-cffi-bindings/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *cffi: Foreign Function Interface for Python calling C code*
- *setuptools_scm: Python build system extension to obtain package version from version control*

Version Information

package-version.txt:

```
21.2.0
```

install-requires.txt:

```
argon2-cffi-bindings
```

Equivalent System Packages

(none known)

6.1.15 asttokens: Annotate AST trees with source code positions

Description

Annotate AST trees with source code positions

License

Apache 2.0

Upstream Contact

https://pypi.org/project/asttokens/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.1.0
```

install-requires.txt:

```
asttokens
```

Equivalent System Packages

conda:

```
$ conda install  asttokens
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.16 attrs: Decorator for Python classes with attributes

Description

attrs is the Python package that will bring back the joy of writing classes by relieving you from the drudgery of implementing object protocols (aka dunder methods).

License

MIT License

Upstream Contact

Home page: https://www.attrs.org

Type

standard

Dependencies

- $(PYTHON)
- *vcversioner: Python build system extension to obtain package version from version control*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
22.1.0
```

install-requires.txt:

```
attrs >=19.3.0
```

Equivalent System Packages

conda:

```
$ conda install  attrs
```

macports: install the following packages: py-attrs

void:

```
$ sudo xbps-install  python3-attrs
```

See https://repology.org/project/python:attrs/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.17 auditwheel_or_delocate: Repair wheels on Linux or macOS

Description

This package represents `auditwheel` on Linux and `delocate` on macOS.

(Actually, we install `delocate` also on Linux because our script `make -j list-broken-packages` uses a small subroutine of `delocate` even on Linux.)

License

MIT

BSD 2-clause

Upstream Contact

https://pypi.org/project/auditwheel/

https://pypi.org/project/delocate/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
delocate
auditwheel; sys_platform != 'darwin'
```

Equivalent System Packages

(none known)

6.1.18 awali: Computation of/with finite state machines

Description

Awali is a software platform dedicated to the computation of, and with, finite state machines. Here finite state machines is to be understood in the broadest possible sense: finite automata with output — often called transducers then — or even more generally finite automata with multiplicity, that is, automata that not only accept, or recognize, sequences of symbols but compute for every such sequence a 'value' that is associated with it and which can be taken in any semiring. Hence the variety of situations that can thus be modellized.

License

- GPL 3.0

Upstream Contact

- Website: http://vaucanson-project.org/Awali/index.html
- Releases: http://files.vaucanson-project.org/tarballs/

Dependencies

- graphviz must be installed from your distro, and available in the path.

Type

experimental

Dependencies

- $(PYTHON)
- *cmake: A cross-platform build system generator*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *nbconvert: Converting Jupyter Notebooks*
- *ncurses: Classic terminal output library*

Version Information

package-version.txt:

```
1.0.2-190218
```

Equivalent System Packages

See https://repology.org/project/awali/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.19 babel: Internationalization utilities for Python

Description

A collection of tools for internationalizing Python applications.

Upstream Contact

http://babel.pocoo.org/en/latest/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *pytz: Timezone definitions for Python*

Version Information

package-version.txt:

```
2.11.0
```

install-requires.txt:

```
babel >=2.6.0
```

Equivalent System Packages

conda:

```
$ conda install  babel
```

macports: install the following packages: py-babel

opensuse:

```
$ sudo zypper install python3-Babel
```

void:

```
$ sudo xbps-install  python3-Babel
```

See https://repology.org/project/python:babel/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.20 backcall: Specifications for callback functions

Description

Specifications for callback functions passed in to an API

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *flit_core: Distribution-building parts of Flit. See flit package for more information*
- *tomli: A lil' TOML parser*

Version Information

package-version.txt:

```
0.2.0
```

install-requires.txt:

```
backcall >=0.1.0
```

Equivalent System Packages

conda:

```
$ conda install  backcall
```

macports: install the following packages: py-backcall

void:

```
$ sudo xbps-install  python3-backcall
```

See https://repology.org/project/python:backcall/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.21 backports_zoneinfo: Backport of the standard library zoneinfo module

Description

Backport of the standard library zoneinfo module for Python 3.8

License

Apache-2.0

Upstream Contact

https://pypi.org/project/backports.zoneinfo/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.2.1
```

install-requires.txt:

```
backports.zoneinfo
```

Equivalent System Packages

conda:

```
$ conda install  backports.zoneinfo
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.22 barvinok: Projections of integer point sets of parametric polytopes

Description

barvinok is a library for counting the number of integer points in parametric and non-parametric polytopes as well as projections of such sets.

License

GPL v2

Upstream Contact

- https://sourceforge.net/projects/barvinok/
- https://groups.google.com/group/isl-development

Type

experimental

Dependencies

- *ntl: A library for doing number theory*
- *isl: Sets and relations of integer points bounded by affine constraints*
- *polylib: Operations on unions of polyhedra*

Version Information

package-version.txt:

```
0.41.7
```

Equivalent System Packages

freebsd:

```
$ sudo pkg install math/barvinok
```

opensuse:

```
$ sudo zypper install barvinok "pkgconfig(barvinok)"
```

See https://repology.org/project/barvinok/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.23 beautifulsoup4: Screen-scraping library

Description

Screen-scraping library

License

MIT

Upstream Contact

https://pypi.org/project/beautifulsoup4/

Type

standard

Dependencies

- $(PYTHON)
- *soupsieve: A modern CSS selector implementation for Beautiful Soup.*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
4.11.1
```

install-requires.txt:

```
beautifulsoup4
```

Equivalent System Packages

conda:

```
$ conda install  beautifulsoup4
```

macports: install the following packages: py-beautifulsoup4

void:

```
$ sudo xbps-install  python3-BeautifulSoup4
```

See https://repology.org/project/python:beautifulsoup4/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.24 beniget: Extract semantic information about static Python code

Description

Extract semantic information about static Python code

License

BSD 3-Clause

Upstream Contact

https://pypi.org/project/beniget/

Type

standard

Dependencies

- $(PYTHON)
- *gast: Python AST that abstracts the underlying Python version*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.4.1
```

install-requires.txt:

```
beniget
```

Equivalent System Packages

conda:

```
$ conda install  beniget
```

void:

```
$ sudo xbps-install  python3-beniget
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.25 benzene: Generate fusenes and benzenoids with a given number of faces

Description

Benzene is a program for the efficient generation of all nonisomorphic fusenes and benzenoids with a given number of faces. Fusenes are planar polycyclic hydrocarbons with all bounded faces hexagons. Benzenoids are fusenes that are subgraphs of the hexagonal lattice.

License

Benzene is licensed under the GNU General Public License v2 or later (June 2007)

Upstream Contact

Benzene was written by Gunnar Brinkmann and Gilles Caporossi. This version was adapted by Gunnar Brinkmann and Nico Van Cleemput for Grinvin.

http://www.grinvin.org/

Type

optional

Dependencies

Version Information

package-version.txt:

```
20130630
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  benzene
```

opensuse:

```
$ sudo zypper install benzene
```

See https://repology.org/project/benzene/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.26 biopython: Tools for computational molecular biology

Description

Freely available tools for computational molecular biology.

License

Upstream Contact

https://pypi.org/project/biopython/

http://biopython.org/

Type

optional

Dependencies

Version Information

requirements.txt:

```
biopython
```

Equivalent System Packages

conda:

```
$ conda install  biopython
```

macports: install the following packages: py-biopython

See https://repology.org/project/biopython/versions, https://repology.org/project/python:biopython/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.27 bleach: An HTML-sanitizing tool

Description

An easy safelist-based HTML-sanitizing tool.

License

Apache License v2

Upstream Contact

Home Page: https://github.com/mozilla/bleach

Type

standard

Dependencies

- $(PYTHON)
- *packaging: Core utilities for Python packages*
- *six: Python 2 and 3 compatibility utilities*
- *webencodings: Character encoding aliases for legacy web content*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
5.0.1
```

install-requires.txt:

```
bleach >=3.1.5
```

Equivalent System Packages

conda:

```
$ conda install  bleach
```

macports: install the following packages: py-bleach

void:

```
$ sudo xbps-install  python3-bleach
```

See https://repology.org/project/python:bleach/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.28 bliss: Computing automorphism groups and canonical forms of graphs

Description

bliss is an open source tool for computing automorphism groups and canonical forms of graphs.

License

LGPL3

Upstream Contact

Bliss is currently being maintained by Tommi Junttila at

https://users.aalto.fi/~tjunttil/bliss/index.html

Bliss used to be maintained by Tommi Junttila and Petteri Kaski up to version 0.73 at

http://www.tcs.tkk.fi/Software/bliss/index.html

Dependencies

None

Type

optional

Dependencies

- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
0.77
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  bliss
```

conda:

```
$ conda install  bliss
```

gentoo:

```
$ sudo emerge sci-libs/bliss
```

opensuse:

```
$ sudo zypper install bliss bliss-devel
```

See https://repology.org/project/bliss-graphs/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.29 boost_cropped: Portable C++ libraries (subset needed for Sage)

Description

Boost provides free peer-reviewed portable C++ source libraries.

We emphasize libraries that work well with the C++ Standard Library. Boost libraries are intended to be widely useful, and usable across a broad spectrum of applications. The Boost license encourages both commercial and non-commercial use.

We aim to establish "existing practice" and provide reference implementations so that Boost libraries are suitable for eventual standardization. Ten Boost libraries are already included in the C++ Standards Committee's Library Technical Report (TR1) and will be in the new C++0x Standard now being finalized. C++0x will also include several more Boost libraries in addition to those from TR1. More Boost libraries are proposed for TR2.

License

Boost Software License - see http://www.boost.org/users/license.html

Upstream Contact

Website: http://www.boost.org/

See mailing list page at http://www.boost.org/community/groups.html

Type

standard

Dependencies

Version Information

package-version.txt:

```
1.66.0.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  boost
```

conda:

```
$ conda install  boost-cpp
```

cygwin:

```
$ apt-cyg install libboost-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libboost-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  boost-devel
```

freebsd:

```
$ sudo pkg install devel/boost-libs
```

homebrew:

```
$ brew install boost
```

macports: install the following packages: boost

nix:

```
$ nix-env --install boost
```

opensuse:

```
$ sudo zypper install boost-devel
```

slackware:

```
$ sudo slackpkg install boost
```

void:

```
$ sudo xbps-install  boost-devel
```

See https://repology.org/project/boost/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.30 brial: Boolean Ring Algebra implementation using binary decision diagrams

Description

BRiAl ("Boolean Ring Algebra") is the successor to PolyBoRi.

The core of PolyBoRi is a C++ library, which provides high-level data types for Boolean polynomials and monomials, exponent vectors, as well as for the underlying polynomial rings and subsets of the powerset of the Boolean variables. As a unique approach, binary decision diagrams are used as internal storage type for polynomial structures. On top of this C++-library we provide a Python interface. This allows parsing of complex polynomial systems, as well as sophisticated and extendable strategies for Gröbner base computation. PolyBoRi features a powerful reference implementation for Gröbner basis computation.

License

GPL version 2 or later

Upstream Contact

https://github.com/BRiAl/BRiAl

Type

standard

Dependencies

- *boost_cropped: Portable C++ libraries (subset needed for Sage)*
- *m4ri: fast arithmetic with dense matrices over GF(2)*
- *libpng: Bitmap image support*
- *pkgconf: An implementation of the pkg-config spec*

Version Information

package-version.txt:

```
1.2.8
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  brial
```

conda:

```
$ conda install  brial
```

Debian/Ubuntu:

```
$ sudo apt-get install  libbrial-dev libbrial-groebner-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  brial brial-devel
```

freebsd:

```
$ sudo pkg install math/brial
```

gentoo:

```
$ sudo emerge sci-libs/brial
```

nix:

```
$ nix-env --install brial
```

opensuse:

```
$ sudo zypper install brial-devel
```

void:

```
$ sudo xbps-install  brial-devel
```

See https://repology.org/project/brial/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.31 buckygen: Efficient generation of nonisomorphic fullerenes

Description

Buckygen is a program for the efficient generation of all nonisomorphic fullerenes. These are triangulations where all vertices have degree 5 or 6. Or if the dual representation is used: cubic plane graphs where all faces are pentagons or hexagons.

License

Buckygen is licensed under the GNU General Public License v3 (June 2007)

Upstream Contact

Buckygen was mainly written by Jan Goedgebeur, jan.goedgebeur[at]ugent.be.

http://caagt.ugent.be/buckygen/

Type

optional

Dependencies

Version Information

package-version.txt:

```
1.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  buckygen
```

opensuse:

```
$ sudo zypper install buckygen
```

See https://repology.org/project/buckygen/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.32 bzip2: High-quality data compressor

Description

bzip2 is a freely available, patent free, high-quality data compressor.

It typically compresses files to within 10% to 15% of the best available techniques (the PPM family of statistical compressors), whilst being around twice as fast at compression and six times faster at decompression.

License

BSD-style

Upstream Contact

- Website http://bzip.org/
- Author: Julian Seward <julian@bzip.org>

Special Update/Build Instructions

This package must not be bzip2 compressed, so create it using

```
tar c bzip2-1.0.6 | gzip --best >bzip2-1.0.6.spkg
```

The build system has been autotoolized based on a patch by the Suse folk at http://ftp.uni-kl.de/pub/linux/suse/people/sbrabec/bzip2/for_downstream/bzip2-1.0.6-autoconfiscated.patch

See patches/autotools and spkg-src for details.

Type

standard

Dependencies

- *pkgconf: An implementation of the pkg-config spec*

Version Information

package-version.txt:

```
1.0.6-20150304.p0
```

Equivalent System Packages

conda:

```
$ conda install  bzip2
```

cygwin:

```
$ apt-cyg install bzip2 libbz2-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libbz2-dev bzip2
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  bzip2 bzip2-devel
```

homebrew:

```
$ brew install bzip2
```

opensuse:

```
$ sudo zypper install bzip2 "pkgconfig(bzip2)"
```

slackware:

```
$ sudo slackpkg install bzip2
```

void:

```
$ sudo xbps-install  bzip2-devel
```

See https://repology.org/project/bzip2/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.33 cbc: COIN-OR branch and cut solver for mixed-integer programs

Description

The Computational Infrastructure for Operations Research (COIN-OR**, or simply COIN) project is an initiative to spur the development of open-source software for the operations research community.

The COIN Branch and Cut solver (CBC) is an open-source mixed-integer program (MIP) solver written in C++. CBC is intended to be used primarily as a callable library to create customized branch-and-cut solvers. A basic, stand-alone executable version is also available.

License

Eclipse Public License, Version 1.0 (EPL-1.0) (http://opensource.org/licenses/eclipse-1.0)

Upstream Contact

- https://github.com/coin-or/Cbc

Type

optional

Dependencies

- *readline: Command line editing library*
- *zlib: Data compression library*
- *bzip2: High-quality data compressor*
- $(BLAS)

Version Information

package-version.txt:

```
2.9.4.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  coin-or-cbc
```

conda:

```
$ conda install  coincbc
```

Debian/Ubuntu:

```
$ sudo apt-get install  coinor-cbc coinor-libcbc-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  coin-or-Cbc coin-or-Cbc-devel
```

freebsd:

```
$ sudo pkg install math/cbc
```

gentoo:

```
$ sudo emerge sci-libs/coinor-cbc
```

homebrew:

```
$ brew install cbc
```

nix:

```
$ nix-env --install cbc
```

void:

```
$ sudo xbps-install  CoinMP-devel
```

See https://repology.org/project/coin-or-cbc/versions, https://repology.org/project/cbc/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.34 ccache: A compiler cache

Description

ccache is a compiler cache. It speeds up recompilation by caching previous compilations and detecting when the same compilation is being done again. Supported languages are C, C++, Objective-C and Objective-C++.

License

GNU General Public License version 3 or later

Upstream Contact

- Author: Andrew Tridgell
- Website: http://ccache.samba.org/

Type

optional

Dependencies

- *zlib: Data compression library*

Version Information

package-version.txt:

```
3.3.4
```

Equivalent System Packages

conda:

```
$ conda install  ccache
```

homebrew:

```
$ brew install ccache
```

macports: install the following packages: ccache

opensuse:

```
$ sudo zypper install ccache
```

void:

```
$ sudo xbps-install  ccache
```

See https://repology.org/project/ccache/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.35 cddlib: Double description method for polyhedral representation conversion

Description

The C-library cddlib is a C implementation of the Double Description Method of Motzkin et al. for generating all vertices (i.e. extreme points) and extreme rays of a general convex polyhedron in R^d given by a system of linear inequalities:

P = { x=(x1, . . . , xd)^T : b - A x >= 0 }

where A is a given m x d real matrix, b is a given m-vector and 0 is the m-vector of all zeros.

The program can be used for the reverse operation (i.e. convex hull computation). This means that one can move back and forth between an inequality representation and a generator (i.e. vertex and ray) representation of a polyhedron with cdd. Also, cdd can solve a linear programming problem, i.e. a problem of maximizing and minimizing a linear function over P.

License

GPL v2

Upstream Contact

https://github.com/cddlib/cddlib

Type

standard

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
0.94m
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  cddlib
```

conda:

```
$ conda install  cddlib
```

cygwin:

```
$ apt-cyg install cddlib-devel cddlib-tools
```

Debian/Ubuntu:

```
$ sudo apt-get install  libcdd-dev libcdd-tools
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  cddlib
```

freebsd:

```
$ sudo pkg install math/cddlib
```

gentoo:

```
$ sudo emerge sci-libs/cddlib
```

homebrew:

```
$ brew install cddlib
```

macports: install the following packages: cddlib

nix:

```
$ nix-env --install cddlib
```

opensuse:

```
$ sudo zypper install cddlib-tools "pkgconfig(cddlib)"
```

void:

```
$ sudo xbps-install  cddlib-devel
```

See https://repology.org/project/cddlib/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.36 certifi: Python package for providing Mozilla's CA Bundle

Description

Python package for providing Mozilla's CA Bundle.

License

ISC

Upstream Contact

Home page: https://pypi.python.org/pypi/certifi

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2022.9.24
```

install-requires.txt:

```
certifi >=2020.6.20
```

Equivalent System Packages

conda:

```
$ conda install  certifi
```

macports: install the following packages: py-certifi

opensuse:

```
$ sudo zypper install python3-certifi
```

void:

```
$ sudo xbps-install  python3-certifi
```

See https://repology.org/project/python:certifi/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.37 cffi: Foreign Function Interface for Python calling C code

Description

development website: https://foss.heptapod.net/pypy/cffi

documentation website: https://cffi.readthedocs.io/en/latest/

PyPI page: https://pypi.org/project/cffi/

License

MIT

Upstream Contact

https://foss.heptapod.net/pypy/cffi

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *pycparser: Parser of the C language in Python*

Version Information

package-version.txt:

```
1.15.1
```

install-requires.txt:

```
cffi >=1.14.0
```

Equivalent System Packages

conda:

```
$ conda install  cffi
```

macports: install the following packages: py-cffi

opensuse:

```
$ sudo zypper install python3-cffi
```

void:

```
$ sudo xbps-install  python3-cffi
```

See https://repology.org/project/python:cffi/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.38 charset_normalizer: The Real First Universal Charset Detector. Open, modern and actively maintained alternative to Chardet.

Description

The Real First Universal Charset Detector. Open, modern and actively maintained alternative to Chardet.

License

MIT

Upstream Contact

https://pypi.org/project/charset-normalizer/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.1.1
```

install-requires.txt:

```
charset-normalizer
```

Equivalent System Packages

conda:

```
$ conda install  charset-normalizer
```

void:

```
$ sudo xbps-install  python3-charset-normalizer
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.39 cliquer: Routines for clique searching

Description

Cliquer is a set of C routines for finding cliques in an arbitrary weighted graph. It uses an exact branch-and-bound algorithm developed by Patric Östergård.

License

GNU General Public License v2

Upstream Contact

Cliquer was mainly written by Sampo Niskanen, sampo.niskanenQiki.fi (Q=@).

https://users.aalto.fi/~pat/cliquer.html

Patches

- minor config updates (v1.22)
- autotoolized - see https://github.com/dimpase/autocliquer (v1.21)

Type

standard

Dependencies

Version Information

package-version.txt:

```
1.22
```

Equivalent System Packages

conda:

```
$ conda install  cliquer
```

Debian/Ubuntu:

```
$ sudo apt-get install  cliquer libcliquer-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  cliquer cliquer-devel
```

freebsd:

```
$ sudo pkg install math/cliquer
```

gentoo:

```
$ sudo emerge sci-mathematics/cliquer
```

nix:

```
$ nix-env --install cliquer
```

opensuse:

```
$ sudo zypper install cliquer cliquer-devel
```

void:

```
$ sudo xbps-install  cliquer-devel
```

See https://repology.org/project/cliquer/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.40 cmake: A cross-platform build system generator

Description

The "cmake" executable is the CMake command-line interface. It may be used to configure projects in scripts. Project configuration settings may be specified on the command line with the -D option. The -i option will cause cmake to interactively prompt for such settings.

CMake is a cross-platform build system generator. Projects specify their build process with platform-independent CMake listfiles included in each directory of a source tree with the name CMakeLists.txt. Users build a project by using CMake to generate a build system for a native tool on their platform.

License

CMake is distributed under the OSI-approved BSD 3-clause License.

Upstream Contact

- https://cmake.org/
- cmake-developers@cmake.org

Type

standard

Dependencies

- *curl: Multiprotocol data transfer library and utility*
- *zlib: Data compression library*
- *bzip2: High-quality data compressor*
- *liblzma: General-purpose data compression software*

Version Information

package-version.txt:

```
3.24.3
```

Equivalent System Packages

alpine: install the following packages: cmake

arch:

```
$ sudo pacman -S  cmake
```

conda:

```
$ conda install  cmake
```

cygwin:

```
$ apt-cyg install cmake
```

Debian/Ubuntu:

```
$ sudo apt-get install  cmake
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  cmake
```

freebsd:

```
$ sudo pkg install devel/cmake
```

gentoo:

```
$ sudo emerge dev-util/cmake
```

homebrew:

```
$ brew install cmake
```

macports: install the following packages: cmake

nix:

```
$ nix-env --install cmake
```

opensuse:

```
$ sudo zypper install cmake
```

slackware:

```
$ sudo slackpkg install cmake
```

void:

```
$ sudo xbps-install  cmake
```

See https://repology.org/project/cmake/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.41 cocoalib: Computations in commutative algebra

Description

CoCoA is a program to compute with numbers and polynomials.

License

- GPL v3

Upstream Contact

- Authors: http://cocoa.dima.unige.it/research/
- Email: cocoa@dima.unige.it
- Website: http://cocoa.dima.unige.it/
- Releases: http://cocoa.dima.unige.it/cocoalib/

Type

experimental

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
0.99564
```

Equivalent System Packages

freebsd:

```
$ sudo pkg install math/cocoalib
```

See https://repology.org/project/cocoalib/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.42 combinatorial_designs: Data from the Handbook of Combinatorial Designs

Description

Data for Combinatorial Designs. Current content:

- The table of MOLS (10 000 integers) from the Handbook of Combinatorial Designs, 2ed.

License

Public domain.

Upstream Contact

None

Type

standard

Dependencies

Version Information

package-version.txt:

```
20140630.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  sage-data-combinatorial_designs
```

conda:

```
$ conda install  sagemath-db-combinatorial-designs
```

See https://repology.org/project/sagemath-combinatorial-designs/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.43 configure: Files of the Sage distribution that are autogenerated in the bootstrapping phase

Description

This package contains a tar archive of auto-generated files. They are shipped with Sage in case you do not have a sufficiently recent autotools version installed.

License

GPLv3+

Upstream Contact

Automatically generated by Sage, use trac and/or sage-devel for questions.

Special Update/Build Instructions

This tarball is automatically generated by Sage whenever you run the $SAGE_ROOT/bootstrap -s or the $SAGE_ROOT/src/bin/sage-update-version script.

Type

base

Dependencies

Version Information

package-version.txt:

```
50208b761995b49bf6f0702f4b9d36da24fae1a0
```

Equivalent System Packages

(none known)

6.1.44 contourpy: Python library for calculating contours of 2D quadrilateral grids

Description

Python library for calculating contours of 2D quadrilateral grids

License

BSD-3-Clause

Upstream Contact

https://pypi.org/project/contourpy/

Type

standard

Dependencies

- $(PYTHON)
- *numpy: Package for scientific computing with Python*
- $(PYTHON_TOOLCHAIN)
- *pybind11: Create Python bindings to C++ code*

Version Information

package-version.txt:

```
1.0.6
```

install-requires.txt:

```
contourpy
```

Equivalent System Packages

(none known)

6.1.45 conway_polynomials: Tables of Conway polynomials over finite fields

Description

Frank Lübeck's tables of Conway polynomials over finite fields.

Upstream contact

http://www.math.rwth-aachen.de/~Frank.Luebeck/data/ConwayPol/

Type

standard

Dependencies

- $(PYTHON)

Version Information

package-version.txt:

```
0.5
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  sage-data-conway_polynomials
```

conda:

```
$ conda install  sagemath-db-conway-polynomials
```

See https://repology.org/project/sagemath-conway-polynomials/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.46 coxeter3: Library for Coxeter groups, Bruhat ordering, Kazhdan-Lusztig polynomials

Description

This package wraps Fokko Ducloux's Coxeter 3 C++ library

Features:

- General Coxeter groups, implemented through the combinatorics of reduced words;
- Reduced expression and normal form computations;
- Bruhat ordering;
- Ordinary Kazhdan-Lusztig polynomials;
- Kazhdan-Lusztig polynomials with unequal parameters;
- Inverse Kazhdan-Lusztig polynomials;
- Cells and W-graphs;

http://math.univ-lyon1.fr/~ducloux/coxeter/coxeter3/english/coxeter3_e.html

This is a patched version done by Mike Hansen 2009-2013 and some fixes by Nicolas M. Thiéry and Jean-Pierre Flori.

License

GPL

Upstream Contact

github: https://github.com/tscrim/coxeter

Alas, Fokko Ducloux passed away in 2006.

http://math.univ-lyon1.fr/~ducloux/du_Cloux.html

Special Update/Build Instructions

The source package was created by running

```
commit=8ac9c71723c8ca57a836d6381aed125261e44e9e
git clone https://github.com/tscrim/coxeter.git
cd coxeter
git archive $commit | bzip2 --best >coxeter-$commit.tar.bz2
```

Type

optional

Dependencies

Version Information

package-version.txt:

```
8ac9c71723c8ca57a836d6381aed125261e44e9e.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  coxeter
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  coxeter coxeter-devel coxeter-tools
```

opensuse:

```
$ sudo zypper install coxeter
```

See https://repology.org/project/coxeter/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.47 cppy: C++ headers for C extension development

Description

From: https://pypi.org/project/cppy/

A small C++ header library which makes it easier to write Python extension modules. The primary feature is a PyObject smart pointer which automatically handles reference counting and provides convenience methods for performing common object operations.

License

Modified BSD 3-Clause-License

Upstream Contact

https://github.com/nucleic/cppy

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.2.1
```

install-requires.txt:

```
cppy
```

Equivalent System Packages

conda:

```
$ conda install  cppy
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.48 cryptominisat: A SAT solver

Description

CryptoMiniSat is a SAT solver that aims to become a premiere SAT solver with all the features and speed of successful SAT solvers, such as MiniSat and PrecoSat. The long-term goals of CryptoMiniSat are to be an efficient sequential, parallel and distributed solver. There are solvers that are good at one or the other, e.g. ManySat (parallel) or PSolver (distributed), but we wish to excel at all.

CryptoMiniSat 2.5 won the SAT Race 2010 among 20 solvers submitted by researchers and industry.

License

MIT License

Upstream Contact

- Authors: Mate Soos
- Email: soos.mate@gmail.com
- Website: http://www.msoos.org/
- Releases: https://github.com/msoos/cryptominisat/releases

Special Update/Build Instructions

CryptoMiniSat's tarball downloaded from github is called VERSION.tar.gz and should be renamed to cryptominisat-VERSION.tar.gz Its Python module is installed by the pycryptosat spkg.

Type

optional

Dependencies

- $(PYTHON)
- *m4ri: fast arithmetic with dense matrices over GF(2)*
- *zlib: Data compression library*
- *libpng: Bitmap image support*
- *cmake: A cross-platform build system generator*
- *boost_cropped: Portable C++ libraries (subset needed for Sage)*

Version Information

package-version.txt:

```
5.8.0
```

Equivalent System Packages

conda:

```
$ conda install  cryptominisat
```

homebrew:

```
$ brew install cryptominisat
```

See https://repology.org/project/cryptominisat/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.49 csdp: Solver for semidefinite programs

Description

This is a fast SDP solver written in C, with a callable library namely, an autotool'ed version of CSDP, by Brian Borchers, see https://projects.coin-or.org/Csdp

License

Common Public License Version 1.0

Upstream Contact

Dmitrii Pasechnik <dimpase+sage@gmail.com>

Special Update/Build Instructions

csdp is an autotool'ed version of CSDP, see https://projects.coin-or.org/Csdp, developed in its own repository at https://github.com/dimpase/csdp.

To update to a new version, you need to bump the version number in configure.ac and rerun autotools (autoreconf -fiv). Any changes should be merged to the upstream repo.

The build is done with NOSHORTS variable defined; this makes it compatible with packages, where NOSHORTS must be defined, e.g. https://github.com/dimpase/pycsdp; also the Sage Cython interface needs NOSHORTS defined.

Detailed steps to build the spkg are as follows. You need

- git
- autotools and libtool (the full autohell suite, version at least 2.67)

With these ready:

- ./spkg-src
- copy the resulting csdp-<version>.tar.gz to SAGE_ROOT/upstream, or somewhere else appropriate

Type

optional

Dependencies

- $(BLAS)

Version Information

package-version.txt:

```
6.2.p1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  coin-or-csdp
```

See https://repology.org/project/coin-or-csdp/versions, https://repology.org/project/csdp/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.50 cunningham_tables: List of the prime numbers occuring in the Cunningham table

The script read_cunningham_prime_factors.py was used to generate the data set from the file http://cage.ugent.be/~jdemeyer/cunningham/main.gz We include a local copy, main.gz (see comments in the file for details)

Type

optional

Dependencies

Version Information

package-version.txt:

```
1.0
```

Equivalent System Packages

See https://repology.org/project/cunningham-tables/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.51 curl: Multiprotocol data transfer library and utility

Description

Multiprotocols data transfer library (and utility).

License

"MIT style license" : see file "COPYING" at the root of the source tarball, explanations at https://curl.haxx.se/docs/copyright.html.

Upstream Contact

According to the file README at the root of the tarball, contact is done by mailing https://curl.haxx.se/mail/

Type

standard

Dependencies

- *openssl: Implementation of the SSL and TLS protocols*

Version Information

package-version.txt:

```
7.84.0
```

Equivalent System Packages

conda:

```
$ conda install  curl
```

cygwin:

```
$ apt-cyg install libcurl-devel curl
```

Debian/Ubuntu:

```
$ sudo apt-get install  curl libcurl4-openssl-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libcurl-devel curl
```

freebsd:

```
$ sudo pkg install ftp/curl
```

homebrew:

```
$ brew install curl
```

macports: install the following packages: curl

opensuse:

```
$ sudo zypper install curl "pkgconfig(libcurl)"
```

slackware:

```
$ sudo slackpkg install curl cyrus-sasl openldap-client libssh2
```

void:

```
$ sudo xbps-install  curl libcurl-devel
```

See https://repology.org/project/curl/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.52 cvxopt: Python software for convex optimization

Description

CVXOPT is a free software package for convex optimization based on the Python programming language. It can be used with the interactive Python interpreter, on the command line by executing Python scripts, or integrated in other software via Python extension modules. Its main purpose is to make the development of software for convex optimization applications straightforward by building on Python's extensive standard library and on the strengths of Python as a high-level programming language.

Upstream Contact

- J. Dahl <dahl.joachim@gmail.com>
- L. Vandenberghe <vandenbe@ee.ucla.edu>

https://cvxopt.org/

License

GPLv3 or later. Includes parts under GPLv2, GNU Lesser General Public License, v2.1. See src/LICENSE for more details. (Sage-compatible)

Type

standard

Dependencies

- $(PYTHON)
- *numpy: Package for scientific computing with Python*
- $(BLAS)
- *gsl: The GNU Scientific Library*
- *glpk: GNU Linear Programming Kit*
- *suitesparse: A suite of sparse matrix software*
- $(PYTHON_TOOLCHAIN)
- *pkgconfig: Python interface to pkg-config*

Version Information

package-version.txt:

```
1.3.0
```

install-requires.txt:

```
cvxopt >=1.2.5
```

Equivalent System Packages

conda:

```
$ conda install  cvxopt
```

freebsd:

```
$ sudo pkg install math/py-cvxopt
```

macports: install the following packages: py-cvxopt

See https://repology.org/project/python:cvxopt/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.53 cvxpy: A domain-specific language for modeling convex optimization problems in Python.

Description

A domain-specific language for modeling convex optimization problems in Python.

License

Apache License, Version 2.0

Upstream Contact

https://pypi.org/project/cvxpy/

Type

optional

Dependencies

- $(PYTHON)
- *numpy: Package for scientific computing with Python*
- *scipy: Scientific tools for Python*
- *glpk: GNU Linear Programming Kit*
- *cvxopt: Python software for convex optimization*
- *osqp_python: The Operator Splitting QP Solver (Python wrapper)*
- *ecos_python: Embedded Cone Solver (Python wrapper)*
- *scs: Splitting conic solver*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.3.0
```

install-requires.txt:

```
cvxpy
```

Equivalent System Packages

conda:

```
$ conda install  cvxpy
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.54 cycler: Composable cycles

Description

Cycler is a small break-off of matplotlib to deal with "composable cycles". It is a required dependency of matplotlib 1.5.0.

License

BSD

Upstream Contact

cycler is developed on github: https://github.com/matplotlib/cycler

A more informative webpage about cycler, its motivation and usage is at http://tacaswell.github.io/cycler/

Type

standard

Dependencies

- $(PYTHON)
- *six: Python 2 and 3 compatibility utilities*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.11.0
```

install-requires.txt:

```
cycler >=0.10.0
```

Equivalent System Packages

conda:

```
$ conda install  cycler
```

macports: install the following packages: py-cycler

void:

```
$ sudo xbps-install  python3-cycler
```

See https://repology.org/project/cycler/versions, https://repology.org/project/python:cycler/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.55 cylp: A Python interface for CLP, CBC, and CGL

Description

A Python interface for CLP, CBC, and CGL

License

Eclipse Public License (EPL) version 2 (without a Secondary Licenses Notice).

Note: This license is incompatible with the GPL according to https://www.gnu.org/licenses/license-list.html#EPL2; see also the discussion in github issue #26511.

Upstream Contact

https://pypi.org/project/cylp/

Type

optional

Dependencies

- $(PYTHON)
- *numpy: Package for scientific computing with Python*
- *scipy: Scientific tools for Python*
- *cbc: COIN-OR branch and cut solver for mixed-integer programs*
- $(PYTHON_TOOLCHAIN)
- *cython: C-Extensions for Python, an optimizing static compiler*

Version Information

package-version.txt:

```
0.91.5
```

install-requires.txt:

```
cylp
```

Equivalent System Packages

(none known)

6.1.56 cypari2: Python interface to the number theory library libpari

Description

A Python interface to the number theory library libpari.

License

GPL version 2 or later

Upstream Contact

https://github.com/defeo/cypari2

Type

standard

Dependencies

- $(PYTHON)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pari: Computer algebra system for fast computations in number theory*
- *cysignals: Interrupt and signal handling for Cython*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.1.3
```

install-requires.txt:

```
cypari2 >=2.1.1
```

Equivalent System Packages

conda:

```
$ conda install  cypari2
```

See https://repology.org/project/python:cypari2/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.57 cysignals: Interrupt and signal handling for Cython

Description

Interrupt and signal handling for Cython

License

LGPL version 3 or later

Upstream Contact

https://github.com/sagemath/cysignals

Type

standard

Dependencies

- $(PYTHON)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pari: Computer algebra system for fast computations in number theory*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.11.2
```

install-requires.txt:

```
cysignals >=1.10.2
```

Equivalent System Packages

conda:

```
$ conda install  cysignals
```

See https://repology.org/project/cysignals/versions, https://repology.org/project/python:cysignals/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.58 cython: C-Extensions for Python, an optimizing static compiler

Description

Cython is a language that makes writing C extensions for the Python language as easy as Python itself. Cython is based on the well-known Pyrex, but supports more cutting edge functionality and optimizations.

The Cython language is very close to the Python language, but Cython additio- nally supports calling C functions and declaring C types on variables and class attributes. This allows the compiler to generate very efficient C code from Cython code.

This makes Cython the ideal language for wrapping for external C libraries, and for fast C modules that speed up the execution of Python code.

License

Apache License, Version 2.0

Upstream Contact

- http://www.cython.org/
- cython-devel@python.org

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.29.32.p2
```

install-requires.txt:

```
cython >=0.29.21, <1.0
```

Equivalent System Packages

conda:

```
$ conda install  cython
```

freebsd:

```
$ sudo pkg install lang/cython
```

homebrew:

```
$ brew install cython
```

macports: install the following packages: py-cython

void:

```
$ sudo xbps-install  python3-Cython
```

See https://repology.org/project/python:cython/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.59 d3js: JavaScript library for manipulating documents based on data

Description

D3.js is a JavaScript library for manipulating documents based on data. The file d3.min.js will be placed into the ${SAGE_SHARE}/d3js/ directory.

License

BSD 3-Clause License

Upstream Contact

- Author: Mike Bostock (http://bost.ocks.org/mike/)
- Home page: http://d3js.org/

Special Update/Build Instructions

Two kind of archives can be downloaded from d3.js website: one with all source code and tests that weights 2,9M (both in zip and tar.gz formats) and one with the final javascript scripts which weights 121K (zip format only). Since testing requires node.js that is not shipped with Sage, we currenlty ship the final js only. Hence we have to transform it from zip to tar.gz format. Running sage-src should do all the repackaging job.

Type

optional

Dependencies

Version Information

package-version.txt:

```
3.4.8
```

Equivalent System Packages

See https://repology.org/project/node:d3/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.60 database_cremona_ellcurve: Database of elliptic curves

Description

John Cremona's database of elliptic curves

See https://github.com/JohnCremona/ecdata

This is an optional package, not included by default.

License

Public Domain

Upstream Contact

- Author: John Cremona
- Email: john.cremona@gmail.com
- Website: http://homepages.warwick.ac.uk/staff/J.E.Cremona/

Update Instructions

Get an up-to-date copy of the git repository ecdata from https://github.com/JohnCremona/ecdata.

If the cremona database has already been installed, remove `SAGE_DATA/cremona/cremona.db`. Then run

The build script expects to find the files in subfolders allcurves, allgens, degphi and allbsd of the ecdata folder. It extracts them and builds the new cremona.db file from the contents.

Finally, copy `SAGE_DATA/cremona/cremona.db` to the src directory of the spkg.

Type

optional

Dependencies

Version Information

package-version.txt:

```
20190911
```

Equivalent System Packages

See https://repology.org/project/sage-data-cremona-ellcurve/versions, https://repology.org/project/sagemath-database-cremona-elliptic-curves/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.61 database_cubic_hecke: Ivan Marin's representations of the cubic Hecke algebra

Description

Ivan Marin's representations of the cubic Hecke algebra on 4 strands as Python dictionaries

License

GPL

Upstream Contact

https://pypi.org/project/database-cubic-hecke/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2022.3.1
```

install-requires.txt:

```
database-cubic-hecke
```

Equivalent System Packages

(none known)

6.1.62 database_jones_numfield: Table of number fields

Description

This is a table of number fields with bounded ramification and degree at most 6.

License

GPLv2+

Upstream Contact

sage-devel@googlegroups.com

Special Update/Build Instructions

Created by taking the original old-style spkg and removing crud from it.

Type

optional

Dependencies

Version Information

package-version.txt:

```
4
```

Equivalent System Packages

See https://repology.org/project/sage-data-jones-numfield/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.63 database_knotinfo: Content of the KnotInfo and LinkInfo databases as lists of dictionaries

Description

Content of the KnotInfo and LinkInfo databases as lists of dictionaries

License

GPL

Upstream Contact

https://pypi.org/project/database-knotinfo/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2023.6.1
```

install-requires.txt:

```
database-knotinfo
```

Equivalent System Packages

(none known)

6.1.64 database_kohel: Database of modular and Hilbert polynomials

Description

Database of modular and Hilbert polynomials.

Upstream Contact

- David Kohel <David.Kohel@univ-amu.fr>

Type

optional

Dependencies

Version Information

package-version.txt:

```
20160724
```

Equivalent System Packages

See https://repology.org/project/sage-data-kohel/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.65 database_mutation_class: Database of exceptional mutation classes of quivers

Description

Contains a database of all exceptional mutation classes of quivers.

Every file in the database is of the form `mutation_classes_n.dig6` for some `n` and

- contains a `cPickle.dump` of a dictionary where
- the keys are tuples representing irreducible exceptional quiver mutation types of rank `n`, and
- the values are all quivers in the given mutation class stored in canonical form as `(dig6,edges)` where
- `dig6` is the dig6 data of the given `DiGraph`, and
- `edges` are the non-simply-laced edges thereof.
- is obtained by running the function

  `sage.combinat.cluster_algebra_quiver.quiver_mutation_type._save_data_dig6(n, types='Exceptional', verbose=False)`

SPKG Maintainers

- C. Stump <christian.stump@gmail.com>

Type

optional

Dependencies

Version Information

package-version.txt:

```
1.0
```

Equivalent System Packages

See https://repology.org/project/database-mutation-class/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.66 database_odlyzko_zeta: Table of zeros of the Riemann zeta function

Description

Table of zeros of the Riemann zeta function by Andrew Odlyzko.

This package contains the file 'zeros6' with the first 2,001,052 zeros of the Riemann zeta function, accurate to within 4*10^(-9).

Type

optional

Dependencies

- $(SAGERUNTIME)

Version Information

package-version.txt:

```
20061209
```

Equivalent System Packages

See https://repology.org/project/sage-data-odlyzko-zeta/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.67 database_stein_watkins: Database of elliptic curves (full version)

Description

The Stein-Watkins database of elliptic curves (full version)

See http://modular.math.washington.edu/papers/stein-watkins/

This is an optional (huge) package, not included by default.

License

Public Domain

Type

optional

Dependencies

Version Information

package-version.txt:

```
20110713
```

Equivalent System Packages

See https://repology.org/project/database-stein-watkins/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.68 database_stein_watkins_mini: Database of elliptic curves (small version)

Description

The Stein-Watkins database of elliptic curves (small version)

See http://modular.math.washington.edu/papers/stein-watkins/

This is an optional package, not included by default.

License

Public Domain

Type

optional

Dependencies

Version Information

package-version.txt:

```
20070827
```

Equivalent System Packages

See https://repology.org/project/database-stein-watkins-mini/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.69 database_symbolic_data: Database from the SymbolicData project

Description

The SymbolicData project is set out

- to develop concepts and tools for profiling, testing and benchmarking Computer Algebra Software (CAS) and
- to collect and interlink relevant data and activities from different Computer Algebra Communities.

SymbolicData is an

- inter-community project that has its roots in the activities of different Computer Algebra Communities and
- aims at interlinking these activities using modern Semantic Web concepts.

Tools and data are designed to be used both

- on a local site for special testing and profiling purposes
- and to manage a central repository at www.symbolicdata.org.

License

GNU General Public License

Upstream Contact

- Andreas Nareike <nareike@informatik.uni-leipzig.de>

Type

optional

Dependencies

Version Information

package-version.txt:

```
20070206
```

Equivalent System Packages

See https://repology.org/project/database-symbolic-data/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.70 dateutil: Extensions to the standard Python module datetime

Description

The dateutil module provides powerful extensions to the standard datetime module.

License

Simplified BSD License

Upstream Contact

Author: Gustavo Niemeyer <gustavo@niemeyer.net>

Home page: http://labix.org/python-dateutil

https://pypi.org/project/python-dateutil/

Type

standard

Dependencies

- $(PYTHON)
- *six: Python 2 and 3 compatibility utilities*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.8.2
```

install-requires.txt:

```
dateutil >=2.8.1
```

Equivalent System Packages

conda:

```
$ conda install  python-dateutil
```

macports: install the following packages: py-dateutil

void:

```
$ sudo xbps-install  python3-dateutil
```

See https://repology.org/project/python:python-dateutil/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.71 debugpy: An implementation of the Debug Adapter Protocol for Python

Description

An implementation of the Debug Adapter Protocol for Python

License

MIT

Upstream Contact

https://pypi.org/project/debugpy/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.6.3
```

install-requires.txt:

```
debugpy
```

Equivalent System Packages

conda:

```
$ conda install  debugpy
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.72 decorator: Python library providing decorators

Description

Better living through Python with decorators

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
5.1.1
```

install-requires.txt:

```
decorator >=4.4.0
```

Equivalent System Packages

conda:

```
$ conda install  decorator
```

macports: install the following packages: py-decorator

opensuse:

```
$ sudo zypper install python3-decorator
```

void:

```
$ sudo xbps-install  python3-decorator
```

See https://repology.org/project/python:decorator/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.73 deformation: Count points on hypersurfaces using the deformation method

Description

Deformation is a C library for counting points on hypersurfaces using the deformation method, developed by Sebastian Pancratz.

License

GLPv3

Upstream Contact

- Sebastian Pancratz: sebastian.pancratz@gmail.com, sage-devel@googlegroups.com
- We use the fork at https://github.com/sagemath/deformation the fork uses GMP instead of MPIR, and Flint 2.7+.

Type

experimental

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *flint: Fast Library for Number Theory*

Version Information

package-version.txt:

```
20210503
```

Equivalent System Packages

See https://repology.org/project/deformation/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.74 defusedxml: Addresses vulnerabilities of XML parsers and XML libraries

Description

defusedxml addresses vulnerabilities of XML parsers and XML libraries.

It became a dependency of nbconvert starting with nbconvert 5.4.

License

Python Software Foundation License (PSFL)

Upstream Contact

https://pypi.org/project/defusedxml/

Special Update/Build Instructions

None.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.7.1
```

install-requires.txt:

```
defusedxml >=0.6.0
```

Equivalent System Packages

conda:

```
$ conda install  defusedxml
```

macports: install the following packages: py-defusedxml

void:

```
$ sudo xbps-install  python3-defusedxml
```

See https://repology.org/project/python:defusedxml/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.75 deprecation: A library to handle automated deprecations

Description

A library to handle automated deprecations

License

Apache 2

Upstream Contact

https://pypi.org/project/deprecation/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.1.0
```

install-requires.txt:

```
deprecation
```

Equivalent System Packages

conda:

```
$ conda install  deprecation
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.76 distlib: Distribution utilities

Description

Distribution utilities

License

Python license

Upstream Contact

https://pypi.org/project/distlib/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.3.6
```

install-requires.txt:

```
distlib
```

Equivalent System Packages

conda:

```
$ conda install  distlib
```

void:

```
$ sudo xbps-install  python3-distlib
```

If the system package is installed, ./configure will check whether it can be used.

6.1.77 docutils: Processing plaintext documentation into useful formats, such as HTML or LaTeX

Description

Docutils is a modular system for processing documentation into useful formats, such as HTML, XML, and LaTeX. For input Docutils supports reStructuredText, an easy-to-read, what-you-see-is-what-you-get plaintext markup syntax.

