1  Standard Packages  
2  Optional Packages  
3  Experimental Packages  
4  Detailed Listing of External 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 OS X
- arb: Arbitrary-precision floating-point ball arithmetic
- argon2_cffi: The secure Argon2 password hashing algorithm
- attrs: Decorator for Python classes with attributes
- babel: Internationalization utilities for Python
- backcall: Specifications for callback functions
- 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
- cliquer: Routines for clique searching
- cmake: A cross-platform build system generator
- combinatorial_designs: Data from the Handbook of Combinatorial Designs
- conway_polynomials: Tables of Conway polynomials over finite fields
- 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
• 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
• elliptic_curves: Databases of elliptic curves
• entrypoints: Discover and load entry points from installed Python packages
• fflas_ffpack: Dense linear algebra over word-size finite fields
• filelock: A platform independent file lock
• flint: Fast Library for Number Theory
• flintqs: Multi-polynomial quadratic sieve for integer factorization
• fplll: Lattice algorithms, including LLL with floating-point orthogonalization
• fpylll: Python interface for FPLLL
• freetype: A free, high-quality, and portable font engine
• gap: Groups, Algorithms, Programming - a system for computational discrete algebra
• gc: The Boehm-Demers-Weiser conservative garbage collector
• gcc: The GNU Compiler Collection, including the C, C++ and Fortran compiler
• 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
• graphs: A database of combinatorial graphs
• gsl: The GNU Scientific Library
• html5lib: An HTML parser
• iconv: Library for language/country-dependent character encodings
• 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
• 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
• 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
• libpng: Bitmap image support
• linbox: Linear algebra with dense, sparse, structured matrices over the integers and finite fields
• lrcalc: 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
• maxima: System for manipulating symbolic and numerical expressions
• MemoryAllocator: An extension class to allocate memory easily with cython.
• mistune: A markdown parser in pure Python
• mpc: Arithmetic of complex numbers with arbitrarily high precision and correct rounding
• mpfr: Multiple precision floating-point computations with correct rounding
• mpir: Multiple precision integers and rationals (fork of GMP)
• mpmath: Pure Python library for multiprecision floating-point arithmetic
• nauty: Find automorphism groups of graphs, generate non-isomorphic graphs
• nbconvert: Converting Jupyter Notebooks
• nbformat: Base implementation of the Jupyter notebook format
• ncurses: Classic terminal output library
• networkx: Python package for complex networks
• nose: Python unit testing framework
• 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
• pcre: Perl-compatible regular expressions library
• pexpect: Python module for controlling and automating other programs
• pickleshare: A ‘shelf’ 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
• pluggy: Plugin and hook calling mechanisms for python
• polytopes_db: Databases of 2- and 3-dimensional reflexive polytopes
• ppl: Parma Polyhedra Library
• pplpy: Python interface to the Parma Polyhedra Library
• prometheus_client: Python client for the systems monitoring and alerting toolkit Prometheus
• prompt_toolkit: Interactive command lines for Python
• psutil: Python library to retrieve information on processes and system utilization
• ptyprocess: Python interaction with subprocesses in a pseudoterminal
• 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
- pynac: A fork of the symbolic computation software GiNaC that uses Python objects
- pyparsing: A Python parsing module
- pyrsistent: Persistent data structures in Python
- python3: The Python programming language
- pytz: Timezone definitions for Python
- pyzmq: Python bindings for the zeromq networking library
- r: A free software environment for statistical computing and graphics
- ratpoints: Find rational points on hyperelliptic curves
- 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
- Sage: Open Source Mathematics Software: Build system of the Sage documentation
- 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
- scandir: Fast file system iteration for Python
- 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_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
- sphinx: Python documentation generator
- 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
• suitesparse: A suite of sparse matrix software
• symmetrics: 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
• testpath: Testing utilities for filesystem-related code
• thebe: Add live Jupyter interaction to static websites
• threejs: JavaScript library to display 3D graphics in the browser
• toml: Python Library for Tom’s Obvious, Minimal Language
• tornado: Python web framework and asynchronous networking library
• tox: tox is a generic virtualenv management and test command line tool
• traitlets: A configuration system for Python applications
• typing_extensions: Backported and Experimental Type Hints for Python 3.5+
• tzlocal: Python timezone information for the local timezone
• vcversioner: Python build system extension to obtain package version from version control
• virtualenv: Virtual Python Environment builder
• wcwidth: Python support for wide characters 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
• yasm: An assembler for the x86 and AMD64 instruction sets
• zeromq: A modern networking library
• zipp: A pathlib-compatible zipfile object wrapper
• zlib: Data compression library
• zn_poly: C library for polynomial arithmetic in Z/nZ[x]
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
- **_recommended**: Represents system packages recommended for additional functionality
- **admcycles**: Computation in the tautological ring of the moduli space of curves
- **atlas**: Automatically Tuned Linear Algebra Software (BLAS implementation)
- **barvinok**: Projections of integer point sets of parametric polytopes
- **beautifulsoup4**: A screen-scraping library
- **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 occurring in the Cunningham table
- **d3js**: JavaScript library for manipulating documents based on data
- **database_cremona_ellcurve**: Database of elliptic curves
- **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
- **dot2tex**: Create PGF/TikZ commands from Graphviz output
- **e_antic**: Real embedded number fields
- **fricas**: A general purpose computer algebra system
- **froby**: Computations on monomial ideals
- **gap_jupyter**: Jupyter kernel for GAP
- **gap_packages**: A collection of GAP packages
- **git**: Version control system
- **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
- **ipympl**: Matplotlib Jupyter Extension
- **isl**: Sets and relations of integer points bounded by affine constraints
- **jupymake**: A Python wrapper for the polymake shell
- **jupyter_packaging**: Jupyter Packaging Utilities
- **jupyterlab**: An extensible environment for interactive and reproducible computing
- **jupyterlab_widgets**: A JupyterLab extension for Jupyter/IPython widgets
- **kenzo**: Construct topological spaces and compute homology groups
- **latte_int**: Count lattice points, compute volumes, and integrate over convex polytopes
- **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
- **mcqd**: An exact algorithm for finding a maximum clique in an undirected graph
- **meataxe**: Library for computing with modular representations
- **mpfrcx**: Arithmetic of univariate polynomials over arbitrary precision real or complex numbers
- **nibabel**: Access a multitude of neuroimaging data formats
- **ninja_build**: A build system with a focus on speed
- **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
• ore_algebra: Ore algebra
• p_group_cohomology: Modular cohomology rings of finite groups
• pandoc: A document converter
• pandoc_attributes: A parser and generator for pandoc block attributes
• pari_elldata: PARI data package for elliptic curves
• pari_galpol: PARI data package for polynomials defining Galois extensions of the rationals
• pari_jupyter: 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)
• perl_cpan_polymake_prereq: Represents all Perl packages that are prerequisites for polymake
• perl_mongodb: A prerequisite for polymake’s PolyDB feature
• plantri: Generate non-isomorphic sphere-embedded graphs
• polylib: Operations on unions of polyhedra
• polytopes_db_4d: Database of 4-dimensional reflexive polytopes
• primecount: Algorithms for counting primes
• pybtex: A BibTeX-compatible bibliography processor in Python
• pycosat: SAT solver picosat with Python bindings
• pyflakes: Passive checker of Python programs
• pygraphviz: Python interface to Graphviz
• pynormaliz: Python bindings for the normaliz library
• pyopenssl: Python wrapper module around the OpenSSL library
• pysingular: A basic Python interface to Singular
• pytest: Simple powerful testing with Python
• python_igraph: Python bindings for igraph
• pyx: Generate PostScript, PDF, and SVG files in Python
• qhull: Compute convex hulls, Delaunay triangulations, Voronoi diagrams
• r_jupyter: Jupyter kernel for R
• 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
• singular_jupyter: Jupyter kernel for Singular
• **sip**: Python extension module generator for C and C++ libraries
• **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
• **speaklater**: Lazy strings for Python
• **sqlalchemy**: A database abstraction library
• **surface_dynamics**: dynamics on surfaces (measured foliations, interval exchange transformation, Teichmüller flow, etc)
• **symengine**: A C++ symbolic manipulation library
• **symengine_py**: Python wrappers for SymEngine
• **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
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
- **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
- **perl_term_readline_gnu**: Perl extension for the GNU Readline/History libraries
- **polymake**: Computations with polyhedra, fans, simplicial complexes, matroids, graphs, tropical hypersurfaces
- **qepcad**: Quantifier elimination by partial cylindrical algebraic decomposition
- **scipoptsuite**: Mixed integer programming solver
- **surf**: Visualization of algebraic curves, algebraic surfaces and hyperplane sections of surfaces
- **valgrind**: Memory error detector, call graph generator, runtime profiler
DETAILED LISTING OF EXTERNAL PACKAGES

4.1 External Packages (alphabetical order)

4.1.1 4ti2: Algebraic, geometric and combinatorial problems on linear spaces

Description
A software package for algebraic, geometric and combinatorial problems on linear spaces. Available at www.4ti2.de.

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

Dependencies
GLPK, GMP.

Type
optional
Version Information

package-version.txt:

1.6.7.p0

Equivalent System Packages

conda:

$ conda install 4ti2

opensuse:

$ sudo zypper install 4ti2

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

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.2 _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

Version Information

Equivalent System Packages

arch:

$ sudo pacman -S gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure

conda:

$ conda install gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure

cygwin:

$ apt-cyg install gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure
Debian/Ubuntu:

```bash
$ sudo apt-get install gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure
```

Fedora/Redhat/CentOS:

```bash
$ sudo yum install gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure
```

freebsd:

```bash
$ sudo pkg install gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure
```

gentoo:

```bash
$ sudo emerge gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure
```

homebrew:

```bash
$ brew install gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure
```

nix:

```bash
$ nix-env --install gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure
```

opensuse:

```bash
$ sudo zypper install gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure
```

slackware:

```bash
$ sudo slackpkg install gettext autoconf automake libtool pkg-config gettext-devel xtools mk-configure
```

void:

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

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330
4.1.3 `_prereq`: Represents system packages required for installing SageMath from source

Description

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

Type

standard

Version Information

Equivalent System Packages

arch:

$ sudo pacman -S binutils make m4 perl python3 tar bc gcc which

conda:

$ conda install binutils make m4 perl python3 tar bc gcc which

cygwin:

$ apt-cyg install binutils make m4 perl python3 tar bc gcc which

Debian/Ubuntu:

$ sudo apt-get install binutils make m4 perl python3 tar bc gcc which

Fedora/Redhat/CentOS:

$ sudo yum install binutils make m4 perl python3 tar bc gcc which

freebsd:

$ sudo pkg install binutils make m4 perl python3 tar bc gcc which

gentoo:

$ sudo emerge binutils make m4 perl python3 tar bc gcc which

homebrew:

$ brew install binutils make m4 perl python3 tar bc gcc which

nix:

$ nix-env --install binutils make m4 perl python3 tar bc gcc which

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

### 4.1.4 _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

**Version Information**

**Equivalent System Packages**

**Debian/Ubuntu:**

```
$ sudo apt-get install ffmpeg imagemagick texinfo
```

**homebrew:**

```
$ brew install ffmpeg imagemagick texinfo
```

**macports:** install the following packages: ffmpeg imagemagick texinfo

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

### 4.1.5 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

Version Information

requirements.txt:

```
admcycles
```

Equivalent System Packages

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.6 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
**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 alabaster

See [https://repology.org/project/alabaster/versions](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 [https://trac.sagemath.org/ticket/29023](https://trac.sagemath.org/ticket/29023)

### 4.1.7 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/](https://pypi.org/project/appdirs/)

**Type**

standard
Version Information

package-version.txt:

1.4.4

install-requires.txt:

appdirs

Equivalent System Packages

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

4.1.8 appnope: Disable App Nap on OS X

Description

Disable App Nap on OS X 10.9

Upstream Contact

https://github.com/minrk/appnope

Type

standard

Version Information

package-version.txt:

0.1.0.p0

install-requires.txt:

appnope >=0.1.0

Equivalent System Packages

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023
4.1.9 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/

Dependencies

- FLINT
- MPIR or GMP
- MPFR

Special Update/Build Instructions

Type

standard

Version Information

package-version.txt:

2.19.0.p0

Equivalent System Packages

arch:

$ sudo pacman -S arb-fp

conda:

$ conda install arb-fp

Debian/Ubuntu:
$ sudo apt-get install arb-fp

Fedora/Redhat/CentOS:

$ sudo yum install arb-fp

freebsd:

$ sudo pkg install arb-fp

gentoo:

$ sudo emerge arb-fp

homebrew:

$ brew install arb-fp

nix:

$ nix-env --install arb-fp

opensuse:

$ sudo zypper install arb-fp

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

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

4.1.10 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

Version Information

package-version.txt:

20.1.0

install-requires.txt:

argon2-cffi

Equivalent System Packages

macports: install the following packages: argon2-cffi python:argon2-cffi 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 https://trac.sagemath.org/ticket/29023

4.1.11 atlas: Automatically Tuned Linear Algebra Software (BLAS implementation)

Description

Automatically Tuned Linear Algebra Software

License

3-clause BSD

Upstream Contact

- Atlas devel mailing list.
- Clint Whaley has frequently answered questions from the Sage project

Dependencies

- Python
Special Update/Build Instructions

- `src/lapack-x.y.z.tgz`: The netlib lapack tarball. If you update this, make sure you also update the LAPACK_TARBALL variable in spkg-install.