License

Modified BSD

Upstream Contact

Author: David Goodger

Home Page: http://docutils.sourceforge.net/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.19
```

install-requires.txt:

```
docutils >=0.14
```

Equivalent System Packages

conda:

```
$ conda install  docutils
```

homebrew:

```
$ brew install docutils
```

macports: install the following packages: py-docutils

opensuse:

```
$ sudo zypper install python3-docutils
```

void:

```
$ sudo xbps-install  python3-docutils
```

See https://repology.org/project/docutils/versions, https://repology.org/project/python:docutils/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.78 dot2tex: Create PGF/TikZ commands from Graphviz output

Description

dot2tex is a Python module, whose purpose is to give graphs generated by Graphviz a more LaTeX friendly look and feel. This is accomplished by converting xdot output from Graphviz to a series of PSTricks or PGF/TikZ commands.

See https://github.com/kjellmf/dot2tex/

License

- MIT

Upstream Contact

- Kjell Magne Fauske, km@fauskes.net

Dependencies

graphviz (www.graphviz.org) should be installed and in the path (for example via the graphviz spkg).

preview, a LaTeX package for extracting parts of a document.

Self-tests dependencies:

- graphviz
- texlive-latex-base
- texlive-pictures
- texlive-pstricks

Patches

- remove_test_semicolon.patch:

  Remove the failing semicolon test for the open dot2tex issue #5 - https://github.com/kjellmf/dot2tex/issues/5

Special Update/Build Instructions

Make sure corresponding optional doctests still pass:

sage -t –long –optional=dot2tex,graphviz,sage src/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *pyparsing: A Python parsing module*

Version Information

package-version.txt:

```
2.11.3.p0
```

install-requires.txt:

```
dot2tex >=2.11.3
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  dot2tex
```

conda:

```
$ conda install  dot2tex
```

macports: install the following packages: dot2tex

See https://repology.org/project/dot2tex/versions, https://repology.org/project/python:dot2tex/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.79 dsdp: Semidefinite programming solver

Description

Implementation of an interior-point method for semidefinite programming. It provides primal and dual solutions, exploits low-rank structure and sparsity in the data, and has relatively low memory requirements for an interior-point method. It allows feasible and infeasible starting points and provides approximate certificates of infeasibility when no feasible solution exists. The dual-scaling algorithm implemented in this package has a convergence proof and worst-case polynomial complexity under mild assumptions on the data.

License

Permissive open source license https://www.mcs.anl.gov/hs/software/DSDP/Copyright.txt

Upstream Contact

https://www.mcs.anl.gov/hs/software/DSDP/

Type

optional

Dependencies

- $(BLAS)
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
5.8
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  dsdp
```

conda:

```
$ conda install  dsdp
```

Debian/Ubuntu:

```
$ sudo apt-get install  libdsdp-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  DSDP-devel
```

freebsd:

```
$ sudo pkg install math/dsdp
```

gentoo:

```
$ sudo emerge sci-libs/dsdp
```

macports: install the following packages: DSDP

See https://repology.org/project/dsdp/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.80 e_antic: Real embedded number fields

Description

e-antic is a C library for exact computations with real embedded number field maintained by Vincent Delecroix.

Website: https://github.com/videlec/e-antic

License

e-antic is licensed GPL v3.

Upstream Contact

- https://github.com/videlec/e-antic

Type

optional

Dependencies

- $(MP_LIBRARY)
- *flint: Fast Library for Number Theory*
- *arb: Arbitrary-precision floating-point ball arithmetic*
- *antic: Algebraic Number Theory In C*
- *boost_cropped: Portable C++ libraries (subset needed for Sage)*

Version Information

package-version.txt:

```
1.3.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  e-antic
```

conda:

```
$ conda install  libeantic
```

Debian/Ubuntu:

```
$ sudo apt-get install  libeantic-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  e-antic-devel
```

freebsd:

```
$ sudo pkg install math/e-antic
```

opensuse:

```
$ sudo zypper install e-antic-devel
```

See https://repology.org/project/e-antic/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.81 ecl: An implementation of the Common Lisp language

Description

ECL is an implementation of the Common Lisp language as defined by the ANSI X3J13 specification. The most relevant features:

- A bytecodes compiler and interpreter.
- Compiles Lisp also with any C/C++ compiler.
- It can build standalone executables and libraries.
- ASDF, Sockets, Gray streams, MOP, and other useful components.
- Extremely portable.
- A reasonable license.

ECL supports the operating systems Linux, FreeBSD, NetBSD, OpenBSD, Solaris and Windows, running on top of the Intel, Sparc, Alpha and PowerPC processors. Porting to other architectures should be rather easy.

Website: https://common-lisp.net/project/ecl/

License

- LGPL V2+ or compatible - for details see

  https://common-lisp.net/project/ecl/static/manual/Copyrights.html#Copyright-of-ECL

Upstream Contact

- the ECL mailing list - see https://mailman.common-lisp.net/listinfo/ecl-devel

Special Update/Build Instructions

- Note: for the time being, ECL is built single threaded library as it seems to interact badly with the pexpect interface and Sage's signal handling when built multithreaded.
- Do NOT quote SAGE_LOCAL when setting CPPFLAGS and/or LDFLAGS, in spkg-install as this caused the build to break. See github issue #10187#comment:117
- TODO: Add the ECL test suite, and an spkg-check file to run it.
- TODO: Make ECL use Sage's Boehm GC on MacOS X as well (but perhaps put some changes from ECL's into Sage's Boehm GC), then remove the src/src/gc directory, too.

Type

standard

Dependencies

- $(MP_LIBRARY)
- *readline: Command line editing library*
- *gc: The Boehm-Demers-Weiser conservative garbage collector*
- *libffi: A portable foreign-function interface library*
- *info: stand-alone Info documentation reader*

Version Information

package-version.txt:

```
21.2.1
```

Equivalent System Packages

alpine: install the following packages: ecl-dev

arch:

```
$ sudo pacman -S  ecl
```

conda:

```
$ conda install  ecl
```

Debian/Ubuntu:

```
$ sudo apt-get install  ecl
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  ecl
```

freebsd:

```
$ sudo pkg install lang/ecl
```

gentoo:

```
$ sudo emerge dev-lisp/ecls
```

homebrew:

```
$ brew install ecl
```

macports: install the following packages: ecl

nix:

```
$ nix-env --install ecl
```

void:

```
$ sudo xbps-install  ecl
```

See https://repology.org/project/ecl/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.82 eclib: Enumerating and computing with elliptic curves defined over the rational numbers

Description

John Cremona's programs for enumerating and computing with elliptic curves defined over the rational numbers.

mwrank is a program written in C++ for computing Mordell-Weil groups of elliptic curves over Q via 2-descent. It is available as source code in the eclib package, which may be distributed under the GNU General Public License, version 2, or any later version.

mwrank is now only distributed as part of eclib. eclib is also included in Sage, and for most potential users the easiest way to run mwrank is to install Sage (which also of course gives you much much more). I no longer provide a source code distribution of mwrank by itself: use eclib instead.

License

eclib is licensed GPL v2+.

Upstream Contact

- Author: John Cremona
- Email: john.cremona@gmail.com
- Website: http://homepages.warwick.ac.uk/staff/J.E.Cremona/mwrank/index.html
- Repository: https://github.com/JohnCremona/eclib

Type

standard

Dependencies

- *pari: Computer algebra system for fast computations in number theory*
- *ntl: A library for doing number theory*
- *flint: Fast Library for Number Theory*

Version Information

package-version.txt:

```
20230424
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  eclib
```

conda:

```
$ conda install  eclib
```

Debian/Ubuntu:

```
$ sudo apt-get install  libec-dev eclib-tools
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  eclib eclib-devel
```

freebsd:

```
$ sudo pkg install math/eclib
```

gentoo:

```
$ sudo emerge sci-mathematics/eclib[flint]
```

nix:

```
$ nix-env --install eclib
```

void:

```
$ sudo xbps-install  eclib-devel
```

See https://repology.org/project/eclib/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.83 ecm: Elliptic curve method for integer factorization

Description

GMP-ECM - Elliptic Curve Method for Integer Factorization

Sources can be obtained from https://gitlab.inria.fr/zimmerma/ecm

License

LGPL V3+

Upstream Contact

- ecm-discuss@inria.fr

Special Update/Build Instructions

- GMP-ECM comes with a self-tuning feature; we could support that as an option ($SAGE_TUNE_*=yes) in the future.
- ECM currently does not (by itself) use the CC and CFLAGS settings from 'gmp.h' since we pass (other) options in CFLAGS, and CC is set by Sage and might got set by the user. We now at least partially fix that such that "optimized" code generation options ('-mcpu=…', '-mtune=…') are used by gcc. Of course a user can also manually enable them by setting the "global" CFLAGS to e.g. '-march=native' on x86[_64] systems, or '-mcpu=…' and '-mtune=…' on other architectures where "native" isn't supported. Note that this doesn't affect the packages' selection of processor- specific optimized [assembly] code. 'spkg-install' already reads the settings from Sage's and also a system-wide GMP now, but doesn't (yet) use all of them. If SAGE_FAT_BINARY="yes", we should avoid too specific settings of "-mcpu=…", and perhaps pass a more generic "–host=…" to 'configure'.

- We currently work around a linker bug on MacOS X 10.5 PPC (with GCC 4.2.1) which breaks 'configure' if debug symbols are enabled. This *might* get fixed in later upstream releases.
- We could save some space by removing the `src/build.vc10/` directory which isn't used in Sage. (It gets probably more worth in case also directories / files for later versions of Microsoft Visual C get added.)

Type

standard

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
7.0.5
```

Equivalent System Packages

conda:

```
$ conda install  ecm
```

Debian/Ubuntu:

```
$ sudo apt-get install  gmp-ecm libecm-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gmp-ecm gmp-ecm-devel
```

freebsd:

```
$ sudo pkg install math/gmp-ecm
```

macports: install the following packages: gmp-ecm

nix:

```
$ nix-env --install ecm
```

void:

```
$ sudo xbps-install  ecm-devel
```

See https://repology.org/project/gmp-ecm/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.84 ecos_python: Embedded Cone Solver (Python wrapper)

Description

This is the Python package for ECOS: Embedded Cone Solver.

It vendors ECOS.

License

GPLv3

Upstream Contact

https://pypi.org/project/ecos/

Type

optional

Dependencies

- $(PYTHON)
- *numpy: Package for scientific computing with Python*
- *scipy: Scientific tools for Python*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.0.12
```

install-requires.txt:

```
ecos
```

Equivalent System Packages

conda:

```
$ conda install  ecos
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.85 editables: Editable installations

Description

Editable installations

License

MIT

Upstream Contact

https://pypi.org/project/editables/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.3
```

install-requires.txt:

```
editables
```

Equivalent System Packages

conda:

```
$ conda install  editables
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.86 elliptic_curves: Databases of elliptic curves

Description

Includes two databases:

- A small subset of John Cremona's database of elliptic curves up to conductor 10000.
- William Stein's database of interesting curves

Upstream Contact

cremona_mini

- Author: John Cremona
- Email: john.cremona@gmail.com
- Website: http://johncremona.github.io/ecdata/

ellcurves

- Author: William Stein
- Email: wstein@gmail.com

Type

standard

Dependencies

- $(PYTHON)

Version Information

package-version.txt:

```
0.8.1
```

Equivalent System Packages

conda:

```
$ conda install  sagemath-db-elliptic-curves
```

See https://repology.org/project/sagemath-elliptic-curves/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.87 entrypoints: Discover and load entry points from installed Python packages

Description

Discover and load entry points from installed packages.

Upstream Contact

https://github.com/takluyver/entrypoints

Special Update/Build Instructions

Upstream does not provide a source tarball, so the tarball was taken from github and renamed.

The source tarball does not contain setup.py, so we put the setup commands in spkg-install.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *flit_core: Distribution-building parts of Flit. See flit package for more information*
- *tomli: A lil' TOML parser*

Version Information

package-version.txt:

```
0.4
```

install-requires.txt:

```
entrypoints >=0.3
```

Equivalent System Packages

conda:

```
$ conda install  entrypoints
```

macports: install the following packages: py-entrypoints

void:

```
$ sudo xbps-install  python3-entrypoints
```

See https://repology.org/project/entrypoints/versions, https://repology.org/project/python:entrypoints/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.88 executing: Get the currently executing AST node of a frame, and other information

Description

Get the currently executing AST node of a frame, and other information

License

MIT

Upstream Contact

https://pypi.org/project/executing/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.2.0
```

install-requires.txt:

```
executing
```

Equivalent System Packages

conda:

```
$ conda install  executing
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.89 fastjsonschema: Fastest Python implementation of JSON schema

Description

Fastest Python implementation of JSON schema

License

BSD

Upstream Contact

https://pypi.org/project/fastjsonschema/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.16.2
```

install-requires.txt:

```
fastjsonschema
```

Equivalent System Packages

conda:

```
$ conda install  python-fastjsonschema
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.90 fflas_ffpack: Dense linear algebra over word-size finite fields

Description

FFLAS-FFPACK is a LGPL-2.1+ source code library for dense linear algebra over word-size finite fields.

http://linbox-team.github.io/fflas-ffpack/

License

LGPL V2.1 or later

Upstream Contact

- <ffpack-devel@googlegroups.com>

Type

standard

Dependencies

- $(MP_LIBRARY)
- *givaro: C++ library for arithmetic and algebraic computations*
- *gsl: The GNU Scientific Library*
- $(BLAS)
- *pkgconf: An implementation of the pkg-config spec*

Version Information

package-version.txt:

```
2.4.3.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  fflas-ffpack
```

conda:

```
$ conda install  fflas-ffpack
```

Debian/Ubuntu:

```
$ sudo apt-get install  fflas-ffpack
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  fflas-ffpack-devel
```

freebsd:

```
$ sudo pkg install math/fflas-ffpack
```

gentoo:

```
$ sudo emerge sci-libs/fflas-ffpack
```

nix:

```
$ nix-env --install fflas-ffpack
```

opensuse:

```
$ sudo zypper install "pkgconfig(fflas-ffpack)"
```

void:

```
$ sudo xbps-install  fflas-ffpack
```

See https://repology.org/project/fflas-ffpack/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.91 ffmpeg: ffmpeg video converter

Description

ffmpeg is a very fast video and audio converter that can also grab from a live audio/video source. It can also convert between arbitrary sample rates and resize video on the fly with a high quality polyphase filter.

License

"FFmpeg is licensed under the GNU Lesser General Public License (LGPL) version 2.1 or later. However, FFmpeg incorporates several optional parts and optimizations that are covered by the GNU General Public License (GPL) version 2 or later. If those parts get used the GPL applies to all of FFmpeg."

http://ffmpeg.org/legal.html

Upstream Contact

http://ffmpeg.org/

Type

optional

Dependencies

Version Information

Equivalent System Packages

alpine: install the following packages: ffmpeg

arch:

```
$ sudo pacman -S  ffmpeg
```

conda:

```
$ conda install  imageio-ffmpeg
```

Debian/Ubuntu:

```
$ sudo apt-get install  ffmpeg
```

Fedora/Redhat/CentOS:

freebsd:

```
$ sudo pkg install multimedia/ffmpeg
```

homebrew:

```
$ brew install ffmpeg
```

macports: install the following packages: ffmpeg

nix:

```
$ nix-env --install ffmpeg
```

opensuse:

```
$ sudo zypper install ffmpeg
```

void:

```
$ sudo xbps-install  ffmpeg
```

See https://repology.org/project/ffmpeg/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.92 filelock: A platform independent file lock

Description

A platform independent file lock.

License

Public Domain <http://unlicense.org>

Upstream Contact

https://pypi.org/project/filelock/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.8.0
```

install-requires.txt:

```
filelock
```

Equivalent System Packages

conda:

```
$ conda install  filelock
```

void:

```
$ sudo xbps-install  python3-filelock
```

If the system package is installed, ./configure will check whether it can be used.

6.1.93 flint: Fast Library for Number Theory

Description

FLINT is a C library for doing number theory, maintained by William Hart.

Website: http://www.flintlib.org

License

FLINT is licensed GPL v2+.

Upstream Contact

- flint-devel Gougle Group (http://groups.google.co.uk/group/flint-devel)
- William Hart

Type

standard

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *ntl: A library for doing number theory*

Version Information

package-version.txt:

```
2.8.4
```

Equivalent System Packages

conda:

```
$ conda install  libflint
```

cygwin:

```
$ apt-cyg install libflint-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libflint-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  flint flint-devel
```

freebsd:

```
$ sudo pkg install math/flint2
```

gentoo:

```
$ sudo emerge sci-mathematics/flint[ntl]
```

homebrew:

```
$ brew install flint
```

macports: install the following packages: flint

nix:

```
$ nix-env --install flint
```

opensuse:

```
$ sudo zypper install flint-devel
```

void:

```
$ sudo xbps-install  flintlib-devel
```

See https://repology.org/project/flint/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.94 flit_core: Distribution-building parts of Flit. See flit package for more information

Description

Distribution-building parts of Flit. See flit package for more information

License

Upstream Contact

https://pypi.org/project/flit-core/

Type

standard

Dependencies

- $(PYTHON)
- *pip: Tool for installing and managing Python packages*

Version Information

package-version.txt:

```
3.7.1
```

install-requires.txt:

```
flit-core
```

Equivalent System Packages

conda:

```
$ conda install  flit-core
```

void:

```
$ sudo xbps-install  python3-flit_core
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.95 fonttools: Tools to manipulate font files

Description

Tools to manipulate font files

License

MIT

Upstream Contact

https://pypi.org/project/fonttools/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *cython: C-Extensions for Python, an optimizing static compiler*

Version Information

package-version.txt:

```
4.28.4
```

install-requires.txt:

```
fonttools
```

Equivalent System Packages

conda:

```
$ conda install  fonttools
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.96 fplll: Lattice algorithms, including LLL with floating-point orthogonalization

Description

fplll contains implementations of several lattice algorithms. The implementation relies on floating-point orthogonalization, and LLL is central to the code, hence the name.

Website: https://github.com/fplll/fplll

License

- LGPL V2.1+

Upstream Contact

- Martin Albrecht <martinralbrecht+fplll@googlemail.com>
- Mailing List https://groups.google.com/forum/#!forum/fplll-devel

Type

standard

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*

Version Information

package-version.txt:

```
5.4.4
```

Equivalent System Packages

conda:

```
$ conda install  fplll
```

Debian/Ubuntu:

```
$ sudo apt-get install  libfplll-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libfplll libfplll-devel
```

freebsd:

```
$ sudo pkg install math/fplll
```

gentoo:

```
$ sudo emerge sci-libs/fplll
```

homebrew:

```
$ brew install fplll
```

opensuse:

```
$ sudo zypper install "pkgconfig(fplll)" fplll-devel fplll
```

void:

```
$ sudo xbps-install  fplll-devel
```

See https://repology.org/project/fplll/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.97 fpylll: Python interface for FPLLL

Description

A Python interface for https://github.com/fplll/fplll (Lattice algorithms using floating-point arithmetic)

License

GPL version 2 or later

Upstream Contact

https://github.com/fplll/fpylll

Type

standard

Dependencies

- $(PYTHON)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *cysignals: Interrupt and signal handling for Cython*
- *numpy: Package for scientific computing with Python*
- *fplll: Lattice algorithms, including LLL with floating-point orthogonalization*

Version Information

package-version.txt:

```
0.5.9
```

install-requires.txt:

```
fpylll >=0.5.9, <=0.5.9
```

Equivalent System Packages

conda:

```
$ conda install  fpylll
```

See https://repology.org/project/fpylll/versions, https://repology.org/project/python:fpylll/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.98 freetype: A free, high-quality, and portable font engine

Description

From the documentation:

FreeType is a software font engine that is designed to be small, efficient, highly customizable, and portable while capable of producing high-quality output (glyph images). It can be used in graphics libraries, display servers, font conversion tools, text image generation tools, and many other products as well.

Note that FreeType is a font service and doesn't provide APIs to perform higher-level features like text layout or graphics processing (e.g., colored text rendering, 'hollowing', etc.). However, it greatly simplifies these tasks by providing a simple, easy to use, and uniform interface to access the content of font files.

Please note that 'FreeType' is also called 'FreeType 2', to distinguish it from the old, deprecated 'FreeType 1' library, a predecessor no longer maintained and supported.

The package in Sage is called freetype (in lowercase).

License

- FreeType (BSD-like)
- GNU Public License v2

From the documentation:

FreeType is released under two open-source licenses: our own BSD-like FreeType License and the GNU Public License, Version 2. It can thus be used by any kind of projects, be they proprietary or not.

Upstream Contact

- home: https://www.freetype.org
- repo:
  - official: http://git.savannah.gnu.org/cgit/freetype
  - mirror: https://github.com/aseprite/freetype2/

Type

standard

Dependencies

- *libpng: Bitmap image support*
- *bzip2: High-quality data compressor*

Version Information

package-version.txt:

```
2.10.4
```

Equivalent System Packages

conda:

```
$ conda install  freetype
```

cygwin:

```
$ apt-cyg install libfreetype-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libfreetype6-dev
```

freebsd:

```
$ sudo pkg install print/freetype2
```

homebrew:

```
$ brew install freetype
```

macports: install the following packages: freetype

nix:

```
$ nix-env --install freetype
```

opensuse:

```
$ sudo zypper install "pkgconfig(freetype2)"
```

slackware:

```
$ sudo slackpkg install freetype harfbuzz glib glib2
```

void:

```
$ sudo xbps-install  freetype-devel
```

See https://repology.org/project/freetype/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.99 fricas: A general purpose computer algebra system

Description

FriCAS is a general purpose computer algebra system.

License

Modified BSD license.

Upstream Contact

http://fricas.sourceforge.net/

Type

optional

Dependencies

- *ecl: An implementation of the Common Lisp language*

Version Information

package-version.txt:

```
1.3.8.p1
```

Equivalent System Packages

macports: install the following packages: fricas

See https://repology.org/project/fricas/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.100 frobby: Computations on monomial ideals

Description

The software package Frobby provides a number of computations on monomial ideals. The current main feature is the socle of a monomial ideal, which is largely equivalent to computing the maximal standard monomials, the Alexander dual or the irreducible decomposition.

Operations on monomial ideals are much faster than algorithms designed for ideals in general, which is what makes a specialized library for these operations on monomial ideals useful.

License

- GPL version 2.0 or later

Upstream Contact

- http://www.broune.com/frobby/
- https://github.com/Macaulay2/frobby

Special Update/Build instructions

Download Frobby at www.broune.com/ and then type "make spkg VER=blah" which wil create an spkg named frobby-VER.spkg in bin/. The files related to doing this is in the sage/ sub-directory of the Frobby source distribution.

Type

optional

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
0.9.0.p2
```

Equivalent System Packages

See https://repology.org/project/frobby/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.101 furo: A clean customizable Sphinx documentation theme

Description

A clean customizable Sphinx documentation theme.

License

Upstream Contact

https://pypi.org/project/furo/

Type

standard

Dependencies

- $(PYTHON)
- *beautifulsoup4: Screen-scraping library*
- *sphinx: Python documentation generator*
- *pygments: Generic syntax highlighter*
- *sphinx_basic_ng: A modern skeleton for Sphinx themes.*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2022.9.29
```

install-requires.txt:

```
furo
```

Equivalent System Packages

conda:

```
$ conda install  furo
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.102 gambit: Computations on finite, noncooperative games

Description

Gambit is a set of software tools for doing computation on finite, noncooperative games. The Gambit Project was founded in the mid-1980s by Richard McKelvey at the California Institute of Technology.

License

GPL v2+

Upstream Contact

- Website: http://www.gambit-project.org/
- Mailing List: http://sourceforge.net/p/gambit/mailman/gambit-devel/

Dependencies

- python
- cython
- setuptools
- IPython
- scipy

Type

experimental

Dependencies

- *cython: C-Extensions for Python, an optimizing static compiler*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
15.1.1.p0
```

Equivalent System Packages

homebrew:

```
$ brew install gambit
```

See https://repology.org/project/gambit-game-theory/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.103 gap: Groups, Algorithms, Programming - a system for computational discrete algebra

Description

GAP is a system for computational discrete algebra, with particular emphasis on Computational Group Theory. GAP provides a programming language, a library of thousands of functions implementing algebraic algorithms written in the GAP language as well as large data libraries of algebraic objects. See also the overview and the description of the mathematical capabilities. GAP is used in research and teaching for studying groups and their representations, rings, vector spaces, algebras, combinatorial structures, and more. The system, including source, is distributed freely. You can study and easily modify or extend it for your special use.

This is a stripped-down version of GAP. The databases, which are architecture-independent, are in a separate package.

Upstream Contact

https://www.gap-system.org

Mailing list at https://mail.gap-system.org/mailman/listinfo/gap

Special Update/Build Instructions

This is a stripped-down version of GAP. The downloading of the sources and removal of unneeded parts is done by the script spkg-src. When you update GAP, please also update and use the spkg-src script.

- Do we really want to copy everything from the build directory???

  You need the full GAP tree to compile/install many GAP packages.

- There's apparently a command missing (in `spkg-install`) building the (HTML?) documentation. Earlier changelog entries as well as the description above state the documentation was removed from the upstream sources… Since the (pre-)built HTML documentation is currently included, I've commented out some lines in that part of `spkg-install`. -leif

Patches

Type

standard

Dependencies

- *ncurses: Classic terminal output library*
- *readline: Command line editing library*
- *zlib: Data compression library*
- $(MP_LIBRARY)

Version Information

package-version.txt:

```
4.12.2
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  gap
```

conda:

```
$ conda install  gap-defaults>=4.12.2
```

Debian/Ubuntu:

```
$ sudo apt-get install  libgap-dev
```

freebsd:

```
$ sudo pkg install math/gap
```

nix:

```
$ nix-env --install gap
```

See https://repology.org/project/gap/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.104 gap3: A minimal distribution of GAP 3 containing packages that have no equivalent in GAP 4

Description

This package installs Jean Michel's pre-packaged GAP3, which is a minimal GAP3 distribution containing packages that have no equivalent in GAP4.

Below is the full description from Jean Michel's webpage (accessed 23 July 2015).

> A pre-packaged GAP3 with everything you need
>
> To help people who are just interested in GAP3 because they need a package which has not been ported to GAP4, I have prepared an easy-to install minimal GAP3 distribution containing an up-to-date versions of the packages:
>
> anusq, arep, autag, chevie, cryst, dce, grim, matrix, meataxe, monoid, nq, pcqa, sisyphos, specht, ve, vkcurve.
>
> These packages have been chosen since most have no equivalent in GAP4. They are autoloaded when starting gap.
>
> This distribution includes only partial lists of small groups, 2-groups, 3-groups, character tables from the Atlas and tables of marks. It does not include either the packages:
>
> anupq, grape, kbmag, xgap, cohomolo, gliss, guava, xmod
>
> which have some equivalent in GAP4. You can get these extra features at
>
> http://www.math.rwth-aachen.de/~Frank.Luebeck/gap/GAP3
>
> In this distribution:

- The on-line help includes the documentation of the included packages.
- The html documentation (htm/index.html) also does.
- The manual (manual.pdf) also does.

License

Most parts of the GAP distribution, including the core part of the GAP system, are distributed under the terms of the GNU General Public License (see http://www.gnu.org/licenses/gpl.html or the file GPL in the etc directory of the GAP installation).

SPKG Maintainers

- Christian Stump <christian.stump@gmail.com>

Upstream Contact

Jean Michel <jmichel@math.jussieu.fr> http://webusers.imj-prg.fr/~jean.michel/

Special Update/Build Instructions

The difference between the distributed tarball and Jean Michel's original tarball also contains the binaries

Patches

None

Type

experimental

Dependencies

Version Information

package-version.txt:

```
04jul17
```

Equivalent System Packages

(none known)

6.1.105 gap_jupyter: Jupyter kernel for GAP

Description

Jupyter kernel for GAP

This wrapper-kernel is a Jupyter kernel for the GAP Computer Algebra System based on the same ideas as the bash wrapper kernel.

License

3-Clause BSD License

Upstream Contact

- https://github.com/gap-packages/jupyter-gap

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *gap: Groups, Algorithms, Programming - a system for computational discrete algebra*

Version Information

package-version.txt:

```
0.9
```

install-requires.txt:

```
gap_jupyter >=0.9
```

Equivalent System Packages

conda:

```
$ conda install  gap
```

See https://repology.org/project/gap-jupyterkernel/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.106 gap_packages: A collection of GAP packages

Description

Several "official" and "undeposited" GAP packages available from https://www.gap-system.org/Packages/packages.html

Upstream Contact

Mailing list at https://mail.gap-system.org/mailman/listinfo/gap

Dependencies

- GAP (a standard spkg)

TODO

The crystallographic group packages are untested/untestable. They rely on polymake and the dependency "cryst" is missing. This needs to be cleaned up.

Notes

A brief description of each package follows:

cohomolo - The cohomolo package is a GAP interface to some `C` programs for computing Schur multipliers and covering groups of finite groups and first and second cohomology groups of finite groups acting on finite modules. (Author: Max Horn, Markus Pfeiffer)

CoReLG - Contains functionality for working with real semisimple Lie algebras. (Author: Heiko Dietrich, Paolo Faccin, Willem Adriaan de Graaf)

crime - package to compute the cohomology ring of finite p-groups, induced maps, and Massey products. (Author: Marcus Bishop)

cryst - Computing with crystallographic groups (Authors: Bettina Eick, Franz Gähler, Werner Nickel)

CTblLib - The GAP Character Table Library (Author: Thomas Breuer)

DESIGN is a package for classifying, partitioning and studying block designs. (Author: Leonard H. Soicher)

FactInt is a package providing routines for factoring integers, in particular:

- Pollard's p-1
- Williams' p+1
- Elliptic Curves Method (ECM)
- Continued Fraction Algorithm (CFRAC)
- Multiple Polynomial Quadratic Sieve (MPQS)

(Author: Stefan Kohl)

GAPDoc is a package containing a definition of a structure for GAP documentation, based on XML. It also contains conversion programs for producing text-, DVI-, PDF- or HTML-versions of such documents, with hyperlinks if possible. (Authors: Frank Luebeck, Max Neunhoeffer)

GBNP - The GBNP package provides algorithms for computing Grobner bases of noncommutative polynomials with coefficients from a field implemented in GAP and with respect to the "total degree first then lexicographical" ordering. Further provided are some variations, such as a weighted and truncated version and a tracing facility. The word "algorithm" is to be interpreted loosely here: in general one cannot expect such an algorithm to terminate, as it would imply solvability of the word problem for finitely presented (semi)groups. (Authors: A.M. Cohen, J.W. Knopper)

GRAPE is a package for computing with graphs and groups, and is primarily designed for constructing and analysing graphs related to groups, finite geometries, and designs. (Author: Leonard H. Soicher)

GUAVA is included here, and with Sage standard.

HAP (Homological Algebra Programming) is a GAP package providing some functions for group cohomology computation. (Author: Graham Ellis)

HAPcryst - an extension package for HAP, which allows for group cohomology computation for a wider class of groups. (Author: Marc Roeder)

hecke - Provides functions for calculating decomposition matrices of Hecke algebras of the symmetric groups and q-Schur algebras. Hecke is a port of the GAP 3 package Specht 2.4 to GAP 4. (Author: Dmitriy Traytel)

LAGUNA - this package provides functionality for calculation of the normalized unit group of the modular group algebra of the finite p-group and for investigation of Lie algebra associated with group algebras and other associative algebras. (Authors :Victor Bovdi, Alexander Konovalov, Richard Rossmanith, Csaba Schneider)

liealgdb - A database of Lie algebras (Author: Serena Cicalo', Willem Adriaan de Graaf, Csaba Schneider)

LiePRing - Database and algorithms for Lie p-rings (Author: Michael Vaughan-Lee, Bettina Eick)

LieRing - contains functionality for working with finitely presented Lie rings and the Lazard correspondence. (Author: Serena Cicalo', Willem Adriaan de Graaf)

loops - Provides researchers in nonassociative algebra with a computational tool that integrates standard notions of loop theory with libraries of loops and group-theoretical algorithms of GAP. The package also expands GAP toward nonassociative structures. (Authors: Gabor Nagy, Petr Vojtechovsky)

mapclass - The package calculates the mapping class group orbits for a given finite group. (Authors: Adam James, Kay Magaard, Sergey Shpectorov, Helmut Volklein)

polymake - an interface with the (standalone) polymake program used by HAPcryst. (Author: Marc Roeder)

qpa - Quivers and Path Algebras provides data structures and algorithms for doing computations with finite dimensional quotients of path algebras, and finitely generated modules over such algebras. The current version of the QPA package has data structures for quivers, quotients of path algebras, and modules, homomorphisms and complexes of modules over quotients of path algebras. (Authors: Edward Green, Oeyvind Solberg)

quagroup - Contains functionality for working with quantized enveloping algebras of finite-dimensional semisimple Lie algebras. (Author: Willem Adriaan de Graaf)

repsn - The package provides GAP functions for computing characteristic zero matrix representations of finite groups. (Author: Vahid Dabbaghian)

sla - a package for doing computations with simple Lie algebras (Author: Willem Adriaan de Graaf)

SONATA ("System Of Nearrings And Their Applications") is a package which constructs finite nearrings and related objects. (Authors: Erhard Aichinger, Franz Binder, Jürgen Ecker, Peter Mayr, Christof Noebauer)

TORIC is a GAP package for computing with toric varieties. (Author: David Joyner)

Type

optional

Dependencies

- *gap: Groups, Algorithms, Programming - a system for computational discrete algebra*
- *libsemigroups: Library for semigroups and monoids*
- *planarity: Planarity-related graph algorithms*
- $(SAGERUNTIME)

Version Information

package-version.txt:

```
4.12.2
```

Equivalent System Packages

conda:

```
$ conda install  gap
```

See https://repology.org/project/gap/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.107 gast: Python AST that abstracts the underlying Python version

Description

Python AST that abstracts the underlying Python version

License

BSD 3-Clause

Upstream Contact

https://pypi.org/project/gast/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.5.3
```

install-requires.txt:

```
gast
```

Equivalent System Packages

conda:

```
$ conda install  gast
```

void:

```
$ sudo xbps-install  python3-gast
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.108 gc: The Boehm-Demers-Weiser conservative garbage collector

Description

The Boehm-Demers-Weiser conservative garbage collector.

License

- Permissive BSD + GPL 2.0+

Upstream Contact

Webpage: http://www.hboehm.info/gc/

Email List: bdwgc@lists.opendylan.org

Special Update/Build Instructions

None.

Patches

- cygwin64.patch: let libgc build on Cygwin64.

Type

standard

Dependencies

- *libatomic_ops: Access hardware-provided atomic memory update operations*

Version Information

package-version.txt:

```
8.0.4
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  gc
```

conda:

```
$ conda install  bdw-gc
```

cygwin:

```
$ apt-cyg install libgc-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libgc-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gc gc-devel
```

freebsd:

```
$ sudo pkg install devel/boehm-gc devel/boehm-gc-threaded
```

gentoo:

```
$ sudo emerge dev-libs/boehm-gc
```

homebrew:

```
$ brew install bdw-gc
```

macports: install the following packages: boehmgc

opensuse:

```
$ sudo zypper install "pkgconfig(bdw-gc)"
```

slackware:

```
$ sudo slackpkg install gc
```

void:

```
$ sudo xbps-install  gc-devel
```

See https://repology.org/project/boehm-gc/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.109 gcc: The GNU Compiler Collection or other suitable C and C++ compilers

Description

This package represents the required C and C++ compilers.

- GCC (GNU Compiler Collection) versions 8.x to 12.x are supported.
- Clang (LLVM) is also supported.

The required Fortran compiler is represented by the package `gfortran`.

You can pass the names of compilers to use to `./configure` using the environment variables `CC`, `CXX`, and `FC`, for C, C++, and Fortran compilers, respectively.

For example, if your C compiler is `clang`, your C++ compiler is `clang++`, and your Fortran compiler is `flang`, then you would need to run:

```
$ ./configure CC=clang CXX=clang++ FC=flang
```

Vendor and versions of the C and C++ compilers should match.

Users of older Linux distributions (in particular, `ubuntu-xenial` or older, `debian-stretch` or older, `linuxmint-18` or older) should upgrade their systems before attempting to install Sage from source. Users of `ubuntu-bionic`, `linuxmint-19.x`, and `opensuse-15.x` can install a versioned `gcc` system package and then use:

```
$ ./configure CC=gcc-8 CXX=g++-8 FC=gfortran-8
```

or similar. Users on `ubuntu` can also install a modern compiler toolchain using the ubuntu-toolchain-r ppa. On `ubuntu-trusty`, also the package `binutils-2.26` is required; after installing it, make it available using `export PATH="/usr/lib/binutils-2.26/bin:$PATH"`. Instead of upgrading their distribution, users of `centos-7` can install a modern compiler toolchain using Redhat's devtoolset.

This package uses the non-standard default `configure --with-system-gcc=force`, giving an error at `configure` time when no suitable system compilers are configured.

You can override this using `./configure --without-system-gcc`. In this case, Sage builds and installs the GNU Compiler Collection, including the C, C++ and Fortran compiler. This is not recommended. You will need suitable C and C++ compilers from which GCC can bootstrap itself. There are some known problems with old assemblers, in particular when building the `ecm` and `fflas_ffpack` packages. You should ensure that your assembler understands all instructions for your processor. On Linux, this means you need a recent version of `binutils` (not provided by an SPKG); on macOS you need a recent version of Xcode.

(Installing the `gfortran` SPKG becomes a no-op in this case.)

Building Sage from source on Apple Silicon (M1/M2) requires the use of Apple's Command Line Tools, and those tools include a suitable compiler. Sage's `gcc` SPKG is not suitable for M1/M2; building it will likely fail.

License

GPL version 2 or version 3

Upstream Contact

https://gcc.gnu.org/

Type

standard

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *mpc: Arithmetic of complex numbers with arbitrarily high precision and correct rounding*
- *zlib: Data compression library*
- *xz: General-purpose data compression software*

Version Information

package-version.txt:

```
12.2.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  gcc
```

cygwin:

```
$ apt-cyg install gcc-core gcc-g++ gcc-fortran
```

Debian/Ubuntu:

```
$ sudo apt-get install  gcc g++
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gcc gcc-c++ gcc-gfortran
```

freebsd:

```
$ sudo pkg install lang/gcc9
```

homebrew:

```
$ brew install gcc
```

opensuse:

```
$ sudo zypper install gcc-c++
```

void:

```
$ sudo xbps-install  gcc
```

See https://repology.org/project/gcc/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.110 gdb: The GNU Project debugger

Description

GDB, the GNU Project debugger, allows you to see what is going on "inside" another program while it executes – or what another program was doing at the moment it crashed.

License

GPL v3+

Upstream Contact

http://www.gnu.org/software/gdb/

Special Update/Build Instructions

Current version needs makeinfo installed to build successfully.

Type

experimental

Dependencies

- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *zlib: Data compression library*
- *ncurses: Classic terminal output library*
- $(PYTHON)
- *xz: General-purpose data compression software*

Version Information

package-version.txt:

```
8.2
```

Equivalent System Packages

conda:

homebrew:

```
$ brew install gdb
```

macports: install the following packages: gdb

opensuse:

```
$ sudo zypper install gdb
```

void:

```
$ sudo xbps-install  gdb
```

See https://repology.org/project/gdb/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.111 gengetopt: getopt_long parser generator

Description

GNU Gengetopt converts a textual description of your program's arguments and options into a getopt_long() parser in C (or C++).

Website: https://www.gnu.org/software/gengetopt/

License

GPL-3+ (https://www.gnu.org/software/gengetopt/LICENSE)

Type

standard

Dependencies

- *xz: General-purpose data compression software*

Version Information

package-version.txt:

```
2.23
```

Equivalent System Packages

conda:

```
$ conda install  gengetopt
```

cygwin:

```
$ apt-cyg install gengetopt
```

Debian/Ubuntu:

```
$ sudo apt-get install  gengetopt
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gengetopt
```

gentoo:

```
$ sudo emerge dev-util/gengetopt
```

homebrew:

```
$ brew install gengetopt
```

nix:

```
$ nix-env --install gengetopt
```

void:

```
$ sudo xbps-install  gengetopt
```

See https://repology.org/project/gengetopt/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.112 gf2x: Fast arithmetic in GF(2)[x] and searching for irreducible/primitive trinomials

Description

gf2x is a C/C++ software package containing routines for fast arithmetic in GF(2)[x] (multiplication, squaring, GCD) and searching for irreducible/primitive trinomials.

Website: https://gitlab.inria.fr/gf2x/gf2x

License

- GNU GPLv2+.

Upstream Contact

- Richard Brent
- Pierrick Gaudry
- Emmanuel Thomé
- Paul Zimmermann

Special Update/Build Instructions

- As some patches touch config/acinclude.m4, we have to touch aclocal.m4, configure, Makefile.in and gf2x/gf2x-config.h.in to prevent autotools to try to regenerate these files.

Patches

- 0001-Trac-15014-Let-gf2x-build-a-shared-library-on-Cygwin.patch: pass -no-undefined flag to libtool.
- 0002-tr-portability.patch: backport upstream fix for non-portable tr use
- 0003-Improve-detection-of-sse2-support.patch: backport upstream improved check for sse2
- 0004-Add-disable-hardware-specific-code.patch: add option -disable-hardware-specific-code to build system. This is partly backported from upstream.
- 0005-Update-autotooled-files.patch: the above patches make changes to code used by autotools for generation of the build system. This patches those files, so that autotools need not be installed.
- 0006-Fix_make_check_not_failing_on_errors.patch: (upstream patch) Fix bug in shell script such that 'make check' always fails upon errors.

Type

standard

Dependencies

Version Information

package-version.txt:

```
1.3.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  gf2x
```

conda:

```
$ conda install  gf2x
```

Debian/Ubuntu:

```
$ sudo apt-get install  libgf2x-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gf2x gf2x-devel
```

freebsd:

```
$ sudo pkg install math/gf2x
```

opensuse:

```
$ sudo zypper install "pkgconfig(gf2x)"
```

void:

```
$ sudo xbps-install  gf2x-devel
```

See https://repology.org/project/gf2x/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.113 gfan: Groebner fans and tropical varieties

Description

Gfan is a software package for computing Groebner fans and tropical varieties.

These are polyhedral fans associated to polynomial ideals. The maximal cones of a Groebner fan are in bijection with the marked reduced Groebner bases of its defining ideal. The software computes all marked reduced Groebner bases of an ideal. Their union is a universal Groebner basis. The tropical variety of a polynomial ideal is a certain subcomplex of the Groebner fan. Gfan contains algorithms for computing this complex for general ideals and specialized algorithms for tropical curves, tropical hypersurfaces and tropical varieties of prime ideals. In addition to the above core functions the package contains many tools which are useful in the study of Groebner bases, initial ideals and tropical geometry. The full list of commands can be found in Appendix B of the manual. For ordinary Groebner basis computations Gfan is not competitive in speed compared to programs such as CoCoA, Singular and Macaulay2.

License

- GPL version 2 or version 3 (according to the gfan website)

Upstream Contact

Anders Nedergaard Jensen

https://users-math.au.dk/jensen/software/gfan/gfan.html

Special Update/Build Instructions

Remove the doc, homepage, and examples subdirectories, which take up most of the space.

Type

standard

Dependencies

- $(MP_LIBRARY)
- *cddlib: Double description method for polyhedral representation conversion*

Version Information

package-version.txt:

```
0.6.2.p1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  gfan
```

conda:

```
$ conda install  gfan
```

Debian/Ubuntu:

```
$ sudo apt-get install  gfan
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gfan
```

freebsd:

```
$ sudo pkg install math/gfan
```

gentoo:

```
$ sudo emerge sci-mathematics/gfan
```

nix:

```
$ nix-env --install gfan
```

opensuse:

```
$ sudo zypper install gfan
```

void:

```
$ sudo xbps-install  gfan
```

See https://repology.org/project/gfan/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.114 gfortran: Fortran compiler from the GNU Compiler Collection

Description

This package represents the required Fortran compiler.

Officially we support `gfortran` from GNU Compiler Collection (GCC). It has also been reported that using `flang` (from LLVM) might work.

You can pass the names of compilers to use to `./configure` using the environment variables `CC`, `CXX`, and `FC`, for C, C++, and Fortran compilers, respectively.

For example, if your C compiler is `clang`, your C++ compiler is `clang++`, and your Fortran compiler is `flang`, then you would need to run:

```
$ ./configure CC=clang CXX=clang++ FC=flang
```

License

GPL version 2 or version 3

Upstream Contact

http://gcc.gnu.org/

Special Update/Build Instructions

None.

Type

standard

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *mpc: Arithmetic of complex numbers with arbitrarily high precision and correct rounding*
- *zlib: Data compression library*
- *xz: General-purpose data compression software*

Version Information

package-version.txt:

```
12.2.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  gcc-fortran
```

conda:

```
$ conda install  fortran-compiler
```

cygwin:

```
$ apt-cyg install gcc-fortran
```

Debian/Ubuntu:

```
$ sudo apt-get install  gfortran
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gcc-gfortran
```

freebsd:

```
$ sudo pkg install lang/gcc9
```

homebrew:

```
$ brew install gfortran
```

macports: install the following packages: gcc10 +gfortran

opensuse:

```
$ sudo zypper install gcc-fortran
```

slackware:

```
$ sudo slackpkg install gcc-gfortran
```

void:

```
$ sudo xbps-install  gcc-fortran
```

See https://repology.org/project/gfortran/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.115 giac: A general purpose computer algebra system

Description

- Giac is a general purpose Computer algebra system by Bernard Parisse. It consists of:
- a C++ library (libgiac).
- a command line interpreter (icas or giac).
- the built of the FLTK-based GUI (xcas) has been disabled in the spkg-install file.
- The english documentation will be installed in:

  $SAGE_LOCAL/share/giac/doc/en/cascmd_en/index.html
- Author's website with debian, ubuntu, macosx, windows package:

  http://www-fourier.ujf-grenoble.fr/~parisse/giac.html
- The Freebsd port is math/giacxcas

Licence

GPLv3+

Note: except the french html documentation which is freely redistributable for non commercial only purposes. This doc has been removed in the Sage package, see spkg-src

Upstream Contact

- Bernard Parisse: http://www-fourier.ujf-grenoble.fr/~parisse/giac.html
- Source file (giac-x.y.z-t.tar.gz) in:

  http://www-fourier.ujf-grenoble.fr/~parisse/debian/dists/stable/main/source/

Dependencies

- gettext, readline
- giac will benefit of ntl, pari, mpfr, gsl, lapack but they should be already installed by sage.
- giac can also benefit of mpfi for arithmetic on intervals.
- The Documentation is pre-built, hevea or latex or … are not needed to install the package.

Special Update/Build Instructions

- Use spkg-src to update this package

Type

standard

Dependencies

- *readline: Command line editing library*
- *libpng: Bitmap image support*
- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *mpfi: Multiple precision interval arithmetic library based on MPFR*
- *ntl: A library for doing number theory*
- *gsl: The GNU Scientific Library*
- *pari: Computer algebra system for fast computations in number theory*
- *glpk: GNU Linear Programming Kit*
- *curl: Multiprotocol data transfer library and utility*
- *cliquer: Routines for clique searching*
- *ecm: Elliptic curve method for integer factorization*
- $(findstring
- libnauty,$(OPTIONAL_INSTALLED_PACKAGES))

Version Information

package-version.txt:

```
1.9.0.15p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  libgiac giac
```

conda:

```
$ conda install  giac
```

Debian/Ubuntu:

```
$ sudo apt-get install  libgiac-dev xcas
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  giac giac-devel
```

freebsd:

```
$ sudo pkg install math/giacxcas
```

nix:

```
$ nix-env --install giac
```

opensuse:

```
$ sudo zypper install giac-devel
```

void:

```
$ sudo xbps-install  giac-devel
```

See https://repology.org/project/giac/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.116 git: Version control system

Description

Git is a fast, scalable, distributed revision control system with an unusually rich command set that provides both high-operations and full access to internals.

- `man git`

Upstream Contact

- Website: https://git-scm.com/

Type

optional

Dependencies

Version Information

Equivalent System Packages

arch:

```
$ sudo pacman -S  git
```

conda:

```
$ conda install  git
```

cygwin:

```
$ apt-cyg install git
```

Debian/Ubuntu:

```
$ sudo apt-get install  git
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  git
```

freebsd:

```
$ sudo pkg install devel/git
```

homebrew:

```
$ brew install git
```

macports: install the following packages: git

opensuse:

```
$ sudo zypper install git
```

slackware:

```
$ sudo slackpkg install git
```

void:

```
$ sudo xbps-install  git
```

See https://repology.org/project/git/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.117 github_cli: Command-line interface for GitHub

Description

`gh` is GitHub on the command line. It brings pull requests, issues, and other GitHub concepts to the terminal next to where you are already working with `git` and your code.

License

MIT

Upstream Contact

https://github.com/cli/cli

Type

optional

Dependencies

Version Information

Equivalent System Packages

alpine: install the following packages: github-cli

arch:

```
$ sudo pacman -S  github-cli
```

conda:

```
$ conda install  gh
```

Debian/Ubuntu:

```
$ sudo apt-get install  gh
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gh
```

freebsd:

```
$ sudo pkg install devel/gh
```

gentoo:

```
$ sudo emerge dev-util/github-cli
```

homebrew:

```
$ brew install gh
```

macports: install the following packages: gh

nix:

```
$ nix-env --install gh
```

opensuse:

```
$ sudo zypper install gh
```

void:

```
$ sudo xbps-install  github-cli
```

See https://repology.org/project/github-cli/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.118 gitpython: GitPython is a python library used to interact with Git repositories

Description

GitPython is a python library used to interact with Git repositories

License

BSD

Upstream Contact

https://pypi.org/project/GitPython/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
GitPython
```

Equivalent System Packages

(none known)

6.1.119 givaro: C++ library for arithmetic and algebraic computations

Description

Givaro is a C++ library for arithmetic and algebraic computations. Its main features are implementations of the basic arithmetic of many mathematical entities: Primes fields, Extensions Fields, Finite Fields, Finite Rings, Polynomials, Algebraic numbers, Arbitrary precision integers and rationals (C++ wrappers over gmp) It also provides data-structures and templated classes for the manipulation of basic algebraic objects, such as vectors, matrices (dense, sparse, structured), univariate polynomials (and therefore recursive multivariate).

Website: https://casys.gricad-pages.univ-grenoble-alpes.fr/givaro/

SPKG Repository: https://bitbucket.org/malb/givaro-spkg

License

- GNU GPL

Upstream Contact

- Clement Pernet

Type

standard

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
4.1.1
```

Equivalent System Packages

conda:

```
$ conda install  givaro
```

Debian/Ubuntu:

```
$ sudo apt-get install  libgivaro-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  givaro givaro-devel
```

freebsd:

```
$ sudo pkg install math/givaro
```

gentoo:

```
$ sudo emerge sci-libs/givaro
```

nix:

```
$ nix-env --install givaro
```

opensuse:

```
$ sudo zypper install "pkgconfig(givaro)"
```

void:

```
$ sudo xbps-install  givaro-devel
```

See https://repology.org/project/givaro/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.120 glpk: GNU Linear Programming Kit

Description

The GLPK (GNU Linear Programming Kit) package is intended for solving large-scale linear programming (LP), mixed integer programming (MIP), and other related problems. It is a set of routines written in ANSI C and organized in the form of a callable library.

GLPK supports the GNU MathProg modelling language, which is a subset of the AMPL language.

The GLPK package includes the following main components:

- primal and dual simplex methods
- primal-dual interior-point method
- branch-and-cut method
- translator for GNU MathProg
- application program interface (API)
- stand-alone LP/MIP solver

License

The GLPK package is GPL version 3.

Upstream Contact

GLPK is currently being maintained by:

- Andrew Makhorin (mao@gnu.org, mao@mai2.rcnet.ru)

http://www.gnu.org/software/glpk/#maintainer

Special Update/Build Instructions

- `configure` doesn't support specifying the location of the GMP library to use; only `--with-gmp[=yes]` or `--with-gmp=no` are valid options. (So we *have to* add Sage's include and library directories to `CPPFLAGS` and `LDFLAGS`, respectively.)
- Do we need the `--disable-static`? The stand-alone solver presumably runs faster when built with a static library; also other (stand-alone) programs using it would. (Instead, we should perhaps use `--enable-static --enable-shared` to go safe.)

Patches

- All patches below are currently used by spkg-src
- src/01-zlib.patch: don't build the included zlib library.
- src/02-cygwin_sharedlib.patch: Let a shared library be built on Cygwin by passing the -no-undefined flag to libtool.

  The numbering reflect the order in which they have been created from glpk pristine's sources

Type

standard

Dependencies

- $(MP_LIBRARY)
- *zlib: Data compression library*

Version Information

package-version.txt:

```
5.0.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  glpk
```

conda:

```
$ conda install  glpk
```

cygwin:

```
$ apt-cyg install glpk libglpk-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  glpk-utils libglpk-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  glpk glpk-devel glpk-utils
```

freebsd:

```
$ sudo pkg install math/glpk
```

gentoo:

```
$ sudo emerge sci-mathematics/glpk
```

homebrew:

```
$ brew install glpk
```

macports: install the following packages: glpk

nix:

```
$ nix-env --install glpk
```

opensuse:

```
$ sudo zypper install glpk glpk-devel
```

void:

```
$ sudo xbps-install  glpk-devel
```

See https://repology.org/project/glpk/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.121 glucose: A SAT solver

Description

Glucose is a SAT solver.

Citing its website:

> The name of the solver is a contraction of the concept of "glue clauses", a particular kind of clauses that glucose detects and preserves during search. Glucose is heavily based on Minisat, so please do cite Minisat also if you want to cite Glucose.

License

- nonparallel glucose: MIT
- parallel glucose-syrup: MIT modified with:

  The parallel version of Glucose (all files modified since Glucose 3.0 releases, 2013) cannot be used in any competitive event (sat competitions/evaluations) without the express permission of the authors (Gilles Audemard / Laurent Simon). This is also the case for any competitive event using Glucose Parallel as an embedded SAT engine (single core or not).

Upstream Contact

Website: http://www.labri.fr/perso/lsimon/glucose/

Special Update/Build Instructions

None.

Type

optional

Dependencies

- *zlib: Data compression library*

Version Information

package-version.txt:

```
4.1
```

Equivalent System Packages

See https://repology.org/project/glucose/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.122 gmp: Library for arbitrary precision arithmetic

Description

GMP is a free library for arbitrary precision arithmetic, operating on signed integers, rational numbers, and floating-point numbers. There is no practical limit to the precision except the ones implied by the available memory in the machine GMP runs on. GMP has a rich set of functions, and the functions have a regular interface.

License

- LGPL V3

Upstream Contact

- http://gmplib.org

Type

standard

Dependencies

- *xz: General-purpose data compression software*

Version Information

package-version.txt:

```
6.2.1
```

Equivalent System Packages

conda:

```
$ conda install  gmp
```

cygwin:

```
$ apt-cyg install libgmp-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libgmp-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gmp gmp-devel
```

freebsd:

```
$ sudo pkg install math/gmp
```

gentoo:

```
$ sudo emerge dev-libs/gmp
```

homebrew:

```
$ brew install gmp
```

macports: install the following packages: gmp

opensuse:

```
$ sudo zypper install gmp-devel
```

slackware:

```
$ sudo slackpkg install gmp
```

void:

```
$ sudo xbps-install  gmp-devel gmpxx-devel
```

See https://repology.org/project/gmp/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.123 gmpy2: Python interface to GMP/MPIR, MPFR, and MPC

Description

GMP/MPIR, MPFR, and MPC interface to Python 2.6+ and 3.x

gmpy2 is a C-coded Python extension module that supports multiple-precision arithmetic. In addition to supporting GMP or MPIR for multiple-precision integer and rational arithmetic, gmpy2 adds support for the MPFR (correctly rounded real floating-point arithmetic) and MPC (correctly rounded complex floating-point arithmetic) libraries.

Type

standard

Dependencies

- $(PYTHON)
- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *mpc: Arithmetic of complex numbers with arbitrarily high precision and correct rounding*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.1.2
```

install-requires.txt:

```
gmpy2 >=2.1.0
```

Equivalent System Packages

conda:

```
$ conda install  gmpy2
```

macports: install the following packages: py-gmpy2

void:

```
$ sudo xbps-install  python3-gmpy2
```

See https://repology.org/project/python:gmpy2/versions, https://repology.org/project/python:gmpy2-devel/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.124 gnulib: Modules imported from Gnulib

This script package represents the modules imported into the Sage source tree from Gnulib.

Upstream Contact

https://www.gnu.org/software/gnulib/

Type

standard

Dependencies

Version Information

package-version.txt:

```
f9b39c4e337f1dc0dd07c4f3985c476fb875d799
```

Equivalent System Packages

(none known)

6.1.125 gp2c: A compiler for translating GP routines to C

Description

The gp2c compiler is a package for translating GP routines into the C programming language, so that they can be compiled and used with the PARI system or the GP calculator.

License

GPL version 2+

Upstream Contact

- http://pari.math.u-bordeaux.fr/

Dependencies

- PARI
- Perl

Type

optional

Dependencies

- *pari: Computer algebra system for fast computations in number theory*

Version Information

package-version.txt:

```
0.0.10.p0
```

Equivalent System Packages

Debian/Ubuntu:

```
$ sudo apt-get install  pari-gp2c
```

freebsd:

```
$ sudo pkg install math/gp2c
```

gentoo:

```
$ sudo emerge sci-mathematics/gp2c
```

opensuse:

```
$ sudo zypper install gp2c
```

void:

```
$ sudo xbps-install  gp2c
```

See https://repology.org/project/gp2c/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.126 graphs: A database of combinatorial graphs

Description

A database of graphs. Created by Emily Kirkman based on the work of Jason Grout. Since April 2012 it also contains the ISGCI graph database.

Upstream Contact

- https://jasongrout.org/graph_database
- For ISGCI:

  H.N. de Ridder (hnridder@graphclasses.org)
- For Andries Brouwer's database:

  The data is taken from from Andries E. Brouwer's website (https://www.win.tue.nl/~aeb/). Anything related to the data should be reported to him directly (aeb@cwi.nl)

  The code used to parse the data and create the .json file is available at https://github.com/nathanncohen/strongly_regular_graphs_database.

Type

standard

Dependencies

Version Information

package-version.txt:

```
20210214.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  sage-data-graphs
```

conda:

```
$ conda install  sagemath-db-graphs
```

See https://repology.org/project/sagemath-graphs/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.127 graphviz: Graph visualization software

Description

Graphviz is open source graph visualization software. It has several main graph layout programs. They take descriptions of graphs in a simple text language, and make diagrams in several useful formats.

License

Eclipse Public License 1.0

Upstream Contact

https://graphviz.org/about/

Type

optional

Dependencies

Version Information

Equivalent System Packages

alpine: install the following packages: graphviz-dev

arch:

```
$ sudo pacman -S  graphviz
```

conda:

```
$ conda install  graphviz
```

cygwin:

```
$ apt-cyg install graphviz
```

Debian/Ubuntu:

```
$ sudo apt-get install  graphviz
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  graphviz
```

freebsd:

```
$ sudo pkg install graphics/graphviz
```

homebrew:

```
$ brew install graphviz
```

macports: install the following packages: graphviz

nix:

```
$ nix-env --install graphviz
```

opensuse:

```
$ sudo zypper install graphviz
```

void:

```
$ sudo xbps-install  graphviz graphviz-devel
```

See https://repology.org/project/graphviz/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.128 gsl: The GNU Scientific Library

Description

The GNU Scientific Library

Website: http://www.gnu.org/software/gsl/

From the website above: The GNU Scientific Library (GSL) is a numerical library for C and C++ programmers. It is free software under the GNU General Public License.

The library provides a wide range of mathematical routines such as random number generators, special functions and least-squares fitting. There are over 1000 functions in total with an extensive test suite. If the variable SAGE_CHECK is exported to the value "yes" when building Sage, GSL's test suite is run.

License

- GPL V3

Upstream Contact

- http://www.gnu.org/software/gsl/

GSL mailing lists:

- Bug-gsl <bug-gsl@gnu.org> mailing list – bug reports for the GNU Scientific Library should be sent to bug-gsl@gnu.org
- Help-gsl <help-gsl@gnu.org> users mailing list – for questions about installation, how GSL works and how it is used, or general questions concerning GSL.
- Info-gsl <info-gsl@gnu.org> mailing list – announcements of new releases are made there.

Special Update/Build Instructions

Type

standard

Dependencies

- $(BLAS)
- *pkgconf: An implementation of the pkg-config spec*

Version Information

package-version.txt:

```
2.7.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  gsl
```

conda:

```
$ conda install  gsl
```

cygwin:

```
$ apt-cyg install libgsl-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libgsl-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gsl gsl-devel
```

freebsd:

```
$ sudo pkg install math/gsl
```

gentoo:

```
$ sudo emerge sci-libs/gsl
```

homebrew:

```
$ brew install gsl
```

macports: install the following packages: gsl

nix:

```
$ nix-env --install gsl
```

opensuse:

```
$ sudo zypper install "pkgconfig(gsl)"
```

slackware:

```
$ sudo slackpkg install gsl
```

void:

```
$ sudo xbps-install  gsl-devel
```

See https://repology.org/project/gsl/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.129 hatch_fancy_pypi_readme: Fancy PyPI READMEs with Hatch

Description

Fancy PyPI READMEs with Hatch

License

MIT

Upstream Contact

https://pypi.org/project/hatch-fancy-pypi-readme/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *hatchling: Modern, extensible Python build backend*

Version Information

package-version.txt:

```
22.8.0
```

install-requires.txt:

```
hatch-fancy-pypi-readme
```

Equivalent System Packages

(none known)

6.1.130 hatch_nodejs_version: Hatch plugin for versioning from a package.json file

Description

Hatch plugin for versioning from a package.json file

License

MIT

Upstream Contact

https://pypi.org/project/hatch-nodejs-version/

Type

standard

Dependencies

- $(PYTHON)
- *hatchling: Modern, extensible Python build backend*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.3.1
```

install-requires.txt:

```
hatch-nodejs-version
```

Equivalent System Packages

(none known)

6.1.131 hatch_vcs: Hatch plugin for versioning with your preferred VCS

Description

Hatch plugin for versioning with your preferred VCS

License

Upstream Contact

https://pypi.org/project/hatch-vcs/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *hatchling: Modern, extensible Python build backend*

Version Information

package-version.txt:

```
0.2.0
```

install-requires.txt:

```
hatch-vcs
```

Equivalent System Packages

(none known)

6.1.132 hatchling: Modern, extensible Python build backend

Description

Modern, extensible Python build backend

License

MIT

Upstream Contact

https://pypi.org/project/hatchling/

Type

standard

Dependencies

- $(PYTHON)
- *pathspec: Utility library for gitignore style pattern matching of file paths.*
- *tomli: A lil' TOML parser*
- *editables: Editable installations*
- *pluggy: plugin and hook calling mechanisms for python*
- *packaging: Core utilities for Python packages*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.11.1
```

install-requires.txt:

```
hatchling
```

Equivalent System Packages

conda:

```
$ conda install  hatchling
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.133 html5lib: An HTML parser

Description

HTML parser based on the WHATWG HTML specification.

License

MIT License

Upstream Contact

Home Page: https://github.com/html5lib/html5lib-python/issues

Type

standard

Dependencies

- $(PYTHON)
- *webencodings: Character encoding aliases for legacy web content*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.1
```

install-requires.txt:

```
html5lib >=1.0.1
```

Equivalent System Packages

conda:

```
$ conda install  html5lib
```

macports: install the following packages: py-html5lib

void:

```
$ sudo xbps-install  python3-html5lib
```

See https://repology.org/project/html5lib/versions, https://repology.org/project/python:html5lib/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.134 iconv: Library for language/country-dependent character encodings

Description

GNU libiconv is a library that is used to enable different languages, with different characters to be handled properly.

License

- GPL 3 and LGPL 3. So we can safely link against the library in Sage.

Upstream Contact

- http://www.gnu.org/software/libiconv/
- Bug reports to bug-gnu-libiconv@gnu.org

Special Update/Build Instructions

- None, other than anyone updating this package should be familiar with how to write shell scripts.

Type

standard

Dependencies

Version Information

package-version.txt:

```
1.15
```

Equivalent System Packages

cygwin:

```
$ apt-cyg install libiconv-devel
```

homebrew:

```
$ brew install libiconv
```

macports: install the following packages: libiconv

See https://repology.org/project/libiconv/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.135 idna: Internationalized Domain Names in Applications (IDNA)

Description

Internationalized Domain Names in Applications (IDNA)

License

BSD-3-Clause

Upstream Contact

https://pypi.org/project/idna/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.4
```

install-requires.txt:

```
idna
```

Equivalent System Packages

conda:

```
$ conda install  idna
```

void:

```
$ sudo xbps-install  python3-idna
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.136 igraph: A library for creating and manipulating graphs

Description

igraph is a library for creating and manipulating graphs. It is intended to be as powerful (ie. fast) as possible to enable the analysis of large graphs.

License

GPL version 2

Upstream Contact

http://igraph.org/c/

Dependencies

igraph can optionally use libxml2 for providing a GraphML importer.

Special Update/Build Instructions

Type

optional

Dependencies

- $(MP_LIBRARY)
- *glpk: GNU Linear Programming Kit*
- $(BLAS)
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
0.10.4
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  igraph
```

conda:

```
$ conda install  igraph
```

Debian/Ubuntu:

```
$ sudo apt-get install  libigraph-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  igraph igraph-devel
```

freebsd:

```
$ sudo pkg install math/igraph
```

gentoo:

```
$ sudo emerge dev-libs/igraph
```

homebrew:

```
$ brew install igraph
```

macports: install the following packages: igraph

void:

```
$ sudo xbps-install  igraph-devel
```

See https://repology.org/project/igraph/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.137 ImageMagick: A collection of tools and libraries for many image file formats

Description

A collection of tools and libraries for many image file formats

License

Copyright [yyyy] [name of copyright owner]

Licensed under the ImageMagick License (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at

> https://imagemagick.org/script/license.php

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

Upstream Contact

http://www.imagemagick.org/

Type

optional

Dependencies

Version Information

Equivalent System Packages

alpine: install the following packages: imagemagick

arch:

```
$ sudo pacman -S  imagemagick
```

conda:

```
$ conda install  imagemagick
```

cygwin:

```
$ apt-cyg install ImageMagick
```

Debian/Ubuntu:

```
$ sudo apt-get install  imagemagick
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  ImageMagick
```

freebsd:

```
$ sudo pkg install graphics/ImageMagick7
```

homebrew:

```
$ brew install imagemagick
```

macports: install the following packages: ImageMagick

nix:

```
$ nix-env --install imagemagick
```

opensuse:

```
$ sudo zypper install ImageMagick
```

void:

```
$ sudo xbps-install  ImageMagick
```

See https://repology.org/project/imagemagick/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.138 imagesize: Parser for image file metadata

Description

It parses image files' header and return image size.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.4.1
```

install-requires.txt:

```
imagesize >=1.1.0
```

Equivalent System Packages

conda:

```
$ conda install  imagesize
```

macports: install the following packages: py-imagesize

void:

```
$ sudo xbps-install  python3-imagesize
```

See https://repology.org/project/python:imagesize/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.139 iml: Integer Matrix Library

Description

IML is a free library of C source code which implements algorithms for computing exact solutions to dense systems of linear equations over the integers. IML is designed to be used with the ATLAS/BLAS library and GMP bignum library.

Written in portable C, IML can be used on both 32-bit and 64-bit machines. It can be called from C++.

Website: https://www.cs.uwaterloo.ca/~astorjoh/iml.html

License

- GPLv2+

Upstream Contact

- Zhuliang Chen z4chen@uwaterloo.ca
- Arne Storjohann astorjoh@uwaterloo.ca

Special Update/Build Instructions

- As of version 1.0.4, you need to repackage the upstream tarball using the spkg-src script because there was a bugfix version of 1.0.4 reposted upstream without version number bump.

Patches

- examples.patch: Modified some of the examples.

Type

standard

Dependencies

- $(MP_LIBRARY)
- $(BLAS)
- *pkgconf: An implementation of the pkg-config spec*

Version Information

package-version.txt:

```
1.0.4p2.p2
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  iml
```

conda:

```
$ conda install  iml
```

Debian/Ubuntu:

```
$ sudo apt-get install  libiml-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  iml iml-devel
```

freebsd:

```
$ sudo pkg install math/iml
```

gentoo:

```
$ sudo emerge sci-libs/iml
```

nix:

```
$ nix-env --install iml
```

opensuse:

```
$ sudo zypper install iml-devel
```

void:

```
$ sudo xbps-install  iml-devel
```

See https://repology.org/project/iml/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.140 importlib_metadata: Library to access the metadata for a Python package

Description

This is a backport package, supplying access to the functionality of `importlib.metadata` including improvements added to subsequent Python versions.

License

Apache Software License

Upstream Contact

- https://pypi.org/project/importlib-metadata/
- http://importlib-metadata.readthedocs.io/

Type

standard

Dependencies

- $(PYTHON)
- *zipp: A pathlib-compatible zipfile object wrapper*
- *typing_extensions: Backported and Experimental Type Hints for Python 3.5+*
- $(PYTHON_TOOLCHAIN)
- *tomli: A lil' TOML parser*

Version Information

package-version.txt:

```
6.0.0
```

install-requires.txt:

```
# According to https://pypi.org/project/importlib-metadata/,
# 4.13 provides the features of Python 3.11 importlib.metadata
importlib_metadata >=4.13
```

Equivalent System Packages

conda:

```
$ conda install  importlib_metadata
```

void:

```
$ sudo xbps-install  python3-importlib_metadata
```

See https://repology.org/project/python:importlib-metadata/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.141 importlib_resources: Read resources from Python packages

Description

Read resources from Python packages

License

Apache2

Upstream Contact

https://pypi.org/project/importlib-resources/

Type

standard

Dependencies

- $(PYTHON)
- *zipp: A pathlib-compatible zipfile object wrapper*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
5.12.0
```

install-requires.txt:

```
# According to https://pypi.org/project/importlib-resources/,
# version 5.7 provides the features of Python 3.11 importlib.resources
importlib_resources >= 5.7
```

Equivalent System Packages

conda:

```
$ conda install  importlib-resources
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.142 info: stand-alone Info documentation reader

Description

GNU Info is the stand-alone "info" reader that is part of the GNU Texinfo suite of tools. Several packages (Maxima, Singular, ...) install documentation in "info" format, which can be read either with Emacs, the stand-alone "info" reader, and some other software. In particular, the interactive help system of `singular_console()` uses the `info` program in environments in which a web browser is not available; if `info` is not installed, it falls back to a basic pager with limited capabilities.

Website: https://www.gnu.org/software/texinfo/manual/info-stnd/info-stnd.html

License

GPL-3+ (`info/*.c` comments in the source repository)

Type

standard

Dependencies

- *ncurses: Classic terminal output library*
- *xz: General-purpose data compression software*

Version Information

package-version.txt:

```
6.8
```

Equivalent System Packages

conda:

```
$ conda install  texinfo
```

cygwin:

```
$ apt-cyg install info
```

Debian/Ubuntu:

```
$ sudo apt-get install  texinfo
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  texinfo info
```

gentoo:

```
$ sudo emerge sys-apps/texinfo
```

homebrew:

```
$ brew install texinfo
```

macports: install the following packages: texinfo

nix:

```
$ nix-env --install texinfo
```

opensuse:

```
$ sudo zypper install texinfo
```

void:

```
$ sudo xbps-install  texinfo
```

See https://repology.org/project/texinfo/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.143 ipykernel: IPython Kernel for Jupyter

Description

This package provides the IPython kernel for Jupyter.

Type

standard

Dependencies

- $(PYTHON)
- *ipython_genutils: Vestigial utilities from IPython*
- *importlib_metadata: Library to access the metadata for a Python package*
- *matplotlib_inline: Inline Matplotlib backend for Jupyter*
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *jupyter_client: Jupyter protocol implementation and client libraries*
- *tornado: Python web framework and asynchronous networking library*
- *appnope: Disable App Nap on macOS >= 10.9*
- *traitlets: Traitlets Python configuration system*
- *executing: Get the currently executing AST node of a frame, and other information*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
6.6.0
```

install-requires.txt:

```
ipykernel >=5.2.1
```

Equivalent System Packages

conda:

```
$ conda install  ipykernel
```

macports: install the following packages: py-ipykernel

void:

```
$ sudo xbps-install  python3-ipython_ipykernel
```

See https://repology.org/project/python:ipykernel/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.144 ipympl: Matplotlib Jupyter Extension

Description

Matplotlib Jupyter Extension

License

BSD License

Upstream Contact

https://pypi.org/project/ipympl/

Type

optional

Dependencies

- $(PYTHON)
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*
- *matplotlib: Python 2D plotting library*
- *ipykernel: IPython Kernel for Jupyter*
- $(PYTHON_TOOLCHAIN)
- *jupyter_packaging: Jupyter Packaging Utilities*

Version Information

requirements.txt:

```
ipympl
```

install-requires.txt:

```
ipympl
```

Equivalent System Packages

conda:

```
$ conda install  ipympl
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.145 ipython: Interactive computing environment with an enhanced interactive Python shell

Description

Interactive computing environment with an enhanced interactive Python shell

From the IPython website:

IPython is a multiplatform, Free Software project (BSD licensed) that offers:

- An enhanced Python shell designed for efficient interactive work. It includes many enhancements over the default Python shell, including the ability for controlling interactively all major GUI toolkits in a non-blocking manner.
- A library to build customized interactive environments using Python as the basic language (but with the possibility of having extended or alternate syntaxes).
- A system for interactive distributed and parallel computing (this is part of IPython's new development).

License

BSD

Upstream Contact

http://ipython.org

ipython-dev@scipy.org

ipython-user@scipy.org

Type

standard

Dependencies

- $(PYTHON)
- *jinja2: General purpose template engine for Python*
- *tornado: Python web framework and asynchronous networking library*
- *pyzmq: Python bindings for the zeromq networking library*
- *pickleshare: A 'shelve' like datastore with concurrency support*
- *simplegeneric: Simple single-dispatch generic functions for Python*
- *traitlets: Traitlets Python configuration system*
- *decorator: Python library providing decorators*
- *wcwidth: Measures the displayed width of unicode strings in a terminal*
- *prompt_toolkit: Interactive command lines for Python*
- *pygments: Generic syntax highlighter*
- *pexpect: Python module for controlling and automating other programs*
- *appnope: Disable App Nap on macOS >= 10.9*
- *backcall: Specifications for callback functions*
- *jedi: Static analysis tool providing IDE support for Python*
- *stack_data: Extract data from python stack frames and tracebacks for informative displays*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
8.6.0
```

install-requires.txt:

```
ipython >=7.13.0
```

Equivalent System Packages

conda:

```
$ conda install  ipython
```

homebrew:

```
$ brew install ipython
```

macports: install the following packages: py-ipython

opensuse:

```
$ sudo zypper install python3-ipython
```

void:

```
$ sudo xbps-install  python3-ipython
```

See https://repology.org/project/ipython/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.146 ipython_genutils: Vestigial utilities from IPython

Description

Vestigial utilities from IPython

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.2.0
```

install-requires.txt:

```
ipython_genutils >=0.2.0
```

Equivalent System Packages

conda:

```
$ conda install  ipython_genutils
```

macports: install the following packages: py-ipython_genutils

void:

```
$ sudo xbps-install  python3-ipython_genutils
```

See https://repology.org/project/python:ipython-genutils/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.147 ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel

Description

Interactive HTML widgets for Jupyter notebooks and the IPython kernel.

Type

standard

Dependencies

- $(PYTHON)
- *widgetsnbextension: Jupyter notebook extension for interactive HTML widgets*
- *jupyterlab_widgets: Jupyter interactive widgets for JupyterLab*
- $(PYTHON_TOOLCHAIN)
- *ipykernel: IPython Kernel for Jupyter*
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *traitlets: Traitlets Python configuration system*

Version Information

package-version.txt:

```
8.0.2
```

install-requires.txt:

```
ipywidgets >=7.5.1
```

Equivalent System Packages

conda:

```
$ conda install  ipywidgets<8.0.0
```

macports: install the following packages: py-ipywidgets

void:

```
$ sudo xbps-install  python3-jupyter_ipywidgets
```

See https://repology.org/project/python:ipywidgets/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.148 isl: Sets and relations of integer points bounded by affine constraints

Description

isl is a thread-safe C library for manipulating sets and relations of integer points bounded by affine constraints. The descriptions of the sets and relations may involve both parameters and existentially quantified variables. All computations are performed in exact integer arithmetic using GMP.

License

isl is released under the MIT license, but depends on the LGPL GMP library.

Upstream Contact

- http://groups.google.com/group/isl-development

Citation

```
@incollection{Verdoolaege2010isl,
   author = {Verdoolaege, Sven},
   title = {isl: An Integer Set Library for the Polyhedral Model},
   booktitle = {Mathematical Software - ICMS 2010},
   series = {Lecture Notes in Computer Science},
   editor = {Fukuda, Komei and Hoeven, Joris and Joswig, Michael and
   Takayama, Nobuki},
   publisher = {Springer},
   isbn = {978-3-642-15581-9},
   pages = {299-302},
   volume = {6327},
   year = {2010}
}
```

Type

optional

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
0.20
```

Equivalent System Packages

conda:

```
$ conda install  isl
```

cygwin:

```
$ apt-cyg install libisl-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libisl-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  isl-devel
```

freebsd:

```
$ sudo pkg install devel/isl
```

gentoo:

```
$ sudo emerge dev-libs/isl
```

homebrew:

```
$ brew install isl
```

macports: install the following packages: isl

opensuse:

```
$ sudo zypper install "pkgconfig(isl)"
```

void:

```
$ sudo xbps-install  isl-devel
```

See https://repology.org/project/isl/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.149 jedi: Static analysis tool providing IDE support for Python

Description

Jedi is a static analysis tool for Python that is typically used in IDEs/editors plugins. Jedi has a focus on autocompletion and goto functionality. Other features include refactoring, code search and finding references.

Type

standard

Dependencies

- $(PYTHON)
- *parso: A Python parser*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.18.1
```

install-requires.txt:

```
jedi >=0.17.0
```

Equivalent System Packages

conda:

```
$ conda install  jedi
```

macports: install the following packages: py-jedi

void:

```
$ sudo xbps-install  python3-jedi
```

See https://repology.org/project/jedi/versions, https://repology.org/project/python:jedi/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.150 jinja2: General purpose template engine for Python

Description

Jinja2 is a library for Python 2.4 and onwards that is designed to be flexible, fast and secure.

If you have any exposure to other text-based template languages, such as Smarty or Django, you should feel right at home with Jinja2. It's both designer and developer friendly by sticking to Python's principles and adding functionality useful for templating environments.

License

Modified BSD License

Upstream Contact

Author: Pocoo Team <http://pocoo.org>

Homepage: http://jinja.pocoo.org/

Special Update/Build Instructions

None. (Just make sure its prerequisites are new enough in Sage, to avoid downloads during the build / installation.)

Type

standard

Dependencies

- $(PYTHON)
- *markupsafe: Safely add untrusted strings to HTML/XML markup*
- *docutils: Processing plaintext documentation into useful formats, such as HTML or LaTeX*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.1.2
```

install-requires.txt:

```
jinja2 >=2.11.2
```

Equivalent System Packages

conda:

```
$ conda install  jinja2
```

macports: install the following packages: py-jinja2

opensuse:

```
$ sudo zypper install python3-Jinja2
```

void:

```
$ sudo xbps-install  python3-Jinja2
```

See https://repology.org/project/python:jinja2/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.151 jmol: Java viewer for chemical structures in 3D

Description

Java viewer for chemical structures in 3D.

This provides files necessary for Jmol (java).

This package does not install JSmol (javascript), which upstream bundles with Jmol.

License

GPLv2+

Upstream Contact

- http://jmol.sourceforge.net
- Bob Hanson
- e-mail: hansonr@stolaf.edu
- Homepage: https://www.stolaf.edu/people/hansonr/
- Development page: https://github.com/BobHanson/Jmol-SwingJS
- Download page: https://sourceforge.net/projects/jmol/files/Jmol/

Dependencies

No build-time dependencies.

The commandline jmol requires java at runtime.

Special Build Instructions

To avoid depending on `unzip` at build time, we have to repack the tarball, see `spkg-src`. We take the opportunity to remove some unnecessary subdirectories, see http://wiki.jmol.org/index.php/Jmol_JavaScript_Object#In_detail

Type

standard

Dependencies

Version Information

package-version.txt:

```
14.29.52
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  jmol
```

conda:

```
$ conda install  jmol
```

macports: install the following packages: jmol

nix:

```
$ nix-env --install jmol
```

opensuse:

```
$ sudo zypper install jmol
```

void:

```
$ sudo xbps-install  jmol
```

See https://repology.org/project/jmol/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.152 jsonschema: Python implementation of JSON Schema

Description

jsonschema is an implementation of JSON Schema for Python

License

MIT License

Upstream Contact

Home page: http://github.com/Julian/jsonschema

Type

standard

Dependencies

- $(PYTHON)
- *vcversioner: Python build system extension to obtain package version from version control*
- *attrs: Decorator for Python classes with attributes*
- *importlib_metadata: Library to access the metadata for a Python package*
- *pyrsistent: Persistent data structures in Python*
- $(PYTHON_TOOLCHAIN)
- *hatchling: Modern, extensible Python build backend*
- *hatch_vcs: Hatch plugin for versioning with your preferred VCS*
- *hatch_fancy_pypi_readme: Fancy PyPI READMEs with Hatch*

Version Information

package-version.txt:

```
4.17.1
```

install-requires.txt:

```
jsonschema >=3.2.0
```

Equivalent System Packages

conda:

```
$ conda install  jsonschema
```

macports: install the following packages: py-jsonschema

opensuse:

```
$ sudo zypper install python3-jsonschema
```

void:

```
$ sudo xbps-install  python3-jsonschema
```

See https://repology.org/project/python:jsonschema/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.153 jupymake: A Python wrapper for the polymake shell

Description

The Python module JuPyMake provides an interface to polymake.

License

- GPL v2

Upstream Contact

https://github.com/polymake/JuPyMake

Special Update/Build Instructions

Type

optional

Dependencies

- $(PYTHON)
- *polymake: Computations with polyhedra, fans, simplicial complexes, matroids, graphs, tropical hypersurfaces*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.9
```

install-requires.txt:

```
jupymake >=0.9
```

Equivalent System Packages

See https://repology.org/project/jupymake/versions, https://repology.org/project/python:jupymake/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.154 jupyter_client: Jupyter protocol implementation and client libraries

Description

jupyter_client contains the reference implementation of the Jupyter protocol. It also provides client and kernel management APIs for working with kernels.

It also provides the jupyter kernelspec entrypoint for installing kernelspecs for use with Jupyter frontends.

Type

standard

Dependencies

- $(PYTHON)
- *jupyter_core: Jupyter core package*
- $(PYTHON_TOOLCHAIN)
- *pyzmq: Python bindings for the zeromq networking library*
- *dateutil: Extensions to the standard Python module datetime*
- *nest_asyncio: Patch asyncio to allow nested event loops*
- *tornado: Python web framework and asynchronous networking library*
- *traitlets: Traitlets Python configuration system*
- *entrypoints: Discover and load entry points from installed Python packages*
- *hatchling: Modern, extensible Python build backend*

Version Information

package-version.txt:

```
7.4.4
```

install-requires.txt:

```
jupyter_client >=6.1.6
```

Equivalent System Packages

conda:

```
$ conda install  jupyter_client
```

macports: install the following packages: py-jupyter_client

opensuse:

```
$ sudo zypper install python3-jupyter-client
```

void:

```
$ sudo xbps-install  python3-jupyter_client
```

See https://repology.org/project/jupyter-client/versions, https://repology.org/project/python:jupyter-client/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.155 jupyter_core: Jupyter core package

Description

Jupyter core package. A base package on which Jupyter projects rely.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *traitlets: Traitlets Python configuration system*

Version Information

package-version.txt:

```
4.11.2
```

install-requires.txt:

```
jupyter_core >=4.6.3
```

Equivalent System Packages

conda:

```
$ conda install  jupyter_core
```

macports: install the following packages: py-jupyter_core

opensuse:

```
$ sudo zypper install python3-jupyter-core
```

void:

```
$ sudo xbps-install  python3-jupyter_core
```

See https://repology.org/project/jupyter-core/versions, https://repology.org/project/python:jupyter-core/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.156 jupyter_jsmol: JSmol viewer widget for Jupyter

Description

JSmol viewer widget for Jupyter

License

BSD

Upstream Contact

https://pypi.org/project/jupyter-jsmol/

Type

standard

Dependencies

- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*
- *jupyter_packaging: Jupyter Packaging Utilities*
- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2022.1.0
```

install-requires.txt:

```
jupyter-jsmol >=2022.1.0
```

Equivalent System Packages

conda:

```
$ conda install  jupyter-jsmol
```

See https://repology.org/project/jupyter-jsmol/versions, https://repology.org/project/python:jupyter-jsmol/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.157 jupyter_packaging: Jupyter Packaging Utilities

Description

Jupyter Packaging Utilities

License

BSD

Upstream Contact

https://pypi.org/project/jupyter-packaging/

Type

standard

Dependencies

- $(PYTHON)
- *packaging: Core utilities for Python packages*
- *deprecation: A library to handle automated deprecations*
- *tomlkit: Style preserving TOML library*
- $(PYTHON_TOOLCHAIN)
- *hatchling: Modern, extensible Python build backend*

Version Information

package-version.txt:

```
0.12.3
```

install-requires.txt:

```
jupyter-packaging
```

Equivalent System Packages

conda:

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.158 jupyter_sphinx: Jupyter Sphinx Extension

Description

Jupyter Sphinx Extension

License

BSD

Upstream Contact

https://pypi.org/project/jupyter-sphinx/

Type

standard

Dependencies

- $(PYTHON)
- *sphinx: Python documentation generator*
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *nbconvert: Converting Jupyter Notebooks*
- *nbformat: Base implementation of the Jupyter notebook format*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.3.2
```

install-requires.txt:

```
jupyter-sphinx
```

Equivalent System Packages

conda:

```
$ conda install  jupyter_sphinx
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.159 jupyterlab: An extensible environment for interactive and reproducible computing

Description

An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.

License

BSD License

Upstream Contact

Home page: https://jupyter.org/

Type

optional

Dependencies

- $(PYTHON)
- *vcversioner: Python build system extension to obtain package version from version control*
- *jupyter_core: Jupyter core package*
- *jupyter_client: Jupyter protocol implementation and client libraries*
- *jinja2: General purpose template engine for Python*
- *tornado: Python web framework and asynchronous networking library*
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *packaging: Core utilities for Python packages*
- *terminado: Tornado websocket backend for the term.js Javascript terminal emulator library*
- *traitlets: Traitlets Python configuration system*
- *nbconvert: Converting Jupyter Notebooks*
- *send2trash: Send file to trash natively under Mac OS X, Windows and Linux*
- *nbformat: Base implementation of the Jupyter notebook format*
- *prometheus_client: Python client for the systems monitoring and alerting toolkit Prometheus*
- *ipython_genutils: Vestigial utilities from IPython*
- *argon2_cffi: The secure Argon2 password hashing algorithm*
- *pyzmq: Python bindings for the zeromq networking library*
- *idna: Internationalized Domain Names in Applications (IDNA)*
- *requests: An HTTP library for Python*
- *jsonschema: Python implementation of JSON Schema*

- *babel: Internationalization utilities for Python*
- *notebook: Jupyter notebook, a web-based notebook environment for interactive computing*
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
jupyterlab ~= 3.3
# See :issue:`33607`
jupyterlab-server < 2.11
```

Equivalent System Packages

conda:

```
$ conda install  jupyterlab
```

homebrew:

```
$ brew install jupyterlab
```

macports: install the following packages: py-jupyterlab

void:

```
$ sudo xbps-install  jupyterlab
```

See https://repology.org/project/jupyterlab/versions, https://repology.org/project/python:jupyterlab/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.160 jupyterlab_pygments: Pygments theme using JupyterLab CSS variables

Description

Pygments theme using JupyterLab CSS variables

License

BSD

Upstream Contact

https://pypi.org/project/jupyterlab-pygments/

Type

standard

Dependencies

- $(PYTHON)
- *pygments: Generic syntax highlighter*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.1.2
```

install-requires.txt:

```
jupyterlab-pygments
```

Equivalent System Packages

conda:

```
$ conda install  jupyterlab_pygments
```

void:

```
$ sudo xbps-install  python3-jupyterlab_pygments
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.161 jupyterlab_widgets: Jupyter interactive widgets for JupyterLab

Description

Jupyter interactive widgets for JupyterLab

License

BSD-3-Clause

Upstream Contact

https://pypi.org/project/jupyterlab-widgets/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.0.3
```

install-requires.txt:

```
jupyterlab-widgets
```

Equivalent System Packages

macports: install the following packages: py-jupyterlab_widgets

See https://repology.org/project/jupyterlab-widgets/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.162 kenzo: Construct topological spaces and compute homology groups

Description

Kenzo is a package to compute properties (mainly homology groups) of topological spaces. It allows defining spaces created from others by constuctions like loop spaces, classifying spaces and so on.

License

GPL

Upstream Contact

- https://github.com/gheber/kenzo
- https://github.com/miguelmarco/kenzo/

Type

optional

Dependencies

- *ecl: An implementation of the Common Lisp language*

Version Information

package-version.txt:

```
1.1.10
```

Equivalent System Packages

See https://repology.org/project/kenzo/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.163 kissat: SAT solver

Description

From the package README:

```
KISSAT is a "keep it simple and clean bare metal SAT solver" written in C.
It is a port of CaDiCaL back to C with improved data structures, better
scheduling of inprocessing and optimized algorithms and implementation.

Coincidentally 'kissat' also means 'cats' in Finnish.
```

From the website:

```
The Kissat SAT solver is a condensed and improved reimplementation of
CaDiCaL in C.

Kissat won first place in the main track of the SAT Competition 2020 and
first place on unsatisfiable instances.
```

License

MIT license.

Upstream Contact

Website: http://fmv.jku.at/kissat/

Type

optional

Dependencies

Version Information

package-version.txt:

```
3.0.0
```

Equivalent System Packages

Fedora/Redhat/CentOS:

```
$ sudo yum install  kissat
```

gentoo:

```
$ sudo emerge sci-mathematics/kissat
```

nix:

```
$ nix-env --install kissat
```

See https://repology.org/project/kissat/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.164 kiwisolver: An implementation of the Cassowary constraint solving algorithm

Description

From https://pypi.org/project/kiwisolver/

A fast implementation of the Cassowary constraint solver

Kiwi is an efficient C++ implementation of the Cassowary constraint solving algorithm. Kiwi is an implementation of the algorithm based on the seminal Cassowary paper. It is not a refactoring of the original C++ solver. Kiwi has been designed from the ground up to be lightweight and fast. Kiwi ranges from 10x to 500x faster than the original Cassowary solver with typical use cases gaining a 40x improvement. Memory savings are consistently > 5x.

In addition to the C++ solver, Kiwi ships with hand-rolled Python bindings.