- `src/ATLAS-lib`: We are using a dummy autotools/libtools project to repack the static ATLAS libraries into shared libraries.

- `src/ARCHS`: We ship some archdef tarballs to speed ATLAS build.

- `spkg-install`: If you update atlas to a new version make sure that the ATLAS_OSTYPE, ATLAS_MACHTYPE, and ATLAS_ISAEXT variables in spkg-install remain in sync with atlas' CONFIG/include/atlconf.h.

- The package is never installed on OS X, unless you set SAGE_ATLAS_ARCH.

Patches

- `patches/detect.patch`: Fix Itanium2 support on modern RHEL 5 and SLES 10 systems, work around -m64 issue on Itanium2, and correctly detect number and speed of CPUs on a bunch of systems.

- `patches/arm_hard_floats.patch`: make sure soft floats are not enforced on ARM.

- `patches/Makefile.patch`: fix clean target.

- `patches/do_not_force_mutex.patch`: always use assembly over mutex since the mutex version fails to build a shared library. See #15045 for details.

- `patches/glibc_scanf_workaround.patch`: Workaround for the scanf bug in glibc-2.18 that breaks the atlas auto-tuning system.

Configuration

The package can be configured via three environment variables:

- `SAGE_ATLAS_LIB=path`  
  If this environment variable is set, the libraries libatlas, libcblas, liblapack, and libf77blas from the direcoriy “path” are used and ATLAS is not compiled from source. The libraries can be either static (ending in .a) or shared libraries (ending in .so or .dylib).

- `SAGE_ATLAS_ARCH=arch[,isaext1][,isaext2]...[,isaextN]`  
  The given architectural default and instruction set extensions are used instead of the empirical tuning. Available architectures are
  
  POWER3, POWER4, POWER5, PPCG4, PPCG5, POWER6, POWER7, IBMz9, IBMz10, IBMz196, x86x87, x86SSE1, x86SSE2, x86SSE3, P5, P5MX, PPROM, PIII, PM, CoreSolo, CoreDuo, Core2Solo, Core2, Core2Duo, Atom, P4, P4E, Efficeon, K7, HAMMER, AMD64K10h, AMDDOZER, UNKNOWNx86, IA64Itan, IA64Itan2, USI, USII, USIII, USIV, UST1, UST2, UnknownUS, MIPS1xK, MIPSICE9, ARMv6, ARMv7
  
  and instruction set extensions are
  
  VSX, Altivec, AVXMAC, AVXFMA4, AVX, SSE3, SSE2, SSE1, 3DNow, NEON
  
  In addition, you can also set

- `SAGE_ATLAS_ARCH=fast` picks defaults for a modern (2-3 year old) CPU of your processor line, and
• SAGE_ATLAS_ARCH=base picks defaults that should work for a ~10 year old CPU.
   
   For example, SAGE_ATLAS_ARCH=Corei2,AVX,SSE3,SSE2,SSE1
   would be appropriate for a Core i7 CPU.

• If SAGE_ATLAS_SAVE_ARCHDEF = is given, then a new archdef file is created and saved to the given path.

**Type**

optional

**Version Information**

package-version.txt:

3.10.2.p3

**Equivalent System Packages**

macports: install the following packages: atlas-linear-algebra See https://repology.org/project/atlas-linear-algebra/versions

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

### 4.1.12 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
**Dependencies**

Python

**Type**

standard

**Version Information**

package-version.txt:

```
19.3.0
```

install-requires.txt:

```
attrs >=19.3.0
```

**Equivalent System Packages**

conda:

```
$ conda install python:attrs
```

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

**4.1.13 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 modelized.

**License**

- GPL 3.0
Upstream Contact

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

Dependencies

- Python
- CMake
- Cython
- ncurses
- graphviz must be installed from your distro, and available in the path.

Special Update/Build Instructions

- None

Type

experimental

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 https://trac.sagemath.org/ticket/27330

4.1.14 babel: Internationalization utilities for Python

Description

A collection of tools for internationalizing Python applications.
Upstream Contact

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

Type

standard

Version Information

package-version.txt:

2.9.1

install-requires.txt:

babel >=2.6.0

Equivalent System Packages

conda:

$ conda install python:babel

cmake: install the following packages: python:babel opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.15 backcall: Specifications for callback functions

Description

Specifications for callback functions passed in to an API

Type

standard
Version Information

package-version.txt:

0.1.0

install-requires.txt:

backcall >=0.1.0

Equivalent System Packages

conda:

$ conda install python:backcall

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.16 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

• http://groups.google.com/group/isl-development

Type

optional

Version Information

package-version.txt:

0.41.1

4.1. External Packages (alphabetical order)
Equivalent System Packages

opensuse:

$ sudo zypper install 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 https://trac.sagemath.org/ticket/27330

4.1.17 beautifulsoup4: A screen-scraping library

Description

Screen-scraping library

License

MIT

Upstream Contact

https://pypi.org/project/beautifulsoup4/
https://www.crummy.com/software/BeautifulSoup/

Type

optional

Version Information

requirements.txt:

beautifulsoup4

Equivalent System Packages

conda:

$ conda install python:beautifulsoup4

macports: install the following packages: python:beautifulsoup4 See https://repology.org/project/python:beautifulsoup4/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330
4.1.18 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/

Dependencies

- None

Type

optional

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 https://trac.sagemath.org/ticket/27330
4.1.19 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

Version Information

requirements.txt:

| biopython |

Equivalent System Packages

conda:

$ conda install biopython python:biopython

macports: install the following packages: biopython python: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 https://trac.sagemath.org/ticket/27330

4.1.20 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

Dependencies

Python, html5lib, six

Type

standard

Version Information

package-version.txt:

3.1.5

install-requires.txt:

bleach >=3.1.5

Equivalent System Packages

conda:

$ conda install python:bleach

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.21 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

LGPL

Upstream Contact

Bliss is currently being maintained by Tommi Junttila and Petteri Kaski.

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

We apply patches generated from https://github.com/mkoeppe/bliss (branch apply_debian_patches) as our upstream. This tracks the patches from the Debian package, adding an autotools build system and adjusting the include file locations.

Dependencies

None

Type

optional

Version Information

package-version.txt:

0.73+debian-1+sage-2016-08-02.p0

Equivalent System Packages

arch:

$ sudo pacman -S bliss-graphs

conda:

$ conda install bliss-graphs

opensuse:

$ sudo zypper install bliss-graphs

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 https://trac.sagemath.org/ticket/27330
4.1.22 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

Dependencies

None

Type

standard

Version Information

package-version.txt:

1.66.0.p0

Equivalent System Packages

arch:

$ sudo pacman -S boost-devel

conda:

$ conda install boost-devel

cygwin:

$ apt-cyg install boost-devel

Debian/Ubuntu:

$ sudo apt-get install boost-devel

Fedora/Redhat/CentOS:

$ sudo yum install boost-devel

freebsd:

$ sudo pkg install boost-devel

homebrew:

$ brew install boost-devel

macports: install the following packages: boost-devel

$ nix-env --install boost-devel

opensuse:

$ sudo zypper install boost-devel

slackware:

$ sudo slackpkg install boost-devel

void:

$ sudo xbps-install boost-devel

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

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

### 4.1.23 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

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 brial

Fedora/Redhat/CentOS:

$ sudo yum install brial

freebsd:

$ sudo pkg install brial

gentoo:

$ sudo emerge brial

nix:

$ nix-env --install brial

opensuse:

$ sudo zypper install brial
4.1.24 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/

Dependencies

- None

Type

optional

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 https://trac.sagemath.org/ticket/27330
4.1.25 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>

Dependencies

None

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

Version Information

package-version.txt:

```
1.0.6-20150304.p0
```
Equivalent System Packages

conda:

```bash
$ conda install bzip2-devel
```

cygwin:

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

Debian/Ubuntu:

```bash
$ sudo apt-get install bzip2-devel
```

Fedora/Redhat/CentOS:

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

homebrew:

```bash
$ brew install bzip2-devel
```

opensuse:

```bash
$ sudo zypper install bzip2-devel
```

slackware:

```bash
$ sudo slackpkg install bzip2-devel
```

void:

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

See [https://repology.org/project/bzip2-devel/versions](https://repology.org/project/bzip2-devel/versions)

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

### 4.1.26 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. CBC is an active open-source project led by John Forrest at www.coin-or.org.
License

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

Upstream Contact

- John Forrest <jjforre@us.ibm.com>
- Robin Lougee-Heimer

Project Home Page

- https://projects.coin-or.org/Cbc

Type

optional

Version Information

text: package-version.txt:

2.9.4.p0

Equivalent System Packages

arch:

$ sudo pacman -S coin-or-cbc

conda:

$ conda install coin-or-cbc

Debian/Ubuntu:

$ sudo apt-get install coin-or-cbc

Fedora/Redhat/CentOS:

$ sudo yum install coin-or-cbc

freebsd:

$ sudo pkg install coin-or-cbc

homebrew:

$ brew install coin-or-cbc

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

If the system package is installed, ./configure will check whether it can be used.
4.1.27 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

Version Information

package-version.txt:

3.3.4

Equivalent System Packages

conda:

```bash
$ conda install ccache
```

homebrew:

```bash
$ brew install ccache
```

macports: install the following packages: ccache opensuse:

```bash
$ sudo zypper 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 https://trac.sagemath.org/ticket/27330
4.1.28 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 \( \mathbb{R}^d \) given by a system of linear inequalities:

\[
P = \{ x=(x_1, \ldots, x_d)^T : b - A x \geq 0 \}
\]

where \( A \) is a given \( m \times d \) 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

Dependencies

- gmp (or its fork mpir)

Type

standard

Version Information

package-version.txt:

0.94m

Equivalent System Packages

arch:

$ sudo pacman -S cddlib

conda:

$ conda install cddlib

cygwin:
$ apt-cyg install cddlib

Debian/Ubuntu:

$ sudo apt-get install cddlib

Fedora/Redhat/CentOS:

$ sudo yum install cddlib

freebsd:

$ sudo pkg install cddlib

gentoo:

$ sudo emerge cddlib

homebrew:

$ brew install cddlib

macports: install the following packages: cddlib nix:

$ nix-env --install cddlib

opensuse:

$ sudo zypper install cddlib

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

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

4.1.29 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

Dependencies

Python, setuptools

Type

standard

Version Information

package-version.txt:

2020.11.8

install-requires.txt:

certifi >=2020.6.20

Equivalent System Packages

conda:

$ conda install python:certifi

macports: install the following packages: python:certifi opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.30 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

Version Information

package-version.txt:

1.14.5

install-requires.txt:

cffi >=1.14.0

Equivalent System Packages

conda:

$ conda install python:cffi

macports: install the following packages: python:cffi opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.31 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.niskanen@iki.fi (Q=®).
https://users.aalto.fi/~pat/cliquer.html

Dependencies

- None

Patches

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

Type

standard

Version Information

package-version.txt:

1.22

Equivalent System Packages

conda:

$ conda install cliquer

Debian/Ubuntu:

$ sudo apt-get install cliquer

Fedora/Redhat/CentOS:

$ sudo yum install cliquer

freebsd:

$ sudo pkg install cliquer

gentoo:
$ sudo emerge cliquer

nix:

$ nix-env --install cliquer

opensuse:

$ sudo zypper install cliquer

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

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

## 4.1.32 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

### Dependencies

- curl
- zlib
- bzip2
- xz
Type

standard

Version Information

package-version.txt:

3.21.0

Equivalent System Packages

alpine: install the following packages: cmake arch:

```bash
$ sudo pacman -S cmake
```

conda:

```bash
$ conda install cmake
```

cygwin:

```bash
$ apt-cyg install cmake
```

Debian/Ubuntu:

```bash
$ sudo apt-get install cmake
```

Fedora/Redhat/CentOS:

```bash
$ sudo yum install cmake
```

freebsd:

```bash
$ sudo pkg install cmake
```

gentoo:

```bash
$ sudo emerge cmake
```

homebrew:

```bash
$ brew install cmake
```

macports: install the following packages: cmake nix:

```bash
$ nix-env --install cmake
```

opensuse:

```bash
$ 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.