License

Modified BSD License

Upstream Contact

https://github.com/nucleic/kiwi

Type

standard

Dependencies

- $(PYTHON)
- *cppy: C++ headers for C extension development*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.4.3
```

install-requires.txt:

```
kiwisolver >=1.0.1
```

Equivalent System Packages

conda:

```
$ conda install  kiwisolver
```

macports: install the following packages: py-kiwisolver

void:

```
$ sudo xbps-install  python3-kiwisolver
```

See https://repology.org/project/python:kiwisolver/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.165 latte_int: Count lattice points, compute volumes, and integrate over convex polytopes

Description

LattE (Lattice point Enumeration) Integrale solves the problems of counting lattice points in and integration over convex polytopes.

License

GPLv2

Upstream Contact

Matthias Köppe, UC Davis, CA, USA

Type

optional

Dependencies

- $(MP_LIBRARY)
- *ntl: A library for doing number theory*
- *4ti2: Algebraic, geometric and combinatorial problems on linear spaces*
- *cddlib: Double description method for polyhedral representation conversion*
- *lidia: A library for computational number theory*

Version Information

package-version.txt:

```
1.7.6
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  latte-integrale
```

conda:

```
$ conda install  latte-integrale
```

opensuse:

```
$ sudo zypper install latte
```

See https://repology.org/project/latte-integrale/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.166 lcalc: L-function calculator

Description

Michael Rubinstein's L-function calculator.

License

- LGPL V2+

Upstream contact

Michael Rubinstein <mrubinst@uwaterloo.ca>

Sources: http://oto.math.uwaterloo.ca/~mrubinst/L_function_public/L.html

Newer beta version 1.3 (not yet in Sage): http://code.google.com/p/l-calc/

Dependencies

- GMP/MPIR
- MPFR
- PARI
- GNU patch

Special Update/Build Instructions

- There is some garbage in the upstream sources which should be removed:

```
src/include/.Lexplicit_formula.h.swp
src/include/.Lvalue.h.swp
src/include/._.DS_Store
src/include/.DS_Store
src/include/Lexplicit_formula.h.swap.crap
src/include/Lvalue.h.bak
src/src/Makefile.old
src/src/.Makefile.old.swp
src/src/._.DS_Store
src/src/.DS_Store
src/src/.Lcommandline.ggo.swp
src/src/libLfunction.a
```

- We (and apparently also upstream) currently don't build Lcalc's tests (see Makefile), hence there's no spkg-check. This might change in newer upstream versions.

- The original Makefile uses $(CC) to compile C++ (also using $(CCFLAGS)), which it defines to 'g++', and hardcodes 'g++' when linking the shared library. (It should use $(CXX) instead, which might *default* to 'g++'.) We now (lcalc-1.23.p10) patch the Makefile also to use $(CXX) for compiling and linking C++; $(CXX) now *defaults* to 'g++', and $(CC) to 'gcc', but both can be overridden by simply setting their respective environment variables. (Same for $(INSTALL_DIR) btw.)

Patches

- Makefile.patch:

  We change a lot there, since Lcalc doesn't have a 'configure' script, and hence the Makefile is supposed to be edited to customize Lcalc (build options, locations of headers and libraries etc.). Besides that, we

  - put CXXFLAGS into Lcalc's "CCFLAGS" used for compiling C++,
  - remove some stuff involving LDFLAGS1 and LDFLAGS2, setting just LDFLAGS,
  - use $(MAKE) instead of 'make' in the crude build receipts,
  - use CXXFLAG64 when linking the shared library,
  - now use $(CXX) for compiling and linking C++, which *defaults* to 'g++', but can be overridden by setting the environment variable of the same name. ($(CC) now *defaults* to 'gcc', although currently not really used as far as I can see.)
  - $(INSTALL_DIR) can now be overridden by simply setting the environment variable of the same name.

- Lcommon.h.patch:

  Uncomment the definition of lcalc_to_double(const long double& x). (Necessary for GCC >= 4.6.0, cf. #10892.) Comment from there: The reason is the following code horror from src/src/include/Lcommon.h: [. . .] But somebody who is familiar with the codebase should really rewrite lcalc to not redefine the double() cast, thats just fragile and will sooner or later again fail inside some system headers.

- pari-2.7.patch:

  Various changes to port to newer versions of PARI.

- time.h.patch:

  (Patches src/include/Lcommandline_numbertheory.h) Include also <time.h> in Lcommandline_numbertheory.h (at least required on Cygwin, cf. #9845). This should get reported upstream.

- lcalc-1.23_default_parameters_1.patch: Make Lcalc (1.23) build with GCC 4.9

Type

standard

Dependencies

- *pari: Computer algebra system for fast computations in number theory*
- *gengetopt: getopt_long parser generator*

Version Information

package-version.txt:

```
2.0.5
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  lcalc
```

conda:

```
$ conda install  lcalc
```

Debian/Ubuntu:

```
$ sudo apt-get install  lcalc liblfunction-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  L-function-devel L-function
```

freebsd:

```
$ sudo pkg install math/lcalc
```

gentoo:

```
$ sudo emerge sci-mathematics/lcalc
```

nix:

```
$ nix-env --install lcalc
```

void:

```
$ sudo xbps-install  lcalc-devel
```

See https://repology.org/project/lcalc/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.167 libatomic_ops: Access hardware-provided atomic memory update operations

Description

A part of the Boehm-Demers-Weiser conservative garbage collector.

License

- Permissive BSD + GPL 2.0+

Upstream Contact

- Webpage: http://www.hboehm.info/gc/
- Email List: bdwgc@lists.opendylan.org

Special Update/Build Instructions

None.

Type

standard

Dependencies

Version Information

package-version.txt:

```
7.6.10
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  libatomic_ops
```

conda:

```
$ conda install  libatomic_ops
```

cygwin:

```
$ apt-cyg install libatomic_ops-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libatomic-ops-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libatomic_ops libatomic_ops-devel
```

freebsd:

```
$ sudo pkg install devel/libatomic_ops
```

gentoo:

```
$ sudo emerge dev-libs/libatomic_ops
```

homebrew:

```
$ brew install libatomic_ops
```

macports: install the following packages: libatomic_ops

opensuse:

```
$ sudo zypper install "pkgconfig(atomic_ops)"
```

slackware:

```
$ sudo slackpkg install libatomic_ops
```

void:

```
$ sudo xbps-install  libatomic_ops-devel
```

See https://repology.org/project/libatomic-ops/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.168 libbraiding: Computing with braids

Description

libbraiding is a library to compute several properties of braids, including centralizer and conjugacy check.

License

GPLv3+

SPKG Maintainers

- Miguel Marco

Upstream Contact

Miguel Marco (mmarco@unizar.es)

Type

standard

Dependencies

Version Information

package-version.txt:

```
1.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  libbraiding
```

conda:

```
$ conda install  libbraiding
```

Debian/Ubuntu:

```
$ sudo apt-get install  libbraiding-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libbraiding
```

freebsd:

```
$ sudo pkg install math/libbraiding
```

gentoo:

```
$ sudo emerge sci-libs/libbraiding
```

nix:

```
$ nix-env --install libbraiding
```

opensuse:

```
$ sudo zypper install libbraiding-devel
```

void:

```
$ sudo xbps-install  libbraiding-devel
```

See https://repology.org/project/libbraiding/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.169 libffi: A portable foreign-function interface library

Description

Compilers for high level languages generate code that follow certain conventions. These conventions are necessary, in part, for separate compilation to work. One such convention is the "calling convention". The "calling convention" is essentially a set of assumptions made by the compiler about where function arguments will be found on entry to a function. A "calling convention" also specifies where the return value for a function is found.

Some programs may not know at the time of compilation what arguments are to be passed to a function. For instance, an interpreter may be told at run-time about the number and types of arguments used to call a given function. Libffi can be used in such programs to provide a bridge from the interpreter program to compiled code.

The libffi library provides a portable, high level programming interface to various calling conventions. This allows a programmer to call any function specified by a call interface description at run time.

FFI stands for Foreign Function Interface. A foreign function interface is the popular name for the interface that allows code written in one language to call code written in another language. The libffi library really only provides the lowest, machine dependent layer of a fully featured foreign function interface. A layer must exist above libffi that handles type conversions for values passed between the two languages.

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Upstream Contact

- https://sourceware.org/libffi/
- https://github.com/libffi/libffi

Type

standard

Dependencies

Version Information

package-version.txt:

```
3.2.1
```

Equivalent System Packages

conda:

```
$ conda install  libffi
```

cygwin:

```
$ apt-cyg install libffi-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libffi-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libffi libffi-devel
```

freebsd:

```
$ sudo pkg install devel/libffi
```

homebrew:

```
$ brew install libffi
```

macports: install the following packages: libffi

opensuse:

```
$ sudo zypper install "pkgconfig(libffi)"
```

slackware:

```
$ sudo slackpkg install libffi
```

void:

```
$ sudo xbps-install  libffi-devel
```

See https://repology.org/project/libffi/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.170 libgd: Dynamic graphics generation tool

Description

GD is an open source code library for the dynamic creation of images by programmers. GD is written in C, and "wrappers" are available for Perl, PHP and other languages. GD creates PNG, JPEG, GIF, WebP, XPM, BMP images, among other formats. GD is commonly used to generate charts, graphics, thumbnails, and most anything else, on the fly. While not restricted to use on the web, the most common applications of GD involve website development.

License

- Custom (BSD-ish)

Upstream Contact

- https://libgd.github.io
- Pierre Joye (http://blog.thepimp.net)
- https://github.com/libgd/libgd

Type

standard

Dependencies

- *libpng: Bitmap image support*
- *xz: General-purpose data compression software*

Version Information

package-version.txt:

```
2.3.3
```

Equivalent System Packages

alpine: install the following packages: gd

arch:

```
$ sudo pacman -S  gd
```

conda:

```
$ conda install  libgd
```

cygwin:

```
$ apt-cyg install libgd-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libgd-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  gd gd-devel
```

freebsd:

```
$ sudo pkg install graphics/gd
```

gentoo:

```
$ sudo emerge media-libs/gd
```

homebrew:

```
$ brew install gd
```

macports: install the following packages: gd2

nix:

```
$ nix-env --install gd
```

opensuse:

```
$ sudo zypper install gd "pkgconfig(gdlib)"
```

slackware:

```
$ sudo slackpkg install gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

void:

```
$ sudo xbps-install  gd-devel
```

See https://repology.org/project/gd/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.171 libgraphviz: Graph visualization software (callable library)

Description

Graphviz is open source graph visualization software. It has several main graph layout programs. They take descriptions of graphs in a simple text language, and make diagrams in several useful formats.

This script package represents the callable library.

License

Eclipse Public License 1.0

Upstream Contact

https://graphviz.org/about/

Type

optional

Dependencies

Version Information

Equivalent System Packages

alpine: install the following packages: graphviz-dev

arch:

```
$ sudo pacman -S  graphviz
```

conda:

```
$ conda install  graphviz
```

cygwin:

```
$ apt-cyg install graphviz
```

Debian/Ubuntu:

```
$ sudo apt-get install  libgraphviz-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  graphviz
```

freebsd:

```
$ sudo pkg install graphics/graphviz
```

homebrew:

```
$ brew install graphviz
```

macports: install the following packages: graphviz

nix:

```
$ nix-env --install graphviz
```

opensuse:

```
$ sudo zypper install graphviz
```

void:

```
$ sudo xbps-install  graphviz
```

See https://repology.org/project/graphviz/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.172 libhomfly: Compute the homfly polynomial of knots and links

Description

libhomfly is a library to compute the homfly polynomial of knots and links.

License

Public domain

SPKG Maintainers

- Miguel Marco

Upstream Contact

Miguel Marco (mmarco@unizar.es)

Type

standard

Dependencies

- *gc: The Boehm-Demers-Weiser conservative garbage collector*

Version Information

package-version.txt:

```
1.02r6
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  libhomfly
```

conda:

```
$ conda install  libhomfly
```

Debian/Ubuntu:

```
$ sudo apt-get install  libhomfly-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libhomfly-devel
```

freebsd:

```
$ sudo pkg install math/libhomfly
```

gentoo:

```
$ sudo emerge sci-libs/libhomfly
```

nix:

```
$ nix-env --install libhomfly
```

opensuse:

```
$ sudo zypper install libhomfly-devel
```

void:

```
$ sudo xbps-install  libhomfly-devel
```

See https://repology.org/project/libhomfly/versions, https://repology.org/project/llibhomfly/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.173 liblzma: General-purpose data compression software

Description

This packages represents liblzma, a part of XZ Utils, the free general-purpose data compression software with a high compression ratio.

License

Some parts public domain, other parts GNU LGPLv2.1, GNU GPLv2, or GNU GPLv3.

Upstream Contact

http://tukaani.org/xz/

Type

standard

Dependencies

Version Information

package-version.txt:

```
5.2.5
```

Equivalent System Packages

conda:

```
$ conda install  xz
```

cygwin:

```
$ apt-cyg install xz liblzma-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  xz-utils liblzma-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  xz xz-devel
```

homebrew:

```
$ brew install xz
```

macports: install the following packages: xz

opensuse:

```
$ sudo zypper install xz "pkgconfig(liblzma)"
```

slackware:

```
$ sudo slackpkg install xz
```

void:

```
$ sudo xbps-install  xz liblzma-devel
```

See https://repology.org/project/xz/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.174 libnauty: Find automorphism groups of graphs, generate non-isomorphic graphs (callable library)

Description

Nauty has various tools for finding the automorphism group of a graph, generating non-isomorphic graphs with certain properties, etc.

This script package represents the callable library of nauty.

License

Since version 2.6, nauty license is GPL-compatible, see

http://users.cecs.anu.edu.au/~bdm/nauty/COPYRIGHT.txt

(a copy of this file, called COPYRIGHT, is also present in the tarball)

Special Packaging Instruction

Upstream distribute tarball named nauty${version}.tar.gz. We cannot deal with that so rename it nauty-${version}.tar.gz (notice the "-") without any changes.

Upstream Contact

Brendan D. McKay Computer Science Department Australian National University bdm@cs.anu.edu.au

Adolfo Piperno Dipartimento di Informatica Sapienza - Università di Roma piperno@di.uniroma1.it

See http://cs.anu.edu.au/~bdm/nauty/ or http://pallini.di.uniroma1.it/

Type

optional

Dependencies

Version Information

Equivalent System Packages

Debian/Ubuntu:

```
$ sudo apt-get install  libnauty-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libnauty-devel
```

homebrew:

```
$ brew install nauty
```

macports: install the following packages: nauty

void:

```
$ sudo xbps-install  nauty-devel
```

See https://repology.org/project/nauty/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.175 libogg: Library for the Ogg multimedia container format

Description

libogg is the official reference library for the Ogg multimedia container format, and the native file and stream format for the Xiph.org multimedia codecs. As with all Xiph.org technology is it an open format free for anyone to use.

Website: http://www.xiph.org/ogg

License

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Upstream Contact

The Xiph.org mailing lists - see http://lists.xiph.org/mailman/listinfo

Special Update/Build Instructions

- No changes went into src.

Type

optional

Dependencies

Version Information

package-version.txt:

```
1.3.1.p0
```

Equivalent System Packages

conda:

```
$ conda install  libogg
```

homebrew:

```
$ brew install libogg
```

macports: install the following packages: libogg

opensuse:

```
$ sudo zypper install "pkgconfig(ogg)"
```

void:

```
$ sudo xbps-install  libogg-devel
```

See https://repology.org/project/libogg/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.176 libpng: Bitmap image support

Description

libpng is the official PNG reference library. It supports almost all PNG features, is extensible, and has been extensively tested for over 13 years. The home site for development versions (i.e., may be buggy or subject to change or include experimental features) is http://libpng.sourceforge.net/, and the place to go for questions about the library is the png-mng-implement mailing list.

Website: http://www.libpng.org/pub/png/libpng.html

License

The libpng license - see http://www.libpng.org/pub/png/src/libpng-LICENSE.txt

Upstream Contact

https://libpng.sourceforge.io

The png mailing lists - see http://www.libpng.org/pub/png/pngmisc.html#lists

Special Update/Build Instructions

- On old versions of Darwin, the symbolic links libpng.* created by libpng16 may interfere with a system-wide libPng.dylib.

  – the following is very likely to be obsolete in 2014 —

  This system-wide library is likely to be a different version and on top of that, the symbols exported there are prefixed with "_cg" (for "Core Graphics"). So even if by chance the functionalities of the two libraries were interchangeable, libraries or applications looking for one and being presented the other won't find the symbols they expect. Note the uppercase "P" which could prevent this conflict; unfortunately, the default filesystem used by Apple is case-insensitive.

  Note there would be no problem if the system-wide library was not looked for when Sage is being built or run, but that's not the case either; it is at least looked for by the "ImageIO" framework:

  - when Python is built with Mac OS extensions, fixed in #4008;
  - when Mercurial is built because it uses $EDITOR, cf. #4678;
  - when R is built and it finds `-lpng`, cf. #4409 and #11696.

  – this is no longer done, as of #27186 —

  As not all of these problems are easily dealt with and new ones may arise, we chose to delete the $SAGE_LOCAL/lib/libpng.* symlinks. Therefore, some packages like Tachyon, which by default look for `-lpng` are patched to look for `-lpng16` instead.

Type

standard

Dependencies

- *zlib: Data compression library*

Version Information

package-version.txt:

```
1.6.29.p1
```

Equivalent System Packages

conda:

```
$ conda install  libpng
```

freebsd:

```
$ sudo pkg install graphics/png
```

homebrew:

```
$ brew install libpng
```

macports: install the following packages: libpng

opensuse:

```
$ sudo zypper install "pkgconfig(libpng16)"
```

slackware:

```
$ sudo slackpkg install libpng
```

void:

```
$ sudo xbps-install  libpng-devel
```

See https://repology.org/project/libpng/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.177 libsemigroups: Library for semigroups and monoids

Description

C++ library for semigroups and monoids; used in GAP's package Semigroups.

License

GPL-3.0

Upstream Contact

http://james-d-mitchell.github.io/libsemigroups https://github.com/james-d-mitchell/libsemigroups

Type

optional

Dependencies

Version Information

package-version.txt:

```
2.3.2
```

Equivalent System Packages

conda:

```
$ conda install  libsemigroups
```

freebsd:

```
$ sudo pkg install math/libsemigroups
```

opensuse:

```
$ sudo zypper install "pkgconfig(libsemigroups)"
```

See https://repology.org/project/libsemigroups/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.178 libtheora: Library for the Theora video codec

Description

libtheora is the official reference library for the Theora video codec. Theora is a free and open video compression format from the Xiph.org Foundation.

Website: http://www.xiph.org/theora

License

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Upstream Contact

The Xiph.org mailing lists - see http://lists.xiph.org/mailman/listinfo

Special Update/Build Instructions

- No changes went into src.

Type

experimental

Dependencies

- *libogg: Library for the Ogg multimedia container format*
- *libpng: Bitmap image support*

Version Information

package-version.txt:

```
1.1.1
```

Equivalent System Packages

conda:

```
$ conda install  libtheora
```

homebrew:

```
$ brew install theora
```

macports: install the following packages: libtheora

opensuse:

```
$ sudo zypper install "pkgconfig(theora)"
```

void:

```
$ sudo xbps-install  libtheora-devel
```

See https://repology.org/project/libtheora/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.179 libxml2: XML parser and toolkit

Description

XML C parser and toolkit

License

MIT

Upstream Contact

http://www.xmlsoft.org/index.html

Type

optional

Dependencies

- *iconv: Library for language/country-dependent character encodings*
- *zlib: Data compression library*

Version Information

Equivalent System Packages

alpine: install the following packages: libxml2-dev

arch:

```
$ sudo pacman -S  libxml2
```

cygwin:

```
$ apt-cyg install libxml2-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libxml2-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libxml2-devel
```

freebsd:

```
$ sudo pkg install libxml2
```

gentoo:

```
$ sudo emerge dev-libs/libxml2
```

homebrew:

```
$ brew install libxml2
```

macports: install the following packages: py-libxml2

nix:

```
$ nix-env --install libxml2
```

opensuse:

```
$ sudo zypper install libxml2
```

slackware:

```
$ sudo slackpkg install libxml2
```

void:

```
$ sudo xbps-install  libxml2-devel
```

See https://repology.org/project/libxml2/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.180 lidia: A library for computational number theory

Description

A library for computational number theory.

Abandoned upstream and has disappeared from the web at TU Darmstadt.

We use as our new upstream a version minimally maintained for the LattE project.

https://www.math.ucdavis.edu/~latte/software/packages/lidia/current/lidia-2.3.0+latte-patches-2014-10-04.tar.gz

License

lidia is released under the GPL, or so it is claimed. See https://groups.google.com/forum/#!msg/sage-devel/kTxgPSqrbUM/5Txj3_IKhlQJ and https://lists.debian.org/debian-legal/2007/07/msg00120.html

Upstream Contact

Matthias Köppe, UC Davis, CA, USA

Type

optional

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
2.3.0+latte-patches-2019-05-02
```

Equivalent System Packages

See https://repology.org/project/lidia/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.181 lie: Library for the representation theory of complex semisimple Lie groups and algebras

Description

LiE is the name of a software package that enables mathematicians and physicists to perform computations of a Lie group theoretic nature. It focuses on the representation theory of complex semisimple (reductive) Lie groups and algebras, and on the structure of their Weyl groups and root systems.

LiE does not compute directly with elements of the Lie groups and algebras themselves; it rather computes with weights, roots, characters and similar objects. Some specialities of LiE are: tensor product decompositions, branching to subgroups, Weyl group orbits, reduced elements in Weyl groups, distinguished coset representatives and much more. These operations have been compiled into the program which results in fast execution: typically one or two orders of magnitude faster than similar programs written in a general purpose program.

The LiE programming language makes it possible to customise and extend the package with more mathematical functions. A user manual is provided containing many examples.

LiE establishes an interactive environment from which commands can be given that involve basic programming primitives and powerful built-in functions. These commands are read by an interpreter built into the package and passed to the core of the system. This core consists of programs representing some 100 mathematical functions. The interpreter offers on-line facilities which explain operations and functions, and which give background information about Lie group theoretical concepts and about currently valid definitions and values.

(from http://www-math.univ-poitiers.fr/~maavl/LiE/description.html)

License

GNU Lesser General Public License (LGPL), version unspecified

Upstream Contact

- Marc van Leeuwen, http://www-math.univ-poitiers.fr/~maavl/

Dependencies

- readline
- ncurses
- bison (not included in this package or in Sage!)

Type

experimental

Dependencies

- *readline: Command line editing library*
- *ncurses: Classic terminal output library*

Version Information

package-version.txt:

```
2.2.2
```

Equivalent System Packages

Debian/Ubuntu:

```
$ sudo apt-get install  lie
```

gentoo:

```
$ sudo emerge sci-mathematics/lie
```

macports: install the following packages: LiE

nix:

```
$ nix-env --install lie
```

opensuse:

```
$ sudo zypper install LiE
```

See https://repology.org/project/lie/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.182 linbox: Linear algebra with dense, sparse, structured matrices over the integers and finite fields

Description

LinBox is a C++ template library for exact, high-performance linear algebra computation with dense, sparse, and structured matrices over the integers and over finite fields.

License

LGPL V2 or later

Upstream Contact

- https://linalg.org/
- <linbox-devel@googlegroups.com>
- <linbox-use@googlegroups.com>

SPKG Repository

https://bitbucket.org/malb/linbox-spkg

Dependencies

- GNU patch
- GMP/MPIR
- MPFR
- NTL
- fpLLL
- IML
- M4RI
- M4RIE
- Givaro
- FFLAS/FFPACK
- a BLAS implementation such as openblas

Special Update/Build Instructions

TODO:

- spkg-check is disabled for now, should work in the next release after 1.3.2.
- Check whether `make fullcheck` works/builds, is worth running, and doesn't take ages. (Version 1.1.6 doesn't seem to have such a target.)

Type

standard

Dependencies

- $(MP_LIBRARY)
- *ntl: A library for doing number theory*
- *givaro: C++ library for arithmetic and algebraic computations*
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *iml: Integer Matrix Library*
- *flint: Fast Library for Number Theory*
- *fflas_ffpack: Dense linear algebra over word-size finite fields*

Version Information

package-version.txt:

```
1.6.3.p1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  linbox
```

conda:

```
$ conda install  linbox
```

Debian/Ubuntu:

```
$ sudo apt-get install  liblinbox-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  linbox
```

freebsd:

```
$ sudo pkg install math/linbox
```

gentoo:

```
$ sudo emerge sci-libs/linbox
```

nix:

```
$ nix-env --install linbox
```

opensuse:

```
$ sudo zypper install "pkgconfig(linbox)"
```

void:

```
$ sudo xbps-install  linbox-devel
```

See https://repology.org/project/linbox/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.183 llvm: The LLVM Compiler Infrastructure, including the Clang C/C++/Objective-C compiler

Description

The LLVM Project is a collection of modular and reusable compiler and toolchain technologies.

Clang is an “LLVM native” C/C++/Objective-C compiler.

The libc++ and libc++ ABI projects provide a standard conformant and high-performance implementation of the C++ Standard Library, including full support for C++11 and C++14.

License

Apache 2.0 License with LLVM exceptions

Upstream Contact

https://llvm.org/

Type

optional

Dependencies

Version Information

Equivalent System Packages

alpine: install the following packages: clang

arch:

```
$ sudo pacman -S  clang
```

cygwin:

```
$ apt-cyg install clang
```

Debian/Ubuntu:

```
$ sudo apt-get install  clang
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  clang
```

freebsd:

```
$ sudo pkg install devel/llvm
```

gentoo:

```
$ sudo emerge sys-devel/clang
```

homebrew:

```
$ brew install llvm
```

macports: install the following packages: clang

nix:

```
$ nix-env --install clang
```

openbsd: install the following packages: devel/llvm

opensuse:

```
$ sudo zypper install llvm
```

slackware:

```
$ sudo slackpkg install llvm
```

void:

```
$ sudo xbps-install  clang
```

If the system package is installed, ./configure will check whether it can be used.

6.1.184 lrcalc: Littlewood-Richardson calculator

Description

Littlewood-Richardson Calculator

http://sites.math.rutgers.edu/~asbuch/lrcalc/

License

GNU General Public License V2+

Upstream Contact

Anders S. Buch (asbuch@math.rutgers.edu)

https://bitbucket.org/asbuch/lrcalc

Type

standard

Dependencies

Version Information

package-version.txt:

```
2.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  lrcalc
```

conda:

```
$ conda install  lrcalc
```

Debian/Ubuntu:

```
$ sudo apt-get install  liblrcalc-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  lrcalc-devel
```

freebsd:

```
$ sudo pkg install math/lrcalc
```

gentoo:

```
$ sudo emerge sci-mathematics/lrcalc
```

nix:

```
$ nix-env --install lrcalc
```

void:

```
$ sudo xbps-install  lrcalc-devel
```

See https://repology.org/project/lrcalc/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.185 lrcalc_python: Littlewood-Richardson calculator

Description

Python bindings for the Littlewood-Richardson Calculator

http://sites.math.rutgers.edu/~asbuch/lrcalc/

License

GNU General Public License V3

Upstream Contact

Anders S. Buch (asbuch@math.rutgers.edu)

https://bitbucket.org/asbuch/lrcalc

Type

standard

Dependencies

- $(PYTHON)
- *lrcalc: Littlewood-Richardson calculator*
- $(PYTHON_TOOLCHAIN)
- *cython: C-Extensions for Python, an optimizing static compiler*

Version Information

package-version.txt:

```
2.1
```

install-requires.txt:

```
lrcalc ~=2.1
```

Equivalent System Packages

conda:

```
$ conda install  python-lrcalc~=2.1
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.186 lrslib: Reverse search algorithm for vertex enumeration and convex hull problems

Description

lrslib implements the linear reverse search algorithm of Avis and Fukuda.

See the homepage (http://cgm.cs.mcgill.ca/~avis/C/lrs.html) for details.

We use an autotoolized version from https://github.com/mkoeppe/lrslib/tree/autoconfiscation

License

lrslib is released under a GPL v2+ license.

Upstream Contact

David Avis, avis at cs dot mcgill dot edu.

Dependencies

To build and install the “plrs” binary, a multi-thread version of lrs, need to first install the full Boost package (“sage -i boost”).

If the package finds an MPI C++ compiler script (mpic++), it also builds and installs the “mplrs” binary, a distributed version of lrs using MPI.

(Sage currently does not make use of plrs and mplrs.)

Special Update/Build Instructions

Type

optional

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
071b+autotools-2021-07-13
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  lrs
```

conda:

```
$ conda install  lrslib
```

Debian/Ubuntu:

```
$ sudo apt-get install  lrslib
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  lrslib
```

freebsd:

```
$ sudo pkg install math/lrslib
```

gentoo:

```
$ sudo emerge sci-libs/lrslib
```

nix:

```
$ nix-env --install lrs
```

opensuse:

```
$ sudo zypper install lrslib lrslib-devel
```

See https://repology.org/project/lrslib/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.187 m4ri: fast arithmetic with dense matrices over GF(2)

Description

M4RI: Library for matrix multiplication, reduction and inversion over GF(2). (See also m4ri/README for a brief overview.)

License

- GNU General Public License Version 2 or later (see src/COPYING)

Upstream Contact

- Authors: Martin Albrecht et al.
- Email: <m4ri-devel@googlegroups.com>
- Website: https://bitbucket.org/malb/m4ri

Special Update/Build Instructions

- Delete the upstream Mercurial repositories (file m4ri/.hgtags, directory m4ri/.hg).
- Delete the directory m4ri/autom4te.cache (if present).
- Delete m4ri.vcproj (and perhaps other unnecessary baggage).
- Touch m4ri/configure to make sure it is newer than its sources.

Type

standard

Dependencies

- *libpng: Bitmap image support*

Version Information

package-version.txt:

```
20200115
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  m4ri
```

conda:

```
$ conda install  m4ri
```

Debian/Ubuntu:

```
$ sudo apt-get install  libm4ri-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  m4ri-devel
```

freebsd:

```
$ sudo pkg install math/m4ri
```

gentoo:

```
$ sudo emerge sci-libs/m4ri[png]
```

nix:

```
$ nix-env --install m4ri
```

opensuse:

```
$ sudo zypper install "pkgconfig(m4ri)"
```

void:

```
$ sudo xbps-install  m4ri-devel
```

See https://repology.org/project/libm4ri/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.188 m4rie: Arithmetic with dense matrices over GF(2^e)

Description

M4RIE: Library for matrix multiplication, reduction and inversion over GF(2^k) for 2 <= k <= 10.

License

- GNU General Public License Version 2 or later (see src/COPYING)

Upstream Contact

- Authors: Martin Albrecht
- Email: <m4ri-devel@googlegroups.com>
- Website: http://m4ri.sagemath.org

Dependencies

- M4RI
- Givaro

Type

standard

Dependencies

- *m4ri: fast arithmetic with dense matrices over GF(2)*

Version Information

package-version.txt:

```
20200115
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  m4rie
```

conda:

```
$ conda install  m4rie
```

Debian/Ubuntu:

```
$ sudo apt-get install  libm4rie-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  m4rie-devel
```

freebsd:

```
$ sudo pkg install math/m4rie
```

gentoo:

```
$ sudo emerge sci-libs/m4rie
```

nix:

```
$ nix-env --install m4rie
```

opensuse:

```
$ sudo zypper install "pkgconfig(m4rie)"
```

void:

```
$ sudo xbps-install  m4rie-devel
```

See https://repology.org/project/libm4rie/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.189 markupsafe: Safely add untrusted strings to HTML/XML markup

Description

Implements a XML/HTML/XHTML Markup safe string for Python

License

Simplified BSD

Upstream Contact

Home page: http://github.com/mitsuhiko/markupsafe

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.1.1
```

install-requires.txt:

```
markupsafe >=1.1.0
```

Equivalent System Packages

conda:

```
$ conda install  markupsafe
```

macports: install the following packages: py-markupsafe

opensuse:

```
$ sudo zypper install python3-MarkupSafe
```

void:

```
$ sudo xbps-install  python3-MarkupSafe
```

See https://repology.org/project/python:markupsafe/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.190 mathics: A general-purpose computer algebra system

Description

A general-purpose computer algebra system.

License

GPL

Upstream Contact

https://pypi.org/project/Mathics3/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *pint: Physical quantities module*
- *palettable: Color palettes for Python*
- *mathics_scanner: Character Tables and Tokenizer for Mathics and the Wolfram Language.*

Version Information

package-version.txt:

```
4.0.0
```

install-requires.txt:

```
Mathics3
```

Equivalent System Packages

conda:

```
$ conda install  mathics3
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.191 mathics_scanner: Character Tables and Tokenizer for Mathics and the Wolfram Language.

Description

Character Tables and Tokenizer for Mathics and the Wolfram Language.

License

GPL-3.0-only

Upstream Contact

https://pypi.org/project/Mathics-Scanner/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.2.4
```

install-requires.txt:

```
Mathics-Scanner
```

Equivalent System Packages

(none known)

6.1.192 mathjax: A JavaScript library for displaying mathematical formulas

Description

MathJax is a JavaScript library for displaying mathematical formulas.

MathJax is used in the Sage documentation built by Sphinx.

License

Apache License, version 2.0

Upstream Contact

Home page: https://www.mathjax.org/

Type

standard

Dependencies

Version Information

package-version.txt:

```
3.2.0
```

Equivalent System Packages

conda:

```
$ conda install  mathjax
```

opensuse:

```
$ sudo zypper install mathjax
```

void:

```
$ sudo xbps-install  mathjax
```

See https://repology.org/project/mathjax/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.193 matplotlib: Python 2D plotting library

Description

From the Matplotlib website: matplotlib is a python 2D plotting library which produces publication quality figures in a variety of hardcopy formats and interactive environments across platforms. matplotlib can be used in python scripts, the python and ipython shell (ala matlab or mathematica), web application servers, and six graphical user interface toolkits.

License

The Matplotlib license - see http://matplotlib.sourceforge.net/users/license.html: Matplotlib only uses BSD compatible code, and its license is based on the PSF license. See the Open Source Initiative licenses page for details on individual licenses. Non-BSD compatible licenses (eg LGPL) are acceptable in matplotlib Toolkits. For a discussion of the motivations behind the licencing choice, see Licenses.

Upstream Contact

https://matplotlib.org

The matplotlib mailing lists: see http://sourceforge.net/projects/matplotlib

Dependencies

- python
- numpy
- setuptools (>= 0.7)
- freetype
- patch (used in spkg-install)
- dateutil
- pyparsing
- tornado
- kiwisolver

Build Instructions/Changes

- NOTE: To drastically cut down on spkg size, we delete the internal testing images. To do this, we repackage the tarball by removing the contents of `lib/matplotlib/tests/baseline_images/*`, this is done by the `spkg-src` script.
- `setup.py.patch`: disable loading of Tests. Otherwise, `setup.py` raises an error because it can't find the deleted files from `src/lib/matplotlib/tests/baseline_images/*`
- NOTE: as of matplotlib-1.0.0 and Sage 4.6, Sage does not use $HOME/.matplotlib by default. Instead, it sets MPLCONFIGDIR to a subdirectory in $DOT_SAGE, see src/bin/sage-env

Type

standard

Dependencies

- $(PYTHON)
- *numpy: Package for scientific computing with Python*
- *freetype: A free, high-quality, and portable font engine*
- *pillow: Python Imaging Library*
- *dateutil: Extensions to the standard Python module datetime*
- *pyparsing: A Python parsing module*
- *tornado: Python web framework and asynchronous networking library*
- *six: Python 2 and 3 compatibility utilities*
- *cycler: Composable cycles*

- *qhull: Compute convex hulls, Delaunay triangulations, Voronoi diagrams*
- *fonttools: Tools to manipulate font files*
- *contourpy: Python library for calculating contours of 2D quadrilateral grids*
- $(PYTHON_TOOLCHAIN)
- *kiwisolver: An implementation of the Cassowary constraint solving algorithm*
- *certifi: Python package for providing Mozilla's CA Bundle*
- *setuptools_scm_git_archive: setuptools_scm plugin for git archives*

Version Information

package-version.txt:

```
3.6.2
```

install-requires.txt:

```
# Trac #33642: Set lower bound for use of matplotlib color maps introduced in #33491,
# and to suppress deprecation warnings (https://github.com/matplotlib/matplotlib/pull/
↪21073)
matplotlib >=3.5.1
```

Equivalent System Packages

conda:

```
$ conda install  "matplotlib>=3.5.1"
```

macports: install the following packages: py-matplotlib

opensuse:

```
$ sudo zypper install python3-matplotlib
```

void:

```
$ sudo xbps-install  python3-matplotlib
```

See https://repology.org/project/python:matplotlib/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.194 matplotlib_inline: Inline Matplotlib backend for Jupyter

Description

Inline Matplotlib backend for Jupyter

License

BSD 3-Clause

Upstream Contact

https://pypi.org/project/matplotlib-inline/

Type

standard

Dependencies

- $(PYTHON)
- *traitlets: Traitlets Python configuration system*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.1.6
```

install-requires.txt:

```
matplotlib-inline
```

Equivalent System Packages

conda:

```
$ conda install  matplotlib-inline
```

void:

```
$ sudo xbps-install  python3-matplotlib-inline
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.195 maxima: System for manipulating symbolic and numerical expressions

Description

Maxima is a system for the manipulation of symbolic and numerical expressions, including differentiation, integration, Taylor series, Laplace transforms, ordinary differential equations, systems of linear equations, polynomials, and sets, lists, vectors, matrices, and tensors. Maxima yields high precision numeric results by using exact fractions, arbitrary precision integers, and variable precision floating point numbers. Maxima can plot functions and data in two and three dimensions.

For more information, see the Maxima web site

http://maxima.sourceforge.net

License

Maxima is distributed under the GNU General Public License, with some export restrictions from the U.S. Department of Energy. See the file COPYING.

Upstream Contact

- The Maxima mailing list - see http://maxima.sourceforge.net/maximalist.html

Special Update/Build Instructions

1. Go to http://sourceforge.net/projects/maxima/files/Maxima-source/ and download the source tarball maxima-x.y.z.tar.gz; place it in the upstream/ directory.
2. Update package-version.txt and run 'sage –package fix-checksum'.
3. Make sure the patches still apply cleanly, and update them if necessary.
4. Test the resulting package.

All patch files in the patches/ directory are applied. Descriptions of these patches are either in the patch files themselves or below.

- 0001-taylor2-Avoid-blowing-the-stack-when-diff-expand-isn.patch: Fix for Maxima bug #2520 (abs_integrate fails on abs(sin(x)) and abs(cos(x))). Introduced in Trac #13364 (Upgrade Maxima to 5.29.1).
- build-fasl.patch: Build a fasl library for ecl in addition to an executable program. Introduced in Trac #16178 (Build maxima fasl without asdf).
- infodir.patch: Correct the path to the Info directory. Introduced in Trac #11348 (maxima test fails when install tree is moved).
- matrixexp.patch: Fix matrixexp(matrix([%i*%pi])), which broke after Maxima 5.29.1. Introduced in Trac #13973.
- maxima.system.patch: Set `c::*compile-in-constants*` to t. Introduced in Trac #11966 (OS X 10.7 Lion: Maxima fails to build).
- undoing_true_false_printing_patch.patch: Revert an upstream change causing '?' to be printed around some words. Introduced in Trac #13364 (Upgrade Maxima to 5.29.1).

Type

standard

Dependencies

- *ecl: An implementation of the Common Lisp language*
- *info: stand-alone Info documentation reader*

Version Information

package-version.txt:

```
5.46.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  maxima-fas
```

conda:

```
$ conda install  maxima
```

cygwin:

```
$ apt-cyg install maxima
```

Debian/Ubuntu:

```
$ sudo apt-get install  maxima-sage maxima
```

freebsd:

```
$ sudo pkg install math/maxima
```

gentoo:

```
$ sudo emerge sci-mathematics/maxima[ecls]
```

homebrew:

```
$ brew install maxima
```

macports: install the following packages: maxima

nix:

```
$ nix-env --install maxima-ecl
```

opensuse:

```
$ sudo zypper install maxima-exec-clisp
```

void:

```
$ sudo xbps-install  maxima-ecl
```

See https://repology.org/project/maxima/versions, https://repology.org/project/maxima-ecl/versions, https://repology.org/project/maxima-sage/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.196 mcqd: An exact algorithm for finding a maximum clique in an undirected graph

Description

MaxCliqueDyn is a fast exact algorithm for finding a maximum clique in an undirected graph.

License

GPL 3

Upstream Contact

MCQD is currently being maintained by Janez Konc. https://gitlab.com/janezkonc/mcqd

Type

optional

Dependencies

Version Information

package-version.txt:

```
1.0.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  mcqd
```

opensuse:

```
$ sudo zypper install mcqd
```

See https://repology.org/project/mcqd/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.197 meataxe: Library for computing with modular representations

Description

SharedMeatAxe 1.0 is an autotoolized shared library version of C MeatAxe 2.4.24, a set of programs for computing with modular representations. The package comprises a shared library "libmtx", as well as several executables.

See http://users.minet.uni-jena.de/~king/SharedMeatAxe/ for the package documentation.

Licence

The Shared Meat-Axe is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 2 of the License, or (at your option) any later version. See the file COPYING.

Upstream contact

- Simon King <simon.king@uni-jena.de>

Type

optional

Dependencies

Version Information

package-version.txt:

```
1.0.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  shared_meataxe
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  sharedmeataxe
```

See https://repology.org/project/shared-meataxe/versions, https://repology.org/project/sharedmeataxe/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.198 memory_allocator: An extension class to allocate memory easily with Cython

This extension class started as part of the Sage software.

Description

development website: https://github.com/sagemath/memory_allocator

PyPI page: https://pypi.org/project/memory_allocator

License

GPL-3.0

Upstream Contact

https://github.com/sagemath/memory_allocator

Type

standard

Dependencies

- $(PYTHON)
- *cython: C-Extensions for Python, an optimizing static compiler*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.1.3
```

install-requires.txt:

```
memory_allocator
```

Equivalent System Packages

conda:

```
$ conda install  memory-allocator
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.199 meson: A high performance build system

Description

A high performance build system

License

Apache License, Version 2.0

Upstream Contact

https://pypi.org/project/meson/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.0.1
```

install-requires.txt:

```
meson
```

Equivalent System Packages

alpine: install the following packages: meson

arch:

```
$ sudo pacman -S  meson
```

Debian/Ubuntu:

```
$ sudo apt-get install  meson
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  meson
```

freebsd:

```
$ sudo pkg install devel/meson
```

gentoo:

```
$ sudo emerge dev-util/meson
```

homebrew:

```
$ brew install meson
```

nix:

```
$ nix-env --install meson
```

opensuse:

```
$ sudo zypper install meson
```

slackware:

```
$ sudo slackpkg install meson
```

See https://repology.org/project/meson/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.200 meson_python: Meson Python build backend (PEP 517)

Description

Meson Python build backend (PEP 517)

License

Upstream Contact

https://pypi.org/project/meson-python/

Type

standard

Dependencies

- $(PYTHON)
- *meson: A high performance build system*
- *pyproject_metadata: PEP 621 metadata parsing*
- *tomli: A lil' TOML parser*
- *ninja_build: A build system with a focus on speed*
- *patchelf: A small utility to modify the dynamic linker and RPATH of ELF executables*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.12.1
```

install-requires.txt:

```
meson-python
```

Equivalent System Packages

(none known)

6.1.201 mistune: A markdown parser in pure Python

Description

The fastest markdown parser in pure Python

License

BSD License

Upstream Contact

Home Page: https://github.com/lepture/mistune

Type

standard

Dependencies

- $(PYTHON)
- *cython: C-Extensions for Python, an optimizing static compiler*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.0.4
```

install-requires.txt:

```
mistune >=0.8.4
```

Equivalent System Packages

conda:

```
$ conda install  mistune
```

void:

```
$ sudo xbps-install  python3-mistune
```

See https://repology.org/project/mistune/versions, https://repology.org/project/python:mistune/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.202 modular_decomposition: A modular decomposition algorithm

Description

This is an implementation of a modular decomposition algorithm.

http://www.liafa.jussieu.fr/~fm/ (in french)

License

GPL

Upstream Contact

Fabien de Montgolfier

http://www.liafa.jussieu.fr/~fm/

Type

experimental

Dependencies

Version Information

package-version.txt:

```
20100607
```

Equivalent System Packages

See https://repology.org/project/modular-decomposition/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.203 p_group_cohomology: Modular cohomology rings of finite groups

Description

Modular Cohomology Rings of Finite Groups

The package is located at http://users.fmi.uni-jena.de/cohomology/, that's to say the tarball p_group_cohomology-x.y.tar.xz can be found there and the documentation of the package is provided at http://users.fmi.uni-jena.de/cohomology/documentation/

License

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David J. Green <david.green@uni-jena.de>

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The full text of the GPL is available at:

http://www.gnu.org/licenses/

The package includes a data base of cohomology rings of the groups of order 64 and provides access to a data base of cohomology rings of the groups of order 128 and 243, located at

http://cohomology.uni-jena.de/db/

These data bases are distributed under the Creative Commons Attribution-Share Alike 3.0 License. The full text of this licence is available at

http://creativecommons.org/licenses/by-sa/3.0/

SPKG Maintainers

Simon A. King <simon.king@uni-jena.de>

Upstream Contact

Simon A. King <simon.king@uni-jena.de> David J. Green <david.green@uni-jena.de>

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We thank William Stein for giving us access to various computers on which we could build test the SPKG and on which some huge computations could be completed, and acknowledge the support by National Science Foundation Grant No. DMS-0821725.

We thank Mathieu Dutour Sikirić for hints on how to use GAP more efficiently.

We owe Peter Symonds the idea of using the Poincaré series in a rather efficient completeness criterion.

We are greatful to John Palmieri for his help on making p_group_cohomology work with python-3.

Dependencies

- The SharedMeatAxe needs to be installed, as a build time dependency.

  This can be met by installing the meataxe spkg

Testing

Our package provides a very short test suite for David Green's routines for the computation of minimal projective resolutions. The majority of this package's tests is formed by doc tests in the Cython code. In fact, any class, method and function is covered by tests.

Note that internet access is required for these tests, as it is attempted to download cohomology rings from a public data base in the web.

The script `spkg-check` calls `sage -t --force_lib` on the files in `pGroupCohomology`.

Documentation

The documentation of this package is automatically built, if the environment variable SAGE_SPKG_INSTALL_DOCS is yes (do "export SAGE_SPKG_INSTALL_DOCS=yes" on the command line before installation). The documents are put into SAGE_ROOT/local/share/doc/p_group_cohomology/.

Type

optional

Dependencies

- *singular: Computer algebra system for polynomial computations, algebraic geometry, singularity theory*
- *meataxe: Library for computing with modular representations*

Version Information

package-version.txt:

```
1.1
```

Equivalent System Packages

(none known)

6.1.204 mpc: Arithmetic of complex numbers with arbitrarily high precision and correct rounding

Description

From https://www.multiprecision.org/mpc: GNU MPC is a C library for the arithmetic of complex numbers with arbitrarily high precision and correct rounding of the result. It extends the principles of the IEEE-754 standard for fixed precision real floating point numbers to complex numbers, providing well-defined semantics for every operation. At the same time, speed of operation at high precision is a major design goal.

License

LGPLv3+ for the code and GFDLv1.3+ (with no invariant sections) for the documentation.

Upstream Contact

The MPC website is located at https://www.multiprecision.org/mpc .

The MPC team can be contacted via the MPC mailing list: mpc-discuss@inria.fr

Special Update/Build Instructions

- mpc_mul_faster.patch: Patch from Paul Zimmermann to speed up MPC multiplication (for small precisions) by reducing overhead in MPFR operations.

Type

standard

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*

Version Information

package-version.txt:

```
1.1.0
```

Equivalent System Packages

conda:

```
$ conda install  mpc
```

cygwin:

```
$ apt-cyg install libmpc-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libmpc-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libmpc libmpc-devel
```

freebsd:

```
$ sudo pkg install math/mpc
```

gentoo:

```
$ sudo emerge dev-libs/mpc
```

homebrew:

```
$ brew install libmpc
```

nix:

```
$ nix-env --install libmpc
```

opensuse:

```
$ sudo zypper install mpc-devel
```

void:

```
$ sudo xbps-install  libmpc-devel
```

See https://repology.org/project/libmpc/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.205 mpfi: Multiple precision interval arithmetic library based on MPFR

Description

MPFI is a library for interval arithmetic, which is built upon the MPFR multiple precision floating-point arithmetic.

MPFI is intended to be a portable library written in C for arbitrary precision interval arithmetic with intervals represented using MPFR reliable floating-point numbers. It is based on the GNU MP library and on the MPFR library. The purpose of an arbitrary precision interval arithmetic is on the one hand to get “guaranteed” results, thanks to interval computation, and on the other hand to obtain accurate results, thanks to multiple precision arithmetic. The MPFI library is built upon MPFR in order to benefit from the correct rounding provided, for each operation or function, by MPFR. Further advantages of using MPFR are its portability and compliance with the IEEE 754 standard for floating-point arithmetic.

License

This version of MPFI is released under the GNU Lesser General Public License. It is permitted to link MPFI to non-free programs, as long as when distributing them the MPFI source code and a means to re-link with a modified MPFI is provided.

Upstream Contact

http://perso.ens-lyon.fr/nathalie.revol/software.html

The MPFI website is located at https://gitlab.inria.fr/mpfi/mpfi

The MPFI team can be contacted via the MPFI mailing list: mpfi-users@inria.fr

Type

standard

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*

Version Information

package-version.txt:

```
1.5.2
```

Equivalent System Packages

conda:

```
$ conda install  mpfi
```

Debian/Ubuntu:

```
$ sudo apt-get install  libmpfi-dev
```

freebsd:

```
$ sudo pkg install math/mpfi
```

gentoo:

```
$ sudo emerge sci-libs/mpfi
```

homebrew:

```
$ brew install mpfi
```

nix:

```
$ nix-env --install mpfi
```

opensuse:

```
$ sudo zypper install mpfi-devel
```

void:

```
$ sudo xbps-install  mpfi-devel
```

See https://repology.org/project/mpfi/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.206 mpfr: Multiple-precision floating-point computations with correct rounding

Description

The MPFR library is a C library for multiple-precision floating-point computations with correct rounding. MPFR has continuously been supported by the INRIA and the current main authors come from the Caramba and AriC project-teams at Loria (Nancy, France) and LIP (Lyon, France) respectively; see more on the credit page. MPFR is based on the GMP multiple-precision library.

The main goal of MPFR is to provide a library for multiple-precision floating-point computation which is both efficient and has a well-defined semantics. It copies the good ideas from the ANSI/IEEE-754 standard for double-precision floating-point arithmetic (53-bit significand).

License

MPFR is free. It is distributed under the GNU Lesser General Public License (GNU Lesser GPL), version 3 or later (2.1 or later for MPFR versions until 2.4.x). The library has been registered in France by the Agence de Protection des Programmes under the number IDDN FR 001 120020 00 R P 2000 000 10800, on 15 March 2000. This license guarantees your freedom to share and change MPFR, to make sure MPFR is free for all its users. Unlike the ordinary General Public License, the Lesser GPL enables developers of non-free programs to use MPFR in their programs. If you have written a new function for MPFR or improved an existing one, please share your work!

Upstream Contact

The MPFR website is located at http://mpfr.org/

The MPFR team can be contacted via the MPFR mailing list: mpfr@loria.fr

Special Update/Build Instructions

- Make sure MPFR's settings of `CC` and `CFLAGS` still get properly extracted, currently from its `config.log` in the `src/` directory.
- We should remove the `configure` option `--disable-thread-safe` in case the issues without that have meanwhile been fixed. (Then we should actually pass `--enable-thread-safe`.)

TODO

- `--disable-thread-safe` should be switched to `--enable-thread-safe`, need to check that this works on the buildbot machines

Type

standard

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
4.0.1.p0
```

Equivalent System Packages

conda:

```
$ conda install  mpfr
```

cygwin:

```
$ apt-cyg install libmpfr-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libmpfr-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  mpfr-devel
```

freebsd:

```
$ sudo pkg install math/mpfr
```

gentoo:

```
$ sudo emerge dev-libs/mpfr
```

homebrew:

```
$ brew install mpfr
```

opensuse:

```
$ sudo zypper install "pkgconfig(mpfr)"
```

slackware:

```
$ sudo slackpkg install mpfr
```

void:

```
$ sudo xbps-install  mpfr-devel
```

See https://repology.org/project/mpfr/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.207 mpfrcx: Arithmetic of univariate polynomials over arbitrary precision real or complex numbers

Description

Mpfrcx is a library for the arithmetic of univariate polynomials over arbitrary precision real (Mpfr) or complex (Mpc) numbers, without control on the rounding. For the time being, only the few functions needed to implement the floating point approach to complex multiplication are implemented. On the other hand, these comprise asymptotically fast multiplication routines such as Toom–Cook and the FFT.

License

MPFRCX is distributed under the Gnu Lesser General Public License, either version 2.1 of the licence, or (at your option) any later version (LGPLv2.1+).

Upstream Contact

The MPFRCX website is located at http://www.multiprecision.org/mpfrcx .

Type

optional

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *mpc: Arithmetic of complex numbers with arbitrarily high precision and correct rounding*

Version Information

package-version.txt:

```
0.5
```

Equivalent System Packages

opensuse:

```
$ sudo zypper install mpfrcx-devel
```

See https://repology.org/project/mpfrcx/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.208 mpmath: Pure Python library for multiprecision floating-point arithmetic

Description

Mpmath is a pure-Python library for multiprecision floating-point arithmetic. It provides an extensive set of transcendental functions, unlimited exponent sizes, complex numbers, interval arithmetic, numerical integration and differentiation, root-finding, linear algebra, and much more. Almost any calculation can be performed just as well at 10-digit or 1000-digit precision, and in many cases mpmath implements asymptotically fast algorithms that scale well for extremely high precision work. If available, mpmath will (optionally) use gmpy to speed up high precision operations.

Upstream Contact

- Author: Fredrik Johansson
- Email: fredrik.johansson@gmail.com
- https://mpmath.org
- Website: https://github.com/mpmath/mpmath

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.3.0
```

install-requires.txt:

```
mpmath >=1.1.0
```

Equivalent System Packages

conda:

```
$ conda install  mpmath
```

void:

```
$ sudo xbps-install  python3-mpmath
```

See https://repology.org/project/mpmath/versions, https://repology.org/project/python:mpmath/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.209 msolve: Multivariate polynomial system solver

Description

Open source C library implementing computer algebra algorithms for solving polynomial systems (with rational coefficients or coefficients in a prime field).

License

GPL v2+

Upstream Contact

https://github.com/algebraic-solving/msolve

Type

optional

Dependencies

- $(MP_LIBRARY)
- *flint: Fast Library for Number Theory*
- *mpfr: Multiple-precision floating-point computations with correct rounding*

Version Information

package-version.txt:

```
0.4.9
```

Equivalent System Packages

(none known)

6.1.210 nauty: Find automorphism groups of graphs, generate non-isomorphic graphs

Description

Nauty has various tools for finding the automorphism group of a graph, generating non-isomorphic graphs with certain properties, etc.

License

Since version 2.6, nauty license is GPL-compatible, see

http://users.cecs.anu.edu.au/~bdm/nauty/COPYRIGHT.txt

(a copy of this file, called COPYRIGHT, is also present in the tarball)

Special Packaging Instruction

Upstream distribute tarball named nauty${version}.tar.gz. We cannot deal with that so rename it nauty-${version}.tar.gz (notice the "-") without any changes.

Upstream Contact

Brendan D. McKay, Computer Science Department Australian National University bdm@cs.anu.edu.au

Adolfo Piperno, Dipartimento di Informatica Sapienza - Università di Roma piperno@di.uniroma1.it

See http://cs.anu.edu.au/~bdm/nauty/ Or http://pallini.di.uniroma1.it/

Type

standard

Dependencies

Version Information

package-version.txt:

```
27r1.p1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  nauty
```

conda:

```
$ conda install  nauty
```

Debian/Ubuntu:

```
$ sudo apt-get install  nauty
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  nauty
```

freebsd:

```
$ sudo pkg install math/nauty
```

homebrew:

```
$ brew install nauty
```

nix:

```
$ nix-env --install nauty
```

opensuse:

```
$ sudo zypper install nauty nauty-devel
```

void:

```
$ sudo xbps-install  nauty
```

See https://repology.org/project/nauty/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.211 nbclient: A client library for executing notebooks. Formerly nbconvert's ExecutePreprocessor.

Description

A client library for executing notebooks. Formerly nbconvert's ExecutePreprocessor.

License

BSD

Upstream Contact

https://pypi.org/project/nbclient/

Type

standard

Dependencies

- $(PYTHON)
- *jupyter_client: Jupyter protocol implementation and client libraries*
- *nbformat: Base implementation of the Jupyter notebook format*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.7.0
```

install-requires.txt:

```
nbclient
```

Equivalent System Packages

conda:

```
$ conda install  nbclient
```

void:

```
$ sudo xbps-install  python3-nbclient
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.212 nbconvert: Converting Jupyter Notebooks

Description

jupyter nbconvert converts notebooks to various other formats via Jinja templates.

License

BSD

Upstream Contact

https://pypi.org/project/nbconvert/

Type

standard

Dependencies

- $(PYTHON)
- *mistune: A markdown parser in pure Python*
- *jinja2: General purpose template engine for Python*
- *pygments: Generic syntax highlighter*
- *traitlets: Traitlets Python configuration system*
- *jupyter_core: Jupyter core package*
- *nbformat: Base implementation of the Jupyter notebook format*
- *entrypoints: Discover and load entry points from installed Python packages*
- *bleach: An HTML-sanitizing tool*
- *pandocfilters: A Python module for writing pandoc filters*
- *defusedxml: Addresses vulnerabilities of XML parsers and XML libraries*
- *jupyter_client: Jupyter protocol implementation and client libraries*
- *jupyterlab_pygments: Pygments theme using JupyterLab CSS variables*
- *nbclient: A client library for executing notebooks. Formerly nbconvert's ExecutePreprocessor.*
- *beautifulsoup4: Screen-scraping library*
- *markupsafe: Safely add untrusted strings to HTML/XML markup*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
7.2.3
```

install-requires.txt:

```
nbconvert >=5.6.1
```

Equivalent System Packages

conda:

```
$ conda install  nbconvert
```

opensuse:

```
$ sudo zypper install jupyter-nbconvert
```

void:

```
$ sudo xbps-install  python3-jupyter_nbconvert
```

See https://repology.org/project/nbconvert/versions, https://repology.org/project/python:nbconvert/versions, https://repology.org/project/jupyter-nbconvert/versions, https://repology.org/project/python:jupyter-nbconvert/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.213 nbformat: Base implementation of the Jupyter notebook format

Description

This package contains the base implementation of the Jupyter Notebook format, and Python APIs for working with notebooks.

Type

standard

Dependencies

- $(PYTHON)
- *jsonschema: Python implementation of JSON Schema*
- *fastjsonschema: Fastest Python implementation of JSON schema*
- *jupyter_core: Jupyter core package*
- *traitlets: Traitlets Python configuration system*
- $(PYTHON_TOOLCHAIN)
- *hatchling: Modern, extensible Python build backend*
- *hatch_nodejs_version: Hatch plugin for versioning from a package.json file*

Version Information

package-version.txt:

```
5.7.0
```

install-requires.txt:

```
nbformat >=5.0.7
```

Equivalent System Packages

conda:

```
$ conda install  nbformat
```

opensuse:

```
$ sudo zypper install jupyter-nbformat
```

void:

```
$ sudo xbps-install  python3-jupyter_nbformat
```

See https://repology.org/project/nbformat/versions, https://repology.org/project/python:nbformat/versions, https://repology.org/project/jupyter-nbformat/versions, https://repology.org/project/python:jupyter-nbformat/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.214 ncurses: Classic terminal output library

Description

Ncurses (new curses, pronounced "enn-curses") started as a freely distributable "clone" of System V Release 4.0 (SVr4) curses. It has outgrown the "clone" description, and now contains many features which are not in SVr4 curses. Curses is a pun on the term "cursor optimization". It is a library of functions that manage an application's display on character-cell terminals (e.g., VT100).

The name "ncurses" was first used as the name of the curses library in Pavel Curtis's pcurses, dated 1982. It was apparently developed on a BSD 4.4 system, at Cornell. Parts of pcurses are readily identifiable in ncurses, including the basics for the terminfo compiler (named compile in that package):

- the Caps, used to define the terminfo capabilities
- awk scripts MKcaptab.awk, MKnames.awk
- the library modules used for the terminfo compiler.

Besides ncurses, parts of pcurses still survive in 2010, in recognizable form in Solaris.

Website: http://invisible-island.net/ncurses

License

- MIT-style

Upstream Contact

- bug-ncurses@gnu.org

Special Update/Build Instructions

None

Type

standard

Dependencies

Version Information

package-version.txt:

```
6.3
```

Equivalent System Packages

conda:

```
$ conda install  ncurses
```

cygwin:

```
$ apt-cyg install libncurses-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libncurses5-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  ncurses-devel
```

freebsd:

```
$ sudo pkg install devel/ncurses
```

homebrew:

```
$ brew install ncurses
```

macports: install the following packages: ncurses

opensuse:

```
$ sudo zypper install "pkgconfig(ncurses)" "pkgconfig(ncursesw)"
```

slackware:

```
$ sudo slackpkg install ncurses
```

void:

```
$ sudo xbps-install  ncurses-devel
```

See https://repology.org/project/ncurses/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.215 nest_asyncio: Patch asyncio to allow nested event loops

Description

Patch asyncio to allow nested event loops

License

BSD

Upstream Contact

https://pypi.org/project/nest-asyncio/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.5.6
```

install-requires.txt:

```
nest-asyncio
```

Equivalent System Packages

conda:

```
$ conda install  nest-asyncio
```

void:

```
$ sudo xbps-install  python3-nest_asyncio
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.216 networkx: Python package for complex networks

Description

NetworkX (NX) is a Python package for the creation, manipulation, and study of the structure, dynamics, and functions of complex networks.

License

BSD

Upstream Contact

https://networkx.github.io/

Type

standard

Dependencies

- $(PYTHON)
- *decorator: Python library providing decorators*
- $(PYTHON_TOOLCHAIN)
- *scipy: Scientific tools for Python*

Version Information

package-version.txt:

```
3.1
```

install-requires.txt:

```
networkx >=2.4, <3.2
```

Equivalent System Packages

conda:

```
$ conda install  networkx<3.0,>=2.4
```

macports: install the following packages: py-networkx

opensuse:

```
$ sudo zypper install python3-networkx
```

void:

```
$ sudo xbps-install  python3-networkx
```

See https://repology.org/project/python:networkx/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.217 nibabel: Access a multitude of neuroimaging data formats

Description

Access a multitude of neuroimaging data formats

License

MIT License

Upstream Contact

https://pypi.org/project/nibabel/

Type

optional

Dependencies

Version Information

requirements.txt:

```
nibabel
```

Equivalent System Packages

conda:

```
$ conda install  nibabel
```

macports: install the following packages: py-nibabel

opensuse:

```
$ sudo zypper install python3-nibabel
```

See https://repology.org/project/nibabel/versions, https://repology.org/project/python:nibabel/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.218 ninja_build: A build system with a focus on speed

Description

Ninja is a small build system with a focus on speed.

License

Apache License 2.0

Upstream Contact

https://ninja-build.org/

Type

standard

Dependencies

- $(PYTHON)

Version Information

package-version.txt:

```
1.11.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  ninja
```

conda:

```
$ conda install  ninja
```

cygwin:

```
$ apt-cyg install ninja
```

Debian/Ubuntu:

```
$ sudo apt-get install  ninja-build
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  ninja-build
```

freebsd:

```
$ sudo pkg install devel/ninja
```

gentoo:

```
$ sudo emerge dev-util/ninja
```

homebrew:

```
$ brew install ninja
```

macports: install the following packages: ninja

opensuse:

```
$ sudo zypper install ninja
```

void:

```
$ sudo xbps-install  ninja
```

See https://repology.org/project/ninja/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.219 nodeenv: A tool to create isolated node.js environments

Description

nodeenv (node.js virtual environment) is a tool to create isolated node.js environments.

It creates an environment that has its own installation directories, that doesn't share libraries with other node.js virtual environments.

License

BSD License

Upstream Contact

Home page: https://github.com/ekalinin/nodeenv

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *certifi: Python package for providing Mozilla's CA Bundle*

Version Information

requirements.txt:

```
nodeenv ~= 1.4.0
```

Equivalent System Packages

conda:

```
$ conda install  nodeenv
```

homebrew:

```
$ brew install nodeenv
```

See https://repology.org/project/nodeenv/versions, https://repology.org/project/python:nodeenv/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.220 nodejs: A JavaScript runtime built on Chrome's V8 JavaScript engine

Description

Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine.

It is installed into an isolated nodeenv.

License

MIT License

Upstream Contact

Home page: https://nodejs.org/

Type

optional

Dependencies

- *nodeenv: A tool to create isolated node.js environments*

Version Information

package-version.txt:

```
12.18.3
```

Equivalent System Packages

conda:

```
$ conda install  nodejs
```

homebrew:

```
$ brew install node
```

opensuse:

```
$ sudo zypper install nodejs
```

void:

```
$ sudo xbps-install  nodejs
```

See https://repology.org/project/nodejs/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.221 normaliz: Computations in affine monoids, vector configurations, lattice polytopes, and rational cones

Description

Normaliz is a tool for computations in affine monoids, vector configurations, lattice polytopes, and rational cones.

For more details see http://www.mathematik.uni-osnabrueck.de/normaliz/

License

- GPL v3

Upstream Contact

- normaliz@uos.de
- Winfried Bruns <wbruns@uos.de>
- Christof Söger <csoeger@uos.de>
- see also https://www.normaliz.uni-osnabrueck.de/home/contact/

  and https://github.com/Normaliz

Special Update/Build Instructions

- The spkg currently disables features that require packages SCIP and CoCoA, for which we don't have packages (yet).

Type

optional

Dependencies

- $(MP_LIBRARY)
- *flint: Fast Library for Number Theory*
- *e_antic: Real embedded number fields*
- *libnauty: Find automorphism groups of graphs, generate non-isomorphic graphs (callable library)*

Version Information

package-version.txt:

```
3.10.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  normaliz
```

conda:

```
$ conda install  normaliz
```

Debian/Ubuntu:

```
$ sudo apt-get install  libnormaliz-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  libnormaliz-devel
```

gentoo:

```
$ sudo emerge sci-mathematics/normaliz
```

opensuse:

```
$ sudo zypper install normaliz-devel
```

See https://repology.org/project/normaliz/versions, https://repology.org/project/libnormaliz/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.222 notebook: Jupyter notebook, a web-based notebook environment for interactive computing

Description

The Jupyter HTML notebook is a web-based notebook environment for interactive computing.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *jupyter_client: Jupyter protocol implementation and client libraries*
- *ipykernel: IPython Kernel for Jupyter*
- *nbconvert: Converting Jupyter Notebooks*
- *nbformat: Base implementation of the Jupyter notebook format*
- *jinja2: General purpose template engine for Python*
- *tornado: Python web framework and asynchronous networking library*
- *terminado: Tornado websocket backend for the term.js Javascript terminal emulator library*
- *send2trash: Send file to trash natively under Mac OS X, Windows and Linux*
- *prometheus_client: Python client for the systems monitoring and alerting toolkit Prometheus*
- *argon2_cffi: The secure Argon2 password hashing algorithm*

Version Information

package-version.txt:

```
6.4.12
```

install-requires.txt:

```
notebook >=6.1.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  jupyter-notebook
```

conda:

```
$ conda install  notebook
```

macports: install the following packages: py-notebook

void:

```
$ sudo xbps-install  python3-jupyter_notebook
```

See https://repology.org/project/python:notebook/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.223 notedown: Create IPython notebooks from markdown

Description

Notedown is a simple tool to create IPython notebooks from markdown.

License

BSD 2-Clause License

Upstream Contact

Author: Aaron O'Leary Home page: https://github.com/aaren/notedown

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *pip: Tool for installing and managing Python packages*
- *nbformat: Base implementation of the Jupyter notebook format*
- *nbconvert: Converting Jupyter Notebooks*
- *six: Python 2 and 3 compatibility utilities*
- *pandoc_attributes: A parser and generator for pandoc block attributes*

Version Information

package-version.txt:

```
1.5.1
```

install-requires.txt:

```
notedown >=1.5.1
```

Equivalent System Packages

conda:

```
$ conda install  notedown
```

See https://repology.org/project/python:notedown/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.224 ntl: A library for doing number theory

Description

NTL is a high-performance, portable C++ library providing data structures and algorithms for manipulating signed, arbitrary length integers, and for vectors, matrices, and polynomials over the integers and over finite fields.

Website: http://www.shoup.net/ntl/

License

- GNU LGPLv2.1+

Upstream Contact

- Victor Shoup - for contact info see http://www.shoup.net/

Special Update/Build Instructions

- None

Type

standard

Dependencies

- $(MP_LIBRARY)
- *gf2x: Fast arithmetic in GF(2)[x] and searching for irreducible/primitive trinomials*

Version Information

package-version.txt:

```
11.4.3
```

Equivalent System Packages

conda:

```
$ conda install  ntl
```

cygwin:

```
$ apt-cyg install libntl-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libntl-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  ntl-devel
```

freebsd:

```
$ sudo pkg install math/ntl
```

gentoo:

```
$ sudo emerge dev-libs/ntl
```

homebrew:

```
$ brew install ntl
```

macports: install the following packages: ntl

nix:

```
$ nix-env --install ntl
```

opensuse:

```
$ sudo zypper install ntl-devel
```

void:

```
$ sudo xbps-install  ntl-devel
```

See https://repology.org/project/ntl/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.225 numpy: Package for scientific computing with Python

Description

This package adds numerical linear algebra and other numerical computing capabilities to python.

Upstream Contact

- https://numpy.org/
- Travis Oliphant
- Fernando Perez
- Brian Granger

Special Update/Build Instructions

- Scipy uses numpy's distutils to control its compilation of fortran code.

  Whenever numpy is updated it is necessary to make sure that scipy still builds ok.

Type

standard

Dependencies

- $(PYTHON)
- $(BLAS)
- *gfortran: Fortran compiler from the GNU Compiler Collection*
- $(PYTHON_TOOLCHAIN)
- *pkgconfig: Python interface to pkg-config*
- *cython: C-Extensions for Python, an optimizing static compiler*

Version Information

package-version.txt:

```
1.23.5
```

install-requires.txt:

```
numpy >=1.19
```

Equivalent System Packages

conda:

```
$ conda install  numpy
```

homebrew:

```
$ brew install numpy
```

macports: install the following packages: py-numpy

void:

```
$ sudo xbps-install  python3-numpy
```

See https://repology.org/project/python:numpy/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.226 onetbb: oneAPI Threading Building Blocks

Description

C++ parallelization library

License

Apache License, Version 2.0

Upstream Contact

https://github.com/oneapi-src/oneTBB

Type

optional

Dependencies

- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
2021.7.0
```

Equivalent System Packages

alpine: install the following packages: libtbb-dev

arch:

```
$ sudo pacman -S  intel-oneapi-tbb
```

conda:

```
$ conda install  tbb
```

Debian/Ubuntu:

```
$ sudo apt-get install  libtbb-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  tbb-devel
```

freebsd:

```
$ sudo pkg install devel/onetbb
```

gentoo:

```
$ sudo emerge dev-cpp/tbb
```

homebrew:

```
$ brew install tbb
```

macports: install the following packages: onetbb

nix:

```
$ nix-env --install tbb
```

opensuse:

```
$ sudo zypper install tbb
```

void:

```
$ sudo xbps-install  tbb-devel
```

If the system package is installed, ./configure will check whether it can be used.

6.1.227 openblas: An optimized implementation of BLAS (Basic Linear Algebra Subprograms)

Description

OpenBLAS is an optimized open library implementing the Basic Linear Algebra Subprograms (BLAS) specification.

It is based on GotoBLAS2 1.13 BSD version.

License

3-clause BSD license

SPKG Repository

https://www.openblas.net

GitHub page: https://github.com/xianyi/OpenBLAS

Releases: https://github.com/xianyi/OpenBLAS/releases

Upstream Contact

- OpenBLAS users mailing list:

  https://groups.google.com/forum/#!forum/openblas-users

- OpenBLAS developers mailing list:

  https://groups.google.com/forum/#!forum/openblas-dev

Type

standard

Dependencies

- *gfortran: Fortran compiler from the GNU Compiler Collection*

Version Information

package-version.txt:

```
0.3.23
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  openblas lapack cblas
```

conda:

```
$ conda install  openblas blas=2.*=openblas
```

cygwin:

```
$ apt-cyg install liblapack-devel libopenblas
```

Debian/Ubuntu:

```
$ sudo apt-get install  libopenblas-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  openblas-devel
```

freebsd:

```
$ sudo pkg install math/openblas
```

gentoo:

```
$ sudo emerge sci-libs/openblas
```

homebrew:

```
$ brew install openblas
```

macports: install the following packages: OpenBLAS-devel

nix:

```
$ nix-env --install blas lapack
```

opensuse:

```
$ sudo zypper install openblas-devel
```

void:

```
$ sudo xbps-install  openblas-devel
```

See https://repology.org/project/openblas/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.228 openssl: Implementation of the SSL and TLS protocols

Description

From wikipedia: OpenSSL is an open source implementation of the SSL and TLS protocols. The core library (written in the C programming language) implements the basic cryptographic functions and provides various utility functions. Wrappers allowing the use of the OpenSSL library in a variety of computer languages are available.

License

- Apache License v2 (considered compatible with GPL v3)

Upstream Contact

- http://openssl.org/

Type

standard

Dependencies

Version Information

package-version.txt:

```
3.0.8
```

Equivalent System Packages

alpine: install the following packages: openssl-dev

arch:

```
$ sudo pacman -S  openssl
```

conda:

```
$ conda install  openssl
```

cygwin:

```
$ apt-cyg install libssl-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  openssl libssl-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  openssl openssl-devel
```

freebsd:

```
$ sudo pkg install security/openssl
```

homebrew:

```
$ brew install openssl
```

macports: install the following packages: openssl

nix:

```
$ nix-env --install openssl
```

opensuse:

```
$ sudo zypper install libopenssl-3-devel
```

slackware:

```
$ sudo slackpkg install openssl openssl-solibs
```

void:

```
$ sudo xbps-install  openssl-devel
```

See https://repology.org/project/openssl/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.229 ore_algebra: Ore algebra

Description

A Sage implementation of Ore algebras, Ore polynomials, and differentially finite functions.

Main features for the most common algebras include basic arithmetic and actions; gcrd and lclm; D-finite closure properties; creative telescoping; natural transformations between related algebras; guessing; desingularization; solvers for polynomials, rational functions and (generalized) power series. Univariate differential operators also support the numerical computation of analytic solutions with rigorous error bounds and related features.

License

- GPL-2.0+

Upstream Contact

- Website: https://github.com/mkauers/ore_algebra/
- Sage accounts: mkauers, mmezzarobba

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- $(SAGERUNTIME)

Version Information

requirements.txt:

```
git+https://github.com/mkauers/ore_algebra@01c357f590685ff362c008229681ee08269457da
↪#egg=ore_algebra
```

Equivalent System Packages

See https://repology.org/project/ore-algebra/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.230 osqp_python: The Operator Splitting QP Solver (Python wrapper)

Description

This is the Python wrapper for OSQP: The Operator Splitting QP Solver.

It vendors OSQP.

License

Apache 2.0

Upstream Contact

https://pypi.org/project/osqp/

Type

optional

Dependencies

- $(PYTHON)
- *qdldl_python: QDLDL, a free LDL factorization routine (Python wrapper)*
- *numpy: Package for scientific computing with Python*
- *scipy: Scientific tools for Python*
- $(PYTHON_TOOLCHAIN)
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
0.6.2.post8
```

install-requires.txt:

```
osqp
```

Equivalent System Packages

conda:

```
$ conda install  osqp
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.231 p_group_cohomology: Modular cohomology rings of finite groups

Description

Modular Cohomology Rings of Finite Groups

The package is located at http://users.fmi.uni-jena.de/cohomology/, that's to say the tarball p_group_cohomology-x.y.tar.xz can be found there and the documentation of the package is provided at http://users.fmi.uni-jena.de/cohomology/documentation/

License

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> David J. Green <david.green@uni-jena.de>

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The full text of the GPL is available at:

> http://www.gnu.org/licenses/

The package includes a data base of cohomology rings of the groups of order 64 and provides access to a data base of cohomology rings of the groups of order 128 and 243, located at

> http://cohomology.uni-jena.de/db/

These data bases are distributed under the Creative Commons Attribution-Share Alike 3.0 License. The full text of this licence is available at

> http://creativecommons.org/licenses/by-sa/3.0/

SPKG Maintainers

Simon A. King <simon.king@uni-jena.de>

Upstream Contact

Simon A. King <simon.king@uni-jena.de> David J. Green <david.green@uni-jena.de>

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We owe Peter Symonds the idea of using the Poincaré series in a rather efficient completeness criterion.

We are greatful to John Palmieri for his help on making p_group_cohomology work with python-3.

Dependencies

- The SharedMeatAxe needs to be installed, as a build time dependency.

  This can be met by installing the meataxe spkg

Testing

Our package provides a very short test suite for David Green's routines for the computation of minimal projective resolutions. The majority of this package's tests is formed by doc tests in the Cython code. In fact, any class, method and function is covered by tests.

Note that internet access is required for these tests, as it is attempted to download cohomology rings from a public data base in the web.

The script `spkg-check` calls `sage -t --force_lib` on the files in `pGroupCohomology`.

Documentation

The documentation of this package is automatically built, if the environment variable SAGE_SPKG_INSTALL_DOCS is yes (do "export SAGE_SPKG_INSTALL_DOCS=yes" on the command line before installation). The documents are put into SAGE_ROOT/local/share/doc/p_group_cohomology/.

Type

optional

Dependencies

- $(PYTHON)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *cysignals: Interrupt and signal handling for Cython*
- *singular: Computer algebra system for polynomial computations, algebraic geometry, singularity theory*
- *meataxe: Library for computing with modular representations*
- *p_group_cohomology: Modular cohomology rings of finite groups*
- $(PYTHON_TOOLCHAIN)
- *matplotlib: Python 2D plotting library*
- *gap: Groups, Algorithms, Programming - a system for computational discrete algebra*
- *xz: General-purpose data compression software*
- $(SAGERUNTIME)
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*

Version Information

package-version.txt:

```
3.3.3.p1
```

install-requires.txt:

```
p_group_cohomology >=3.3
```

Equivalent System Packages

See https://repology.org/project/sagemath-p-group-cohomology/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.232 packaging: Core utilities for Python packages

Description

Core utilities for Python packages

Type

standard

Dependencies

- $(PYTHON)
- *setuptools: Build system for Python packages*
- *pip: Tool for installing and managing Python packages*
- *wheel: A built-package format for Python*
- *pyparsing: A Python parsing module*
- *setuptools_wheel: Build the setuptools package as a wheel*

Version Information

package-version.txt:

```
21.3
```

install-requires.txt:

```
packaging >=18.0
# Trac #30975: packaging 20.5 is known to work but we have to silence
↪"DeprecationWarning: Creating a LegacyVersion"
```

Equivalent System Packages

conda:

```
$ conda install  packaging
```

macports: install the following packages: py-packaging

void:

```
$ sudo xbps-install  python3-packaging
```

See https://repology.org/project/packaging/versions, https://repology.org/project/python:packaging/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.233 palettable: Color palettes for Python

Description

Color palettes for Python

License

Upstream Contact

https://pypi.org/project/palettable/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.3.0
```

install-requires.txt:

```
palettable
```

Equivalent System Packages

conda:

```
$ conda install  palettable
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.234 palp: A package for Analyzing Lattice Polytopes

Description

A Package for Analyzing Lattice Polytopes (PALP) is a set of C programs for calculations with lattice polytopes and applications to toric geometry.

It contains routines for vertex and facet enumeration, computation of incidences and symmetries, as well as completion of the set of lattice points in the convex hull of a given set of points. In addition, there are procedures specialised to reflexive polytopes such as the enumeration of reflexive subpolytopes, and applications to toric geometry and string theory, like the computation of Hodge data and fibration structures for toric Calabi-Yau varieties. The package is well tested and optimised in speed as it was used for time consuming tasks such as the classification of reflexive polyhedra in 4 dimensions and the creation and manipulation of very large lists of 5-dimensional polyhedra.

While originally intended for low-dimensional applications, the algorithms work in any dimension and our key routine for vertex and facet enumeration compares well with existing packages.

License

- When released, GPL 2 was in force.
- There is a link to a web page, which now points to GPL 3, but would have pointed to GPL 2 at the time the package was released.
- Therefore one can deduce the authors were happy for this to be released under GPL 2 or a later version.

Upstream Contact

- Author: Harald Skarke (skarke@maths.ox.ac.uk)
- Home page: http://hep.itp.tuwien.ac.at/~kreuzer/CY/CYpalp.html

Type

standard

Dependencies

Version Information

package-version.txt:

```
2.11
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  palp
```

conda:

```
$ conda install  palp
```

Debian/Ubuntu:

```
$ sudo apt-get install  palp
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  palp
```

nix:

```
$ nix-env --install palp
```

void:

```
$ sudo xbps-install  palp
```

See https://repology.org/project/palp/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.235 pandoc: A document converter

Description

This script package represents the document converter pandoc.

We do not have an SPKG for it. The purpose of this script package is to associate system package lists with it.

Type

optional

Dependencies

Version Information

Equivalent System Packages

alpine: install the following packages: pandoc

arch:

```
$ sudo pacman -S  pandoc
```

conda:

```
$ conda install  pandoc
```

Debian/Ubuntu:

```
$ sudo apt-get install  pandoc
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  pandoc
```

freebsd:

```
$ sudo pkg install textproc/hs-pandoc
```

gentoo:

```
$ sudo emerge app-text/pandoc
```

homebrew:

```
$ brew install pandoc
```

macports: install the following packages: pandoc

opensuse:

```
$ sudo zypper install pandoc
```

void:

```
$ sudo xbps-install  pandoc
```

See https://repology.org/project/pandoc/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.236 pandoc_attributes: A parser and generator for pandoc block attributes

Description

This is a simple parser / emitter for pandoc block attributes, intended for use with pandocfilters.

License

BSD 2-Clause License

Upstream Contact

- Author: Aaron O'Leary
- Home page: https://github.com/aaren/pandoc-attributes

Special Update/Build Instructions

There are no release numbers, hence find the latest commit, download https://github.com/aaren/pandoc-attributes/archive/${COMMIT}.zip and rename it pandoc_attributes-${COMMIT:0:8}.zip

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *pip: Tool for installing and managing Python packages*
- *pandocfilters: A Python module for writing pandoc filters*

Version Information

package-version.txt:

```
8bc82f6d
```

install-requires.txt:

```
pandoc_attributes >=8bc82f6d
```

Equivalent System Packages

conda:

```
$ conda install  pandoc-attributes
```

See https://repology.org/project/pandoc-attributes/versions, https://repology.org/project/python:pandoc-attributes/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.237 pandocfilters: A Python module for writing pandoc filters

Description

A python module for writing pandoc filters.

License

BSD 3-Clause License

Upstream Contact

Author: John MacFarlane Home page: https://github.com/jgm/pandocfilters

Special Update/Build Instructions

Download the last release from https://pypi.python.org/pypi/pandocfilters

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.5.0
```

install-requires.txt:

```
pandocfilters >=1.4.2
```

Equivalent System Packages

conda:

```
$ conda install  pandocfilters
```

macports: install the following packages: py-pandocfilters

void:

```
$ sudo xbps-install  python3-pandocfilters
```

See https://repology.org/project/python:pandocfilters/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.238 papilo: Parallel presolve for integer and linear optimization

Description

parallel presolve routines for (mixed integer) linear programming problems. The routines are implemented using templates which allows switching to higher precision or rational arithmetic using the boost multiprecision package.

License

LGPL 3.0

Upstream Contact

https://github.com/scipopt/papilo/

Type

optional

Dependencies

- $(MP_LIBRARY)
- *boost_cropped: Portable C++ libraries (subset needed for Sage)*
- *onetbb: oneAPI Threading Building Blocks*
- $(BLAS)
- *gfortran: Fortran compiler from the GNU Compiler Collection*
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
2.1.1
```

Equivalent System Packages

(none known)

6.1.239 pari: Computer algebra system for fast computations in number theory

Description

PARI/GP is a widely used computer algebra system designed for fast computations in number theory (factorizations, algebraic number theory, elliptic curves…), but also contains a large number of other useful functions to compute with mathematical entities such as matrices, polynomials, power series, algebraic numbers etc., and a lot of transcendental functions. PARI is also available as a C library to allow for faster computations.

Originally developed by Henri Cohen and his co-workers (Université Bordeaux I, France), PARI is now under the GPL and maintained by Karim Belabas with the help of many volunteer contributors.

License

GPL version 2+

Upstream Contact

- http://pari.math.u-bordeaux.fr/

Dependencies

- Perl
- MPIR or GMP
- Readline
- GNU patch (shipped with Sage)

Special Update/Build Instructions

See patches/README.txt for a list of patches.

The current upstream tarball was created from the PARI git repository by running "make snapshot".

Type

standard

Dependencies

- *readline: Command line editing library*
- $(MP_LIBRARY)
- *pari_galdata: PARI data package needed to compute Galois groups in degrees 8 through 11*
- *pari_seadata_small: PARI data package needed by ellap for large primes (small version)*

Version Information

package-version.txt:

```
2.15.2.p1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  pari pari-galdata pari-seadata pari-elldata pari-galpol
```

conda:

```
$ conda install  pari=*=*_pthread pari-elldata pari-galdata pari-galpol pari-seadata
```

Debian/Ubuntu:

```
$ sudo apt-get install  pari-gp2c libpari-dev pari-doc pari-elldata pari-galdata pari-
↪galpol pari-seadata
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  pari-devel pari-gp --setopt=tsflags= pari-galdata pari-galpol pari-
↪seadata pari-elldata
```

freebsd:

```
$ sudo pkg install math/pari
```

gentoo:

```
$ sudo emerge sci-mathematics/pari sci-mathematics/pari-data
```

homebrew:

```
$ brew install pari pari-elldata pari-galdata pari-galpol pari-seadata
```

macports: install the following packages: pari

nix:

```
$ nix-env --install pari
```

opensuse:

```
$ sudo zypper install pari-devel pari-gp
```

void:

```
$ sudo xbps-install  pari pari-devel pari-elldata-small pari-galdata pari-galpol-small␣
↪pari-seadata
```

See https://repology.org/project/pari/versions, https://repology.org/project/pari-gp/versions, https://repology.org/project/pari-data/versions, https://repology.org/project/pari-elldata/versions, https://repology.org/project/pari-galdata/versions, https://repology.org/project/pari-galpol/versions, https://repology.org/project/pari-nftables/versions, https://repology.org/project/pari-seadata/versions, https://repology.org/project/pari-seadata-big/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.240 pari_elldata: PARI data package for elliptic curves

Description

PARI/GP version of J. E. Cremona Elliptic Curve Data, needed by ellsearch and ellidentify.

License

GNU General Public License (GPL version 2 or any later version).

Upstream Contact

http://pari.math.u-bordeaux.fr/

Dependencies

- Installation: None
- Runtime: PARI/GP

Type

optional

Dependencies

Version Information

package-version.txt:

```
20161017
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  pari-elldata
```

conda:

```
$ conda install  pari-elldata
```

freebsd:

```
$ sudo pkg install math/pari_elldata
```

opensuse:

```
$ sudo zypper install pari-elldata
```

void:

```
$ sudo xbps-install  pari-elldata-small
```

See https://repology.org/project/pari-elldata/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.241 pari_galdata: PARI data package needed to compute Galois groups in degrees 8 through 11

Description

PARI package "galdata": Needed by polgalois to compute Galois group in degrees 8 through 11.

License

GPL version 2+

Upstream Contact

http://pari.math.u-bordeaux.fr/

Type

standard

Dependencies

Version Information

package-version.txt:

```
20080411.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  pari-galdata
```

conda:

```
$ conda install  pari-galdata
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  pari-galdata
```

freebsd:

```
$ sudo pkg install pari_galdata
```

opensuse:

```
$ sudo zypper install pari-galdata
```

void:

```
$ sudo xbps-install  pari-galdata
```

See https://repology.org/project/pari-galdata/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.242 pari_galpol: PARI data package for polynomials defining Galois extensions of the rationals

Description

PARI package of the GALPOL database of polynomials defining Galois extensions of the rationals, accessed by galoisgetpol, galoisgetgroup, galoisgetname.

License

GNU General Public License (GPL version 2 or any later version).

Upstream Contact

http://pari.math.u-bordeaux.fr/

Dependencies

- Installation: None
- Runtime: PARI/GP

Type

optional

Dependencies

Version Information

package-version.txt:

```
20180625
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  pari-galpol
```

conda:

```
$ conda install  pari-galpol
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  pari-galpol
```

freebsd:

```
$ sudo pkg install math/pari_galpol
```

opensuse:

```
$ sudo zypper install pari-galpol
```

void:

```
$ sudo xbps-install  pari-galpol-small
```

See https://repology.org/project/pari-galpol/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.243 pari_jupyter: A Jupyter kernel for PARI/GP

Description

A Jupyter kernel for PARI/GP

License

GPL version 3 or later

Upstream Contact

- https://github.com/sagemath/pari-jupyter

Dependencies

- Python >= 3.6.1
- Jupyter 4
- PARI version 2.13 or later
- Readline (any version which works with PARI)
- Optional: Cython version 0.25 or later

Type

optional

Dependencies

- $(PYTHON)
- *pari: Computer algebra system for fast computations in number theory*
- $(PYTHON_TOOLCHAIN)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *notebook: Jupyter notebook, a web-based notebook environment for interactive computing*
- *jupyter_core: Jupyter core package*

Version Information

package-version.txt:

```
1.4.0
```

install-requires.txt:

```
pari_jupyter >=1.3.2
```

Equivalent System Packages

conda:

```
$ conda install  pari_jupyter
```

See https://repology.org/project/pari-jupyter/versions, https://repology.org/project/python:pari-jupyter/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.244 pari_nftables: PARI data package for number fields

Description

Repackaging of the historical megrez number field tables (errors fixed, 1/10th the size, easier to use).

License

GNU General Public License (GPL version 2 or any later version).

Upstream Contact

http://pari.math.u-bordeaux.fr/

Dependencies

- Installation: None
- Runtime: PARI/GP

Type

optional

Dependencies

Version Information

package-version.txt:

```
20080929
```

Equivalent System Packages

conda:

```
$ conda install  pari-nftables
```

freebsd:

```
$ sudo pkg install math/pari_nftables
```

opensuse:

```
$ sudo zypper install pari-nftables
```

void:

```
$ sudo xbps-install  pari-nftables
```

See https://repology.org/project/pari-nftables/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.245 pari_seadata: PARI data package needed by ellap for large primes (full version)

Description

Needed by ellap for large primes. These polynomials were extracted from the ECHIDNA databases and computed by David R. Kohel. This covers finite fields of cardinality q up to 750 bits. PARI/GP 2.9 contains fallback code to go on when all modular polynomials in the database have been exhausted and can handle larger fields (with an important slowdown).

License

GNU General Public License (GPL version 2 or any later version).

Upstream Contact

http://pari.math.u-bordeaux.fr/

Dependencies

- Installation: None
- Runtime: PARI/GP

Type

optional

Dependencies

Version Information

package-version.txt:

```
20090618
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  pari-seadata
```

conda:

```
$ conda install  pari-seadata
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  pari-seadata
```

freebsd:

```
$ sudo pkg install math/pari_seadata
```

opensuse:

```
$ sudo zypper install pari-seadata
```

void:

```
$ sudo xbps-install  pari-seadata
```

See https://repology.org/project/pari-seadata/versions, https://repology.org/project/pari-seadata-big/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.246 pari_seadata_small: PARI data package needed by ellap for large primes (small version)

Description

PARI package "seadata_small": Needed by ellap for large primes. This "small" one is a much smaller version that should be suitable for primes up to 350 bits. These polynomials were extracted from the ECHIDNA databases and computed by David R. Kohel.

License

GPL version 2+

Upstream Contact

http://pari.math.u-bordeaux.fr/

Type

standard

Dependencies

Version Information

package-version.txt:

```
20090618.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  pari-seadata
```

conda:

```
$ conda install  pari-seadata-small
```

freebsd:

```
$ sudo pkg install math/pari_seadata
```

void:

```
$ sudo xbps-install  pari-seadata
```

See https://repology.org/project/pari-seadata-small/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.247 parso: A Python parser

Description

Parso is a Python parser that supports error recovery and round-trip parsing for different Python versions (in multiple Python versions). Parso is also able to list multiple syntax errors in your python file.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.8.3
```

install-requires.txt:

```
parso >=0.7.0
```

Equivalent System Packages

conda:

```
$ conda install  parso
```

macports: install the following packages: py-parso

void:

```
$ sudo xbps-install  python3-parso
```

See https://repology.org/project/python:parso/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.248 patch: Applies diffs and patches to files

Description

'patch' takes a patch file containing a difference listing produced by the 'diff' program and applies those differences to one or more original files, producing patched versions.

The version of 'patch' included is the GNU one. Some of the 'diff' files produced by GNU 'diff' are not acceptable to some versions of the 'patch' command, such as the 'patch' command that comes with Solaris.

License

This program is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2, or (at your option) any later version.

Upstream Contact

Main web site: http://savannah.gnu.org/projects/patch/

Bug database: http://savannah.gnu.org/bugs/?group=patch

Submit bugs: http://savannah.gnu.org/bugs/?func=additem&group=patch

Mailing lists: bug-patch@gnu.org

Special Update/Build Instructions

In the event patches ever need to be made to this package, the method of applying the patches should not rely on the 'patch' existing on the system.

Type

standard

Dependencies

Version Information

package-version.txt:

```
2.7.5
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  patch
```

conda:

```
$ conda install  patch
```

cygwin:

```
$ apt-cyg install patch
```

Debian/Ubuntu:

```
$ sudo apt-get install  patch
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  patch
```

freebsd:

```
$ sudo pkg install devel/patch
```

homebrew:

```
$ brew install gpatch
```

macports: install the following packages: gpatch

opensuse:

```
$ sudo zypper install patch
```

slackware:

```
$ sudo slackpkg install patch
```

void:

```
$ sudo xbps-install  patch
```

See https://repology.org/project/patch/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.249 patchelf: A small utility to modify the dynamic linker and RPATH of ELF executables

Description

A small utility to modify the dynamic linker and RPATH of ELF executables.

License

GPL-3.0-or-later

Upstream Contact

https://github.com/NixOS/patchelf

Type

standard

Dependencies

- *bzip2: High-quality data compressor*

Version Information

package-version.txt:

```
0.13.1
```

Equivalent System Packages

(none known)

6.1.250 pathspec: Utility library for gitignore style pattern matching of file paths.

Description

Utility library for gitignore style pattern matching of file paths.

License

MPL 2.0

Upstream Contact

https://pypi.org/project/pathspec/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.10.2
```

install-requires.txt:

```
pathspec
```

Equivalent System Packages

conda:

```
$ conda install  pathspec
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.251 pdf2svg - PDF to SVG convertor

Description

pdf2svg is a tiny command-line utility using Cairo and Poppler to convert PDF documents into SVG files. Multi-page PDF can be split up to one SVG per page by passing a file naming specification.

License

GPL

Upstream Contact

http://cityinthesky.co.uk/opensource/pdf2svg/

Type

optional

Dependencies

Version Information

Equivalent System Packages

alpine: install the following packages: pdf2svg

arch:

```
$ sudo pacman -S  pdf2svg
```

conda:

```
$ conda install  pdf2svg
```

Debian/Ubuntu:

```
$ sudo apt-get install  pdf2svg
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  pdf2svg
```

freebsd:

```
$ sudo pkg install graphics/pdf2svg
```

homebrew:

```
$ brew install pdf2svg
```

macports: install the following packages: pdf2svg

nix:

```
$ nix-env --install pdf2svg
```

opensuse:

```
$ sudo zypper install pdf2svg
```

See https://repology.org/project/pdf2svg/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.252 perl_cpan_polymake_prereq: Represents all Perl packages that are prerequisites for polymake

Description

This script package represents all Perl packages that are prerequisites for polymake.

License

Various free software licenses

Type

optional

Dependencies

Version Information

Equivalent System Packages

cpan:

```
$ cpan -i XML::Writer XML::LibXML XML::LibXSLT File::Slurp JSON SVG Term::ReadKey
```

Debian/Ubuntu:

```
$ sudo apt-get install  libxml-libxslt-perl libxml-writer-perl libxml2-dev libperl-dev␣
↪libfile-slurp-perl libjson-perl libsvg-perl libterm-readkey-perl libterm-readline-gnu-
↪perl
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  perl-ExtUtils-Embed perl-File-Slurp perl-JSON perl-Term-ReadLine-Gnu␣
↪perl-TermReadKey perl-XML-Writer perl-XML-LibXML perl-XML-LibXSLT
```

freebsd:

```
$ sudo pkg install textproc/p5-XML-Writer textproc/p5-XML-LibXML textproc/p5-XML-LibXSLT␣
↪devel/p5-File-Slurp converters/p5-JSON textproc/p5-SVG devel/p5-Term-ReadKey
```

gentoo:

```
$ sudo emerge XML-Writer XML-LibXML XML-LibXSLT File-Slurp dev-perl/Term-ReadLine-Gnu␣
↪dev-perl/TermReadKey JSON SVG
```

void:

```
$ sudo xbps-install  perl-File-Slurp perl-JSON perl-SVG perl-Term-ReadKey perl-XML-
↪LibXML perl-XML-LibXSLT perl-XML-Writer
```

If the system package is installed, ./configure will check whether it can be used.

6.1.253 perl_mongodb: A prerequisite for polymake's PolyDB feature

Description

This script package represents the Perl package MongoDB, which is needed for the PolyDB feature of polymake.

License

Various free software licenses

Type

optional

Dependencies

Version Information

Equivalent System Packages

cpan:

```
$ cpan -i MongoDB
```

Debian/Ubuntu:

```
$ sudo apt-get install  libmongodb-perl
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  perl-MongoDB
```

freebsd:

```
$ sudo pkg install databases/p5-MongoDB
```

gentoo:

```
$ sudo emerge dev-perl/MongoDB
```

If the system package is installed, ./configure will check whether it can be used.