4.1.33 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/

Dependencies
• GMP/MPIR

Special Update/Build Instructions
None.

Type
experimental
Version Information

package-version.txt:

0.99564

Equivalent System Packages

freebsd:

$ sudo pkg install 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 https://trac.sagemath.org/ticket/27330

4.1.34 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

Dependencies

N/A

Type

standard
Version Information

package-version.txt:

| 20140630.p0 |

Equivalent System Packages

arch:

```bash
$ sudo pacman -S sagemath-combinatorial-designs
```

conda:

```bash
$ conda install sagemath-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 https://trac.sagemath.org/ticket/27330

4.1.35 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.

Dependencies

None
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

Version Information

package-version.txt:

7282b2b6c6a282a887fa05b0b5250b77035bf3bf

Equivalent System Packages

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.36 conway_polynomials: Tables of Conway polynomials over finite fields

Description

Frank Lübeck’s tables of Conway polynomials over finite fields.

Dependencies

- Sage library

Upstream contact

http://www.math.rwth-aachen.de/~Frank.Luebeck/data/ConwayPol/

Type

standard

Version Information

package-version.txt:

0.5
Equivalent System Packages

arch:

```
$ sudo pacman -S sagemath-conway-polynomials
```

conda:

```
$ conda install sagemath-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 https://trac.sagemath.org/ticket/27330

4.1.37 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
Dependencies

None

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

Version Information

package-version.txt:

```
8ac9c71723c8ca57a836d6381aed125261e44e9e.p0
```

Equivalent System Packages

arch:

```
$ sudo pacman -S coxeter
```

Fedora/Redhat/CentOS:

```
$ sudo yum install coxeter
```

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.

4.1.38 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

Type

optional

Version Information

package-version.txt:

5.6.8

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 https://trac.sagemath.org/ticket/27330
4.1.39 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>

Dependencies

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

Version Information

package-version.txt:

6.2.p1
Equivalent System Packages

arch:

```
$ sudo pacman -S coin-or-csdp 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 https://trac.sagemath.org/ticket/27330

4.1.40 cunningham_tables: List of the prime numbers occurring 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

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 https://trac.sagemath.org/ticket/27330

4.1.41 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/

Dependencies

None listed.

Special Update/Build Instructions

None.

Type

standard

Version Information

package-version.txt:

7.62.0.p0

Equivalent System Packages

conda:

$ conda install curl libcurl-devel

cygwin:

$ apt-cyg install curl libcurl-devel

Debian/Ubuntu:

$ sudo apt-get install curl libcurl-devel

Fedora/Redhat/CentOS:

$ sudo yum install curl libcurl-devel

freebsd:

$ sudo pkg install curl libcurl-devel

homebrew:

$ brew install curl libcurl-devel

macports: install the following packages: curl libcurl-devel opensuse:
$ sudo zypper install curl libcurl-devel

slackware:
$ sudo slackpkg install curl libcurl-devel

void:
$ sudo xbps-install curl libcurl-devel

See https://repology.org/project/curl/versions, https://repology.org/project/libcurl-devel/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.42 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)

Dependencies

- GNU patch
- GSL
- GLPK
Special Update/Build Instructions

- cvxopt.h.patch: Fix building with GCC on Solaris.
- setup.py.patch: look for libraries and includes in $SAGE_LOCAL instead of /usr. Add fortran, blas,… libraries if needed. Build with GSL and GLPK support.
- remove doc/html/, as it can be rebuild by invoking ‘sage -sh’ and running ‘make html’ in doc/
- TODO: Add more tests in spkg-check
- TODO: one might want to enhance the code to allow other Sage random sources, at the moment only GSL is used in CVXOPT-1.1.3 spkg, apparently it will need an unclear to me “with seed(..)” construct.

Type

standard

Version Information

package-version.txt:

1.2.6

install-requires.txt:

cvxopt >=1.2.5

Equivalent System Packages

conda:

$ conda install python:cvxopt

freebsd:

$ sudo pkg install python:cvxopt

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.43 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/

Dependencies

- python
- setuptools
- six

Type

standard

Version Information

package-version.txt:

0.10.0.p0

install-requires.txt:

cycler >=0.10.0

Equivalent System Packages

conda:

$ conda install cycler python:cycler

macports: install the following packages: cycler python: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 https://trac.sagemath.org/ticket/29023
4.1.44 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

Dependencies

- Python
- Cython
- PARI
- cysignals

Type

standard

Version Information

package-version.txt:

2.1.2

install-requires.txt:

cypari2 >=2.1.1

Equivalent System Packages

conda:

$ conda install python: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 https://trac.sagemath.org/ticket/29023
4.1.45 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

Dependencies

- Python
- Cython
- PARI (optional)

Type

standard

Version Information

package-version.txt:

1.10.3

install-requires.txt:

cysignals >=1.10.2

Equivalent System Packages

conda:

$ conda install cysignals python: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 https://trac.sagemath.org/ticket/29023
4.1.46 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 additionally 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

Dependencies

- Python

Type

standard

Version Information

package-version.txt:

0.29.21

install-requires.txt:

cython >=0.29.21, <1.0
**Equivalent System Packages**

conda:

```
$ conda install python:cython
```

freebsd:

```
$ sudo pkg install python:cython
```

homebrew:

```
$ brew install python:cython
```

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

**4.1.47 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/](http://bost.ocks.org/mike/)
- **Home page**: [http://d3js.org/](http://d3js.org/)

**Dependencies**

None.

**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 currently 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

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 https://trac.sagemath.org/ticket/27330

4.1.48 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

Dependencies

None

Patches

• None

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

Version Information

package-version.txt:

20190911

Equivalent System Packages


However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.49 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
Dependencies
None

Special Update/Build Instructions
Created by taking the original old-style spkg and removing crud from it.

Type
optional

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 https://trac.sagemath.org/ticket/27330

4.1.50 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

Version Information

package-version.txt:

0.7

install-requires.txt:

database-knotinfo

Equivalent System Packages

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.51 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

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 https://trac.sagemath.org/ticket/27330
4.1.52 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 \texttt{mutation\_classes\_n.dig6} for some \( n \) and

- contains a \texttt{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 \((\text{dig6}, \text{edges})\) where
  - \texttt{dig6} is the \texttt{dig6} data of the given \texttt{DiGraph}, and
  - \texttt{edges} are the non-simply-laced edges thereof.
- is obtained by running the function

\[
\text{sage.combinat.cluster\_algebra\_quiver.quiver\_mutation\_type.\_save\_data\_dig6}(n, \text{types='Exceptional'}, \text{verbose=False})
\]

SPKG Maintainers

- C. Stump <christian.stump@gmail.com>

Dependencies

- None

Type

optional

Version Information

package-version.txt:

\begin{verbatim}
1.0
\end{verbatim}

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 https://trac.sagemath.org/ticket/27330
4.1.53 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 $4 \times 10^{-9}$.

Dependencies

- Sage library

Type

optional

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 https://trac.sagemath.org/ticket/27330

4.1.54 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
Dependencies

None

Patches

None

Type

optional

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 https://trac.sagemath.org/ticket/27330

4.1.55 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

Dependencies

None
Patches
None

Type
optional

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 https://trac.sagemath.org/ticket/27330

4.1.56 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>

Dependencies

Special Update/Build Instructions

List patches that need to be applied and what they do

Type

optional

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 https://trac.sagemath.org/ticket/27330

4.1.57 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/
Dependencies

- Python
- Six

Type

standard

Version Information

package-version.txt:

```
2.8.1
```

install-requires.txt:

```
dateutil >=2.8.1
```

Equivalent System Packages

conda:

```
$ conda install python:python-dateutil
```

macports: install the following packages: python:python-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 https://trac.sagemath.org/ticket/29023

4.1.58 decorator: Python library providing decorators

Description

Better living through Python with decorators

Type

standard
Version Information

package-version.txt:

4.4.2

install-requires.txt:

decorator >=4.4.0

Equivalent System Packages

conda:

$ conda install python:decorator

macports: install the following packages: python:decorator opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.59 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

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 https://trac.sagemath.org/ticket/27330

4.1.60 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/

Dependencies
• pip

Special Update/Build Instructions
None.
**Type**

standard

**Version Information**

package-version.txt:

```
0.6.0
```

install-requires.txt:

```
defusedxml >=0.6.0
```

**Equivalent System Packages**

conda:

```
$ conda install python:defusedxml
```

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

### 4.1.61 distlib: Distribution utilities

**Description**

Distribution utilities

**License**

Python license

**Upstream Contact**

https://pypi.org/project/distlib/

**Type**

standard
Version Information

package-version.txt:

0.3.1

install-requires.txt:

distlib

Equivalent System Packages

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

4.1.62 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/

Dependencies

None

Special Update/Build Instructions

None
Type

standard

Version Information

package-version.txt:

0.17.1

install-requires.txt:

docutils >=0.14

Equivalent System Packages

conda:

$ conda install docutils python:docutils

homebrew:

$ brew install docutils python:docutils

macports: install the following packages: docutils python:docutils opensuse:

$ sudo zypper install docutils python: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 https://trac.sagemath.org/ticket/29023

4.1.63 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

Version Information

package-version.txt:

```
2.11.3.p0
```

install-requires.txt:

```
dot2tex >=2.11.3
```
Equivalent System Packages

arch:

```
$ sudo pacman -S dot2tex python:dot2tex
```

macports: install the following packages: dot2tex python: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 https://trac.sagemath.org/ticket/29023

4.1.64 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

Dependencies

- GMP/MPIR
- FLINT
- ARB

Type

optional

Version Information

package-version.txt:

```
0.1.9
```
Equivalent System Packages

conda:

$ conda install e-antic

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

However, these system packages will not be used for building Sage because spkg-config.m4 has not been written
for this package; see https://trac.sagemath.org/ticket/27330

4.1.65 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: http://ecls.sourceforge.net/

License

• LGPL V2+ or compatible - for details see
  http://ecls.sourceforge.net/license.html

Upstream Contact

• the ECL mailing list - see http://ecls.sourceforge.net/resources.html

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 http://trac.sagemath.org/sage_trac/ticket/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

Version Information

package-version.txt:

21.2.1

Equivalent System Packages

alpine: install the following packages: ecl 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 ecl

gentoo:

$ sudo emerge ecl

homebrew:

$ brew install ecl

macports: install the following packages: ecl nix:

$ nix-env --install ecl

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

If the system package is installed, ./configure will check whether it can be used.
4.1.66 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 \( \mathbb{Q} \) 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

Dependencies

- PARI
- NTL
- FLINT

Type

standard

Version Information

package-version.txt:

20210625
Equivalent System Packages

arch:

$ sudo pacman -S eclip

conda:

$ conda install eclip

Debian/Ubuntu:

$ sudo apt-get install eclip

Fedora/Redhat/CentOS:

$ sudo yum install eclip

freebsd:

$ sudo pkg install eclip

gentoo:

$ sudo emerge eclip

nix:

$ nix-env --install eclip

See https://repology.org/project/eclip/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.67 ecm: Elliptic curve method for integer factorization

Description

GMP-ECM - Elliptic Curve Method for Integer Factorization
Sources can be obtained from http://gforge.inria.fr/projects/ecm/

License

LGPL V3+
Upstream Contact

- ecm-discuss@lists.gforge.inria.fr (requires subscription)

Dependencies

- GMP/MPIR (Note: Python is *not* required for ordinary builds.)
- GNU patch

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 get 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 / MPIR 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’. (MPIR honors ‘--enable-fat’ to some extent, but this option isn’t used on anything other than x86 / x86_64.)
- 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

Version Information

package-version.txt:

```
7.0.4.p2
```

Equivalent System Packages

conda:

```
$ conda install ecm-devel
```

Debian/Ubuntu:

```
$ sudo apt-get install ecm-devel
```

Fedora/Redhat/CentOS:
$ sudo yum install ecm-devel

freebsd:
$ sudo pkg install ecm-devel

macports: install the following packages: ecm-devel nix:
$nix-env --install ecm-devel

void:
$sudo xbps-install ecm-devel

See https://repology.org/project/ecm-devel/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.68 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
Dependencies

- sqlite
- python

Type

standard

Version Information

package-version.txt:

0.8.1

Equivalent System Packages

conda:

$ conda install sagemath-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 https://trac.sagemath.org/ticket/27330

4.1.69 **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

Version Information

package-version.txt:

0.3

install-requires.txt:

entrypoints >=0.3

Equivalent System Packages

conda:

$ conda install entrypoints python:entrypoints

macports: install the following packages: entrypoints python: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 https://trac.sagemath.org/ticket/29023

4.1.70 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

SPKG Repository

https://bitbucket.org/malb/fflas-ffpack-spkg
Upstream Contact

- <ffpack-devel@googlegroups.com>

Dependencies

- Givaro
- ATLAS (non-OSX)/The Accelerate FrameWork (on OSX)

Patches

- bash.patch: fix shebang line to “#!/usr/bin/env bash”

Type

standard

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

freebsd:

$ sudo pkg install fflas-ffpack

gentoo:

$ sudo emerge fflas-ffpack

nix:
4.1.71 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

Version Information

cpackage-version.txt:

3.0.12

install-requires.txt:

filelock

Equivalent System Packages

If the system package is installed, ./configure will check whether it can be used.
4.1.72 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 Google Group (http://groups.google.co.uk/group/flint-devel)
- William Hart

Dependencies

- MPIR
- MPFR
- NTL

Type

standard

Version Information

package-version.txt:
2.7.1

Equivalent System Packages

conda:

$ conda install flint

cygwin:

$ apt-cyg install flint

Debian/Ubuntu:

$ sudo apt-get install flint

Fedora/Redhat/CentOS:
```bash
$ sudo yum install flint

freebsd:
$ sudo pkg install flint

gentoo:
$ sudo emerge flint

homebrew:
$ brew install flint

macports: install the following packages: flint
nix:
$ nix-env --install flint

opensuse:
$ sudo zypper install flint

void:
$ sudo xbps-install flint
```

See https://repology.org/project/flint/versions
If the system package is installed, ./configure will check whether it can be used.

### 4.1.73 flintqs: Multi-polynomial quadratic sieve for integer factorization

**Description**

This is William Hart’s GPL’d highly optimized multi-polynomial quadratic sieve for integer factorization:

http://www.friedspace.com/QS/

See also http://www.maths.warwick.ac.uk/~masfaw/preprint.html
See also the repository: https://github.com/sagemath/FlintQS

**Type**

standard
Version Information

package-version.txt:

1.0.p0

Equivalent System Packages

arch:

$ sudo pacman -S flintqs

conda:

$ conda install flintqs

Debian/Ubuntu:

$ sudo apt-get install flintqs

freebsd:

$ sudo pkg install flintqs

gentoo:

$ sudo emerge flintqs

nix:

$ nix-env --install flintqs

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

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

4.1.74 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

Dependencies

- gmp
- mpfr

Type

standard

Version Information

package-version.txt:

5.4.1

Equivalent System Packages

conda:

$ conda install fplll

Fedora/Redhat/CentOS:

$ sudo yum install fplll

freebsd:

$ sudo pkg install fplll

genoot:

$ sudo emerge fplll

homebrew:

$ brew install fplll

opensuse:

$ sudo zypper install fplll
See https://repology.org/project/fplll/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.75 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

Dependencies

• Cython
• fplll
• Sage (optional)
• NumPy (optional)

Type

standard

Version Information

package-version.txt:

0.5.6

install-requires.txt:

fpylll >=0.5.5, <=0.5.6
Equivalent System Packages

conda:

```bash
$ conda install fpylll python:fpylll
```

See [https://repology.org/project/fpylll/versions](https://repology.org/project/fpylll/versions), [https://repology.org/project/python: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 [https://trac.sagemath.org/ticket/29023](https://trac.sagemath.org/ticket/29023)

### 4.1.76 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](https://www.freetype.org)
- repo:
  - official: [http://git.savannah.gnu.org/cgit/freetype](http://git.savannah.gnu.org/cgit/freetype)
  - mirror: [https://github.com/aseprite/freetype2/](https://github.com/aseprite/freetype2/)
Dependencies

See the dependencies file.

Type

standard

Version Information

package-version.txt:

2.10.4

Equivalent System Packages

conda:

```
$ conda install freetype-devel harfbuzz glib
```

cygwin:

```
$ apt-cyg install freetype-devel harfbuzz glib
```

Debian/Ubuntu:

```
$ sudo apt-get install freetype-devel harfbuzz glib
```

freebsd:

```
$ sudo pkg install freetype-devel harfbuzz glib
```

homebrew:

```
$ brew install freetype-devel harfbuzz glib
```

macports: install the following packages: freetype-devel harfbuzz glib nix:

```
$ nix-env --install freetype-devel harfbuzz glib
```

opensuse:

```
$ sudo zypper install freetype-devel harfbuzz glib
```

slackware:

```
$ sudo slackpkg install freetype-devel harfbuzz glib
```

void:

```
$ sudo xbps-install freetype-devel harfbuzz glib
```


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

### 4.1.77 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/

**Dependencies**

- ecl

**Type**

optional

**Version Information**

package-version.txt:

```
1.3.7.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 https://trac.sagemath.org/ticket/27330
4.1.78 frobby: Computations on monomial ideals

Description

The software package Frobbby 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

Dependencies

• GMP built with support for C++

Special Update/Build instructions

Download Frobbby at www.broune.com/ and then type “make spkg VER=blah” which will create an spkg named frobby-VER.spkg in bin/. The files related to doing this is in the sage/ sub-directory of the Frobbby source distribution.

Type

optional

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 https://trac.sagemath.org/ticket/27330
4.1.79 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

Version Information

package-version.txt:

15.1.1.p0

Equivalent System Packages

homebrew:

$ brew install gambit-game-theory

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 https://trac.sagemath.org/ticket/27330
4.1.80 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

Dependencies

- Readline
- GMP

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
Version Information

package-version.txt:

4.11.1

Equivalent System Packages

arch:

$ sudo pacman -S gap

conda:

$ conda install gap

Debian/Ubuntu:

$ sudo apt-get install gap

freebsd:

$ sudo pkg install 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 https://trac.sagemath.org/ticket/27330

4.1.81 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, metataxe, monoid, nq, pcqa, sisyphe, 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

Dependencies

None
Type

experimental

Version Information

package-version.txt:

04 jul 17

Equivalent System Packages

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written
for this package; see https://trac.sagemath.org/ticket/27330

4.1.82 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

Version Information

package-version.txt:

0.9

install-requires.txt:

gap_jupyter >=0.9

4.1. External Packages (alphabetical order)
Equivalent System Packages

conda:

```
$ conda install gap-jupyterkernel
```

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 https://trac.sagemath.org/ticket/29023

### 4.1.83 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

**Version Information**

package-version.txt:

```
4.11.1
```

**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 https://trac.sagemath.org/ticket/27330

### 4.1.84 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
Dependencies
None.

Special Update/Build Instructions
None.

Patches
- cygwin64.patch: let libgc build on Cygwin64.

Type
standard

Version Information
package-version.txt:

8.0.4

Equivalent System Packages
arch:

$ sudo pacman -S gc

conda:

$ conda install gc
cygwin:

$ apt-cyg install gc

Debian/Ubuntu:

$ sudo apt-get install gc

Fedora/Redhat/CentOS:

$ sudo yum install gc

freebsd:

$ sudo pkg install gc

gentoo:
$ sudo emerge gc

homebrew:

$ brew install gc

macports: install the following packages: gc opensuse:

$ sudo zypper install gc

slackware:

$ sudo slackpkg install gc

See https://repology.org/project/gc/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.85 gcc: The GNU Compiler Collection, including the C, C++ and Fortran compiler

Description
The GNU Compiler Collection, including the C, C++ and Fortran compiler.

License
GPL version 2 or version 3

Upstream Contact
https://gcc.gnu.org/

Dependencies
- zlib
- MPIR
- MPFR
- MPC
Special Update/Build Instructions

None.

**Type**

standard

**Version Information**

package-version.txt:

10.3.0

**Equivalent System Packages**

arch:

```bash
$ sudo pacman -S gcc
```

cygwin:

```bash
$ apt-cyg install gcc
```

Debian/Ubuntu:

```bash
$ sudo apt-get install gcc
```

Fedora/Redhat/CentOS:

```bash
$ sudo yum install gcc
```

freebsd:

```bash
$ sudo pkg install gcc
```

homebrew:

```bash
$ brew install gcc
```

opensuse:

```bash
$ sudo zypper install gcc
```

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

If the system package is installed, ./configure will check whether it can be used.
4.1.86 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/

Dependencies

- python
- mpc
- mpfr
- ppl
- gmp/mpir
- makeinfo (external)

Special Update/Build Instructions

Current version needs makeinfo installed to build successfully.

Type

experimental

Version Information

package-version.txt:

8.2
Equivalent System Packages

conda:

```
$ conda install gdb
```

dombrew:

```
$ brew install gdb
```

macports: install the following packages: gdb

```
$ sudo zypper 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 https://trac.sagemath.org/ticket/27330

4.1.87 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: http://gf2x.gforge.inria.fr/

License

- GNU GPLv2+.

Upstream Contact

- Richard Brent
- Pierrick Gaudry
- Emmanuel Thomé
- Paul Zimmermann

Dependencies

- None
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

Version Information

package-version.txt:

| 1.3.0 |

Equivalent System Packages

arch:

```bash
$ sudo pacman -S gf2x
```

conda:

```bash
$ conda install gf2x
```

Debian/Ubuntu:

```bash
$ sudo apt-get install gf2x
```

Fedora/Redhat/CentOS:

```bash
$ sudo yum install gf2x
```

freebsd:

```bash
$ sudo pkg install gf2x
```
opensuse:

```bash
$ sudo zypper install gf2x
```

See https://repology.org/project/gf2x/versions

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

### 4.1.88 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

**Dependencies**

- GMP/MPIR
- CDDLIB

**Special Update/Build Instructions**

Remove the doc, homepage, and examples subdirectories, which take up most of the space.
Type

standard

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 gfan

gentoo:

$ sudo emerge gfan

nix:

$ nix-env --install gfan

opensuse:

$ sudo zypper install gfan

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

If the system package is installed, ./configure will check whether it can be used.
4.1.89 gfortran: Fortran compiler from the GNU Compiler Collection

Description

The GNU Compiler Collection, including the C, C++ and Fortran compiler. This particular package is meant to only make gfortran available.

License

GPL version 2 or version 3

Upstream Contact

http://gcc.gnu.org/

Dependencies

- zlib
- MPIR
- MPFR
- MPC

Special Update/Build Instructions

None.

Type

standard

Version Information

package-version.txt:

10.3.0

Equivalent System Packages

arch:

```bash
$ sudo pacman -S gcc-fortran
```

conda:

```bash
$ conda install gcc-fortran
```

cygwin:
$ apt-cyg install gcc-fortran

Debian/Ubuntu:
$ sudo apt-get install gcc-fortran

Fedora/Redhat/CentOS:
$ sudo yum install gcc-fortran

freebsd:
$ sudo pkg install gcc-fortran

homebrew:
$ brew install gcc-fortran

macports: install the following packages: gcc-fortran opensuse:
$ sudo zypper install gcc-fortran

slackware:
$ sudo slackpkg install gcc-fortran

void:
$ sudo xbps-install gcc-fortran

See https://repology.org/project/gcc-fortran/versions
If the system package is installed, ./configure will check whether it can be used.

### 4.1.90 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:
- Author’s website with debian, ubuntu, macosx, windows package:
  http://www-fourier.ujf-grenoble.fr/~parisse/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:

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

Version Information

package-version.txt:

1.6.0.47p3

Equivalent System Packages

arch:

$ sudo pacman -S giac-devel libgiac

conda:

$ conda install giac-devel libgiac

Debian/Ubuntu:

$ sudo apt-get install giac-devel libgiac

4.1. External Packages (alphabetical order)
Fedora/Redhat/CentOS:

```bash
$ sudo yum install giac-devel libgiac
```

freebsd:

```bash
$ sudo pkg install giac-devel libgiac
```

nix:

```bash
$ nix-env --install giac-devel libgiac
```

opensuse:

```bash
$ sudo zypper install giac-devel libgiac
```

void:

```bash
$ sudo xbps-install giac-devel libgiac
```

See https://repology.org/project/giac-devel/versions, https://repology.org/project/libgiac/versions

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

### 4.1.91 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

#### Version Information

#### Equivalent System Packages

conda:

```bash
$ conda install git
```

cygwin:

```bash
$ apt-cyg install git
```
Debian/Ubuntu:

$ sudo apt-get install git

Fedora/Redhat/CentOS:

$ sudo yum install git

gnome:

$ sudo dnf install git

homebrew:

$ brew install git

macports: install the following packages:

$ sudo port install git

slackware:

$ sudo slackpkg install git

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

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

4.1.92 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

Dependencies

- GNU patch
- GMP/MPIR

Type

standard

Version Information

package-version.txt:

4.1.1

Equivalent System Packages

conda:

$ conda install givaro

Debian/Ubuntu:

$ sudo apt-get install givaro

Fedora/Redhat/CentOS:

$ sudo yum install givaro

freebsd:

$ sudo pkg install givaro

gentoo:

$ sudo emerge givaro

nix:

$ nix-env --install givaro

opensuse:

$ sudo zypper install givaro

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

If the system package is installed, ./configure will check whether it can be used.
4.1.93  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

Dependencies

- GMP/MPIR
- zlib

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

Version Information

package-version.txt:

5.0.p0

Equivalent System Packages

arch:

$ sudo pacman -S glpk-devel

conda:

$ conda install glpk-devel

cygwin:

$ apt-cyg install glpk-devel

Debian/Ubuntu:

$ sudo apt-get install glpk-devel

Fedora/Redhat/CentOS:

$ sudo yum install glpk-devel

freebsd:

$ sudo pkg install glpk-devel

gentoo:

$ sudo emerge glpk-devel

homebrew:
$ brew install glpk-devel

macports: install the following packages: glpk-devel nix:

$ nix-env --install glpk-devel

opensuse:

$ sudo zypper install glpk-devel

void:

$ sudo xbps-install glpk-devel

See https://repology.org/project/glpk-devel/versions
If the system package is installed, ./configure will check whether it can be used.

### 4.1.94 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/
Dependencies

zlib

Special Update/Build Instructions

None.

Type

optional

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 https://trac.sagemath.org/ticket/27330

4.1.95 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

Version Information

package-version.txt:

6.2.0

Equivalent System Packages

conda:

$ conda install gmpxx-devel

cygwin:

$ apt-cyg install gmpxx-devel

Debian/Ubuntu:

$ sudo apt-get install gmpxx-devel

Fedora/Redhat/CentOS:

$ sudo yum install gmpxx-devel

freebsd:

$ sudo pkg install gmpxx-devel

gentoo:

$ sudo emerge gmpxx-devel

homebrew:

$ brew install gmpxx-devel

macports: install the following packages: gmpxx-devel

opensuse:

$ sudo zypper install gmpxx-devel

slackware:

$ sudo slackpkg install gmpxx-devel

void:

$ sudo xbps-install gmpxx-devel

See https://repology.org/project/gmpxx-devel/versions

If the system package is installed, ./configure will check whether it can be used.
4.1.96  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

Version Information

package-version.txt:

2.1.0b5

install-requires.txt:

# We would like to write gmpy2 >=2.1.0b5, but pipenv does not accept prereleases in --version ranges
# https://github.com/pypa/pipenv/issues/1760
# gmpy2 ==2.1.0b5

gmpy2 ==2.1.0b5

Equivalent System Packages

conda:

$ conda install python:gmpy2 python:gmpy2-devel


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.97  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

Version Information

package-version.txt:

0.0.10.p0

Equivalent System Packages

Debian/Ubuntu:

$ sudo apt-get install gp2c

freebsd:

$ sudo pkg install gp2c

gentoo:

$ sudo emerge gp2c

opensuse:

$ sudo zypper install gp2c

See https://repology.org/project/gp2c/versions

If the system package is installed, ./configure will check whether it can be used.
4.1.98 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 (hrirder@graphclasses.org)
- For Andries Brouwer’s database:
  The data is taken 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.

Dependencies

N/A

Type

standard

Version Information

package-version.txt:

20210214.p0

Equivalent System Packages

arch:

$ sudo pacman -S sagemath-graphs

conda:

$ conda install sagemath-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 https://trac.sagemath.org/ticket/27330
4.1.99 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

Version Information

Equivalent System Packages

alpine: install the following packages: graphviz-devel

$ sudo pacman -S graphviz-devel

conda:

$ conda install graphviz-devel

cygwin:

$ apt-cyg install graphviz-devel

Debian/Ubuntu:

$ sudo apt-get install graphviz-devel

Fedora/Redhat/CentOS:

$ sudo yum install graphviz-devel

freebsd:

$ sudo pkg install graphviz-devel

homebrew:

$ brew install graphviz-devel

macports: install the following packages: graphviz-devel

nix:

$ nix-env -i graphviz-devel

4.1. External Packages (alphabetical order)
$ nix-env --install graphviz-devel

opensuse:

$ sudo zypper install graphviz-devel

void:

$ sudo xbps-install graphviz-devel

See https://repology.org/project/graphviz-devel/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.100 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.
Dependencies

- None - GSL does not depend on any other Sage package to compile, link and pass all of GSL's self-tests. Despite that fact, BLAS is listed as a dependency. (It comes with its own CBLAS implementation that is e.g. used when running the GSL test suite during installation; however, the Sage library only uses it as a fall-back, if e.g. BLAS library is not present.)

Special Update/Build Instructions

Type

standard

Version Information

package-version.txt:

2.6

Equivalent System Packages

arch:

$ sudo pacman -S gsl-devel

conda:

$ conda install gsl-devel

cygwin:

$ apt-cyg install gsl-devel

Debian/Ubuntu:

$ sudo apt-get install gsl-devel

Fedora/Redhat/CentOS:

$ sudo yum install gsl-devel

freebsd:

$ sudo pkg install gsl-devel

gentoo:

$ sudo emerge gsl-devel

homebrew:

$ brew install gsl-devel
macports: install the following packages: gsl-devel nix:

```
$ nix-env --install gsl-devel
```

opensuse:

```
$ sudo zypper install gsl-devel
```

slackware:

```
$ sudo slackpkg install gsl-devel
```

void:

```
$ sudo xbps-install gsl-devel
```

See https://repology.org/project/gsl-devel/versions
If the system package is installed, ./configure will check whether it can be used.

### 4.1.101 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

**Dependencies**

Python, webencodings, six

**Type**

standard
Version Information

package-version.txt:

1.0.1

install-requires.txt:

html5lib >= 1.0.1

Equivalent System Packages

conda:

$ conda install html5lib python:html5lib

macports: install the following packages: html5lib python: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 https://trac.sagemath.org/ticket/29023

4.1.102 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

Dependencies

- None for the purposes of Sage, but in general gettext.
Special Update/Build Instructions

- None, other than anyone updating this package should be familiar with how to write shell scripts.

Type

standard

Version Information

package-version.txt:

| 1.15 |

Equivalent System Packages

cygwin:

$ apt-cyg install libiconv

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.

4.1.103 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

- GMP/MPIR
- libxml2, but this is not shipped with Sage, so the user has to install libxml2-dev from her distro.

Special Update/Build Instructions

Type

optional

Version Information

package-version.txt:

0.8.3

Equivalent System Packages

arch:

$ sudo pacman -S igraph

conda:

$ conda install igraph

Debian/Ubuntu:

$ sudo apt-get install igraph

Fedora/Redhat/CentOS:

$ sudo yum install igraph

freebsd:

$ sudo pkg install igraph

gentoo:

$ sudo emerge igraph

homebrew:

$ brew install igraph

macports: install the following packages: igraph See https://repology.org/project/igraph/versions

If the system package is installed, ./configure will check whether it can be used.
4.1.104 imagesize: Parser for image file metadata

Description
It parses image files’ header and return image size.

Type
standard

Version Information
package-version.txt:
1.2.0

install-requires.txt:
imagesize >=1.1.0

Equivalent System Packages
conda:
$ conda install python:imagesize

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.105 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

Dependencies

- GMP
- ATLAS

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

Version Information

package-version.txt:

1.0.4p1.p2

Equivalent System Packages

arch:

$ sudo pacman -S imlib2-devel

conda:

$ conda install imlib2-devel

Debian/Ubuntu:

$ sudo apt-get install imlib2-devel

Fedora/Redhat/CentOS:
$ sudo yum install imlib2-devel

gentoo:
$ sudo emerge imlib2-devel

nix:
$nix-env --install imlib2-devel

google:
$ sudo xbps-install imlib2-devel

See https://repology.org/project/imlib2-devel/versions
If the system package is installed, ./configure will check whether it can be used.

### 4.1.106 importlib_metadata: Library to access the metadata for a Python package

**Description**

importlib_metadata is a library to access the metadata for a Python package. It is intended to be ported to Python 3.8.

**License**

Apache Software License

**Upstream Contact**

Home page: http://importlib-metadata.readthedocs.io/

**Dependencies**

Python, setuptools, zipp
Type
standard

Version Information

package-version.txt:

4.0.1

install-requires.txt:

importlib_metadata >=1.7.0

Equivalent System Packages

conda:

$ conda install python: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 https://trac.sagemath.org/ticket/29023

4.1.107 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
Version Information

package-version.txt:
5.1.4

install-requires.txt:
importlib-resources

Equivalent System Packages

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.108 ipykernel: IPython Kernel for Jupyter

Description

This package provides the IPython kernel for Jupyter.

Type

standard

Version Information

package-version.txt:
5.2.1

install-requires.txt:
ipykernel >=5.2.1

Equivalent System Packages

conda:

$ conda install python:ipykernel

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023
4.1.109 ipympl: Matplotlib Jupyter Extension

Description
Matplotlib Jupyter Extension

License
BSD License

Upstream Contact
https://pypi.org/project/ipympl/

Type
optional

Version Information
package-version.txt:
0.6.3

install-requires.txt:
ipympl

Equivalent System Packages
However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.110 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

Version Information

package-version.txt:

7.16.1

install-requires.txt:

ipython >=7.13.0

Equivalent System Packages

conda:

$ conda install ipython

homebrew:

$ brew install ipython

macports: install the following packages: ipython opensuse:

$ sudo zypper install 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 https://trac.sagemath.org/ticket/29023
4.1.111 ipython_genutils: Vestigial utilities from IPython

Description

Vestigial utilities from IPython

Type

standard

Version Information

package-version.txt:

0.2.0

install-requires.txt:

ipython_genutils >=0.2.0

Equivalent System Packages

conda:

$ conda install python:ipython-genutils

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.112 ipywidgets: Interactive HTML widgets for Jupyter notebooks and the IPython kernel

Description

Interactive HTML widgets for Jupyter notebooks and the IPython kernel.

Type

standard
Version Information

package-version.txt:

7.6.3.p0

install-requires.txt:

ipywidgets >=7.5.1

Equivalent System Packages

conda:

$ conda install python:ipywidgets

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.113 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},
}
Type

optional

Version Information

package-version.txt:

0.20

Equivalent System Packages

conda:

$ conda install isl15-devel

cygwin:

$ apt-cyg install isl15-devel

Debian/Ubuntu:

$ sudo apt-get install isl15-devel

Fedora/Redhat/CentOS:

$ sudo yum install isl15-devel

freebsd:

$ sudo pkg install isl15-devel

gentoo:

$ sudo emerge isl15-devel

homebrew:

$ brew install isl15-devel

macports: install the following packages: isl15-devel opensuse:

$ sudo zypper install isl15-devel

void:

$ sudo xbps-install isl15-devel

4.1. External Packages (alphabetical order)
See https://repology.org/project/isl15-devel/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.114 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

Version Information

package-version.txt:

0.17.2

install-requires.txt:

jedi >=0.17.0

Equivalent System Packages

conda:

$ conda install jedi python:jedi

macports: install the following packages: jedi python: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 https://trac.sagemath.org/ticket/29023

4.1.115 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/

Dependencies

- Python (>= 2.4)
- setuptools (or distribute)
- Pygments (according to ‘spkg/standard/deps’)
- docutils (dito, as a note only)

Special Update/Build Instructions

None. (Just make sure its prerequisites are new enough in Sage, to avoid downloads during the build / installation.)

Type

standard

Version Information

package-version.txt:

2.11.2

install-requires.txt:

jinja2 >=2.11.2

Equivalent System Packages

conda:

$ conda install python:jinja2

macports: install the following packages: python:jinja2 opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1. External Packages (alphabetical order)
4.1.116 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
- 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

Version Information
package-version.txt:

| 14.29.52 |
Equivalent System Packages

arch:

$ sudo pacman -S jmol

conda:

$ conda install jmol

macports:

macports: install the following packages: jmol

nix:

$ nix-env --install jmol

opensuse:

$ sudo zypper 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 https://trac.sagemath.org/ticket/27330

4.1.117 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

Dependencies

• Python
• setuptools
• attrs
• importlib_metadata
• pyrsistent
4.1.118 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
Dependencies

- pip
- polymake

Special Update/Build Instructions

Type

optional

Version Information

package-version.txt:

0.9

install-requires.txt:

jupymake >=0.9

Equivalent System Packages


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.119 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
Version Information

package-version.txt:

6.1.6

install-requires.txt:

jupyter_client >=6.1.6

Equivalent System Packages

conda:

$ conda install jupyter-client python:jupyter-client

macports: install the following packages: jupyter-client python:jupyter-client opensuse:

$ sudo zypper install jupyter-client python:jupyter-client


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.120 jupyter_core: Jupyter core package

Description

Jupyter core package. A base package on which Jupyter projects rely.

Type

standard

Version Information

package-version.txt:

4.6.3

install-requires.txt:

jupyter_core >=4.6.3
**Equivalent System Packages**

conda:

```bash
$ conda install jupyter-core python:jupyter-core
```

macports: install the following packages: jupyter-core python:jupyter-core opensuse:

```bash
$ sudo zypper install jupyter-core python:jupyter-core
```

See [https://repology.org/project/jupyter-core/versions](https://repology.org/project/jupyter-core/versions), [https://repology.org/project/python: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 [https://trac.sagemath.org/ticket/29023](https://trac.sagemath.org/ticket/29023)

### 4.1.121 jupyter_jsmol: JSmol viewer widget for Jupyter

**Description**

JSmol viewer widget for Jupyter

**License**

BSD

**Upstream Contact**

[https://pypi.org/project/jupyter-jsmol/](https://pypi.org/project/jupyter-jsmol/)

**Type**

standard

**Version Information**

package-version.txt:

```
0.2.4
```

install-requires.txt:

```
jupyter-jsmol
```
Equivalent System Packages


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.122 jupyter_packaging: Jupyter Packaging Utilities

Description

Jupyter Packaging Utilities

License

BSD

Upstream Contact

https://pypi.org/project/jupyter-packaging/

Type

optional

Version Information

package-version.txt:

0.7.12

install-requires.txt:

jupyter-packaging

Equivalent System Packages

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023
4.1.123 **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/

**Dependencies**

- Python
- setuptools
- jupyter_core
- jupyter_client

**Type**

optional

**Version Information**

requirements.txt:

```
jupyterlab ~= 2.2.5
```

**Equivalent System Packages**

conda:

```
$ conda install jupyterlab python:jupyterlab
```

homebrew:

```
$ brew install jupyterlab python:jupyterlab
```

macports: install the following packages: jupyterlab python: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 https://trac.sagemath.org/ticket/27330
4.1.124 **jupyterlab_widgets**: A JupyterLab extension for Jupyter/IPython widgets

**Description**

A JupyterLab extension for Jupyter/IPython widgets.

**License**

BSD License

**Upstream Contact**

Home page: https://github.com/jupyter-widgets/ipywidgets

**Dependencies**

- jupyterlab
- nodejs

**Type**

optional

**Version Information**

package-version.txt:

```
2.0
```

**Equivalent System Packages**

macports: install the following packages: jupyterlab-widgets See https://repology.org/project/jupyterlab-widgets/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.125 **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 constructions like loop spaces, classifying spaces and so on.
License

GPL

Upstream Contact

- https://github.com/gheber/kenzo
- https://github.com/miguelmarco/kenzo/

Dependencies

- ECL (Embedded Common Lisp)

Type

optional

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 https://trac.sagemath.org/ticket/27330

4.1.126 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

Dependencies

- python
- setuptools

Type

standard

Version Information

package-version.txt:

1.0.1

install-requires.txt:

kiwisolver >=1.0.1

Equivalent System Packages

conda:

$ conda install python:kiwisolver

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.127 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

Dependencies

GMP (MPIR), 4ti2, NTL, cddlib.

Type

optional

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-integrale

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 https://trac.sagemath.org/ticket/27330

4.1.128 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

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, that’s 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

Version Information

package-version.txt:

1.23.p20
### Equivalent System Packages

**arch:**

```
$ sudo pacman -S lcalc
```

**conda:**

```
$ conda install lcalc
```

**Debian/Ubuntu:**

```
$ sudo apt-get install lcalc
```

**Fedora/Redhat/CentOS:**

```
$ sudo yum install lcalc
```

**freebsd:**

```
$ sudo pkg install lcalc
```

**nix:**

```
$ nix-env --install lcalc
```

See [https://repology.org/project/lcalc/versions](https://repology.org/project/lcalc/versions)

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

### 4.1.129 `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/](http://www.hboehm.info/gc/)
- **Email List:** bdwgc@lists.opendylan.org
Dependencies

None.

Special Update/Build Instructions

None.

Type

standard

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

Debian/Ubuntu:

$ sudo apt-get install libatomic_ops

Fedora/Redhat/CentOS:

$ sudo yum install libatomic_ops

freebsd:

$ sudo pkg install libatomic_ops

gentoo:

$ sudo emerge libatomic_ops

homebrew:

$ brew install libatomic_ops

4.1. External Packages (alphabetical order)
macports: install the following packages: libatomic_ops opensuse:

```
$ sudo zypper install libatomic_ops
```

slackware:

```
$ sudo slackpkg install libatomic_ops
```

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

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

### 4.1.130 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

**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
```

Fedora/Redhat/CentOS:

```
$ sudo yum install libbraiding
```

gentoo:

```
$ sudo emerge libbraiding
```

FreeBSD:

```
$ sudo pkg install libbraiding
```

Gentoo:

```
$ sudo emerge libbraiding
```

Nix:

```
$ nix-env --install libbraiding
```

OpenSUSE:

```
$ sudo zypper install libbraiding
```

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

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

**4.1.131 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.
License

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Upstream Contact

- https://sourceware.org/libffi/
- https://github.com/libffi/libffi

Type

standard

Version Information

package-version.txt:

3.2.1

Equivalent System Packages

conda:

$ conda install libffi-devel

cygwin:

$ apt-cyg install libffi-devel

Debian/Ubuntu:

$ sudo apt-get install libffi-devel

Fedora/Redhat/CentOS:

$ sudo yum install libffi-devel

freebsd:
$ sudo pkg install libffi-devel

homebrew:

$ brew install libffi-devel

macports: install the following packages: libffi-devel

opensuse:

$ sudo zypper install libffi-devel

slackware:

$ sudo slackpkg install libffi-devel

void:

$ sudo xbps-install libffi-devel

See https://repology.org/project/libffi-devel/versions

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

### 4.1.132 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](https://libgd.github.io)
- Pierre Joye ([http://blog.thepimp.net](http://blog.thepimp.net))
- [http://libgd.bitbucket.org/](http://libgd.bitbucket.org/)

**Dependencies**

- libpng
- freetype
- iconv
Special Update/Build Instructions

See spkg-src script.

Type

standard

Version Information

package-version.txt:

2.3.2

Equivalent System Packages

alpine: install the following packages: gd fontconfig libXpm libX11 libxcb libXau libXdmcp arch:

```bash
$ sudo pacman -S gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

conda:

```bash
$ conda install gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

cygwin:

```bash
$ apt-cyg install gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

Debian/Ubuntu:

```bash
$ sudo apt-get install gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

Fedora/Redhat/CentOS:

```bash
$ sudo yum install gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

freebsd:

```bash
$ sudo pkg install gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

gentoo:

```bash
$ sudo emerge gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

homebrew:

```bash
$ brew install gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

macports: install the following packages: gd fontconfig libXpm libX11 libxcb libXau libXdmcp nix:

```bash
$ nix-env --install gd fontconfig libXpm libX11 libxcb libXau libXdmcp
```

opensuse:
$ sudo zypper install gd fontconfig libXpm libX11 libxcb libXau libXdmc

slackware:

$ sudo slackpkg install gd fontconfig libXpm libX11 libxcb libXau libXdmc


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

### 4.1.133 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)

**Dependencies**

- gc

**Type**

standard

**Version Information**

package-version.txt:

1.02r6
Equivalent System Packages

arch:

$ sudo pacman -S libhomfly llibhomfly

conda:

$ conda install libhomfly llibhomfly

Debian/Ubuntu:

$ sudo apt-get install libhomfly llibhomfly

Fedora/Redhat/CentOS:

$ sudo yum install libhomfly llibhomfly

freebsd:

$ sudo pkg install libhomfly llibhomfly

gentoo:

$ sudo emerge libhomfly llibhomfly

nix:

$ nix-env --install libhomfly llibhomfly

opensuse:

$ sudo zypper install libhomfly llibhomfly

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.

4.1.134 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

Version Information

Equivalent System Packages

Debian/Ubuntu:

$ sudo apt-get install nauty

Fedora/Redhat/CentOS:

$ sudo yum install nauty

homebrew:

$ brew install nauty

macports: install the following packages: nauty See https://repology.org/project/nauty/versions

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

Dependencies

This spkg provides dependencies for

• the Sage library
Special Update/Build Instructions

- No changes went into src.

Type

optional

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 libogg

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 https://trac.sagemath.org/ticket/27330

4.1.136 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

Dependencies

This spkg depends on:

• libz

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 ~1png are patched to look for ~1png16 instead.

Type

standard
Version Information

package-version.txt:

1.6.29.p1

Equivalent System Packages

conda:

$ conda install libpng-devel

freebsd:

$ sudo pkg install libpng-devel

homebrew:

$ brew install libpng-devel

macports: install the following packages: libpng-devel opensuse:

$ sudo zypper install libpng-devel

slackware:

$ sudo slackpkg install libpng-devel

void:

$ sudo xbps-install libpng-devel

See https://repology.org/project/libpng-devel/versions

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

4.1.137 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

Type
optional

Version Information

package-version.txt:

1.1.0

Equivalent System Packages

conda:

$ conda install libsemigroups

freebsd:

$ sudo pkg install libsemigroups

opensuse:

$ sudo zypper install libsemigroups

See https://repology.org/project/libsemigroups/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.138 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

Dependencies

This spkg depends on

- libogg
- libpng

This spkg provides dependencies for

- the Sage library

Special Update/Build Instructions

- No changes went into src.

Type

experimental

Version Information

package-version.txt:

1.1.1
Equivalent System Packages

conda:

$ conda install libtheora

homebrew:

$ brew install libtheora

macports: install the following packages: libtheora opensuse:

$ sudo zypper install libtheora

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 https://trac.sagemath.org/ticket/27330

4.1.139 libxml2: XML parser and toolkit

Description

XML C parser and toolkit

License

MIT

Upstream Contact

http://www.xmlsoft.org/index.html

Type

optional

Version Information

Equivalent System Packages

alpine: install the following packages: libxml2-devel arch:

$ sudo pacman -S libxml2-devel

cygwin:

$ apt-cyg install libxml2-devel

Debian/Ubuntu:
$ sudo apt-get install libxml2-devel

Fedora/Redhat/CentOS:
$ sudo yum install libxml2-devel

tfreebsd:
$ sudo pkg install libxml2-devel

gentoo:
$ sudo emerge libxml2-devel

homebrew:
$ brew install libxml2-devel

macports: install the following packages: libxml2-devel
nix:
$ nix-env --install libxml2-devel

opensuse:
$ sudo zypper install libxml2-devel

slackware:
$ sudo slackpkg install libxml2-devel

void:
$ sudo xbps-install libxml2-devel

See https://repology.org/project/libxml2-devel/versions

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

### 4.1.140 *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.
License

lidia is released under the GPL, or so it is claimed. See https://groups.google.com/forum/#!msg/sage-devel/kTxgPSqrbUM/5Txj3_IKhIQJ and https://lists.debian.org/debian-legal/2007/07/msg00120.html

Upstream Contact

Matthias Köppe, UC Davis, CA, USA

Dependencies

GMP.