6.1.254 perl_term_readline_gnu: Perl extension for the GNU Readline/History libraries

Description

Perl extension for the GNU Readline/History Library

Available on CPAN

License

The Perl 5 License (Artistic 1 & GPL 1)

Upstream Contact

Hiroo HAYASHI

Type

optional

Dependencies

- *readline: Command line editing library*

Version Information

package-version.txt:

```
1.35
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  perl-term-readline-gnu
```

cpan:

```
$ cpan -i Term::ReadLine::Gnu
```

cygwin:

```
$ apt-cyg install perl-Term-ReadLine-Gnu
```

Debian/Ubuntu:

```
$ sudo apt-get install  libterm-readline-gnu-perl
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  perl-Term-ReadLine-Gnu
```

freebsd:

```
$ sudo pkg install devel/p5-Term-ReadLine-Gnu
```

gentoo:

```
$ sudo emerge dev-perl/Term-ReadLine-Gnu
```

macports: install the following packages: p5-term-readline-gnu

opensuse:

```
$ sudo zypper install "perl(Term::ReadLine::Gnu)"
```

void:

```
$ sudo xbps-install  perl-Term-ReadLine-Gnu
```

See https://repology.org/project/perl:term-readline-gnu/versions, https://repology.org/project/perl:termreadline-gnu/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.255 pexpect: Python module for controlling and automating other programs

Description

Pexpect is a pure Python module for spawning child applications; controlling them; and responding to expected patterns in their output.

License

ISC license: http://opensource.org/licenses/isc-license.txt This license is approved by the OSI and FSF as GPL-compatible.

Upstream Contact

- http://pexpect.readthedocs.org/en/stable/
- https://github.com/pexpect/pexpect

Type

standard

Dependencies

- $(PYTHON)
- *ptyprocess: Python interaction with subprocesses in a pseudoterminal*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
4.8.0
```

install-requires.txt:

```
pexpect >=4.8.0
```

Equivalent System Packages

conda:

```
$ conda install  pexpect
```

macports: install the following packages: py-pexpect

opensuse:

```
$ sudo zypper install python3-pexpect
```

void:

```
$ sudo xbps-install  python3-pexpect
```

See https://repology.org/project/pexpect/versions, https://repology.org/project/python:pexpect/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.256 phitigra: A graph editor for SageMath/Jupyter

Description

A graph editor for SageMath/Jupyter

License

Upstream Contact

https://pypi.org/project/phitigra/

Type

optional

Dependencies

- $(PYTHON)
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*
- *pillow: Python Imaging Library*
- *numpy: Package for scientific computing with Python*
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
phitigra>=0.2.6
```

Equivalent System Packages

(none known)

6.1.257 pickleshare: A 'shelve' like datastore with concurrency support

Description

PickleShare - a small 'shelve' like datastore with concurrency support

Like shelve, a PickleShareDB object acts like a normal dictionary. Unlike shelve, many processes can access the database simultaneously. Changing a value in database is immediately visible to other processes accessing the same database.

Concurrency is possible because the values are stored in separate files. Hence the "database" is a directory where all files are governed by PickleShare.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.7.5
```

install-requires.txt:

```
pickleshare >=0.7.5
```

Equivalent System Packages

conda:

```
$ conda install  pickleshare
```

macports: install the following packages: py-pickleshare

opensuse:

```
$ sudo zypper install python3-pickleshare
```

void:

```
$ sudo xbps-install  python3-pickleshare
```

See https://repology.org/project/pickleshare/versions, https://repology.org/project/python:pickleshare/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.258 pillow: Python Imaging Library

Description

Pillow is the "friendly" PIL fork by Alex Clark and Contributors.

The Python Imaging Library (PIL) adds powerful image processing and graphics capabilities to Python. The library supports many file formats.

License

Standard PIL License

Upstream Contact

- Author: Alex Clark <aclark@aclark.net>
- https://python-pillow.org/
- Homepage: http://python-imaging.github.io/

Type

standard

Dependencies

- $(PYTHON)
- *zlib: Data compression library*
- *freetype: A free, high-quality, and portable font engine*
- $(PYTHON_TOOLCHAIN)
- *pkgconf: An implementation of the pkg-config spec*

Version Information

package-version.txt:

```
9.0.1
```

install-requires.txt:

```
pillow >=7.2.0
```

Equivalent System Packages

conda:

```
$ conda install  pillow
```

macports: install the following packages: py-Pillow

opensuse:

```
$ sudo zypper install python3-Pillow
```

void:

```
$ sudo xbps-install  python3-Pillow
```

See https://repology.org/project/python:pillow/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.259 pint: Physical quantities module

Description

Physical quantities module

License

BSD

Upstream Contact

https://pypi.org/project/Pint/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.20.1
```

install-requires.txt:

```
Pint
```

Equivalent System Packages

conda:

```
$ conda install  pint
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.260 pip: Tool for installing and managing Python packages

Description

This package installs pip, the tool for installing and managing Python packages, such as those found in the Python Package Index. It's a replacement for easy_install.

License

MIT

Upstream Contact

- Project Page: https://github.com/pypa/pip
- Install howto: https://pip.pypa.io/en/latest/installing.html
- Changelog: https://pip.pypa.io/en/latest/news.html
- Bug Tracking: https://github.com/pypa/pip/issues
- Mailing list: http://groups.google.com/group/python-virtualenv
- Docs: https://pip.pypa.io/

Type

standard

Dependencies

- $(PYTHON)
- *setuptools: Build system for Python packages*
- *wheel: A built-package format for Python*

Version Information

package-version.txt:

```
22.3.1
```

install-requires.txt:

```
pip >=21.3
# for use of the "in-tree-build" feature, default since 21.3, by the Sage distribution
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  python-pip
```

conda:

```
$ conda install  pip
```

macports: install the following packages: py-pip

opensuse:

```
$ sudo zypper install python3-pip
```

void:

```
$ sudo xbps-install  python3-pip
```

See https://repology.org/project/pip3/versions, https://repology.org/project/python:pip/versions, https://repology.org/project/python3x-pip/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.261 pkgconf: An implementation of the pkg-config spec

Description

Pkgconf is an implementation of the pkg-config spec with minimal dependencies.

License

ISC License (equivalent to Simplified BSD)

Upstream Contact

https://github.com/pkgconf/pkgconf

Special Update/Build Instructions

- install.patch: Use install script from AC_PROG_INSTALL

Pkgconf is used in bzip2, so we must not use the bzip2-compressed tarball.

Type

standard

Dependencies

- *patch: Applies diffs and patches to files*
- *xz: General-purpose data compression software*

Version Information

package-version.txt:

```
1.8.0
```

Equivalent System Packages

conda:

```
$ conda install  pkg-config
```

Debian/Ubuntu:

```
$ sudo apt-get install  pkg-config
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  pkg-config
```

freebsd:

```
$ sudo pkg install devel/pkgconf
```

homebrew:

```
$ brew install pkg-config
```

macports: install the following packages: pkgconfig

opensuse:

```
$ sudo zypper install pkgconf
```

void:

```
$ sudo xbps-install  pkgconf
```

See https://repology.org/project/pkgconf/versions, https://repology.org/project/pkg-config/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.262 pkgconfig: Python interface to pkg-config

Description

Pkgconfig is a Python module to interface with the pkg-config command line tool.

License

MIT License

Upstream Contact

https://github.com/matze/pkgconfig

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *pkgconf: An implementation of the pkg-config spec*
- *poetry_core: Poetry PEP 517 Build Backend*

Version Information

package-version.txt:

```
1.5.5
```

install-requires.txt:

```
pkgconfig >=1.5.1
```

Equivalent System Packages

conda:

```
$ conda install  pkgconfig
```

macports: install the following packages: py-pkgconfig

opensuse:

```
$ sudo zypper install pkg-config
```

void:

```
$ sudo xbps-install  python3-pkgconfig
```

See https://repology.org/project/python:pkgconfig/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.263 planarity: Planarity-related graph algorithms

Description

This code project provides a library for implementing graph algorithms as well as implementations of several planarity-related graph algorithms. The origin of this project is the reference implementation for the Edge Addition Planarity Algorithm [1], which is now the fastest and simplest linear-time method for planar graph embedding and planarity obstruction isolation (i.e. Kuratowski subgraph isolation).

[1] http://dx.doi.org/10.7155/jgaa.00091

License

New BSD License

Upstream Contact

- https://github.com/graph-algorithms/edge-addition-planarity-suite/
- John Boyer <John.Boyer.PhD@gmail.com>

Special Update/Build Instructions

The tarballs can be found at, https://github.com/graph-algorithms/edge-addition-planarity-suite/releases sage tarball is repackaged after running autogen.sh

Type

standard

Dependencies

Version Information

package-version.txt:

```
3.0.1.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  planarity
```

conda:

```
$ conda install  planarity
```

Debian/Ubuntu:

```
$ sudo apt-get install  libplanarity-dev planarity
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  planarity planarity-devel
```

freebsd:

```
$ sudo pkg install math/planarity
```

gentoo:

```
$ sudo emerge sci-mathematics/planarity
```

nix:

```
$ nix-env --install planarity
```

opensuse:

```
$ sudo zypper install edge-addition-planarity-suite edge-addition-planarity-suite-devel
```

void:

```
$ sudo xbps-install  planarity-devel
```

See https://repology.org/project/planarity/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.264 plantri: Generate non-isomorphic sphere-embdedded graphs

Description

Plantri is a program that generates certain types of graphs that are imbedded on the sphere.

Exactly one member of each isomorphism class is output, using an amount of memory almost independent of the number of graphs produced. This, together with the exceptionally fast operation and careful validation, makes the program suitable for processing very large numbers of graphs.

Isomorphisms are defined with respect to the embeddings, so in some cases outputs may be isomorphic as abstract graphs.

License

Plantri is distributed without a license.

Upstream Contact

Gunnar Brinkmann

- University of Ghent
- Gunnar.Brinkmann@ugent.be

Brendan McKay

- Australian National University
- bdm@cs.anu.edu.au

See http://cs.anu.edu.au/~bdm/plantri

Type

optional

Dependencies

Version Information

package-version.txt:

```
5.3
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  plantri
```

See https://repology.org/project/plantri/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.265 platformdirs: A small Python module for determining appropriate platform-specific dirs, e.g. a "user data dir".

Description

A small Python module for determining appropriate platform-specific dirs, e.g. a "user data dir".

License

Upstream Contact

https://pypi.org/project/platformdirs/

Type

standard

Dependencies

- $(PYTHON)
- *setuptools_scm: Python build system extension to obtain package version from version control*
- $(PYTHON_TOOLCHAIN)
- *hatchling: Modern, extensible Python build backend*
- *hatch_vcs: Hatch plugin for versioning with your preferred VCS*

Version Information

package-version.txt:

```
2.5.4
```

install-requires.txt:

```
platformdirs
```

Equivalent System Packages

conda:

```
$ conda install  platformdirs
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.266 pluggy: plugin and hook calling mechanisms for python

Description

plugin and hook calling mechanisms for python

License

MIT license

Upstream Contact

https://pypi.org/project/pluggy/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.0.0
```

install-requires.txt:

```
pluggy
```

Equivalent System Packages

conda:

```
$ conda install  pluggy
```

void:

```
$ sudo xbps-install  python3-pluggy
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.267 ply: Python Lex & Yacc

Description

Python Lex & Yacc

License

BSD

Upstream Contact

https://pypi.org/project/ply/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.11
```

install-requires.txt:

```
ply
```

Equivalent System Packages

conda:

```
$ conda install  ply
```

void:

```
$ sudo xbps-install  python3-ply
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.268 poetry_core: Poetry PEP 517 Build Backend

Description

Poetry PEP 517 Build Backend

License

MIT

Upstream Contact

https://pypi.org/project/poetry-core/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.0.8
```

install-requires.txt:

```
poetry-core
```

Equivalent System Packages

conda:

```
$ conda install  poetry-core
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.269 polylib: Operations on unions of polyhedra

Description

The Polyhedral Library (PolyLib for short) operates on objects made up of unions of polyhedra of any dimension. polylib is a C library.

License

GPL v3

Upstream Contact

- https://groups.google.com/forum/#!forum/isl-development

Type

experimental

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *ntl: A library for doing number theory*

Version Information

package-version.txt:

```
5.22.5
```

Equivalent System Packages

macports: install the following packages: polylib

opensuse:

```
$ sudo zypper install polylib "pkgconfig(polylibgmp)"
```

See https://repology.org/project/polylib/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.270 polymake: Computations with polyhedra, fans, simplicial complexes, matroids, graphs, tropical hypersurfaces

Description

polymake is open source software for research in polyhedral geometry. It deals with polytopes, polyhedra and fans as well as simplicial complexes, matroids, graphs, tropical hypersurfaces, and other objects. Supported platforms include various flavors of Linux, Free BSD and Mac OS.

License

- GPL v3

Upstream Contact

- https://polymake.org/

Dependencies

Polymake needs a working installation of Perl, including its shared library and some modules (XML::Writer XML::LibXML XML::LibXSLT Term::ReadLine::Gnu JSON SVG). The Polymake interface in Sage additionally needs File::Slurp. For full functionality including polymake's polyDB, also the Perl module MongoDB is needed.

These are not provided by a Sage package. The script package perl_cpan_polymake_prereq will signal an error at build time if the required prerequisites are not met.

The configure script will inform you about the equivalent system packages that you should install. Otherwise, you can use CPAN (see below).

Sage might install the Term::ReadLine::Gnu module, however, when you install polymake, if it is not provided by the system, or if Sage installs its own readline library.

A distribution-independent way to install Perl modules (into a user's home directory or /usr/local) is using CPAN. This is also the way to install the modules on macOS. For this, if you don't have root access, you will need the local::lib Perl module installed:

```
cpan -i XML::Writer XML::LibXML XML::LibXSLT File::Slurp Term::ReadLine::Gnu JSON SVG MongoDB
```

Several Sage packages should be installed before installing the polymake package to give a more featureful Polymake installation:

```
sage -i 4ti2 latte_int topcom qhull
```

Software that would need to be installed manually (no Sage package available) for a more featureful Polymake installation: azove, porta, vinci, SplitsTree4.

Information on missing Polymake prerequisites after installing polymake:

```
$ sage -sh
(sage-sh) $ polymake
polytope> show_unconfigured;
```

In order to Polymake from Sage, you will need the JuPyMake:

```
sage -i jupymake
```

Debugging polymake install problems

```
# apt-get install libdevel-trace-perl
$ cd src
$ perl -d:Trace support/configure.pl
```

Type

optional

Dependencies

- $(MP_LIBRARY)
- *bliss: Computing automorphism groups and canonical forms of graphs*
- *cddlib: Double description method for polyhedral representation conversion*
- *normaliz: Computations in affine monoids, vector configurations, lattice polytopes, and rational cones*
- *perl_term_readline_gnu: Perl extension for the GNU Readline/History libraries*
- *ppl: Parma Polyhedra Library*
- *perl_cpan_polymake_prereq: Represents all Perl packages that are prerequisites for polymake*
- *libxml2: XML parser and toolkit*
- *lrslib: Reverse search algorithm for vertex enumeration and convex hull problems*
- *ninja_build: A build system with a focus on speed*

Version Information

package-version.txt:

```
4.9
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  polymake
```

Debian/Ubuntu:

```
$ sudo apt-get install  polymake libpolymake-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  polymake
```

homebrew:

```
$ brew install apaffenholz/polymake/polymake
```

nix:

```
$ nix-env --install polymake
```

opensuse:

```
$ sudo zypper install polymake
```

See https://repology.org/project/polymake/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.271 polytopes_db: Databases of 2- and 3-dimensional reflexive polytopes

Description

This package includes lists of 2- and 3-dimensional reflexive polytopes.

The list of polygons is quite easy to get and it has been known for a while. The list of 3-polytopes was originally obtained by Maximilian Kreuzer and Harald Skarke using their software PALP, which is included into the standard distribution of Sage. To work with lattice and reflexive polytopes from Sage you can use sage.geometry.lattice_polytope module, which relies on PALP for some of its functionality. To get access to the databases of this package, use ReflexivePolytope and ReflexivePolytopes commands.

License

GPL

Upstream Contact

http://hep.itp.tuwien.ac.at/~kreuzer/CY/CYpalp.html

Type

standard

Dependencies

Version Information

package-version.txt:

```
20170220.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  sage-data-polytopes_db
```

conda:

```
$ conda install  sagemath-db-polytopes
```

See https://repology.org/project/sagemath-polytopes-db/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.272 polytopes_db_4d: Database of 4-dimensional reflexive polytopes

Description

This package contains the database of 4-d reflexive polytopes with Hodge numbers as index.

Based on the original list by Maximilian Kreuzer and Harald Skarke using their software PALP.

License

GPL v2+

SPKG Maintainers

Volker Braun <vbraun.name@gmail.com>

Type

optional

Dependencies

Version Information

package-version.txt:

```
1.0
```

Equivalent System Packages

See https://repology.org/project/polytopes-db-4d/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.273 ppl: Parma Polyhedra Library

Description

The Parma Polyhedra Library (PPL) provides numerical abstractions especially targeted at applications in the field of analysis and verification of complex systems. These abstractions include convex polyhedra, defined as the intersection of a finite number of (open or closed) halfspaces, each described by a linear inequality (strict or non-strict) with rational coefficients; some special classes of polyhedra shapes that offer interesting complexity/precision tradeoffs; and grids which represent regularly spaced points that satisfy a set of linear congruence relations. The library also supports finite powersets and products of (any kind of) polyhedra and grids, a mixed integer linear programming problem solver using an exact-arithmetic version of the simplex algorithm, a parametric integer programming solver, and primitives for the termination analysis via the automatic synthesis of linear ranking functions.

It is written in C++, but comes with interfaces to C, Java, OCaml, and Prolog. PPL is one of the fastest implementations of polyhedral computations.

Benchmarks are included in this paper: arXiv cs/0612085

License

GPL v3+

Upstream Contact

- https://www.bugseng.com/ppl

Core Development Team

- Roberto Bagnara (University of Parma)
- Patricia M. Hill (University of Parma)
- Enea Zaffanella (University of Parma)

Type

standard

Dependencies

- $(MP_LIBRARY)
- *glpk: GNU Linear Programming Kit*

Version Information

package-version.txt:

```
1.2.p1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  ppl
```

conda:

```
$ conda install  ppl
```

Debian/Ubuntu:

```
$ sudo apt-get install  libppl-dev ppl-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  ppl ppl-devel
```

freebsd:

```
$ sudo pkg install devel/ppl
```

gentoo:

```
$ sudo emerge dev-libs/ppl
```

homebrew:

```
$ brew install ppl
```

macports: install the following packages: ppl

nix:

```
$ nix-env --install ppl
```

opensuse:

```
$ sudo zypper install ppl-devel
```

void:

```
$ sudo xbps-install  ppl-devel
```

See https://repology.org/project/ppl/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.274 pplpy: Python interface to the Parma Polyhedra Library

Description

PPL Python wrapper

This Python package provides a wrapper to the C++ Parma Polyhedra Library (PPL).

The whole package started as a fork of a tiny part of the Sage software.

License

GPL version 3

Upstream Contact

- https://github.com/sagemath/pplpy

Type

standard

Dependencies

- $(PYTHON)
- $(MP_LIBRARY)
- *gmpy2: Python interface to GMP/MPIR, MPFR, and MPC*
- *cysignals: Interrupt and signal handling for Cython*
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *mpc: Arithmetic of complex numbers with arbitrarily high precision and correct rounding*
- *ppl: Parma Polyhedra Library*
- $(PYTHON_TOOLCHAIN)
- *sphinx: Python documentation generator*

Version Information

package-version.txt:

```
0.8.7
```

install-requires.txt:

```
# Trac #30922: pplpy 0.8.4 and earlier do not declare dependencies correctly
pplpy >=0.8.6
```

Equivalent System Packages

conda:

```
$ conda install  pplpy
```

See https://repology.org/project/pplpy/versions, https://repology.org/project/python:pplpy/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.275 pplpy_doc: Python interface to the Parma Polyhedra Library (documentation)

Description

PPL Python wrapper (documentation)

License

GPL version 3

Upstream Contact

- https://github.com/sagemath/pplpy

Type

standard

Dependencies

- *pplpy: Python interface to the Parma Polyhedra Library*
- *sphinx: Python documentation generator*

Version Information

package-version.txt:

```
0.8.7
```

Equivalent System Packages

(none known)

6.1.276 primecount: Algorithms for counting primes

Description

primecount is a C++ implementation of several algorithms for counting primes maintained by Kim Walisch.

Website: https://github.com/kimwalisch/primecount/

License

primecount is licensed BSD 2

Upstream Contact

- https://github.com/kimwalisch/primecount/

Type

standard

Dependencies

- *primesieve: CLI program and C/C++ library for generating primes*
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
7.6
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  primecount
```

conda:

```
$ conda install  primecount
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  primecount primecount-devel
```

gentoo:

```
$ sudo emerge sci-mathematics/primecount
```

homebrew:

```
$ brew install primecount
```

opensuse:

```
$ sudo zypper install primecount libprimecount-devel
```

void:

```
$ sudo xbps-install  primecount-devel
```

See https://repology.org/project/primecount/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.277 primecountpy: Cython interface for C++ primecount library

Description

Cython interface for C++ primecount library

License

GPLv3

Upstream Contact

https://pypi.org/project/primecountpy/

Type

standard

Dependencies

- $(PYTHON)
- *primecount: Algorithms for counting primes*
- *cysignals: Interrupt and signal handling for Cython*
- $(PYTHON_TOOLCHAIN)
- *cython: C-Extensions for Python, an optimizing static compiler*

Version Information

package-version.txt:

```
0.1.0
```

install-requires.txt:

```
primecountpy
```

Equivalent System Packages

conda:

```
$ conda install  primecountpy
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.278 primesieve: CLI program and C/C++ library for generating primes

Description

A CLI program and C/C++ library for quickly generating prime numbers. https://github.com/kimwalisch/primesieve

A dependency of the standard spkg primecount.

License

BSD-2-clause

Upstream Contact

- https://github.com/kimwalisch/primesieve

Type

standard

Dependencies

- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
11.0
```

Equivalent System Packages

alpine: install the following packages: primesieve-dev primesieve

arch:

```
$ sudo pacman -S  primesieve
```

conda:

```
$ conda install  primesieve
```

Debian/Ubuntu:

```
$ sudo apt-get install  libprimesieve-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  primesieve-devel primesieve
```

gentoo:

```
$ sudo emerge sci-mathematics/primesieve
```

homebrew:

```
$ brew install primesieve
```

opensuse:

```
$ sudo zypper install primesieve
```

void:

```
$ sudo xbps-install  primesieve-devel
```

See https://repology.org/project/primesieve/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.279 prometheus_client: Python client for the systems monitoring and alerting toolkit Prometheus

Description

The official Python 2 and 3 client for Prometheus (see https://prometheus.io), an open-source systems monitoring and alerting toolkit.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.14.1
```

install-requires.txt:

```
prometheus_client >=0.8.0
```

Equivalent System Packages

conda:

```
$ conda install  prometheus_client
```

macports: install the following packages: py-prometheus_client

opensuse:

```
$ sudo zypper install python3-prometheus_client
```

void:

```
$ sudo xbps-install  python3-prometheus_client
```

See https://repology.org/project/python:prometheus-client/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.280 prompt_toolkit: Interactive command lines for Python

Description

Library for building powerful interactive command lines in Python

https://pypi.python.org/pypi/prompt_toolkit

Type

standard

Dependencies

- $(PYTHON)
- *six: Python 2 and 3 compatibility utilities*
- *wcwidth: Measures the displayed width of unicode strings in a terminal*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.0.24
```

install-requires.txt:

```
# :issue:`33428` - prompt_toolkit 3.0.25+ breaks Ctrl-C
prompt_toolkit >=3.0.5, <3.0.25
```

Equivalent System Packages

conda:

```
$ conda install  prompt_toolkit
```

macports: install the following packages: py-prompt_toolkit

opensuse:

```
$ sudo zypper install python3-prompt_toolkit
```

void:

```
$ sudo xbps-install  python3-prompt_toolkit
```

See https://repology.org/project/python:prompt-toolkit/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.281 ptyprocess: Python interaction with subprocesses in a pseudoterminal

Description

Launch a subprocess in a pseudo terminal (pty), and interact with both the process and its pty.

Sometimes, piping stdin and stdout is not enough. There might be a password prompt that doesn't read from stdin, output that changes when it's going to a pipe rather than a terminal, or curses-style interfaces that rely on a terminal. If you need to automate these things, running the process in a pseudo terminal (pty) is the answer.

License

Ptyprocess is under the ISC license, as code derived from Pexpect.

> http://opensource.org/licenses/ISC

Upstream Contact

https://github.com/pexpect/ptyprocess

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.5.1.p0
```

install-requires.txt:

```
ptyprocess ==0.5.1
# :issue:`31280`#comment:42 and following
# sagelib is not compatible with ptyprocess 0.5.2, 0.6, and 0.7
```

Equivalent System Packages

conda:

macports: install the following packages: py-ptyprocess

opensuse:

```
$ sudo zypper install python3-ptyprocess
```

void:

```
$ sudo xbps-install  python3-ptyprocess
```

See https://repology.org/project/ptyprocess/versions, https://repology.org/project/python:ptyprocess/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.282 pure_eval: Safely evaluate AST nodes without side effects

Description

Safely evaluate AST nodes without side effects

License

MIT

Upstream Contact

https://pypi.org/project/pure-eval/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.2.2
```

install-requires.txt:

```
pure-eval
```

Equivalent System Packages

conda:

```
$ conda install  pure_eval
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.283 py: library with cross-python path, ini-parsing, io, code, log facilities

Description

library with cross-python path, ini-parsing, io, code, log facilities

License

MIT license

Upstream Contact

https://pypi.org/project/py/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *setuptools_scm: Python build system extension to obtain package version from version control*

Version Information

package-version.txt:

```
1.11.0
```

install-requires.txt:

```
py
```

Equivalent System Packages

conda:

```
$ conda install  py
```

void:

```
$ sudo xbps-install  python3-py
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.284 pybind11: Create Python bindings to C++ code

Description

pybind11 is a lightweight header-only library that exposes C++ types in Python and vice versa, mainly to create Python bindings of existing C++ code. Its goals and syntax are similar to the excellent [Boost.Python](http://www.boost.org/doc/libs/1_58_0/libs/python/doc/) library by David Abrahams: to minimize boilerplate code in traditional extension modules by inferring type information using compile-time introspection.

License

pybind11 is provided under a BSD-style license that can be found in the LICENSE file. By using, distributing, or contributing to this project, you agree to the terms and conditions of this license.

Upstream Contact

https://github.com/pybind/pybind11

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.10.1
```

install-requires.txt:

```
pybind11 >=2.5.0
```

Equivalent System Packages

conda:

```
$ conda install  pybind11
```

homebrew:

```
$ brew install pybind11
```

macports: install the following packages: py-pybind11

void:

```
$ sudo xbps-install  python3-pybind11
```

See https://repology.org/project/python:pybind11/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.285 pybtex: A BibTeX-compatible bibliography processor in Python

Description

A BibTeX-compatible bibliography processor in Python

License

MIT

Upstream Contact

https://pypi.org/project/pybtex/

Type

optional

Dependencies

Version Information

requirements.txt:

```
pybtex
```

Equivalent System Packages

conda:

```
$ conda install  pybtex
```

macports: install the following packages: py-pybtex

opensuse:

```
$ sudo zypper install python3-pybtex
```

See https://repology.org/project/python:pybtex/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.286 pycosat: SAT solver picosat with Python bindings

Description

PicoSAT is a popular SAT solver written by Armin Biere in pure C. This package provides efficient Python bindings to picosat on the C level, i.e. when importing pycosat, the picosat solver becomes part of the Python process itself. For ease of deployment, the picosat source (namely picosat.c and picosat.h) is included in this project. These files have been extracted from the picosat source.

License

MIT

Upstream Contact

- PicoSAT: http://fmv.jku.at/picosat/
- pycosat: https://github.com/ContinuumIO/pycosat

Special Update/Build Instructions

None.

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.6.3
```

install-requires.txt:

```
pycosat >=0.6.3
```

Equivalent System Packages

conda:

```
$ conda install  pycosat
```

See https://repology.org/project/pycosat/versions, https://repology.org/project/python:pycosat/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.287 pycparser: Parser of the C language in Python

Description

development website: https://github.com/eliben/pycparser

PyPI page: https://pypi.org/project/pycparser/

License

BSD

Upstream Contact

https://github.com/eliben/pycparser

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.21
```

install-requires.txt:

```
pycparser >=2.20
```

Equivalent System Packages

conda:

```
$ conda install  pycparser
```

macports: install the following packages: py-pycparser

opensuse:

```
$ sudo zypper install python3-pycparser
```

void:

```
$ sudo xbps-install  python3-pycparser
```

See https://repology.org/project/pycparser/versions, https://repology.org/project/python:pycparser/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.288 pycryptosat: Python module of cryptominisat

Description

Build and install pycryptosat into appropriate venv. See cryptominisat for more details.

License

MIT License

Upstream Contact

- Authors: Mate Soos
- Email: soos.mate@gmail.com
- Website: http://www.msoos.org/
- Releases: https://github.com/msoos/cryptominisat/releases

Type

optional

Dependencies

- $(PYTHON)
- *m4ri: fast arithmetic with dense matrices over GF(2)*
- *zlib: Data compression library*
- *libpng: Bitmap image support*
- *cryptominisat: A SAT solver*
- *cmake: A cross-platform build system generator*
- *boost_cropped: Portable C++ libraries (subset needed for Sage)*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
5.8.0
```

install-requires.txt:

```
pycryptosat
```

Equivalent System Packages

conda:

```
$ conda install  cryptominisat
```

homebrew:

```
$ brew install cryptominisat
```

See https://repology.org/project/cryptominisat/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.289 pycygwin: Python bindings for Cygwin's C API

Description

Python bindings for Cygwin's C API. Provides some utilities to help with the Cygwin port. Naturally, this package should only be installed on Cygwin–for other platforms its installation is a no-op.

Website

https://github.com/embray/PyCygwin

Type

standard

Dependencies

- $(PYTHON)
- *cython: C-Extensions for Python, an optimizing static compiler*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.1
```

install-requires.txt:

```
pycygwin >=0.1
```

Equivalent System Packages

See https://repology.org/project/python:pycygwin/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.290 pygments: Generic syntax highlighter

Description

Pygments is a syntax highlighting package written in Python.

It is a generic syntax highlighter suitable for use in code hosting, forums, wikis or other applications that need to prettify source code. Highlights are:

- a wide range of over 300 languages and other text formats is supported
- special attention is paid to details, increasing quality by a fair amount
- support for new languages and formats are added easily
- a number of output formats, presently HTML, LaTeX, RTF, SVG, all image formats that PIL supports and ANSI sequences
- it is usable as a command-line tool and as a library

License

Modified BSD

Upstream Contact

- Author: Georg Brandl
- Home Page: https://pygments.org

Special Update/Build Instructions

Patches included:

- sage_prompt.patch: patch pygments/lexers/agile.py to treat the "sage:" prompt like Python's ">>>" prompt. This allows a very kludgy patch to be removed from the Sphinx package (see #10118).

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.13.0
```

install-requires.txt:

```
pygments >=2.3.1
```

Equivalent System Packages

conda:

```
$ conda install  pygments
```

homebrew:

```
$ brew install pygments
```

macports: install the following packages: py-pygments

opensuse:

```
$ sudo zypper install python3-Pygments
```

void:

```
$ sudo xbps-install  python3-Pygments
```

See https://repology.org/project/pygments/versions, https://repology.org/project/python:pygments/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.291 pygraphviz: Python interface to Graphviz

Description

Python interface to Graphviz

License

BSD

Upstream Contact

https://pypi.org/project/pygraphviz/

Type

optional

Dependencies

- $(PYTHON)
- *libgraphviz: Graph visualization software (callable library)*
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
pygraphviz
```

install-requires.txt:

```
pygraphviz
```

Equivalent System Packages

conda:

```
$ conda install  pygraphviz
```

macports: install the following packages: py-pygraphviz

See https://repology.org/project/python:pygraphviz/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.292 pynormaliz: Python bindings for the normaliz library

Description

The Python module PyNormaliz provides wrappers for normaliz.

License

- GPL v2 or later

Upstream Contact

https://github.com/sebasguts/PyNormaliz

Special Update/Build Instructions

Type

optional

Dependencies

- $(PYTHON)
- *normaliz: Computations in affine monoids, vector configurations, lattice polytopes, and rational cones*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.18
```

install-requires.txt:

```
pynormaliz ==2.18
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  python-pynormaliz
```

conda:

```
$ conda install  pynormaliz
```

See https://repology.org/project/pynormaliz/versions, https://repology.org/project/python:pynormaliz/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.293 pyparsing: A Python parsing module

Description

A Python Parsing Module

License

MIT License

Upstream Contact

- Author: Paul McGuire
- Home page: http://pyparsing.wikispaces.com

Type

standard

Dependencies

- $(PYTHON)
- *pip: Tool for installing and managing Python packages*
- *wheel: A built-package format for Python*
- *flit_core: Distribution-building parts of Flit. See flit package for more information*
- *tomli: A lil' TOML parser*

Version Information

package-version.txt:

```
3.0.9
```

install-requires.txt:

```
pyparsing >=2.3.0
```

Equivalent System Packages

conda:

```
$ conda install  pyparsing
```

opensuse:

```
$ sudo zypper install python3-pyparsing
```

void:

```
$ sudo xbps-install  python3-parsing
```

See https://repology.org/project/pyparsing/versions, https://repology.org/project/python:pyparsing/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.294 pyppeteer: Headless chrome/chromium automation library

Description

Headless chrome/chromium automation library (unofficial port of puppeteer)

License

MIT

Upstream Contact

https://pypi.org/project/pyppeteer/

Type

optional

Dependencies

- $(PYTHON)
- *appdirs: A small Python module for determining appropriate platform-specific dirs, e.g. a “user data dir”.*
- *importlib_metadata: Library to access the metadata for a Python package*
- *urllib3: HTTP library with thread-safe connection pooling, file post, and more.*
- *certifi: Python package for providing Mozilla’s CA Bundle*
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
pyppeteer
```

Equivalent System Packages

conda:

```
$ conda install  pyppeteer
```

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.295 pyproject_metadata: PEP 621 metadata parsing

Description

PEP 621 metadata parsing

License

MIT

Upstream Contact

https://pypi.org/project/pyproject-metadata/

Type

standard

Dependencies

- $(PYTHON)
- *packaging: Core utilities for Python packages*
- *pyparsing: A Python parsing module*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.6.1
```

install-requires.txt:

```
pyproject-metadata
```

Equivalent System Packages

(none known)

6.1.296 pyrsistent: Persistent data structures in Python

Description

Pyrsistent is a number of persistent collections (by some referred to as functional data structures). Persistent in the sense that they are immutable.

License

MIT License

Upstream Contact

Home page: http://github.com/tobgu/pyrsistent/

Dependencies

- Python
- Setuptools
- hypothesis
- memory-profiler
- pyperform
- pytest
- Sphinx
- sphinx-rtd-theme
- tox

Type

standard

Dependencies

- $(PYTHON)
- *vcversioner: Python build system extension to obtain package version from version control*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.19.2
```

install-requires.txt:

```
pyrsistent >=0.16.0
```

Equivalent System Packages

conda:

```
$ conda install  pyrsistent
```

macports: install the following packages: py-pyrsistent

void:

```
$ sudo xbps-install  python3-pyrsistent
```

See https://repology.org/project/pyrsistent/versions, https://repology.org/project/python:pyrsistent/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.297 pyscipopt: Python interface and modeling environment for SCIP

Description

Python interface and modeling environment for SCIP

License

MIT

Upstream Contact

https://pypi.org/project/PySCIPOpt/

Dependencies

scipoptsuite

Type

optional

Dependencies

- $(PYTHON)
- *scip: Mixed integer programming solver*
- $(PYTHON_TOOLCHAIN)
- *cython: C-Extensions for Python, an optimizing static compiler*

Version Information

package-version.txt:

```
4.3.0
```

install-requires.txt:

```
PySCIPOpt
```

Equivalent System Packages

conda:

```
$ conda install  pyscipopt
```

freebsd:

```
$ sudo pkg install math/py-PySCIPOpt
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.298 pysingular: A basic Python interface to Singular

Description

A basic interface to call Singular from python

This python module is meant to be used in Singulars Jupyter interface.

License

GPL version 2 or later

Upstream Contact

- https://github.com/sebasguts/SingularPython

Type

optional

Dependencies

- $(PYTHON)
- *singular: Computer algebra system for polynomial computations, algebraic geometry, singularity theory*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.9.7
```

install-requires.txt:

```
pysingular >=0.9.5
```

Equivalent System Packages

conda:

```
$ conda install  pysingular
```

See https://repology.org/project/pysingular/versions, https://repology.org/project/python:pysingular/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.299 pytest: Simple powerful testing with Python

Description

pytest: simple powerful testing with Python

License

MIT

Upstream Contact

https://pypi.org/project/pytest/

Type

optional

Dependencies

- $(PYTHON)
- *pluggy: plugin and hook calling mechanisms for python*
- *packaging: Core utilities for Python packages*
- *attrs: Decorator for Python classes with attributes*
- *py: library with cross-python path, ini-parsing, io, code, log facilities*
- *pyparsing: A Python parsing module*
- *importlib_metadata: Library to access the metadata for a Python package*
- *tomli: A lil' TOML parser*
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
pytest
```

Equivalent System Packages

conda:

```
$ conda install  pytest
```

macports: install the following packages: py-pytest

void:

```
$ sudo xbps-install  python3-pytest
```

See https://repology.org/project/python:pytest/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.300 pytest_mock: Thin-wrapper around the mock package for easier use with pytest

Description

Thin-wrapper around the mock package for easier use with pytest

License

MIT

Upstream Contact

https://pypi.org/project/pytest-mock/

Type

optional

Dependencies

- $(PYTHON)
- *pytest: Simple powerful testing with Python*
- *packaging: Core utilities for Python packages*
- *attrs: Decorator for Python classes with attributes*
- *pluggy: plugin and hook calling mechanisms for python*
- *tomli: A lil' TOML parser*
- *py: library with cross-python path, ini-parsing, io, code, log facilities*
- *pyparsing: A Python parsing module*
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
pytest-mock
```

Equivalent System Packages

(none known)

6.1.301 pytest_xdist: pytest xdist plugin for distributed testing and loop-on-failing modes

Description

pytest xdist plugin for distributed testing and loop-on-failing modes

License

MIT

Upstream Contact

https://pypi.org/project/pytest-xdist/

Type

optional

Dependencies

- $(PYTHON)
- *pytest: Simple powerful testing with Python*
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
pytest-xdist
```

Equivalent System Packages

conda:

```
$ conda install  pytest-xdist
```

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.302 python3: The Python programming language

Description

By default, Sage will try to use system's `python3` to set up a virtual environment, a.k.a. venv rather than building a Python 3 installation from scratch.

Sage will accept versions 3.8.x to 3.10.x.

You can also use `--with-python=/path/to/python3_binary` to tell Sage to use `/path/to/python3_binary` to set up the venv. Note that setting up the venv requires a number of Python modules to be available within the Python in question. Currently, as of Sage 9.7, these modules are as follows: `sqlite3`, `ctypes`, `math`, `hashlib`, `crypt`, `socket`, `zlib`, `distutils.core`, `ssl` - they will be checked for by the `configure` script.

Use the `configure` option `--without-system-python3` in case you want Python 3 built from scratch.

Upstream Contact

https://www.python.org

Type

standard

Dependencies

- *zlib: Data compression library*
- *readline: Command line editing library*
- *sqlite: An SQL database engine*
- *libpng: Bitmap image support*
- *bzip2: High-quality data compressor*
- *liblzma: General-purpose data compression software*
- *xz: General-purpose data compression software*
- *libffi: A portable foreign-function interface library*
- *openssl: Implementation of the SSL and TLS protocols*

Version Information

package-version.txt:

```
3.11.1
```

Equivalent System Packages

alpine: install the following packages: python3-dev

cygwin:

```
$ apt-cyg install python39-devel python-pip-wheel python-setuptools-wheel
```

Debian/Ubuntu:

```
$ sudo apt-get install  python3 libpython3-dev python3-distutils python3-venv
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  python3-devel
```

freebsd:

```
$ sudo pkg install lang/python
```

homebrew:

```
$ brew install python3
```

macports: install the following packages: python39

opensuse:

```
$ sudo zypper install python3-devel
```

void:

```
$ sudo xbps-install  python3-devel
```

See https://repology.org/project/python/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.303 python_build: A simple, correct PEP517 package builder

Description

`build` is a simple, correct PEP517 package builder

License

MIT

Upstream Contact

https://pypi.org/project/build/

Type

optional

Dependencies

- $(PYTHON)
- *pyparsing: A Python parsing module*
- *tomli: A lil' TOML parser*
- *packaging: Core utilities for Python packages*
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
build
```

Equivalent System Packages

conda:

```
$ conda install  build
```

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.304 python_igraph: Python bindings for igraph

Description

igraph is a library for creating and manipulating graphs. It is intended to be as powerful (ie. fast) as possible to enable the analysis of large graphs.

License

GPL version 2

Upstream Contact

http://igraph.org/python/

Special Update/Build Instructions

Type

optional

Dependencies

- *igraph: A library for creating and manipulating graphs*
- *texttable: Python module for creating simple ASCII tables*
- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.10.4
```

install-requires.txt:

```
igraph
```

Equivalent System Packages

conda:

```
$ conda install  python-igraph
```

macports: install the following packages: py-igraph

See https://repology.org/project/python:igraph/versions, https://repology.org/project/python:python-igraph/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.305 pythran: Ahead of Time compiler for numeric kernels

Description

Ahead of Time compiler for numeric kernels

License

BSD 3-Clause

Upstream Contact

https://pypi.org/project/pythran/

Type

standard

Dependencies

- $(PYTHON)
- *beniget: Extract semantic information about static Python code*
- *gast: Python AST that abstracts the underlying Python version*
- *ply: Python Lex & Yacc*
- *numpy: Package for scientific computing with Python*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.12.1
```

install-requires.txt:

```
pythran
```

Equivalent System Packages

conda:

```
$ conda install  pythran
```

void:

```
$ sudo xbps-install  pythran
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.306 pytz: Timezone definitions for Python

Description

World Timezone Definitions for Python See https://pypi.org/project/pytz/

Special Update/Build Instructions

The upstream tarball was repackaged after sanitizing the file permissions with

$ chmod go-w

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2022.5
```

install-requires.txt:

```
pytz >=2020.1
```

Equivalent System Packages

conda:

```
$ conda install  pytz
```

macports: install the following packages: py-tz

opensuse:

```
$ sudo zypper install python3-pytz
```

void:

```
$ sudo xbps-install  python3-pytz
```

See https://repology.org/project/python:pytz/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.307 pytz_deprecation_shim: Shims to make deprecation of pytz easier

Description

Shims to make deprecation of pytz easier

License

Apache-2.0

Upstream Contact

https://pypi.org/project/pytz-deprecation-shim/

Type

standard

Dependencies

- $(PYTHON)
- *tzdata: Provider of IANA time zone data*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.1.0.post0
```

install-requires.txt:

```
pytz-deprecation-shim
```

Equivalent System Packages

conda:

```
$ conda install  pytz-deprecation-shim
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.308 pyx: Generate PostScript, PDF, and SVG files in Python

Description

Python package for the generation of PostScript, PDF, and SVG files

https://pypi.python.org/pypi/PyX

Type

optional

Dependencies

Version Information

requirements.txt:

```
pyx
```

Equivalent System Packages

macports: install the following packages: py-pyx

opensuse:

```
$ sudo zypper install python3-PyX
```

void:

```
$ sudo xbps-install  python3-pyx
```

See https://repology.org/project/python:pyx/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.309 pyzmq: Python bindings for the zeromq networking library

Description

Python bindings for the zeromq networking library.

License

LGPLv3+

Upstream Contact

http://www.zeromq.org

Special Update/Build Instructions

None.

Type

standard

Dependencies

- $(PYTHON)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *zeromq: A modern networking library*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
24.0.1
```

install-requires.txt:

```
pyzmq >=19.0.2
```

Equivalent System Packages

conda:

```
$ conda install  pyzmq
```

opensuse:

```
$ sudo zypper install python3-pyzmq
```

void:

```
$ sudo xbps-install  python3-pyzmq
```

See https://repology.org/project/pyzmq/versions, https://repology.org/project/python:pyzmq/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.310 qdldl_python: QDLDL, a free LDL factorization routine (Python wrapper)

Description

QDLDL, a free LDL factorization routine.

License

Apache 2.0

Upstream Contact

https://pypi.org/project/qdldl/

Type

optional

Dependencies

- $(PYTHON)
- *pybind11: Create Python bindings to C++ code*
- *numpy: Package for scientific computing with Python*
- *scipy: Scientific tools for Python*
- $(PYTHON_TOOLCHAIN)
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
0.1.5.post3
```

install-requires.txt:

```
qdldl
```

Equivalent System Packages

conda:

```
$ conda install  qdldl-python
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.311 qepcad: Quantifier elimination by partial cylindrical algebraic decomposition

Description

Qepcad is an implementation of quantifier elimination by partial cylindrical algebraic decomposition

License

QEPCAD B Copyright (c) 1990, 2008, Hoon Hong & Chris Brown (contact wcbrown@usna.edu)

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Upstream Contact

- Website: http://www.usna.edu/CS/qepcadweb/B/QEPCAD.html
- Alternative location (sometimes more up-to-date):

  https://www.usna.edu/Users/cs/wcbrown/qepcad/B/QEPCAD.html

Special Update/Build Instructions

One might need to set MAKE to “make -j1” fo this to be built successfully.

Type

experimental

Dependencies

- *readline: Command line editing library*
- *saclib: Computations with real algebraic numbers*

Version Information

package-version.txt:

```
B.1.72
```

Equivalent System Packages

See https://repology.org/project/qepcad-b/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.312 qhull: Compute convex hulls, Delaunay triangulations, Voronoi diagrams

Description

From the README.txt of Qhull:

Qhull computes convex hulls, Delaunay triangulations, Voronoi diagrams, furthest-site Voronoi diagrams, and halfspace intersections about a point. It runs in 2-d, 3-d, 4-d, or higher. It implements the Quickhull algorithm for computing convex hulls. Qhull handles round-off errors from floating point arithmetic. It can approximate a convex hull.

The program includes options for hull volume, facet area, partial hulls, input transformations, randomization, tracing, multiple output formats, and execution statistics.

Further notes:

The qhull library is already shipped with the Python library scipy (from version 1.4), see

- http://docs.scipy.org/doc/scipy/reference/generated/scipy.spatial.ConvexHull.html
- http://docs.scipy.org/doc/scipy/reference/generated/scipy.spatial.Delaunay.html
- http://docs.scipy.org/doc/scipy/reference/generated/scipy.spatial.Voronoi.html

There is also the Python interface Pyhull available on PyPI https://pypi.python.org/pypi/pyhull (see also documentation at http://pythonhosted.org/pyhull/).

Upstream Contact

http://www.qhull.org/html

C. Bradford Barber bradb@shore.net or qhull@qhull.org

Dependencies

Can be compiled with Qt support, but the Sage version currently doesn't try to do this.

License

Not a standard license, but Sage compatible. See the COPYING.txt file in the source directory for details.

Type

standard

Dependencies

- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
2020-src-8.0.2
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  qhull
```

conda:

```
$ conda install  qhull
```

cygwin:

```
$ apt-cyg install qhull
```

Debian/Ubuntu:

```
$ sudo apt-get install  libqhull-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  qhull qhull-devel
```

freebsd:

```
$ sudo pkg install math/qhull
```

gentoo:

```
$ sudo emerge media-libs/qhull
```

homebrew:

```
$ brew install qhull
```

macports: install the following packages: qhull

nix:

```
$ nix-env --install qhull
```

opensuse:

```
$ sudo zypper install qhull-devel
```

void:

```
$ sudo xbps-install  qhull libqhull-devel
```

See https://repology.org/project/qhull/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.313 r: A free software environment for statistical computing and graphics

Description

R is a language and environment for statistical computing and graphics. It is a GNU project which is similar to the S language and environment which was developed at Bell Laboratories (formerly AT&T, now Lucent Technologies) by John Chambers and colleagues. R can be considered as a different implementation of S. There are some important differences, but much code written for S runs unaltered under R.

(taken from http://www.r-project.org/)

License

- GPL v2 or GPL v3

Upstream Contact

- https://www.r-project.org
- R mailing list, #R in IRC

Type

optional

Dependencies

Version Information

Equivalent System Packages

arch:

```
$ sudo pacman -S  r
```

conda:

```
$ conda install  r r-essentials
```

cygwin:

```
$ apt-cyg install R libtirpc-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  r-base-dev r-cran-lattice
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  R R-devel
```

freebsd:

```
$ sudo pkg install math/R
```

gentoo:

```
$ sudo emerge dev-lang/R
```

homebrew:

```
$ brew install r
```

macports: install the following packages: R

nix:

```
$ nix-env --install R
```

opensuse:

```
$ sudo zypper install R-base
```

void:

```
$ sudo xbps-install  R
```

See https://repology.org/project/r/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.314 r_jupyter: Jupyter kernel for R

Description

This package installs IRkernel, the R Jupyter kernel.

It gets installed via R's package installer on top of Jupyter.

License

MIT

Upstream Contact

- https://github.com/IRkernel/IRkernel
- https://irkernel.github.io/

Dependencies

- R
- notebook

Type

experimental

Dependencies

- *notebook: Jupyter notebook, a web-based notebook environment for interactive computing*
- *r: A free software environment for statistical computing and graphics*

Version Information

Equivalent System Packages

See https://repology.org/project/r:irkernel/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.315 readline: Command line editing library

Description

The GNU Readline library provides a set of functions for use by applications that allow users to edit command lines as they are typed in. Both Emacs and vi editing modes are available. The Readline library includes additional functions to maintain a list of previously-entered command lines, to recall and perhaps reedit those lines, and perform csh-like history expansion on previous commands.

Website: http://tiswww.case.edu/php/chet/readline/rltop.html

License

- GPL V3+

Upstream Contact

- Chet Ramey at http://cnswww.cns.cwru.edu/~chet

Special Update/Build Instructions

We build readline using ncurses. Readline needs to be told to link with libtinfo (part of ncurses), this is what the patch 0002-ltinfo.patch does.

Patches

- 0001-macports.patch: Changes to shobj.conf for OS/X, from macports:

  https://trac.macports.org/browser/trunk/dports/devel/readline/files/patch-shobj-conf.diff
- 0002-ltinfo.patch: We build readline using ncurses, and for that it needs to be told to link with libtinfo (part of ncurses).

Type

standard

Dependencies

- *ncurses: Classic terminal output library*

Version Information

package-version.txt:

```
8.1.2
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  readline
```

conda:

```
$ conda install  readline
```

cygwin:

```
$ apt-cyg install libreadline-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libreadline-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  readline-devel
```

freebsd:

```
$ sudo pkg install devel/readline
```

homebrew:

```
$ brew install readline
```

macports: install the following packages: readline

nix:

```
$ nix-env --install readline
```

opensuse:

```
$ sudo zypper install readline-devel "pkgconfig(readline)"
```

slackware:

```
$ sudo slackpkg install readline
```

void:

```
$ sudo xbps-install  readline-devel
```

See https://repology.org/project/readline/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.316 requests: An HTTP library for Python

Description

Python HTTP for Humans.

License

Apache 2.0

Upstream Contact

https://pypi.org/project/requests/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *idna: Internationalized Domain Names in Applications (IDNA)*
- *urllib3: HTTP library with thread-safe connection pooling, file post, and more.*
- *certifi: Python package for providing Mozilla's CA Bundle*
- *charset_normalizer: The Real First Universal Charset Detector. Open, modern and actively maintained alternative to Chardet.*

Version Information

package-version.txt:

```
2.28.1
```

install-requires.txt:

```
requests >=2.13.0
```

Equivalent System Packages

conda:

```
$ conda install  requests
```

macports: install the following packages: py-requests

opensuse:

```
$ sudo zypper install python3-requests
```

void:

```
$ sudo xbps-install  python3-requests
```

See https://repology.org/project/requests/versions, https://repology.org/project/python:requests/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.317 retrolab: JupyterLab Distribution with a retro look and feel

Description

JupyterLab Distribution with a retro look and feel

License

Upstream Contact

https://pypi.org/project/retrolab/

Type

optional

Dependencies

- $(PYTHON)
- *jupyterlab: An extensible environment for interactive and reproducible computing*
- $(PYTHON_TOOLCHAIN)

Version Information

requirements.txt:

```
retrolab ~= 0.3
```

Equivalent System Packages

conda:

```
$ conda install  retrolab
```

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.318 rpy2: Python interface to R

Description

rpy2 is a redesign and rewrite of rpy. It is providing a low-level interface to R, a proposed high-level interface, including wrappers to graphical libraries, as well as R-like structures and functions.

License

- GPL 2+
- Note that we have deleted references to Mozilla PL as an option, which we are allowed to do by the full rpy2 license in order to remain GPL-compatible

Upstream Contact

- https://rpy2.bitbucket.io

Special Update/Build Instructions

Patches

- setup.patch: takes care of a few parsing issues.
- cygwin.patch: let rpy2 build on Cygwin.

Type

standard

Dependencies

- $(PYTHON)
- *r: A free software environment for statistical computing and graphics*
- *cffi: Foreign Function Interface for Python calling C code*
- *tzlocal: Python timezone information for the local timezone*
- *pytz: Timezone definitions for Python*
- *jinja2: General purpose template engine for Python*
- $(PYTHON_TOOLCHAIN)
- *pycparser: Parser of the C language in Python*

Version Information

package-version.txt:

```
3.4.5
```

install-requires.txt:

```
rpy2 >=3.3
```

Equivalent System Packages

conda:

```
$ conda install  rpy2
```

See https://repology.org/project/rpy2/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.319 rst2ipynb: Convert reStructuredText files to Jupyter notebooks

Description

The rst2pynb program converts a standalone reStructuredText file to a Jupyter notebook file.

This is currently achieved by converting to markdown with pandoc and then to Jupyter notebook using notedown, plus some configuration and tweaks.

License

BSD 3-Clause License

Upstream Contact

Authors: Scott Sievert and Nicolas M. Thiéry Home page: https://github.com/nthiery/rst-to-ipynb

Special Update/Build Instructions

Fetch tarball from https://pypi.python.org/pypi/rst2ipynb/

As it is written in Haskell, pandoc must be installed from the distro.

The main rationale for having a notedown package in Sage (rather than just let pip fetch it) is that the version on pipy (1.5.0, 2015-10-07) is outdated and lacks important features / fixes for us.

Type

optional

Dependencies

- $(PYTHON)
- *pandoc: A document converter*
- $(PYTHON_TOOLCHAIN)
- *notedown: Create IPython notebooks from markdown*

Version Information

package-version.txt:

```
0.2.3
```

install-requires.txt:

```
rst2ipynb >=0.2.2
```

Equivalent System Packages

See https://repology.org/project/python:rst2ipynb/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.320 rubiks: Programs for Rubik's cube

Description

There are several programs for working with Rubik's cubes, by three different people. Look inside the directories under /src to see specific info and licensing. In summary the three contributers are:

Michael Reid (GPL) http://www.cflmath.com/~reid/Rubik/optimal_solver.html

- optimal - uses many pre-computed tables to find an optimal solution to the 3x3x3 Rubik's cube

Dik T. Winter (MIT License)

- cube - uses Kociemba's algorithm to iteratively find a short solution to the 3x3x3 Rubik's cube
- size222 - solves a 2x2x2 Rubik's cube

Eric Dietz (GPL) https://web.archive.org/web/20121212175710/http://www.wrongway.org/?rubiksource

- cu2 - A fast, non-optimal 2x2x2 solver
- cubex - A fast, non-optimal 3x3x3 solver
- mcube - A fast, non-optimal 4x4x4 solver

Type

optional

Dependencies

Version Information

package-version.txt:

```
20070912.p21
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  rubiks
```

conda:

```
$ conda install  rubiks
```

Debian/Ubuntu:

```
$ sudo apt-get install  rubiks
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  rubiks
```

freebsd:

```
$ sudo pkg install math/rubiks
```

nix:

```
$ nix-env --install rubiks
```

See https://repology.org/project/rubiks/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.321 rw: Compute rank-width and rank-decompositions

Description

rw is a program that calculates rank-width and rank-decompositions.

https://sourceforge.net/projects/rankwidth/

License

GPL version 2 or later

Upstream Contact

Philipp Klaus Krause (philipp@informatik.uni-frankfurt.de)

Type

standard

Dependencies

Version Information

package-version.txt:

```
0.9
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  rankwidth
```

conda:

```
$ conda install  rw
```

Debian/Ubuntu:

```
$ sudo apt-get install  librw-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  rw-devel
```

freebsd:

```
$ sudo pkg install math/rankwidth
```

nix:

```
$ nix-env --install rankwidth
```

void:

```
$ sudo xbps-install  rankwidth-devel
```

See https://repology.org/project/rankwidth/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.322 saclib: Computations with real algebraic numbers

Description

Saclib is a library of C programs for computer algebra derived from the SAC2 system. It is mainly used as a dependency of qepcad.

License

Saclib 2.2 Copyright (c) 1993, 2008, RISC-Linz (contact wcbrown@usna.edu)

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Upstream Contact

- Website: http://www.usna.edu/CS/qepcadweb/B/QEPCAD.html
- Alternative location (sometimes more up-to-date):

  https://www.usna.edu/Users/cs/wcbrown/qepcad/B/QEPCAD.html

Type

optional

Dependencies

Version Information

package-version.txt:

```
2.2.7
```

Equivalent System Packages

See https://repology.org/project/saclib/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.323 sage_conf: Configuration module for the SageMath library (distributable version)

Description

This distribution package provides:

- a single Python module, `sage_conf`, providing configuration information to the SageMath library at the time of its installation and at its runtime
- a console script `sage-config`, for querying the variables of `sage_conf` from the shell
- a sourcable shell script `sage-env-config`, providing additional configuration information in the form of environment variables

The `sage_conf` distribution package is polymorphic: It has several implementations.

sage_conf sdist on PyPI

This implementation of the sage_conf distribution package comes from github issue #29039, which added the directory pkgs/sage-conf_pypi.

To install, use pip install -v sage_conf. Using -v ensures that diagnostic messages are displayed.

On installation (or building a wheel), it invokes sage_bootstrap to establish a build tree (SAGE_ROOT) and installation tree (SAGE_LOCAL) for the SageMath distribution. By default, it uses a subdirectory of $HOME/.sage that is specific to the version of the distribution and the version of Python in use. If several virtual environments over the same version of Python install sage_conf, they will share these trees.

After installation of sage_conf, a wheelhouse containing wheels of various libraries is available; type ls $(sage-config SAGE_SPKG_WHEELS) to list them and pip install $(sage-config SAGE_SPKG_WHEELS)/*.whl to install them. After this, you can install the Sage library, for example, using pip install sagemath-standard.

sage_conf wheels

Prebuilt binary wheels of the sage_conf distribution package are available at https://github.com/sagemath/sage-wheels/releases/

This implementation of sage_conf comes from github issue #31396, which adds the directory pkgs/sage-conf_relocatable/.

On building a wheel, it invokes sage_bootstrap to establish a build and installation tree (SAGE_ROOT, SAGE_LOCAL) in a subdirectory of the directory /var/tmp/, whose name is specific to the version of the distribution and the version of Python in use.

The wheel distributes a copy of the prebuilt SAGE_ROOT and SAGE_LOCAL. Importing sage_conf (or using the installed sage-config script), makes sure that a symlink from the /var/tmp location to the actual persistent installation location is created. As the relocated libraries and programs contain the hardcoded path SAGE_LOCAL in various ways (including as rpaths), this symlink is necessary for the prebuilt libraries and programs to work.

/var/tmp is a sticky directory on all Linux distributions following the Filesystem Hierarchy Standard, as well as on macOS and on Cygwin. On multi-user systems, only one user can use a given version of the distribution; other installation schemes are recommended for systems with multiple Sage users.

sage_conf in the SageMath distribution

The original version of the distribution package sage_conf is used internally in the SageMath distribution. It is provided in the directory pkgs/sage-conf. This version of the package is generated by the Sage distribution's configure script.

sage_conf in downstream distributions

Downstream packagers and advanced developers and users may want to provide their own implementation of the distribution package to support the intended deployment of the SageMath library.

License

GNU General Public License (GPL) v3 or later

Upstream Contact

https://www.sagemath.org

This package is included in the source code of the Sage distribution, in pkgs/sage-conf*.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sage-conf ~= 10.1
```

Equivalent System Packages

(none known)

6.1.324 sage_docbuild: Build system of the Sage documentation

About SageMath

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> Copyright (C) 2005-2020 The Sage Development Team
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> https://www.sagemath.org

SageMath fully supports all major Linux distributions, recent versions of macOS, and Windows (using Cygwin or Windows Subsystem for Linux).

The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this pip-installable source distribution

This is the build system of the Sage documentation, based on Sphinx.

Type

standard

Dependencies

- $(PYTHON)
- *sphinx: Python documentation generator*
- $(PYTHON_TOOLCHAIN)
- sagelib

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sage-docbuild ~= 10.1
```

Equivalent System Packages

See https://repology.org/project/sage-docbuild/versions, https://repology.org/project/python:sage-docbuild/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.325 sage_flatsurf: computation with flat surfaces

Description

SageMath package for studying the geometry of flat surfaces and the dynamics of their foliations.

License

GNU General Public License, version 2

Upstream Contact

https://pypi.org/project/sage-flatsurf/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *surface_dynamics: dynamics on surfaces (measured foliations, interval exchange transformation, Teichmüller flow, etc)*
- $(SAGERUNTIME)

Version Information

requirements.txt:

```
sage-flatsurf
```

Equivalent System Packages

(none known)

6.1.326 sage_numerical_backends_coin: COIN-OR backend for Sage MixedIntegerLinearProgram

Description

COIN-OR backend for Sage MixedIntegerLinearProgram

License

GPLv2+

Upstream Contact

https://pypi.org/project/sage-numerical-backends-coin/

Type

optional

Dependencies

- *cbc: COIN-OR branch and cut solver for mixed-integer programs*
- *cysignals: Interrupt and signal handling for Cython*
- $(SAGERUNTIME)
- $(PYTHON_TOOLCHAIN)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*

Version Information

package-version.txt:

```
9.0b12
```

install-requires.txt:

```
sage_numerical_backends_coin >=9.0b12
```

Equivalent System Packages

See https://repology.org/project/sage-numerical-backends-coin/versions, https://repology.org/project/python:sage-numerical-backends-coin/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.327 sage_numerical_backends_cplex: Cplex backend for Sage MixedIntegerLinearProgram

Description

Cplex backend for Sage MixedIntegerLinearProgram

License

GPLv2+

Upstream Contact

https://pypi.org/project/sage-numerical-backends-cplex/

Type

optional

Dependencies

- *cysignals: Interrupt and signal handling for Cython*
- $(SAGERUNTIME)
- $(PYTHON_TOOLCHAIN)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*

Version Information

package-version.txt:

```
9.0b12
```

install-requires.txt:

```
sage_numerical_backends_cplex >=9.0b12
```

Equivalent System Packages

See https://repology.org/project/python:sage-numerical-backends-cplex/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.328 sage_numerical_backends_gurobi: Gurobi backend for Sage MixedIntegerLinearProgram

Description

Gurobi backend for Sage MixedIntegerLinearProgram

License

GPLv2+

Upstream Contact

https://pypi.org/project/sage-numerical-backends-gurobi/

Type

optional

Dependencies

- *cysignals: Interrupt and signal handling for Cython*
- $(SAGERUNTIME)
- $(PYTHON_TOOLCHAIN)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*

Version Information

package-version.txt:

```
9.3.1
```

install-requires.txt:

```
sage_numerical_backends_gurobi >=9.0.0
```

Equivalent System Packages

See https://repology.org/project/sage-numerical-backends-gurobi/versions, https://repology.org/project/python:sage-numerical-backends-gurobi/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.329 sage-setup: Build system of the SageMath library

This is the build system of the Sage library, based on setuptools.

Type

standard

Dependencies

- $(PYTHON)
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pkgconfig: Python interface to pkg-config*
- *jinja2: General purpose template engine for Python*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sage-setup ~= 10.1
```

Equivalent System Packages

(none known)

6.1.330 sage_sws2rst: Translate legacy Sage worksheet files (.sws) to reStructuredText (.rst) files

Description

Provides a script $sage - sws2rst$, which translates a Sage worksheet file (.sws) into a reStructuredText (.rst) file.

Sage worksheet files (.sws) are a file format that was used by the now-obsolete Sage notebook (https://github.com/sagemath/sagenb), superseded by the Jupyter notebook. SageNB was dropped in the course of the transition of SageMath to Python 3.

This package was extracted from the SageNB sources in github issue #28838 to provide a way to convert pedagogical material written available in Sage worksheet format.

Type

optional

Dependencies

- $(PYTHON)
- *beautifulsoup4: Screen-scraping library*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sage-sws2rst ~= 10.1
```

Equivalent System Packages

(none known)

6.1.331 sagemath_bliss: Graph (iso/auto)morphisms with bliss

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SageMath fully supports all major Linux distributions, recent versions of macOS, and Windows (using Cygwin or Windows Subsystem for Linux).

The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this pip-installable source distribution

This pip-installable source distribution `sagemath-bliss` is a small optional distribution for use with `sagemath-standard`.

It provides a Cython interface to the `bliss` library for the purpose of computing graph (iso/auto)morphisms.

Type

optional

Dependencies

- $(PYTHON)
- *bliss: Computing automorphism groups and canonical forms of graphs*
- *cysignals: Interrupt and signal handling for Cython*
- $(PYTHON_TOOLCHAIN)
- *sage-setup: Build system of the SageMath library*
- *sage_conf: Configuration module for the SageMath library (distributable version)*
- *sagemath_environment: System and software environment*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pkgconfig: Python interface to pkg-config*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-bliss ~= 10.1
```

Equivalent System Packages

conda:

```
$ conda install  sagemath-bliss
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.332 sagemath_categories: Sage categories and basic rings

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The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this experimental pip-installable source distribution

This pip-installable source distribution $sagemath-categories$ is an experimental distribution of a small part of the Sage Library. Use at your own risk. It provides a small subset of the modules of the Sage library ("sagelib", $sagemath-standard$). It is a superset of the $sagemath-objects$ (providing Sage objects, the element/parent framework, categories, the coercion system and the related metaclasses), making various additional categories available without introducing dependencies on additional mathematical libraries.

Dependencies

When building from source, development packages of gmp, $mpfr$, and mpc are needed.

Documentation

- Categories
- Structure
- Coercion
- Classes, Metaclasses

Type

experimental

Dependencies

- $(PYTHON)
- *sagemath_objects: Sage objects, elements, parents, categories, coercion, metaclasses*
- $(PYTHON_TOOLCHAIN)
- *sagemath_environment: System and software environment*
- *sage-setup: Build system of the SageMath library*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pkgconfig: Python interface to pkg-config*
- *python_build: A simple, correct PEP517 package builder*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-categories ~= 10.1
```

Equivalent System Packages

(none known)

6.1.333 sagemath_coxeter3: Coxeter groups, Bruhat ordering, Kazhdan-Lusztig polynomials with coxeter3

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The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this pip-installable source distribution

This pip-installable source distribution `sagemath-coxeter3` is a small optional distribution for use with `sagemath-standard`.

It provides a Cython interface to the `coxeter3` library.

Type

optional

Dependencies

- $(PYTHON)
- *coxeter3: Library for Coxeter groups, Bruhat ordering, Kazhdan-Lusztig polynomials*
- $(PYTHON_TOOLCHAIN)
- *sage-setup: Build system of the SageMath library*
- *sagemath_environment: System and software environment*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pkgconfig: Python interface to pkg-config*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-coxeter3 ~= 10.1
```

Equivalent System Packages

conda:

```
$ conda install  sagemath-coxeter3
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.334 sagemath_doc_html: SageMath documentation in HTML format

Upon installation, this package builds the SageMath documentation in HTML format.

It is a standard package. It is built on every invocation of `make` or `make all`, but not on `make build`. The documentation build can also be run separately using `make doc-html`.

Type

standard

Dependencies

- sagelib
- *sphinx: Python documentation generator*
- *sphinx_copybutton: Add a copy button to each of your code cells.*
- *pplpy_doc: Python interface to the Parma Polyhedra Library (documentation)*
- $(SAGERUNTIME)
- *maxima: System for manipulating symbolic and numerical expressions*
- *networkx: Python package for complex networks*
- *scipy: Scientific tools for Python*
- *sympy: Python library for symbolic mathematics*
- *matplotlib: Python 2D plotting library*
- *pillow: Python Imaging Library*
- *mathjax: A JavaScript library for displaying mathematical formulas*
- *mpmath: Pure Python library for multiprecision floating-point arithmetic*
- *ipykernel: IPython Kernel for Jupyter*
- *jupyter_client: Jupyter protocol implementation and client libraries*
- *conway_polynomials: Tables of Conway polynomials over finite fields*
- *tachyon: A ray tracing system*
- *jmol: Java viewer for chemical structures in 3D*
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*
- *jupyter_sphinx: Jupyter Sphinx Extension*
- *sage_docbuild: Build system of the Sage documentation*
- *elliptic_curves: Databases of elliptic curves*
- *furo: A clean customizable Sphinx documentation theme*
- *fpylll: Python interface for FPLLL*

Version Information

Equivalent System Packages

(none known)

6.1.335 sagemath_doc_pdf: SageMath documentation in PDF format

Upon installation, this package builds the SageMath documentation in PDF format.

It is an optional package. It can be enabled at configuration time using `./configure --enable-sagemath_doc_pdf`. Alternatively, it can be installed by using `make doc-pdf`.

Type

optional

Dependencies

- *sagemath_doc_html: SageMath documentation in HTML format*
- *texlive: A comprehensive TeX system*

Version Information

Equivalent System Packages

(none known)

6.1.336 sagemath_environment: System and software environment

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The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this experimental pip-installable source distribution

This pip-installable source distribution $sagemath-environment$ is an experimental distribution of a small part of the Sage Library. Use at your own risk. It provides a small, fundamental subset of the modules of the Sage library ("sagelib", $sagemath-standard$), providing the connection to the system and software environment. It also includes the $sage$ script for launching the Sage REPL and accessing various developer tools (see $sage--help$).

Type

experimental

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *python_build: A simple, correct PEP517 package builder*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-environment ~= 10.1
```

Equivalent System Packages

(none known)

6.1.337 sagemath_mcqd: Finding maximum cliques with mcqd

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The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this pip-installable source distribution

This pip-installable source distribution `sagemath-mcqd` is a small optional distribution for use with `sagemath-standard`.

It provides a Cython interface to the `mcqd` library, providing a fast exact algorithm for finding a maximum clique in an undirected graph.

Type

optional

Dependencies

- $(PYTHON)
- *mcqd: An exact algorithm for finding a maximum clique in an undirected graph*
- *memory_allocator: An extension class to allocate memory easily with Cython*
- *cysignals: Interrupt and signal handling for Cython*
- $(PYTHON_TOOLCHAIN)
- *sage-setup: Build system of the SageMath library*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pkgconfig: Python interface to pkg-config*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-mcqd ~= 10.1
```

Equivalent System Packages

conda:

```
$ conda install  sagemath-mcqd
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.338 sagemath_meataxe: Matrices over small finite fields with meataxe

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SageMath fully supports all major Linux distributions, recent versions of macOS, and Windows (using Cygwin or Windows Subsystem for Linux).

The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this pip-installable source distribution

This pip-installable source distribution `sagemath-meataxe` is a small optional distribution for use with `sagemath-standard`.

This distribution provides the SageMath modules `sage.libs.meataxe` and `sage.matrix.matrix_gfpn_dense`.

It provides a specialized implementation of matrices over the finite field F_q, where q <= 255, using the $SharedMeatAxe < http : //users.minet.uni - jena.de/\ king/SharedMeatAxe/ >$ library.

Type

optional

Dependencies

- $(PYTHON)
- *meataxe: Library for computing with modular representations*
- $(PYTHON_TOOLCHAIN)
- *sage-setup: Build system of the SageMath library*
- *sagemath_environment: System and software environment*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pkgconfig: Python interface to pkg-config*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-meataxe ~= 10.1
```

Equivalent System Packages

conda:

```
$ conda install  sagemath-meataxe
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.339 sagemath_objects: Sage objects, elements, parents, categories, coercion, metaclasses

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About this experimental pip-installable source distribution

This pip-installable source distribution $sagemath-objects$ is an experimental distribution of a small part of the Sage Library. Use at your own risk. It provides a small, fundamental subset of the modules of the Sage library ("sagelib", $sagemath-standard$), making Sage objects, the element/parent framework, categories, the coercion system and the related metaclasses available.

Dependencies

When building from source, development packages of gmp, $mpfr$, and mpc are needed.

Documentation

- Categories
- Structure
- Coercion
- Classes, Metaclasses

Type

experimental

Dependencies

- $(PYTHON)
- *cysignals: Interrupt and signal handling for Cython*
- *gmpy2: Python interface to GMP/MPIR, MPFR, and MPC*
- $(PYTHON_TOOLCHAIN)
- *sagemath_environment: System and software environment*
- *sage-setup: Build system of the SageMath library*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pkgconfig: Python interface to pkg-config*
- *python_build: A simple, correct PEP517 package builder*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-objects ~= 10.1
```

Equivalent System Packages

(none known)

6.1.340 sagemath_repl: IPython kernel, Sage preparser, doctester

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> https://www.sagemath.org

SageMath fully supports all major Linux distributions, recent versions of macOS, and Windows (using Cygwin or Windows Subsystem for Linux).

The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this experimental pip-installable source distribution

This pip-installable source distribution $sagemath - repl$ is an experimental distribution of a small part of the Sage Library. Use at your own risk. It provides a small, fundamental subset of the modules of the Sage library ("sagelib", $sagemath - standard$), providing the IPython kernel, Sage preparser, and doctester.

Type

experimental

Dependencies

- $(PYTHON)
- *sagemath_objects: Sage objects, elements, parents, categories, coercion, metaclasses*
- *sagemath_environment: System and software environment*
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*
- $(PYTHON_TOOLCHAIN)
- *python_build: A simple, correct PEP517 package builder*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-repl ~= 10.1
```

Equivalent System Packages

(none known)

6.1.341 sagemath_sirocco: Certified root continuation with sirocco

About SageMath

> **"Creating a Viable Open Source Alternative to**
> Magma, Maple, Mathematica, and MATLAB"
>
> Copyright (C) 2005-2023 The Sage Development Team
>
> https://www.sagemath.org

SageMath fully supports all major Linux distributions, recent versions of macOS, and Windows (using Cygwin or Windows Subsystem for Linux).

The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this pip-installable source distribution

This pip-installable source distribution `sagemath-sirocco` is a small optional distribution for use with `sagemath-standard`.

It provides a Cython interface to the `sirocco` library for the purpose of compute topologically certified root continuation of bivariate polynomials.

Type

optional

Dependencies

- $(PYTHON)
- *sirocco: Compute topologically certified root continuation of bivariate polynomials*
- *cypari2: Python interface to the number theory library libpari*
- *cysignals: Interrupt and signal handling for Cython*
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- $(PYTHON_TOOLCHAIN)
- *sage-setup: Build system of the SageMath library*
- *sagemath_environment: System and software environment*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pkgconfig: Python interface to pkg-config*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-sirocco ~= 10.1
```

Equivalent System Packages

conda:

```
$ conda install  sagemath-sirocco
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.342 sagemath_tdlib: Tree decompositions with tdlib

About SageMath

> **"Creating a Viable Open Source Alternative to**
> Magma, Maple, Mathematica, and MATLAB"
>
> Copyright (C) 2005-2023 The Sage Development Team
>
> https://www.sagemath.org

SageMath fully supports all major Linux distributions, recent versions of macOS, and Windows (using Cygwin or Windows Subsystem for Linux).

The traditional and recommended way to install SageMath is from source via Sage-the-distribution (https://www.sagemath.org/download-source.html). Sage-the-distribution first builds a large number of open source packages from source (unless it finds suitable versions installed in the system) and then installs the Sage Library (sagelib, implemented in Python and Cython).

About this pip-installable source distribution

This pip-installable source distribution `sagemath-tdlib` is a small optional distribution for use with `sagemath-standard`.

It provides a Cython interface to the `tdlib` library, providing algorithms concerning tree decompositions.

Type

optional

Dependencies

- $(PYTHON)
- *tdlib: Algorithms for computing tree decompositions*
- *cysignals: Interrupt and signal handling for Cython*
- $(PYTHON_TOOLCHAIN)
- *sage-setup: Build system of the SageMath library*
- *sagemath_environment: System and software environment*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pkgconfig: Python interface to pkg-config*

Version Information

package-version.txt:

```
10.1
```

install-requires.txt:

```
# This file is updated on every release by the sage-update-version script
sagemath-tdlib ~= 10.1
```

Equivalent System Packages

conda:

```
$ conda install  sagemath-tdlib
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.343 sagenb_export: Convert legacy SageNB notebooks to Jupyter notebooks and other formats

Description

This is a tool to convert SageNB notebooks to other formats, in particular IPython/Jupyter notebooks.

It includes a Jupyter notebook extension to provide a UI for the import of SageNB notebooks.

Upstream Contact

https://github.com/vbraun/ExportSageNB

Type

standard

Dependencies

- $(PYTHON)
- *notebook: Jupyter notebook, a web-based notebook environment for interactive computing*
- *nbconvert: Converting Jupyter Notebooks*
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *six: Python 2 and 3 compatibility utilities*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.3
```

install-requires.txt:

```
sagenb_export >=3.3
```

Equivalent System Packages

See https://repology.org/project/sagenb-export/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.344 sagetex: Embed code, results of computations, and plots from Sage into LaTeX documents

Description

The SageTeX package allows you to embed code, results of computations, and plots from Sage into LaTeX documents.

License

The *source code* of the SageTeX package may be redistributed and/or modified under the terms of the GNU General Public License as published by the Free Software Foundation, either version 2 of the License, or (at your option) any later version. To view a copy of this license, see http://www.gnu.org/licenses/ or send a letter to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA.

The *documentation* of the SageTeX package is licensed under the Creative Commons Attribution-Share Alike 3.0 License. To view a copy of this license, visit http://creativecommons.org/licenses/by-sa/3.0/ or send a letter to Creative Commons, 171 Second Street, Suite 300, San Francisco, California, 94105, USA.

SPKG Maintainers

Dan Drake (dr.dan.drake at gmail) and SageMath developers (sage-devel@googlegroups.com)

Upstream Contact

Author: Dan Drake.

Web: https://github.com/sagemath/sagetex

Dependencies

To install, nothing more than a standard Sage install. The `spkg-check` script will exit without actually testing anything if it cannot find "latex" in your path.

Notes

To use SageTeX, both Sage and LaTeX need to know about it. SageTeX comes standard with Sage, so you only need to make sure LaTeX can find what it needs. Full details are in the Sage installation guide at http://doc.sagemath.org/html/en/installation/ and http://doc.sagemath.org/html/en/tutorial/sagetex.html .

The directory `$SAGE_ROOT/venv/share/doc/sagetex` contains documentation and an example file. See `$SAGE_ROOT/venv/share/texmf/tex/latex/sagetex` for the source code and some possibly useful scripts. If you have problems or suggestions see the sage-support group.

If you want to help develop SageTeX, please clone the github repository (see the "Upstream Contact" above) and send me patches based on that.

Type

standard

Dependencies

- $(PYTHON)
- *maxima: System for manipulating symbolic and numerical expressions*
- *scipy: Scientific tools for Python*
- *matplotlib: Python 2D plotting library*
- *pillow: Python Imaging Library*
- *tachyon: A ray tracing system*
- *pyparsing: A Python parsing module*

Version Information

package-version.txt:

```
3.6.1
```

install-requires.txt:

```
sagetex >=3.5
```

Equivalent System Packages

conda:

```
$ conda install  sagetex
```

See https://repology.org/project/sagetex/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.345 scip: Mixed integer programming solver

Description

SCIP is currently one of the fastest open source mixed integer programming (MIP) solvers. It is also a framework for constraint integer programming and branch-cut-and-price. It allows total control of the solution process and the access of detailed information down to the guts of the solver.

License

Apache 2.0

Upstream Contact

https://scipopt.org/#scipoptsuite

Dependencies

scip brings its own patched version of the bliss library. This will conflict with the optional package bliss.

Type

optional

Dependencies

- $(MP_LIBRARY)
- *readline: Command line editing library*
- *soplex: Linear optimization solver using the revised simplex method*
- *papilo: Parallel presolve for integer and linear optimization*
- *zlib: Data compression library*
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
802
```

Equivalent System Packages

conda:

```
$ conda install  scip
```

See https://repology.org/project/scipoptsuite/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.346 scip_sdp: Mixed integer semidefinite programming plugin for SCIP

Description

SCIP-SDP allows to solve MISDPs using a nonlinear branch-and-bound approach or a linear programming cutting-plane approach.

- In the first case (the default), the semidefinite programming (SDP) relaxations are solve using interior-point SDP-solvers.
- In the second case, cutting planes based on eigenvector are generated.

SCIP-SDP is based on the branch-and-cut framework SCIP. In addition to providing a constraint handler for SDP-constraints and a relaxator to solve continuous SDP-relaxations using interior-point solvers, SCIP-SDP adds several heuristics and propagators to SCIP.

License

Apache 2.0

Upstream Contact

http://www.opt.tu-darmstadt.de/scipsdp/

https://github.com/scipopt/SCIP-SDP

Type

optional

Dependencies

- *scip: Mixed integer programming solver*
- *dsdp: Semidefinite programming solver*
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
4.1.0
```

Equivalent System Packages

(none known)

6.1.347 scipy: Scientific tools for Python

Description

SciPy (pronounced "Sigh Pie") is open-source software for mathematics, science, and engineering. The SciPy library depends on NumPy, which provides convenient and fast N-dimensional array manipulation. The SciPy library is built to work with NumPy arrays, and provides many user-friendly and efficient numerical routines such as routines for numerical integration and optimization. Together, they run on all popular operating systems, are quick to install, and are free of charge. NumPy and SciPy are easy to use, but powerful enough to be depended upon by some of the world's leading scientists and engineers.

License

SciPy's license is free for both commercial and non-commercial use, under the BSD terms. See http://www.scipy.org/License_Compatibility

Upstream Contact

> https://www.scipy.org/

Dependencies

- Python, which in Sage has numerous dependencies
- Numpy
- Fortran
- GNU patch

Special Update/Build Instructions

- None.

Type

standard

Dependencies

- $(PYTHON)
- $(BLAS)
- *gfortran: Fortran compiler from the GNU Compiler Collection*
- *numpy: Package for scientific computing with Python*
- *pybind11: Create Python bindings to C++ code*
- *cython: C-Extensions for Python, an optimizing static compiler*
- *pythran: Ahead of Time compiler for numeric kernels*
- $(PYTHON_TOOLCHAIN)
- *meson_python: Meson Python build backend (PEP 517)*

Version Information

package-version.txt:

```
1.10.1
```

install-requires.txt:

```
# 1.8 is known good version.
# Per https://docs.scipy.org/doc/scipy/dev/core-dev/index.html#version-numbering
# and https://docs.scipy.org/doc/scipy/dev/core-dev/index.html#deprecations,
# deprecations cannot be introduced in micro releases.
# SciPy devs wait "at least 6 months", "in practice two (minor) releases"
# from deprecation to removal of a feature.
scipy >=1.5, <1.11
```

Equivalent System Packages

conda:

```
$ conda install  scipy<1.11,>=1.5
```

homebrew:

```
$ brew install scipy
```

macports: install the following packages: py-scipy

opensuse:

```
$ sudo zypper install python3-scipy
```

void:

```
$ sudo xbps-install  python3-scipy
```

See https://repology.org/project/python:scipy/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.348 scs: Splitting conic solver

Description

scs: splitting conic solver

License

MIT

Upstream Contact

https://pypi.org/project/scs/

Type

optional

Dependencies

- $(PYTHON)
- *numpy: Package for scientific computing with Python*
- $(PYTHON_TOOLCHAIN)
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
3.2.2
```

install-requires.txt:

```
scs
```

Equivalent System Packages

conda:

```
$ conda install  scs
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.349 send2trash: Send file to trash natively under Mac OS X, Windows and Linux

Description

Send file to trash natively under Mac OS X, Windows and Linux.

License

BSD License

Upstream Contact

https://pypi.org/project/Send2Trash/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.8.0
```

install-requires.txt:

```
send2trash >=1.5.0
```

Equivalent System Packages

conda:

```
$ conda install  send2trash
```

macports: install the following packages: py-send2trash

opensuse:

```
$ sudo zypper install python3-Send2Trash
```

void:

```
$ sudo xbps-install  python3-send2trash
```

See https://repology.org/project/send2trash/versions, https://repology.org/project/python:send2trash/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.350 setuptools: Build system for Python packages

Description

setuptools is the classical build system for Python packages, a collection of enhancements to the Python distutils.

This package represents version 63.x of `setuptools`. Sage installs this version to provide the build system for non-PEP 517 packages. In particular, Sage uses it for building `numpy`, whose build system `numpy.distutils` is not compatible with newer versions of `setuptools`, see https://github.com/numpy/numpy/pull/22154

License

MIT License

Upstream Contact

http://pypi.python.org/pypi/setuptools/

https://github.com/pypa/setuptools

Type

standard

Dependencies

- $(PYTHON)

Version Information

package-version.txt:

```
63.4.3
```

install-requires.txt:

```
setuptools >=49.6.0
```

Equivalent System Packages

conda:

```
$ conda install  "setuptools<64"
```

macports: install the following packages: py-setuptools

opensuse:

```
$ sudo zypper install python3-setuptools
```

void:

```
$ sudo xbps-install  python3-setuptools
```

See https://repology.org/project/python:setuptools/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.351 setuptools_scm: Python build system extension to obtain package version from version control

Description

the blessed package to manage your versions by scm tags

License

MIT

Upstream Contact

https://pypi.org/project/setuptools-scm/

Type

standard

Dependencies

- $(PYTHON)
- *typing_extensions: Backported and Experimental Type Hints for Python 3.5+*
- *setuptools: Build system for Python packages*
- *pip: Tool for installing and managing Python packages*
- *wheel: A built-package format for Python*
- *tomli: A lil' TOML parser*
- *packaging: Core utilities for Python packages*

Version Information

package-version.txt:

```
7.0.5
```

install-requires.txt:

```
setuptools_scm >=4.1.2
```

Equivalent System Packages

conda:

```
$ conda install  setuptools_scm
```

macports: install the following packages: py-setuptools_scm

opensuse:

```
$ sudo zypper install python3-setuptools_scm
```

void:

```
$ sudo xbps-install  python3-setuptools_scm
```

See https://repology.org/project/python:setuptools-scm/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.352 setuptools_scm_git_archive: setuptools_scm plugin for git archives

Description

setuptools_scm plugin for git archives

License

MIT

Upstream Contact

https://pypi.org/project/setuptools-scm-git-archive/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.4
```

install-requires.txt:

```
setuptools-scm-git-archive
```

Equivalent System Packages

(none known)

6.1.353 setuptools_wheel: Build the setuptools package as a wheel

After installing setuptools and wheel, we build a wheel of setuptools to complete the set of wheels stored in our wheelhouse.

This version of setuptools is suitable for PEP 517/518/660 builds, but it is not suitable for building `numpy`.

Type

standard

Dependencies

- $(PYTHON)
- *setuptools: Build system for Python packages*
- *wheel: A built-package format for Python*

Version Information

package-version.txt:

```
65.6.3
```

install-requires.txt:

```
# We use this file to mark the package as a Python package
```

Equivalent System Packages

See https://repology.org/project/python:setuptools/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.354 simplegeneric: Simple single-dispatch generic functions for Python

Description

Simple generic functions (similar to Python's own len(), pickle.dump(), etc.)

The simplegeneric module lets you define simple single-dispatch generic functions, akin to Python's built-in generic functions like len() iter() and so on. However, instead of using specially-named methods, these generic functions use simple lookup tables, akin to those used by e.g. pickle.dump() and other generic functions found in the Python standard library.

As you can see from the above examples, generic functions are actually quite common in Python already, but there is no standard way to create simple ones. This library attempts to fill that gap, as generic functions are an excellent alternative to the Visitor pattern, as well as being a great substitute for most common uses of adaptation.

This library tries to be the simplest possible implementation of generic functions, and it therefore eschews the use of multiple or predicate dispatch, as well as avoiding speedup techniques such as C dispatching or code generation. But it has absolutely no dependencies, other than Python 2.4, and the implementation is just a single Python module of less than 100 lines.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.8.1.p0
```

install-requires.txt:

```
simplegeneric >=0.8.1
```

Equivalent System Packages

conda:

```
$ conda install  simplegeneric
```

macports: install the following packages: py-simplegeneric

opensuse:

```
$ sudo zypper install python3-simplegeneric
```

void:

```
$ sudo xbps-install  python3-simplegeneric
```

See https://repology.org/project/simplegeneric/versions, https://repology.org/project/python:simplegeneric/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.355 singular: Computer algebra system for polynomial computations, algebraic geometry, singularity theory

Description

Singular is a computer algebra system for polynomial computations, with special emphasis on commutative and non-commutative algebra, algebraic geometry, and singularity theory.

License

GPLv2 or GPLv3

Upstream Contact

libsingular-devel@mathematik.uni-kl.de

https://www.singular.uni-kl.de/

Special Update/Build Instructions

Other notes:

- If the environment variable SAGE_DEBUG is set to "yes", then omalloc will be replaced by xalloc. The resulting Singular executable and libsingular library will be slower than with omalloc, but allow for easier debugging of memory corruptions.

Type

standard

Dependencies

- $(MP_LIBRARY)
- *ntl: A library for doing number theory*
- *flint: Fast Library for Number Theory*
- *readline: Command line editing library*
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *cddlib: Double description method for polyhedral representation conversion*

Version Information

package-version.txt:

```
4.3.1p3
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  singular
```

conda:

```
$ conda install  singular
```

cygwin:

```
$ apt-cyg install singular-devel singular
```

Debian/Ubuntu:

```
$ sudo apt-get install  singular singular-doc libsingular4-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  Singular Singular-devel
```

freebsd:

```
$ sudo pkg install math/singular
```

gentoo:

```
$ sudo emerge sci-mathematics/singular[readline]
```

homebrew:

```
$ brew install singular
```

macports: install the following packages: singular

nix:

```
$ nix-env --install singular
```

void:

```
$ sudo xbps-install  singular
```

See https://repology.org/project/singular/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.356 singular_jupyter: Jupyter kernel for Singular

Description

This is a beta version of a jupyter kernel for Singular.

License

GPL version 2 or later

Upstream Contact

- https://github.com/sebasguts/jupyter_kernel_singular

Type

optional

Dependencies

- $(PYTHON)
- *jupyter_client: Jupyter protocol implementation and client libraries*
- $(PYTHON_TOOLCHAIN)
- *pysingular: A basic Python interface to Singular*
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel*

Version Information

package-version.txt:

```
0.9.7
```

install-requires.txt:

```
singular_jupyter >=0.9.7
```

Equivalent System Packages

conda:

```
$ conda install  jupyter-kernel-singular
```

See https://repology.org/project/jupyter-singular/versions, https://repology.org/project/python:jupyter-kernel-singular/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.357 sirocco: Compute topologically certified root continuation of bivariate polynomials

Description

sirocco is a library to compute topologically certified root continuation of bivariate polynomials.

License

GPLv3+

SPKG Maintainers

- Miguel Marco

Upstream Contact

Miguel Marco (mmarco@unizar.es)

Dependencies

- gcc

Type

optional

Dependencies

Version Information

package-version.txt:

```
2.1.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  sirocco
```

conda:

```
$ conda install  sirocco
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  sirocco
```

opensuse:

```
$ sudo zypper install sirocco-devel
```

See https://repology.org/project/sirocco/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.358 six: Python 2 and 3 compatibility utilities

Description

Python 2 and 3 compatibility utilities

License

MIT License

Upstream Contact

- Author: Benjamin Peterson
- Home page: http://pypi.python.org/pypi/six/

Dependencies

Python

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.16.0
```

install-requires.txt:

```
six >=1.15.0
```

Equivalent System Packages

conda:

```
$ conda install  six
```

macports: install the following packages: py-six

opensuse:

```
$ sudo zypper install python3-six
```

void:

```
$ sudo xbps-install  python3-six
```

See https://repology.org/project/python:six/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.359 slabbe: Sébastien Labbé's Research code

Description

This SageMath package contains various modules for experimentation with

- discrete dynamical systems
- combinatorics
- digital geometry
- visualization
- miscellaneous development tools

License

GPLv2+

Upstream Contact

https://pypi.org/project/slabbe/

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- $(SAGERUNTIME)

Version Information

requirements.txt:

```
slabbe
```

Equivalent System Packages

See https://repology.org/project/python:slabbe/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.360 snappy: Topology and geometry of 3-manifolds, with a focus on hyperbolic structures

Description

Studying the topology and geometry of 3-manifolds, with a focus on hyperbolic structures.

License

GPLv2+

Upstream Contact

https://pypi.org/project/snappy/

Type

optional

Dependencies

- $(PYTHON)
- *decorator: Python library providing decorators*
- *ipython: Interactive computing environment with an enhanced interactive Python shell*
- *cypari2: Python interface to the number theory library libpari*
- $(PYTHON_TOOLCHAIN)

- sagelib

Version Information

requirements.txt:

```
# Note: As of 2021-01, snappy will pull in cypari (!= cypari2) as a dependency
# if installed as a wheel but will actually use Sage's cypari2.
# cypari contains a statically linked copy of pari and other libraries
# and will remain completely unused (wastes 30M).  Snappy is about 165M.
# See :issue:`31180`
snappy
# cypari 2.4.0 has a broken sdist, :issue:`31180`
cypari !=2.4.0
# An optional database (110M uncompressed)
snappy_15_knots
```

Equivalent System Packages

(none known)

6.1.361 snowballstemmer: Stemmer algorithms for natural language processing in Python

Description

This package provides 29 stemmers for 28 languages generated from Snowball algorithms.

License

BSD-3-Clause

Upstream Contact

https://pypi.org/project/snowballstemmer/

This is a pure Python stemming library. If PyStemmer is available, this module uses it to accelerate.