Type

optional

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 https://trac.sagemath.org/ticket/27330

4.1.141 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 inter-
preter 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

Version Information

package-version.txt:

2.2.2

Equivalent System Packages

Debian/Ubuntu:

$ sudo apt-get install lie

gentoo:

$ sudo emerge 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 https://trac.sagemath.org/ticket/27330

4.1.142 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
- ATLAS (non-OSX)/The Accelerate FrameWork (on OSX)
- ATLAS (non-MacOS X) / The Accelerate FrameWork (on MacOS X), or GSL’s CBLAS
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

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 linbox

freebsd:

$ sudo pkg install linbox

nix:

$ nix-env --install linbox

opensuse:

$ sudo zypper install linbox

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

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330
4.1.143 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

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 clang
```

genoo:

```
$ sudo emerge clang
```

homebrew:
4.1.144 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

Version Information

package-version.txt:

1.2.p1
Equivalent System Packages

arch:

$ sudo pacman -S lrcalc

conda:

$ conda install lrcalc

Debian/Ubuntu:

$ sudo apt-get install lrcalc

Fedora/Redhat/CentOS:

$ sudo yum install lrcalc

freebsd:

$ sudo pkg install lrcalc

gentoo:

$ sudo emerge lrcalc

nix:

$ nix-env --install lrcalc

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

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

4.1.145 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

Version Information

package-version.txt:

071b+autotools-2021-07-13

Equivalent System Packages

arch:

$ sudo pacman -S lrslib

conda:

$ conda install lrslib

Debian/Ubuntu:

$ sudo apt-get install lrslib

Fedora/Redhat/CentOS:

$ sudo yum install lrslib

freebsd:

$ sudo pkg install lrslib

gentoo:

$ sudo emerge lrslib

nix:
$ nix-env --install lrslib

opensuse:

$ sudo zypper install lrslib

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

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

4.1.146 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

Dependencies

• libPNG

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

Version Information

package-version.txt:

20200115

Equivalent System Packages

arch:

$ sudo pacman -S libm4ri

conda:

$ conda install libm4ri

Debian/Ubuntu:

$ sudo apt-get install libm4ri

Fedora/Redhat/CentOS:

$ sudo yum install libm4ri

freebsd:

$ sudo pkg install libm4ri

gentoo:

$ sudo emerge libm4ri

nix:

$ nix-env --install libm4ri

opensuse:

$ sudo zypper install libm4ri

See https://repology.org/project/libm4ri/versions

If the system package is installed, ./configure will check whether it can be used.
4.1.147 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

Version Information

package-version.txt:

20200115

Equivalent System Packages

arch:

$ sudo pacman -S libm4rie

conda:

$ conda install libm4rie

Debian/Ubuntu:

$ sudo apt-get install libm4rie

Fedora/Redhat/CentOS:
$ sudo yum install libm4rie

freebsd:
$ sudo pkg install libm4rie

gentoo:
$ sudo emerge libm4rie

nix:
$ nix-env --install libm4rie

opensuse:
$ sudo zypper install libm4rie

See https://repology.org/project/libm4rie/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.148 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

Dependencies
Python, setuptools

Type
standard
### Version Information

package-version.txt:

| 1.1.1 |

install-requires.txt:

| markupsafe >=1.1.0 |

### Equivalent System Packages

conda:

```bash
$ conda install python:markupsafe
```

macports: install the following packages: python:markupsafe opensuse:

```bash
$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

### 4.1.149 mathjax: A JavaScript library for displaying mathematical formulas

#### Description

MathJax is a JavaScript library for displaying mathematical formulas.

MathJax is used by the Jupyter notebook and the Sphinx documentation.

#### License

Apache License, version 2.0

#### Upstream Contact

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

#### Dependencies

None.
Special Update/Build Instructions

None.

Patches


Type

standard

Version Information

package-version.txt:

2.7.4.p0

Equivalent System Packages

conda:

$ conda install mathjax

opensuse:

$ sudo zypper 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 https://trac.sagemath.org/ticket/27330

4.1.150 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.

4.1. External Packages (alphabetical order)
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 (e.g. 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
Version Information

package-version.txt:

3.3.4

install-requires.txt:

matplotlib >=3.3.1

Equivalent System Packages

conda:

$ conda install python:matplotlib

macports: install the following packages: python:matplotlib opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.151 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

Dependencies

• ECL (Embedded Common Lisp)

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.
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

Version Information

package-version.txt:

```text
5.45.0
```
Equivalent System Packages

arch:

$ sudo pacman -S maxima maxima-ecl maxima-sage

conda:

$ conda install maxima maxima-ecl maxima-sage

Debian/Ubuntu:

$ sudo apt-get install maxima maxima-ecl maxima-sage

homebrew:

$ brew install maxima maxima-ecl maxima-sage

macports: install the following packages: maxima maxima-ecl maxima-sage nix:

$ nix-env --install maxima maxima-ecl maxima-sage

opensuse:

$ sudo zypper install maxima maxima-ecl maxima-sage


However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.152 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/mcq

**Dependencies**

None

**Type**

optional

**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](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 [https://trac.sagemath.org/ticket/27330](https://trac.sagemath.org/ticket/27330)

### 4.1.153 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/](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

Version Information

package-version.txt:

1.0.1

Equivalent System Packages

arch:

$ sudo pacman -S shared-meataxe sharedmeataxe

Fedora/Redhat/CentOS:

$ sudo yum install shared-meataxe 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 https://trac.sagemath.org/ticket/27330

4.1.154 MemoryAllocator: 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

Dependencies

• Cython

Type

standard

Version Information

package-version.txt:

0.1.0

Equivalent System Packages

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.155 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

Dependencies

Python, Cython, Pip
Type
standard

Version Information

package-version.txt:
0.8.4

install-requires.txt:
mistune >=0.8.4

Equivalent System Packages

conda:

$ conda install mistune python: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 https://trac.sagemath.org/ticket/29023

4.1.156 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/
Dependencies
None

Patches
None

Type
experimental

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 https://trac.sagemath.org/ticket/27330

4.1.157 mpc: Arithmetic of complex numbers with arbitrarily high precision and
correct rounding

Description

From http://www.multiprecision.org/mpc: GNU MPC is a C library for the arithmetic of complex numbers with arbi-
trarily 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 http://www.multiprecision.org/mpc.
The MPC team can be contacted via the MPC mailing list:

mpc-discuss@lists.gforge.inria.fr
Dependencies

- MPIR
- MPFR

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

Version Information

package-version.txt:

1.1.0

Equivalent System Packages

conda:

$ conda install mpc libmpc-devel

cygwin:

$ apt-cyg install mpc libmpc-devel

Debian/Ubuntu:

$ sudo apt-get install mpc libmpc-devel

Fedora/Redhat/CentOS:

$ sudo yum install mpc libmpc-devel

freebsd:

$ sudo pkg install mpc libmpc-devel

gentoo:

$ sudo emerge mpc libmpc-devel

homebrew:

$ brew install mpc libmpc-devel

nix:
$ nix-env --install mpc libmpc-devel

opensuse:

$ sudo zypper install mpc libmpc-devel

void:

$ sudo xbps-install mpc libmpc-devel

See https://repology.org/project/mpc/versions, https://repology.org/project/libmpc-devel/versions
If the system package is installed, ./configure will check whether it can be used.

### 4.1.158 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 http://mpfi.gforge.inria.fr/

The MPFI team can be contacted via the MPFI mailing list: mpfi-users@lists.gforge.inria.fr

#### Dependencies

- GMP
- MPFR
Type
standard

Version Information

package-version.txt:

1.5.2

Equivalent System Packages

conda:

$ conda install mpfi

Debian/Ubuntu:

$ sudo apt-get install mpfi

freebsd:

$ sudo pkg install mpfi

gentoo:

$ sudo emerge mpfi

homebrew:

$ brew install mpfi

nix:

$ nix-env --install mpfi

opensuse:

$ sudo zypper install mpfi

See https://repology.org/project/mpfi/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.159 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/](http://mpfr.org/)

The MPFR team can be contacted via the MPFR mailing list: mpfr@loria.fr

**Dependencies**

- GMP/MPIR
- GNU patch

**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
Version Information

package-version.txt:

4.0.1.p0

Equivalent System Packages

conda:

$ conda install mpfr
cygwin:

$ apt-cyg install mpfr
Debian/Ubuntu:

$ sudo apt-get install mpfr
Fedora/Redhat/CentOS:

$ sudo yum install mpfr
freebsd:

$ sudo pkg install mpfr
gentoo:

$ sudo emerge mpfr
homebrew:

$ brew install mpfr
opensuse:

$ sudo zypper install mpfr
slackware:

$ sudo slackpkg install mpfr
void:

$ sudo xbps-install mpfr

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

If the system package is installed, ./configure will check whether it can be used.
4.1.160 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

Version Information

package-version.txt:

0.5

Equivalent System Packages

opensuse:

$ sudo zypper install mpfrcx

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 https://trac.sagemath.org/ticket/27330

4.1.161 mpir: Multiple precision integers and rationals (fork of GMP)

Description

Multiple Precision Integers and Rationals.

MPIR is an open source multiprecision integer library derived from version 5.0.1 of the GMP (GNU Multi Precision) project (which was licensed LGPL v2+).

See http://www.mpir.org
License

- LGPL V3+

Upstream Contact

- The Google group mpir-devel
  - thempirteam@googlemail.com

Dependencies

- iconv
- GNU patch

Special Update/Build Instructions

- TODO:
  - Perhaps also modify CXXFLAGS (and/or CPPFLAGS).
  - We currently don’t use anything of GMP’s/MPIR’s CC setting, and matching with the current compiler (\$CC) is perhaps suboptimal.
  - Remove some files / directories not needed for Sage from upstream:
    - build.vc* directories (Microsoft Visual C build files)
    - 3.0.0-644f502c56f97d9accd301965fc57d6ec70868 was created by running the spkg-src script.

Type

standard

Version Information

package-version.txt:

3.0.0-644f502c56f97d9accd301965fc57d6ec70868.p0

Equivalent System Packages

conda:

$ conda install mpir

freebsd:

$ sudo pkg install mpir

homebrew:
$ brew install mpir

opensuse:

$ sudo zypper install mpir

See https://repology.org/project/mpir/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.162 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
- http://mpmath.org
- Website: https://github.com/fredrik-johansson/mpmath/

Dependencies

- Python

Type

standard

Version Information

package-version.txt:

1.2.1

install-requires.txt:

mpmath >=1.1.0
Equivalent System Packages

conda:

```
$ conda install mpmath python:mpmath
```


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.163 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


Type

standard
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 nauty

homebrew:

$ brew install nauty

nix:

$ nix-env --install nauty

opensuse:

$ sudo zypper install nauty

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

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

4.1.164 nbconvert: Converting Jupyter Notebooks

Description

jupyter nbconvert converts notebooks to various other formats via Jinja templates.
Type

standard

Version Information

package-version.txt:

5.6.1

install-requires.txt:

nbconvert >=5.6.1

Equivalent System Packages

conda:

$ conda install nbconvert python:nbconvert jupyter-nbconvert python:jupyter-nbconvert

opensuse:

$ sudo zypper install nbconvert python:nbconvert jupyter-nbconvert python:jupyter-nbconvert


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.165 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
Version Information

package-version.txt:

5.0.7

install-requires.txt:

nbformat >=5.0.7

Equivalent System Packages

conda:

$ conda install nbformat python:nbformat jupyter-nbformat python:jupyter-nbformat

opensuse:

$ sudo zypper install nbformat python:nbformat jupyter-nbformat python:jupyter-nbformat


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.166 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

Dependencies

None

Special Update/Build Instructions

None

Type

standard

Version Information

package-version.txt:

6.0.p0

Equivalent System Packages

conda:

$ conda install ncurses-devel

cygwin:

$ apt-cyg install ncurses-devel

Debian/Ubuntu:

$ sudo apt-get install ncurses-devel

Fedora/Redhat/CentOS:

$ sudo yum install ncurses-devel

freebsd:

$ sudo pkg install ncurses-devel

homebrew:
$ brew install ncurses-devel

macports: install the following packages: ncurses-devel opensuse:

$ sudo zypper install ncurses-devel

slackware:

$ sudo slackpkg install ncurses-devel

void:

$ sudo xbps-install ncurses-devel

See https://repology.org/project/ncurses-devel/versions

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

4.1.167 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

Version Information

package-version.txt:

2.5.1

install-requires.txt:

# gentoo uses 2.5
networkx ≥2.4, <2.6
Equivalent System Packages

conda:

$ conda install python:networkx

macports: install the following packages: python:networkx opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.168 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

Version Information

requirements.txt:

nibabel

Equivalent System Packages

conda:

$ conda install nibabel python:nibabel

macports: install the following packages: nibabel python:nibabel opensuse:

$ sudo zypper install nibabel python:nibabel

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.169 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/

Dependencies

None

Type

optional

Version Information

package-version.txt:

1.8.2

Equivalent System Packages

arch:

$ sudo pacman -S ninja

conda:

$ conda install ninja

cygwin:

$ apt-cyg install ninja

Debian/Ubuntu:
$ sudo apt-get install ninja

Fedora/Redhat/CentOS:

$ sudo yum install ninja

freebsd:

$ sudo pkg install ninja

gentoo:

$ sudo emerge 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.