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.2.0
```

install-requires.txt:

```
snowballstemmer >=1.2.1
```

Equivalent System Packages

conda:

```
$ conda install  snowballstemmer
```

macports: install the following packages: py-snowballstemmer

opensuse:

```
$ sudo zypper install python3-snowballstemmer
```

void:

```
$ sudo xbps-install  python3-snowballstemmer
```

See https://repology.org/project/python:snowballstemmer/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.362 soplex: Linear optimization solver using the revised simplex method

Description

SoPlex is an optimization package for solving linear programming problems (LPs) based on an advanced implementation of the primal and dual revised simplex algorithm. It provides special support for the exact solution of LPs with rational input data.

License

Apache License, Version 2.0

Upstream Contact

https://github.com/scipopt/soplex

Type

optional

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *boost_cropped: Portable C++ libraries (subset needed for Sage)*
- *zlib: Data compression library*
- *papilo: Parallel presolve for integer and linear optimization*
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
602
```

Equivalent System Packages

conda:

```
$ conda install  soplex
```

freebsd:

```
$ sudo pkg install math/SoPlex
```

See https://repology.org/project/soplex/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.363 soupsieve: A modern CSS selector implementation for Beautiful Soup.

Description

A modern CSS selector implementation for Beautiful Soup.

License

Upstream Contact

https://pypi.org/project/soupsieve/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *hatchling: Modern, extensible Python build backend*

Version Information

package-version.txt:

```
2.3.2.post1
```

install-requires.txt:

```
soupsieve
```

Equivalent System Packages

conda:

```
$ conda install  soupsieve
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.364 sphinx: Python documentation generator

Description

Sphinx is a tool that makes it easy to create intelligent and beautiful documentation for Python projects (or other documents consisting of multiple reStructuredText sources), written by Georg Brandl. It was originally created to translate the new Python documentation, but has now been cleaned up in the hope that it will be useful to many other projects.

License

Modified BSD; see e.g. its egg-info file for other options

Upstream Contact

- Author: Georg Brandl
- Home Page: http://www.sphinx-doc.org
- see also http://pypi.python.org/pypi/Sphinx

Dependencies

- Jinja2 >= 2.3
- Pygments >= 2.0
- docutils < 0.18
- snowballstemmer >= 1.1
- babel >= 1.3
- setuptools / distribute
- Python
- GNU patch (shipped with Sage)

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *docutils: Processing plaintext documentation into useful formats, such as HTML or LaTeX*
- *jinja2: General purpose template engine for Python*
- *pygments: Generic syntax highlighter*
- *snowballstemmer: Stemmer algorithms for natural language processing in Python*
- *imagesize: Parser for image file metadata*

- *babel: Internationalization utilities for Python*
- *alabaster: Default theme for the Sphinx documentation system*
- *requests: An HTTP library for Python*
- *sphinxcontrib_websupport: Sphinx API for Web apps*
- *sphinxcontrib_applehelp: Sphinx extension which outputs Apple help book*
- *sphinxcontrib_devhelp: Sphinx extension which outputs Devhelp documents*
- *sphinxcontrib_htmlhelp: Sphinx extension which outputs HTML help book*
- *sphinxcontrib_jsmath: Sphinx extension which renders display math in HTML via JavaScript*
- *sphinxcontrib_qthelp: Sphinx extension which outputs QtHelp documents*
- *sphinxcontrib_serializinghtml: Sphinx extension which outputs serialized HTML files*
- *packaging: Core utilities for Python packages*
- *importlib_metadata: Library to access the metadata for a Python package*

Version Information

package-version.txt:

```
5.2.3
```

install-requires.txt:

```
sphinx >=5.2, <8
```

Equivalent System Packages

conda:

```
$ conda install  sphinx<8,>=5.2
```

gentoo:

```
$ sudo emerge dev-python/sphinx
```

homebrew:

```
$ brew install sphinx-doc
```

macports: install the following packages: py-sphinx

opensuse:

```
$ sudo zypper install python3-Sphinx
```

void:

```
$ sudo xbps-install  python3-Sphinx
```

See https://repology.org/project/python:sphinx/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.365 sphinx_basic_ng: A modern skeleton for Sphinx themes.

Description

A modern skeleton for Sphinx themes.

License

Upstream Contact

https://pypi.org/project/sphinx-basic-ng/

Type

standard

Dependencies

- $(PYTHON)
- *sphinx: Python documentation generator*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.0.1a12
```

install-requires.txt:

```
sphinx-basic-ng
```

Equivalent System Packages

conda:

```
$ conda install  sphinx-basic-ng
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.366 sphinx_copybutton: Add a copy button to each of your code cells.

Description

Add a copy button to each of your code cells.

License

MIT License

Upstream Contact

https://pypi.org/project/sphinx-copybutton/

Type

standard

Dependencies

- $(PYTHON)
- *sphinx: Python documentation generator*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.5.1
```

install-requires.txt:

```
sphinx-copybutton
```

Equivalent System Packages

conda:

```
$ conda install  sphinx-copybutton
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.367 sphinxcontrib_applehelp: Sphinx extension which outputs Apple help book

Description

Sphinx extension which outputs Apple help book

License

BSD

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.0.2
```

install-requires.txt:

```
sphinxcontrib_applehelp >=1.0.2
```

Equivalent System Packages

conda:

```
$ conda install  sphinxcontrib-applehelp
```

macports: install the following packages: py-sphinxcontrib-applehelp

opensuse:

```
$ sudo zypper install python3-sphinxcontrib-applehelp
```

void:

```
$ sudo xbps-install  python3-sphinxcontrib-applehelp
```

See https://repology.org/project/python:sphinxcontrib-applehelp/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.368 sphinxcontrib_devhelp: Sphinx extension which outputs Devhelp documents

Description

Sphinx extension which outputs Devhelp documents

License

BSD

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.0.2
```

install-requires.txt:

```
sphinxcontrib_devhelp >=1.0.2
```

Equivalent System Packages

conda:

```
$ conda install  sphinxcontrib-devhelp
```

macports: install the following packages: py-sphinxcontrib-devhelp

void:

```
$ sudo xbps-install  python3-sphinxcontrib-devhelp
```

See https://repology.org/project/python:sphinxcontrib-devhelp/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.369 sphinxcontrib_htmlhelp: Sphinx extension which outputs HTML help book

Description

Sphinx extension which outputs HTML help book

License

BSD

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.0.0
```

install-requires.txt:

```
sphinxcontrib_htmlhelp >=1.0.3
```

Equivalent System Packages

conda:

```
$ conda install  sphinxcontrib-htmlhelp
```

macports: install the following packages: py-sphinxcontrib-htmlhelp

void:

```
$ sudo xbps-install  python3-sphinxcontrib-htmlhelp
```

See https://repology.org/project/python:sphinxcontrib-htmlhelp/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.370 sphinxcontrib_jsmath: Sphinx extension which renders display math in HTML via JavaScript

Description

Sphinx extension which renders display math in HTML via JavaScript

License

BSD

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.0.1
```

install-requires.txt:

```
sphinxcontrib_jsmath >=1.0.1
```

Equivalent System Packages

conda:

```
$ conda install  sphinxcontrib-jsmath
```

macports: install the following packages: py37-sphinxcontrib-jsmath

void:

```
$ sudo xbps-install  python3-sphinxcontrib-jsmath
```

See https://repology.org/project/python:sphinxcontrib-jsmath/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.371 sphinxcontrib_qthelp: Sphinx extension which outputs QtHelp documents

Description

Sphinx extension which outputs QtHelp documents

License

BSD

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.0.3
```

install-requires.txt:

```
sphinxcontrib_qthelp >=1.0.3
```

Equivalent System Packages

conda:

```
$ conda install  sphinxcontrib-qthelp
```

macports: install the following packages: py-sphinxcontrib-qthelp

void:

```
$ sudo xbps-install  python3-sphinxcontrib-qthelp
```

See https://repology.org/project/python:sphinxcontrib-qthelp/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.372 sphinxcontrib_serializinghtml: Sphinx extension which outputs serialized HTML files

Description

Sphinx extension which outputs serialized HTML files

License

BSD

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.1.5
```

install-requires.txt:

```
sphinxcontrib_serializinghtml >=1.1.4
```

Equivalent System Packages

conda:

```
$ conda install  sphinxcontrib-serializinghtml
```

macports: install the following packages: py-sphinxcontrib-serializinghtml

opensuse:

```
$ sudo zypper install python3-sphinxcontrib-serializinghtml
```

void:

```
$ sudo xbps-install  python3-sphinxcontrib-serializinghtml
```

See https://repology.org/project/python:sphinxcontrib-serializinghtml/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.373 sphinxcontrib_websupport: Sphinx API for Web apps

Description

sphinxcontrib-websupport provides a Python API to easily integrate Sphinx documentation into your Web application.

License

BSD

Type

standard

Dependencies

- $(PYTHON)
- *sphinxcontrib_serializinghtml: Sphinx extension which outputs serialized HTML files*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.2.4
```

install-requires.txt:

```
sphinxcontrib_websupport >=1.2.1
```

Equivalent System Packages

conda:

```
$ conda install  sphinxcontrib-websupport
```

macports: install the following packages: py-sphinxcontrib-websupport

opensuse:

```
$ sudo zypper install python3-sphinxcontrib-websupport
```

See https://repology.org/project/python:sphinxcontrib-websupport/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.374 sqlalchemy: A database abstraction library

Description

Database Abstraction Library

License

MIT

Upstream Contact

https://pypi.org/project/SQLAlchemy/

Type

optional

Dependencies

Version Information

requirements.txt:

```
sqlalchemy
```

Equivalent System Packages

conda:

```
$ conda install  sqlalchemy
```

macports: install the following packages: py-sqlalchemy

opensuse:

```
$ sudo zypper install python3-SQLAlchemy
```

void:

```
$ sudo xbps-install  python3-SQLAlchemy
```

See https://repology.org/project/python:sqlalchemy/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.375 sqlite: An SQL database engine

Description

SQLite is a software library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine.

License

Public Domain

Upstream contact

- https://www.sqlite.org

Dependencies

- readline

Special Update/Build Instructions

- Use the autoconf version of sqlite.

Type

standard

Dependencies

- *readline: Command line editing library*

Version Information

package-version.txt:

```
3.36.0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  sqlite3
```

conda:

```
$ conda install  sqlite
```

cygwin:

```
$ apt-cyg install libsqlite3-devel sqlite3
```

Debian/Ubuntu:

```
$ sudo apt-get install  libsqlite3-dev sqlite3
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  sqlite-devel sqlite
```

freebsd:

```
$ sudo pkg install databases/sqlite3
```

gentoo:

```
$ sudo emerge dev-db/sqlite
```

homebrew:

```
$ brew install sqlite
```

macports: install the following packages: sqlite3

nix:

```
$ nix-env --install sqlite
```

opensuse:

```
$ sudo zypper install "pkgconfig(sqlite3)"
```

slackware:

```
$ sudo slackpkg install sqlite icu4c
```

void:

```
$ sudo xbps-install  sqlite-devel
```

See https://repology.org/project/sqlite/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.376 stack_data: Extract data from python stack frames and tracebacks for informative displays

Description

Extract data from python stack frames and tracebacks for informative displays

License

MIT

Upstream Contact

https://pypi.org/project/stack-data/

Type

standard

Dependencies

- $(PYTHON)
- *executing: Get the currently executing AST node of a frame, and other information*
- *asttokens: Annotate AST trees with source code positions*
- *pure_eval: Safely evaluate AST nodes without side effects*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.6.1
```

install-requires.txt:

```
stack-data
```

Equivalent System Packages

conda:

```
$ conda install  stack_data
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.377 suitesparse: A suite of sparse matrix software

SuiteSparse is a collection of software to deal with sparse matrix. It is hosted at http://faculty.cse.tamu.edu/davis/suitesparse.html

This spkg does a minimal install of suitesparse disabling the following

- metis
- GraphBLAS (need cmake)
- Mongoose (need cmake)

An external metis package can be used but we just disable its use.

Patches:

- The first patch disable the building of package using cmake.
- The second patch make sure we use sage's blas/lapack on OS X. By default suitesparse discard any configurations to use the accelerate framework.

The building of metis is diabled by passing MY_METIS_LIB=none to make (any value would have done) We also configure cholmod so it doesn't require metis by passing CHOLMOD_CONFIG=-DNPARTITION to make.

Other configurations are self explanatory.

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AMD/Doc/License.txt

BTF/Doc/License.txt

CAMD/Doc/License.txt

Availability:

http://www.suitesparse.com

CCOLAMD/Doc/License.txt

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LGPL Include/cholmod_io64.h LGPL Include/cholmod_matrixops.h part of MatrixOps module Include/cholmod_modify.h part of Modify module Include/cholmod_partition.h part of Partition module Include/cholmod_supernodal.h part of Supernodal module Include/cholmod_template.h LGPL

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Availability:

http://www.suitesparse.com

SuiteSparse_GPURuntime/Doc/License.txt

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Availability:

http://www.suitesparse.com

CSparse/MATLAB/ssget/Doc/License.txt

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Mongoose License

Type

standard

Dependencies

- $(BLAS)
- *gfortran: Fortran compiler from the GNU Compiler Collection*
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- $(MP_LIBRARY)

Version Information

package-version.txt:

```
5.10.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  suitesparse
```

conda:

```
$ conda install  suitesparse
```

cygwin:

```
$ apt-cyg install libsuitesparseconfig-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libsuitesparse-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  suitesparse suitesparse-devel
```

freebsd:

```
$ sudo pkg install math/suitesparse
```

gentoo:

```
$ sudo emerge sci-libs/amd sci-libs/cholmod sci-libs/suitesparseconfig sci-libs/umfpack
```

homebrew:

```
$ brew install suite-sparse
```

macports: install the following packages: SuiteSparse

opensuse:

```
$ sudo zypper install suitesparse-devel
```

void:

```
$ sudo xbps-install  SuiteSparse-devel
```

See https://repology.org/project/suitesparse/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.378 surf: Visualization of algebraic curves, algebraic surfaces and hyperplane sections of surfaces

Description

surf is a tool to visualize some real algebraic geometry: plane algebraic curves, algebraic surfaces and hyperplane sections of surfaces. surf is script driven and has (optionally) a nifty GUI using the Gtk widget set.

This is used by the Singular Jupyter kernel to produce 3D plots.

License

GPL version 2 or later

Upstream Contact

http://surf.sourceforge.net (although the project is essentially dead)

Dependencies

- cups (optional)
- GNU flex Version 2.5 or higher
- GTK+ Version 1.2.0 or higher (optional)
- POSIX Threads
- GNU MP(gmp) Version 2 or higher
- lib-tiff
- lib-jpeg
- zlib

- ps2pdf (optional)

This package is "experimental" because not all of these dependencies are packaged with Sage.

Type

experimental

Dependencies

- $(MP_LIBRARY)

Version Information

package-version.txt:

```
1.0.6-gcc6
```

Equivalent System Packages

opensuse:

```
$ sudo zypper install surf
```

See https://repology.org/project/surf-alggeo/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.379 surface_dynamics: dynamics on surfaces (measured foliations, interval exchange transformation, Teichmüller flow, etc)

Description

Dynamics on surfaces.

License

GPLv2+

Upstream Contact

https://gitlab.com/videlec/surface_dynamics https://pypi.org/project/surface-dynamics/

Type

optional

Dependencies

- $(PYTHON)
- *cysignals: Interrupt and signal handling for Cython*
- *pplpy: Python interface to the Parma Polyhedra Library*
- $(PYTHON_TOOLCHAIN)
- $(SAGERUNTIME)

Version Information

requirements.txt:

```
surface_dynamics
```

Equivalent System Packages

See https://repology.org/project/python:surface-dynamics/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.380 symengine: A C++ symbolic manipulation library

Description

SymEngine is a standalone fast C++ symbolic manipulation library.

License

BSD 3-clause

Upstream Contact

https://github.com/symengine/symengine

Type

optional

Dependencies

- $(MP_LIBRARY)
- *arb: Arbitrary-precision floating-point ball arithmetic*
- *ecm: Elliptic curve method for integer factorization*
- *flint: Fast Library for Number Theory*
- *mpc: Arithmetic of complex numbers with arbitrarily high precision and correct rounding*
- *mpfr: Multiple-precision floating-point computations with correct rounding*
- *cmake: A cross-platform build system generator*

Version Information

package-version.txt:

```
0.10.1
```

Equivalent System Packages

conda:

```
$ conda install  symengine
```

freebsd:

```
$ sudo pkg install math/symengine
```

gentoo:

```
$ sudo emerge sci-libs/symengine
```

macports: install the following packages: symengine

nix:

```
$ nix-env --install symengine
```

opensuse:

```
$ sudo zypper install symengine
```

See https://repology.org/project/symengine/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.381 symengine_py: Python wrappers for SymEngine

Description

Python wrappers for SymEngine

License

symengine.py is MIT licensed and uses several LGPL, BSD-3 and MIT licensed libraries

Upstream Contact

https://github.com/symengine/symengine.py

Type

experimental

Dependencies

- *symengine: A C++ symbolic manipulation library*
- $(PYTHON)
- *cmake: A cross-platform build system generator*
- *cython: C-Extensions for Python, an optimizing static compiler*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.10.0
```

install-requires.txt:

```
symengine.py >= 0.6.1
```

Equivalent System Packages

conda:

```
$ conda install  python-symengine
```

See https://repology.org/project/python:symengine/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.382 symmetrica: Library for representation theory

Description

Symmetrica is a Collection of C routines for representation theory.

It is a program developed by Lehrstuhl Mathematik II of the University of Bayreuth. It has routines to handle the following topics:

- ordinary representation theory of the symmetric group and related groups (2/11/04)
- ordinary representation theory of the classical groups
- modular representation theory of the symmetric group
- projective representation theory of the symmetric group
- combinatorics of tableaux
- symmetric functions and polynomials (7/22/04)
- commutative and non commutative Schubert polynomials
- operations of finite groups.
- ordinary representation theory of Hecke algebras of type A_n

For more details check http://www.algorithm.uni-bayreuth.de/en/research/SYMMETRICA

Updated package on https://gitlab.com/sagemath/symmetrica/-/releases with changes to modernize the source and the build system.

License

Public Domain (see the above web site)

Upstream Contact

- (passed away in 2013) Axel Kohnert - see http://www.mathe2.uni-bayreuth.de/axel/

Type

standard

Dependencies

- *xz: General-purpose data compression software*

Version Information

package-version.txt:

```
3.0.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  symmetrica
```

conda:

```
$ conda install  symmetrica
```

Debian/Ubuntu:

```
$ sudo apt-get install  libsymmetrica2-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  symmetrica-devel
```

freebsd:

```
$ sudo pkg install math/symmetrica
```

gentoo:

```
$ sudo emerge sci-libs/symmetrica
```

nix:

```
$ nix-env --install symmetrica
```

void:

```
$ sudo xbps-install  symmetrica-devel
```

See https://repology.org/project/symmetrica/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.383 sympow: Computes special values of symmetric power elliptic curve L-functions

Description

SYMPOW is a package to compute special values of symmetric power elliptic curve L-functions. It can compute up to about 64 digits of precision.

License

- See the file src/COPYING

Upstream Contact

SYMPOW does not appear to be maintained any longer. Mark Watkins, the package author, now works at Magma. Previous (possibly still usable) email is watkins@maths.usyd.edu.au

New upstream: https://gitlab.com/rezozer/forks/sympow

Dependencies

- GNU patch

Special Update/Build Instructions

- Some of the code is very dubious, and it is anyones guess really what the compiler does with it. For example, the following line exists in src/eulerfactors.c:

  if ((HECKE) && (d==1)) return hecke_good(p,ap,m,v);

  But since hecke_good is defined as returning void, it's hard to know exactly how this code behaves. I would not be surprised by any bugs that might show up. I (David Kirkby) would personally not trust this code much at all.
- This is a difficult package to maintain. A github issue (#9758) has been opened to implement Watkins-Delaunay's algorithm for computing modular degrees in Sage. Once implemented, it should be possible to remove this package.
- The package is configured such that the data files are in a directory below where 'sympow' is installed. If Sage is installed globally, then it will be impossible to create the data files without being root. This has been fixed in the Gentoo Linux distribution. Some information from Christopher can be seen on github issue #9703 This package will generate binary versions of all shipped datafiles, so these will work. However, creating totally new datafiles from scratch will not work.

Type

standard

Dependencies

- *pari: Computer algebra system for fast computations in number theory*

Version Information

package-version.txt:

```
2.023.6
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  sympow
```

conda:

```
$ conda install  sympow
```

Debian/Ubuntu:

```
$ sudo apt-get install  sympow
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  sympow
```

gentoo:

```
$ sudo emerge sci-mathematics/sympow
```

nix:

```
$ nix-env --install sympow
```

opensuse:

```
$ sudo zypper install sympow
```

void:

```
$ sudo xbps-install  sympow
```

See https://repology.org/project/sympow/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.384 sympy: Python library for symbolic mathematics

Description

SymPy is a Python library for symbolic mathematics. It aims to become a full-featured computer algebra system (CAS) while keeping the code as simple as possible in order to be comprehensible and easily extensible. SymPy is written entirely in Python and does not require any external libraries, except optionally for plotting support.

Website

https://sympy.org/

License

New BSD: http://www.opensource.org/licenses/bsd-license.php

Upstream Contact

sympy mailinglist: http://groups.google.com/group/sympy

Dependencies

- Python 2.5 or later

Special Update/Build Instructions

- A simple script can be used to ease the updating of the SPKG. See the README.

Type

standard

Dependencies

- $(PYTHON)
- *mpmath: Pure Python library for multiprecision floating-point arithmetic*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.12
```

install-requires.txt:

```
sympy >=1.6, <2.0
```

Equivalent System Packages

conda:

```
$ conda install  sympy
```

macports: install the following packages: py-sympy

void:

```
$ sudo xbps-install  python3-sympy
```

See https://repology.org/project/python:sympy/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.385 tachyon: A ray tracing system

Description

Tachyon is a raytracer developed by John E. Stone. Tachyon supports the typical ray tracer features, most of the common geometric primitives, shading and texturing modes, etc. It also supports less common features such as HDR image output, ambient occlusion lighting, and support for various triangle mesh and volumetric texture formats beneficial for molecular visualization (e.g. rendering VMD scenes).

Currently not all of Tachyon's functionality is exported by the Sage interface.

License

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Upstream Contact

- http://jedi.ks.uiuc.edu/~johns/raytracer/
- http://www.photonlimited.com/~johns/raytracer/
- John Stone <johns@ks.uiuc.edu>

Dependencies

This spkg depends on:

- libpng

Special Update/Build Instructions

- Delete the scenes directory, which has lots of cool examples.
- Delete the msvc directory, which is also large and not used within Sage.
- The CVS subdirectories are currently (almost) empty, but should otherwise be deleted.
- The upstream files had strange permissions, i.e. some source files were executable, while almost all files weren't world-readable.
- There's seems to be some crap like `tachyon.html.tar.gz` and a few `.#*` files I haven't [yet] deleted, since they're not that large.
- TODO: Check whether building multi-threaded versions on MacOS X meanwhile works. (This was said to fail with an old beta.)
- TODO: Use `patch` instead of copying over pre-patched files.
- TODO: [Optionally] also install some of the documentation.
- TODO: I doubt the CFLAGS set for AIX and HP-UX won't get overridden by the created Makefile, but that's a minor issue. -leif

Type

standard

Dependencies

- *libpng: Bitmap image support*

Version Information

package-version.txt:

```
0.98.9.p7
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  tachyon
```

conda:

```
$ conda install  tachyon
```

Debian/Ubuntu:

```
$ sudo apt-get install  tachyon
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  tachyon tachyon-devel
```

freebsd:

```
$ sudo pkg install graphics/tachyon
```

gentoo:

```
$ sudo emerge media-gfx/tachyon
```

nix:

```
$ nix-env --install tachyon
```

opensuse:

```
$ sudo zypper install tachyon
```

void:

```
$ sudo xbps-install  tachyon
```

See https://repology.org/project/tachyon/versions, https://repology.org/project/tachyon-opengl/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.386 tdlib: Algorithms for computing tree decompositions

Description

Providing algorithms concerning treedecompositions

website: https://github.com/freetdi/tdlib

License

GNU General Public License v2

SPKG Maintainers

Lukas Larisch (lukas.larisch@kaust.edu.sa)

Upstream Contact

- Lukas Larisch (lukas.larisch@kaust.edu.sa)
- git-repo: https://github.com/freetdi/tdlib

Dependencies

- None

Type

optional

Dependencies

Version Information

package-version.txt:

```
0.3.1.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  tdlib
```

See https://repology.org/project/python:tdlib/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.387 terminado: Tornado websocket backend for the term.js Javascript terminal emulator library

Description

This is a Tornado websocket backend for the term.js Javascript terminal emulator library.

It evolved out of pyxterm, which was part of GraphTerm (as lineterm.py), v0.57.0 (2014-07-18), and ultimately derived from the public-domain Ajaxterm code, v0.11 (2008-11-13) (also on Github as part of QWeb).

Type

standard

Dependencies

- $(PYTHON)
- *ptyprocess: Python interaction with subprocesses in a pseudoterminal*
- *tornado: Python web framework and asynchronous networking library*
- $(PYTHON_TOOLCHAIN)
- *hatchling: Modern, extensible Python build backend*

Version Information

package-version.txt:

```
0.17.0
```

install-requires.txt:

```
terminado >=0.8.3
```

Equivalent System Packages

conda:

```
$ conda install  terminado
```

macports: install the following packages: py-terminado

void:

```
$ sudo xbps-install  python3-terminado
```

See https://repology.org/project/terminado/versions, https://repology.org/project/python:terminado/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.388 texlive: A comprehensive TeX system

Description

TeX Live is an easy way to get up and running with the TeX document production system. It provides a comprehensive TeX system with binaries for most flavors of Unix, including GNU/Linux, and also Windows. It includes all the major TeX-related programs, macro packages, and fonts that are free software, including support for many languages around the world.

This package installs all texlive packages required to build Sage. If necessary, texlive itself is installed.

License

Various FSF-approved free software licenses. See https://www.tug.org/texlive/copying.html for details.

Upstream Contact

Home page: https://www.tug.org/texlive

Dependencies

- python

Special Update/Build Instructions

This package requires internet access to download texlive packages for the TeX mirrors.

Type

optional

Dependencies

Version Information

Equivalent System Packages

alpine: install the following packages: texlive

arch:

```
$ sudo pacman -S  texlive-core texlive-latexextra texlive-langjapanese texlive-
↪langcyrillic
```

cygwin:

```
$ apt-cyg install texlive
```

Debian/Ubuntu:

```
$ sudo apt-get install  texlive-latex-extra texlive-xetex latexmk dvipng tex-gyre␣
↪texlive-fonts-recommended texlive-lang-cyrillic texlive-lang-english texlive-lang-
↪european texlive-lang-french texlive-lang-german texlive-lang-italian texlive-lang-
↪japanese texlive-lang-polish texlive-lang-portuguese texlive-lang-spanish
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  latexmk texlive texlive-collection-latexextra texlive-collection-
↪langcyrillic texlive-collection-langeuropean texlive-collection-langfrench texlive-
↪collection-langgerman texlive-collection-langitalian texlive-collection-langjapanese␣
↪texlive-collection-langpolish texlive-collection-langportuguese texlive-collection-
↪langspanish
```

gentoo:

```
$ sudo emerge dev-tex/latexmk app-text/texlive app-text/dvipng dev-texlive/texlive-
↪langcjk dev-texlive/texlive-langcyrillic dev-texlive/texlive-langenglish dev-texlive/
↪texlive-langeuropean dev-texlive/texlive-langfrench dev-texlive/texlive-langgerman dev-
↪texlive/texlive-langitalian dev-texlive/texlive-langjapanese dev-texlive/texlive-
↪langportuguese dev-texlive/texlive-langspanish dev-texlive/texlive-latexextra dev-
↪texlive/texlive-latexrecommended dev-texlive/texlive-mathscience
```

macports: install the following packages: texlive

opensuse:

```
$ sudo zypper install texlive
```

slackware:

```
$ sudo slackpkg install texlive
```

void:

```
$ sudo xbps-install  texlive
```

See https://repology.org/project/texlive/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.389 texttable: Python module for creating simple ASCII tables

Description

Python module for creating simple ASCII tables

License

MIT License (MIT)

Upstream Contact

https://github.com/foutaise/texttable/

Dependencies

- python

Special Update/Build Instructions

Type

optional

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.6.7
```

install-requires.txt:

```
texttable >=1.6.3
```

Equivalent System Packages

conda:

```
$ conda install  texttable
```

macports: install the following packages: py-texttable

void:

```
$ sudo xbps-install  python3-texttable
```

See https://repology.org/project/texttable/versions, https://repology.org/project/python:texttable/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.390 threejs: JavaScript library to display 3D graphics in the browser

Description

Three.js is a JavaScript library to display 3D graphics in the browser.

License

MIT License

Upstream Contact

Home page: http://threejs.org

Dependencies

None.

Special Update/Build Instructions

None.

Type

standard

Dependencies

Version Information

package-version.txt:

```
r122.p0
```

Equivalent System Packages

conda:

```
$ conda install  threejs-sage=122.*
```

See https://repology.org/project/threejs/versions, https://repology.org/project/threejs-sage/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.391 tides: Integration of ODEs

Description

TIDES is a library for integration of ODEs with high precision.

License

GPLv3+

Upstream Contact

- Marcos Rodriguez (marcos@unizar.es)

Dependencies

- gcc
- mpfr
- gmp

Special Update/Build Instructions

minc_tides.patch changes the size of the name of the temporal files, so there is no problem in systems that use long names. Also solves a bug in the inverse function.

Type

optional

Dependencies

- $(MP_LIBRARY)
- *mpfr: Multiple-precision floating-point computations with correct rounding*

Version Information

package-version.txt:

```
2.0.p0
```

Equivalent System Packages

See https://repology.org/project/tides/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.392 tinycss2: A tiny CSS parser

Description

A tiny CSS parser

License

Upstream Contact

https://pypi.org/project/tinycss2/

Type

standard

Dependencies

- $(PYTHON)
- *webencodings: Character encoding aliases for legacy web content*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.2.1
```

install-requires.txt:

```
tinycss2
```

Equivalent System Packages

conda:

```
$ conda install  tinycss2
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.393 toml: Python Library for Tom's Obvious, Minimal Language

Description

Python Library for Tom's Obvious, Minimal Language

License

MIT

Upstream Contact

https://pypi.org/project/toml/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.10.2
```

install-requires.txt:

```
toml
```

Equivalent System Packages

conda:

```
$ conda install  toml
```

void:

```
$ sudo xbps-install  python3-toml
```

If the system package is installed, ./configure will check whether it can be used.

6.1.394 tomli: A lil' TOML parser

Description

A lil' TOML parser

License

Upstream Contact

https://pypi.org/project/tomli/

Type

standard

Dependencies

- $(PYTHON)
- *pip: Tool for installing and managing Python packages*
- *flit_core: Distribution-building parts of Flit. See flit package for more information*

Version Information

package-version.txt:

```
2.0.1
```

install-requires.txt:

```
tomli
```

Equivalent System Packages

conda:

```
$ conda install  tomli
```

void:

```
$ sudo xbps-install  python3-tomli
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.395 tomlkit: Style preserving TOML library

Description

Style preserving TOML library

License

MIT

Upstream Contact

https://pypi.org/project/tomlkit/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *poetry_core: Poetry PEP 517 Build Backend*

Version Information

package-version.txt:

```
0.11.6
```

install-requires.txt:

```
tomlkit
```

Equivalent System Packages

conda:

```
$ conda install  tomlkit
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.396 topcom: Compute triangulations of point configurations and oriented matroids

Description

TOPCOM is a collection of clients to compute Triangulations Of Point Configurations and Oriented Matroids, resp.

The algorithms use only combinatorial data of the point configuration as is given by its oriented matroid. Some basic commands for computing and manipulating oriented matroids can also be accessed by the user.

It was very much inspired by the maple program PUNTOS, which was written by Jesus de Loera. TOPCOM is entirely written in C++, so there is a significant speed up compared to PUNTOS.

License

GPL v2

Upstream Contact

```
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http://www.rambau.wm.uni-bayreuth.de
```

Dependencies

- gmp, libcdd

Special Update/Build Instructions

See spkg-src

Type

optional

Dependencies

- *cddlib: Double description method for polyhedral representation conversion*

Version Information

package-version.txt:

```
1.1.2
```

Equivalent System Packages

See https://repology.org/project/topcom/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.397 tornado: Python web framework and asynchronous networking library

Description

Python web framework and asynchronous networking library

License

Apache License

Upstream Contact

Home page: http://www.tornadoweb.org

Dependencies

Python

Type

standard

Dependencies

- $(PYTHON)
- *certifi: Python package for providing Mozilla's CA Bundle*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
6.2
```

install-requires.txt:

```
tornado >=6.0.4
```

Equivalent System Packages

conda:

```
$ conda install  tornado
```

macports: install the following packages: py-tornado

opensuse:

```
$ sudo zypper install python3-tornado
```

void:

```
$ sudo xbps-install  python3-tornado
```

See https://repology.org/project/python:tornado/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.398 tox: tox is a generic virtualenv management and test command line tool

Description

tox is a generic virtualenv management and test command line tool

License

MIT

Upstream Contact

https://pypi.org/project/tox/

Type

standard

Dependencies

- $(PYTHON)
- *packaging: Core utilities for Python packages*
- *six: Python 2 and 3 compatibility utilities*
- *filelock: A platform independent file lock*
- *pluggy: plugin and hook calling mechanisms for python*
- *py: library with cross-python path, ini-parsing, io, code, log facilities*
- *toml: Python Library for Tom's Obvious, Minimal Language*
- *virtualenv: Virtual Python Environment builder*
- *importlib_metadata: Library to access the metadata for a Python package*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.27.0
```

install-requires.txt:

```
tox >= 3.21.4
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  python-tox
```

conda:

```
$ conda install  tox
```

Debian/Ubuntu:

```
$ sudo apt-get install  tox
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  tox
```

freebsd:

```
$ sudo pkg install tox
```

gentoo:

```
$ sudo emerge dev-python/tox
```

homebrew:

```
$ brew install tox
```

macports: install the following packages: py-tox

slackware:

```
$ sudo slackpkg install tox
```

void:

```
$ sudo xbps-install  tox
```

See https://repology.org/project/python:tox/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.399 traitlets: Traitlets Python configuration system

Description

Traitlets Python configuration system

License

BSD

Upstream Contact

https://pypi.org/project/traitlets/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)
- *ipython_genutils: Vestigial utilities from IPython*
- *decorator: Python library providing decorators*
- *six: Python 2 and 3 compatibility utilities*
- *hatchling: Modern, extensible Python build backend*

Version Information

package-version.txt:

```
5.5.0
```

install-requires.txt:

```
traitlets >=4.3.3
```

Equivalent System Packages

conda:

```
$ conda install  traitlets
```

macports: install the following packages: py-traitlets

opensuse:

```
$ sudo zypper install python3-traitlets
```

void:

```
$ sudo xbps-install  python3-traitlets
```

See https://repology.org/project/traitlets/versions, https://repology.org/project/python:traitlets/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.400 typing_extensions: Backported and Experimental Type Hints for Python 3.5+

Description

Backported and Experimental Type Hints for Python 3.5+

License

PSF

Upstream Contact

https://pypi.org/project/typing-extensions/

Type

standard

Dependencies

- $(PYTHON)
- *flit_core: Distribution-building parts of Flit. See flit package for more information*

Version Information

package-version.txt:

```
4.5.0
```

install-requires.txt:

```
# According to https://github.com/python/typing_extensions/blob/main/CHANGELOG.md,
# version 4.4.0 adds another Python 3.11 typing backport
typing_extensions >= 4.4.0
```

Equivalent System Packages

conda:

```
$ conda install  typing_extensions
```

void:

```
$ sudo xbps-install  python3-typing_extensions
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.401 tzdata: Provider of IANA time zone data

Description

Provider of IANA time zone data

License

Apache-2.0

Upstream Contact

https://pypi.org/project/tzdata/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2022.6
```

install-requires.txt:

```
tzdata
```

Equivalent System Packages

conda:

```
$ conda install  tzdata
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.402 tzlocal: Python timezone information for the local timezone

Description

tzinfo object for the local timezone

Type

standard

Dependencies

- $(PYTHON)
- *backports_zoneinfo: Backport of the standard library zoneinfo module*
- *pytz_deprecation_shim: Shims to make deprecation of pytz easier*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
4.2
```

install-requires.txt:

```
tzlocal >=2.1
```

Equivalent System Packages

conda:

```
$ conda install  tzlocal
```

macports: install the following packages: py-tzlocal

opensuse:

```
$ sudo zypper install python3-tzlocal
```

void:

```
$ sudo xbps-install  python3-tzlocal
```

See https://repology.org/project/tzlocal/versions, https://repology.org/project/python:tzlocal/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.403 urllib3: HTTP library with thread-safe connection pooling, file post, and more.

Description

HTTP library with thread-safe connection pooling, file post, and more.

License

MIT

Upstream Contact

https://pypi.org/project/urllib3/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
1.26.12
```

install-requires.txt:

```
urllib3
```

Equivalent System Packages

conda:

```
$ conda install  urllib3
```

void:

```
$ sudo xbps-install  python3-urllib3
```

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.404 valgrind: Memory error detector, call graph generator, runtime profiler

Description

This is an optional spkg. It supports Linux on x86, x86-64, ppc, ppc64 and ARM as well as Darwin (Mac OS X 10.5 and 10.6) on x86 and x86-64.

Valgrind is an instrumentation framework for building dynamic analysis tools. There are Valgrind tools that can automatically detect many memory management and threading bugs, and profile your programs in detail. You can also use Valgrind to build new tools.

The Valgrind distribution currently includes six production-quality tools: a memory error detector, two thread error detectors, a cache and branch-prediction profiler, a call-graph generating cache and branch-prediction profiler, and a heap profiler. It also includes three experimental tools: a heap/stack/global array overrun detector, a second heap profiler that examines how heap blocks are used, and a SimPoint basic block vector generator. It runs on the following platforms: X86/Linux, AMD64/Linux, ARM/Linux, PPC32/Linux, PPC64/Linux, S390X/Linux, ARM/Android (2.3.x), X86/Darwin and AMD64/Darwin (Mac OS X 10.6 and 10.7).

License

Valgrind is Open Source / Free Software, and is freely available under the GNU General Public License, version 2.

Upstream Contact

- http://www.valgrind.org/
- valgrind-user, valgrind-devel mailing lists

Dependencies

- None

Special Build Instructions

- To build on OS X, you need to use Apple's compiler. FSF GCC is unsupported.

Patches

- None.

Type

experimental

Dependencies

Version Information

package-version.txt:

```
3.14.0
```

Equivalent System Packages

homebrew:

```
$ brew install valgrind
```

macports: install the following packages: valgrind

opensuse:

```
$ sudo zypper install valgrind
```

void:

```
$ sudo xbps-install  valgrind
```

See https://repology.org/project/valgrind/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see github issue #27330

6.1.405 vcversioner: Python build system extension to obtain package version from version control

Description

Write a setup.py with no version information specified, and vcversioner will find a recent, properly-formatted VCS tag and extract a version from it.

License

Python Software Foundation License

Upstream Contact

Home page: https://pypi.python.org/pypi/vcversioner/

Dependencies

Python, Setuptools

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
2.16.0.0.p0
```

install-requires.txt:

```
vcversioner >=2.16.0.0
```

Equivalent System Packages

conda:

```
$ conda install  vcversioner
```

macports: install the following packages: py-vcversioner

opensuse:

```
$ sudo zypper install python3-vcversioner
```

See https://repology.org/project/vcversioner/versions, https://repology.org/project/python:vcversioner/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.406 virtualenv: Virtual Python Environment builder

Description

Virtual Python Environment builder

License

MIT

Upstream Contact

https://pypi.org/project/virtualenv/

Type

standard

Dependencies

- $(PYTHON)
- *appdirs: A small Python module for determining appropriate platform-specific dirs, e.g. a "user data dir".*
- *distlib: Distribution utilities*
- *filelock: A platform independent file lock*
- *six: Python 2 and 3 compatibility utilities*
- *importlib_metadata: Library to access the metadata for a Python package*
- *importlib_resources: Read resources from Python packages*
- *platformdirs: A small Python module for determining appropriate platform-specific dirs, e.g. a "user data dir".*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
20.16.6
```

install-requires.txt:

```
virtualenv
```

Equivalent System Packages

conda:

```
$ conda install  virtualenv
```

void:

```
$ sudo xbps-install  python3-virtualenv
```

If the system package is installed, ./configure will check whether it can be used.

6.1.407 wcwidth: Measures the displayed width of unicode strings in a terminal

Description

Measures the displayed width of unicode strings in a terminal

License

MIT

Upstream Contact

https://pypi.org/project/wcwidth/

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.2.5
```

install-requires.txt:

```
wcwidth >=0.1.7
```

Equivalent System Packages

conda:

```
$ conda install  wcwidth
```

macports: install the following packages: py-wcwidth

opensuse:

```
$ sudo zypper install python3-wcwidth
```

void:

```
$ sudo xbps-install  python3-wcwidth
```

See https://repology.org/project/wcwidth/versions, https://repology.org/project/python:wcwidth/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.408 webencodings: Character encoding aliases for legacy web content

Description

Character encoding aliases for legacy web content.

License

BSD License

Upstream Contact

Home Page: https://github.com/gsnedders/python-webencodings

Dependencies

Python

Type

standard

Dependencies

- $(PYTHON)
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
0.5.1
```

install-requires.txt:

```
webencodings >=0.5.1
```

Equivalent System Packages

conda:

```
$ conda install  webencodings
```

macports: install the following packages: py-webencodings

opensuse:

```
$ sudo zypper install python3-webencodings
```

void:

```
$ sudo xbps-install  python3-webencodings
```

See https://repology.org/project/python:webencodings/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.409 wheel: A built-package format for Python

Description

A built-package format for Python

License

MIT

Upstream Contact

https://pypi.org/project/wheel/

Type

standard

Dependencies

- $(PYTHON)
- *setuptools: Build system for Python packages*

Version Information

package-version.txt:

```
0.38.4
```

install-requires.txt:

```
# :issue:`31050` - version constraint for macOS Big Sur support
wheel >=0.36.2
```

Equivalent System Packages

conda:

```
$ conda install  wheel
```

macports: install the following packages: py-wheel

opensuse:

```
$ sudo zypper install python3-wheel
```

void:

```
$ sudo xbps-install  python3-wheel
```

See https://repology.org/project/wheel/versions, https://repology.org/project/python:wheel/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.410 widgetsnbextension: Jupyter notebook extension for interactive HTML widgets

Description

Interactive HTML widgets for Jupyter notebooks.

Type

standard

Dependencies

- $(PYTHON)
- *jupyter_packaging: Jupyter Packaging Utilities*
- $(PYTHON_TOOLCHAIN)
- *jupyter_core: Jupyter core package*

Version Information

package-version.txt:

```
4.0.3
```

install-requires.txt:

```
widgetsnbextension >=3.5.1
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  jupyter-widgetsnbextension
```

conda:

```
$ conda install  widgetsnbextension
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  python-widgetsnbextension
```

freebsd:

```
$ sudo pkg install devel/py-widgetsnbextension
```

gentoo:

```
$ sudo emerge dev-python/widgetsnbextension
```

macports: install the following packages: py-widgetsnbextension

opensuse:

```
$ sudo zypper install jupyter-widgetsnbextension
```

void:

```
$ sudo xbps-install  python3-jupyter_widgetsnbextension
```

See https://repology.org/project/python:widgetsnbextension/versions, https://repology.org/project/jupyter-widgetsnbextension/versions, https://repology.org/project/python:jupyter-widgetsnbextension/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.411 xz: General-purpose data compression software

Description

XZ Utils is free general-purpose data compression software with a high compression ratio.

License

Some parts public domain, other parts GNU LGPLv2.1, GNU GPLv2, or GNU GPLv3.

Upstream Contact

http://tukaani.org/xz/

Dependencies

Type

standard

Dependencies

Version Information

package-version.txt:

```
5.2.5
```

Equivalent System Packages

conda:

```
$ conda install  xz
```

cygwin:

```
$ apt-cyg install xz
```

Debian/Ubuntu:

```
$ sudo apt-get install  xz-utils
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  xz
```

homebrew:

```
$ brew install xz
```

macports: install the following packages: xz

opensuse:

```
$ sudo zypper install xz
```

slackware:

```
$ sudo slackpkg install xz
```

void:

```
$ sudo xbps-install  xz
```

See https://repology.org/project/xz/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.412 zeromq: A modern networking library

Description

A modern networking library. Also known as 0mq or zmq. The same API is provided by http://www.crossroads.io, though we currently use the http://www.zeromq.org implementation.

License

LGPLv3+

Upstream Contact

http://www.zeromq.org

Dependencies

A working compiler.

Special Update/Build Instructions

N/A

Type

standard

Dependencies

Version Information

package-version.txt:

```
4.3.4
```

Equivalent System Packages

arch:

```
$ sudo pacman -S  zeromq
```

conda:

```
$ conda install  zeromq
```

cygwin:

```
$ apt-cyg install libzmq-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libzmq3-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  zeromq zeromq-devel
```

freebsd:

```
$ sudo pkg install net/libzmq4
```

gentoo:

```
$ sudo emerge net-libs/zeromq
```

homebrew:

```
$ brew install zeromq
```

macports: install the following packages: zmq-devel

opensuse:

```
$ sudo zypper install "pkgconfig(libzmq)"
```

void:

```
$ sudo xbps-install  zeromq-devel
```

See https://repology.org/project/zeromq/versions

If the system package is installed, ./configure will check whether it can be used.

6.1.413 zipp: A pathlib-compatible zipfile object wrapper

Description

A pathlib-compatible Zipfile object wrapper. A backport of the Path object.

License

MIT License

Upstream Contact

Home page: https://github.com/jaraco/zipp

Dependencies

Python, Setuptools

Type

standard

Dependencies

- $(PYTHON)
- *vcversioner: Python build system extension to obtain package version from version control*
- $(PYTHON_TOOLCHAIN)

Version Information

package-version.txt:

```
3.11.0
```

install-requires.txt:

```
zipp >=0.5.2
```

Equivalent System Packages

conda:

```
$ conda install  zipp
```

macports: install the following packages: py-zipp

void:

```
$ sudo xbps-install  python3-zipp
```

See https://repology.org/project/python:zipp/versions

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see github issue #29023

6.1.414 zlib: Data compression library

Description

Massively Spiffy Yet Delicately Unobtrusive Compression Library (Also Free, Not to Mention Unencumbered by Patents)

License

- Modified BSD.

Upstream Contact

- http://www.zlib.net/

Special Update/Build Instructions

Patches

- cygwin_symbols.patch: remove undefined symbols on Cygwin.

Type

standard

Dependencies

Version Information

package-version.txt:

```
1.2.11.p0
```

Equivalent System Packages

conda:

```
$ conda install  zlib
```

cygwin:

```
$ apt-cyg install zlib-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install  libz-dev
```

Fedora/Redhat/CentOS:

```
$ sudo yum install  zlib-devel
```

homebrew:

```
$ brew install zlib
```

macports: install the following packages: zlib

opensuse:

```
$ sudo zypper install "pkgconfig(zlib)"
```

slackware:

```
$ sudo slackpkg install zlib
```

void:

```
$ sudo xbps-install  zlib-devel
```

See https://repology.org/project/zlib/versions

If the system package is installed, ./configure will check whether it can be used.

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