4.1.170 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
Dependencies

- Python

Type

optional

Version Information

requirements.txt:

```
nodeenv ~= 1.4.0
```

Equivalent System Packages

conda:

```
$ conda install nodeenv python:nodeenv
```

homebrew:

```
$ brew install nodeenv python:nodeenv
```


However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.171 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/
Dependencies

- nodeenv

Type

optional

Version Information

package-version.txt:

12.18.3

Equivalent System Packages

conda:

$ conda install nodejs

homebrew:

$ brew install nodejs

opensuse:

$ sudo zypper install nodejs

See [https://repology.org/project/nodejs/versions](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 [https://trac.sagemath.org/ticket/27330](https://trac.sagemath.org/ticket/27330)

4.1.172 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/](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

Dependencies

- GMP/MPIR
- boost

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

Version Information

package-version.txt:

3.8.10

Equivalent System Packages

conda:

$ conda install normaliz libnormaliz

opensuse:

$ sudo zypper install normaliz libnormaliz

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 https://trac.sagemath.org/ticket/27330
4.1.173 nose: Python unit testing framework

Description

nose extends the test loading and running features of unittest, making it easier to write, find and run tests.

License

GNU LGPL

Upstream Contact

Author: Jason Pellerin Home Page: http://readthedocs.org/docs/nose/
see also https://github.com/nose-devs/nose

Dependencies

- setuptools / distribute
- Python
- GNU patch (shipped with Sage)

Special Update/Build Instructions

None.

Type

standard

Version Information

package-version.txt:

```
1.3.7
```

install-requires.txt:

```
nose >=1.3.7
```
Equivalent System Packages

conda:

$ conda install nose python:nose

macports: install the following packages: nose python:nose See https://repology.org/project/nose/versions, https://repology.org/project/python:nose/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 https://trac.sagemath.org/ticket/29023

4.1.174 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

Version Information

package-version.txt:

6.1.1

install-requires.txt:

notebook >=6.1.1

Equivalent System Packages

conda:

$ conda install python:notebook

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023
4.1.175 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

Dependencies

- Python
- setuptools
- nbformat
- nbconvert
- six
- pandoc_attributes

Type

optional

Version Information

package-version.txt:

1.5.1

install-requires.txt:

notedown >=1.5.1

Equivalent System Packages

conda:

$ conda install python: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 https://trac.sagemath.org/ticket/29023
4.1.176 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/

Dependencies

• gmp
• gf2x

Special Update/Build Instructions

• None

Type

standard

Version Information

package-version.txt:

11.4.3

Equivalent System Packages

conda:

$ conda install ntl

cygwin:

$ apt-cyg install ntl

Debian/Ubuntu:
4.1.177 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
Dependencies

- GNU patch
- Python
- Lapack
- Blas
- Atlas
- Fortran

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

Version Information

package-version.txt:

```
1.20.3
```

install-requires.txt:

```
numpy >=1.19
```

Equivalent System Packages

conda:

```
$ conda install python:numpy
```

homebrew:

```
$ brew install python:numpy
```

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023
4.1.178 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

Version Information

package-version.txt:

0.3.13

Equivalent System Packages

arch:

$ sudo pacman -S openblas-devel

conda:

$ conda install openblas-devel

cygwin:
$ apt-cyg install openblas-devel

Debian/Ubuntu:

$ sudo apt-get install openblas-devel

Fedora/Redhat/CentOS:

$ sudo yum install openblas-devel

freebsd:

$ sudo pkg install openblas-devel

gentoo:

$ sudo emerge openblas-devel

homebrew:

$ brew install openblas-devel

macports: install the following packages: openblas-devel nix:

$ nix-env --install openblas-devel

opensuse:

$ sudo zypper install openblas-devel

void:

$ sudo xbps-install openblas-devel

See https://repology.org/project/openblas-devel/versions

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

### 4.1.179 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

Version Information

package-version.txt:

3.0.0-alpha12

Equivalent System Packages

alpine: install the following packages: libressl-openssl arch:

$ sudo pacman -S libressl-openssl

conda:

$ conda install libressl-openssl

cygwin:

$ apt-cyg install libressl-openssl

Debian/Ubuntu:

$ sudo apt-get install libressl-openssl

Fedora/Redhat/CentOS:

$ sudo yum install libressl-openssl

freebsd:

$ sudo pkg install libressl-openssl

homebrew:

$ brew install libressl-openssl

macports: install the following packages: libressl-openssl nix:

$ nix-env --install libressl-openssl
opensuse:

```bash
$ sudo zypper install libressl-openssl
```

slackware:

```bash
$ sudo slackpkg install libressl-openssl
```

void:

```bash
$ sudo xbps-install libressl-openssl
```

See https://repology.org/project/libressl-openssl/versions

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

### 4.1.180 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

**Dependencies**

- None

**Type**

optional
Version Information

requirements.txt:

```
git+https://github.com/mkauers/ore_algebra@6826ac49b4cdf66a563449aced21a2fd1fd085c9
˓→#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 https://trac.sagemath.org/ticket/27330

4.1.181 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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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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Since version 1.0.1, the further work on this SPKG was funded by Marie Curie grant MTKD-CT-2006-042685 and was pursued at the National University of Ireland, Galway. Since November 2010, it is moved back to Jena.

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 grateful 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

Version Information

package-version.txt:

3.3.2

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 https://trac.sagemath.org/ticket/29023

4.1.182 packaging: Core utilities for Python packages

Description

Core utilities for Python packages

Type

standard

Version Information

package-version.txt:

20.9

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 python:packaging
```


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.183 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
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

See https://repology.org/project/palp/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.184 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
Version Information

Equivalent System Packages

alpine: install the following packages: pandoc

$ 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 pandoc

gentoo:

$ sudo emerge 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.

4.1.185 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

Dependencies

- Python
- setuptools
- pandocfilters

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

Version Information

package-version.txt:

8bc82f6d

install-requires.txt:

pandoc_attributes >=8bc82f6d

Equivalent System Packages

conda:

$ conda install pandoc-attributes python:pandoc-attributes


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1. External Packages (alphabetical order)
4.1.186 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

Dependencies

- Python

Special Update/Build Instructions

Download the last release from https://pypi.python.org/pypi/pandocfilters

Type

standard

Version Information

package-version.txt:

1.4.2

install-requires.txt:

pandocfilters >=1.4.2

Equivalent System Packages

conda:

$ conda install python:pandocfilters

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023
4.1.187 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

Version Information

package-version.txt:

```plaintext
2.13.1
```
Equivalent System Packages

Arch:

```
$ sudo pacman -S pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```

Conda:

```
$ conda install pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```

Debian/Ubuntu:

```
$ sudo apt-get install pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```

Fedora/Redhat/CentOS:

```
$ sudo yum install pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```

Freebsd:

```
$ sudo pkg install pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```

gentoo:

```
$ sudo emerge pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```

Homebrew:

```
$ brew install pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```

Macports: install the following packages: pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata

```
$ nix-env --install pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```

OpenSuse:

```
$ sudo zypper install pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```

Void:

```
$ sudo xbps-install pari pari-devel pari-elldata pari-galdata pari-galpol pari-seadata
```


If the system package is installed, ./configure will check whether it can be used.
4.1.188 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

Version Information

package-version.txt:

20161017

Equivalent System Packages

arch:

$ sudo pacman -S pari-elldata

conda:

$ conda install pari-elldata

freebsd:

$ sudo pkg install pari-elldata

opensuse:

$ sudo zypper install pari-elldata

void:
$ sudo xbps-install pari-elldata

See https://repology.org/project/pari-elldata/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.189 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/

Dependencies
None (package contains data files only)

Type
standard

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](https://repology.org/project/pari-galdata/versions)

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

### 4.1.190 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**


**Dependencies**

- Installation: None
- Runtime: PARI/GP

**Type**

optional
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 pari-galpol

opensuse:

$ sudo zypper install pari-galpol

void:

$ sudo xbps-install pari-galpol

See https://repology.org/project/pari-galpol/versions

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

4.1.191 pari_jupyter: Jupyter kernel for PARI/GP

Description

A Jupyter kernel for PARI/GP

License

GPL version 3 or later
Upstream Contact

- https://github.com/jdemeyer/pari_jupyter
- Jeroen Demeyer <J.Demeyer@UGent.be>

Dependencies

- Python (tested with version 2.7.14 and 3.6.1)
- Jupyter 4
- PARI version 2.8.0 or later
- Readline (any version which works with PARI)
- Optional: Cython version 0.25 or later

Type

optional

Version Information

package-version.txt:

1.3.2

install-require.txt:

pari_jupyter >=1.3.2

Equivalent System Packages

conda:

$ conda install pari-jupyter python:pari-jupyter


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.192 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

Version Information

package-version.txt:

20080929

Equivalent System Packages

conda:

$ conda install pari-nftables

freebsd:

$ sudo pkg install pari-nftables

opensuse:

$ sudo zypper 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.
4.1.193 pari_seadat: 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

Version Information

package-version.txt:

20090618

Equivalent System Packages

arch:

$ sudo pacman -S pari-seadat

conda:

$ conda install pari-seadat

Fedora/Redhat/CentOS:

$ sudo yum install pari-seadat

freebsd:

4.1. External Packages (alphabetical order) 253
\$ sudo pkg install pari-seadata

d恭喜使用：
\$ sudo zypper install pari-seadata

d空包：
\$ sudo xbps-install pari-seadata

See [https://repology.org/project/pari-seadata/versions](https://repology.org/project/pari-seadata/versions)
If the system package is installed, ./configure will check whether it can be used.

### 4.1.194 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/

**Dependencies**

None (package contains data files only)

**Type**

standard

**Version Information**

package-version.txt:

20090618.p0
Equivalent System Packages

arch:

$ sudo pacman -S pari-seadata-small

conda:

$ conda install pari-seadata-small

freebsd:

$ sudo pkg install pari-seadata-small

See https://repology.org/project/pari-seadata-small/versions

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

4.1.195 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

Version Information

package-version.txt:

0.7.0

install-requirements.txt:

parso >=0.7.0

Equivalent System Packages

conda:

$ conda install python:parso

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023
4.1.196 **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

**Dependencies**

None

**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

**Version Information**

package-version.txt:

```plaintext
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 patch
```

**homebrew:**

```
$ brew install patch
```

**macports:** install the following packages: patch opensuse:

```
$ sudo zypper install patch
```

**slackware:**

```
$ sudo slackpkg install patch
```

See [https://repology.org/project/patch/versions](https://repology.org/project/patch/versions)

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

### 4.1.197 pcre: Perl-compatible regular expressions library

**Description**

Perl-compatible regular expressions library.
License

BSD License; see LICENCE (sic) at the root of the original tarball.

Upstream Contact

Mailing list at https://lists.exim.org/mailman/listinfo/pcre-dev

Dependencies

None listed.

Special Update/Build Instructions

None applicable (see README at tarball’s root).

Type

standard

Version Information

package-version.txt:

8.40.p2

Equivalent System Packages

conda:

$ conda install pcre-devel pcre2-devel

cygwin:

$ apt-cyg install pcre-devel pcre2-devel

Debian/Ubuntu:

$ sudo apt-get install pcre-devel pcre2-devel

Fedora/Redhat/CentOS:

$ sudo yum install pcre-devel pcre2-devel

freebsd:

$ sudo pkg install pcre-devel pcre2-devel

homebrew:
macports: install the following packages: pcre-devel pcre2-devel

$ brew install pcre-devel pcre2-devel

opensuse:

$ sudo zypper install pcre-devel pcre2-devel

slackware:

$ sudo slackpkg install pcre-devel pcre2-devel

void:

$ sudo xbps-install pcre-devel pcre2-devel

See https://repology.org/project/pcre-devel/versions, https://repology.org/project/pcre2-devel/versions

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

4.1.198 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

Version Information

Equivalent System Packages

cpan: install the following packages: XML-Writer XML-LibXML XML-LibXSLT File-Slurp dev-perl/Term-ReadLine-Gnu JSON SVG Debian/Ubuntu:

$ sudo apt-get install XML-Writer XML-LibXML XML-LibXSLT File-Slurp dev-perl/Term-ReadLine-Gnu JSON SVG

Fedora/Redhat/CentOS:

$ sudo yum install XML-Writer XML-LibXML XML-LibXSLT File-Slurp dev-perl/Term-ReadLine-Gnu JSON SVG

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

4.1.199 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

Version Information

Equivalent System Packages

cpan: install the following packages: dev-perl/MongoDB

Debian/Ubuntu:

$ sudo apt-get install dev-perl/MongoDB

Fedora/Redhat/CentOS:

$ sudo yum install dev-perl/MongoDB

freebsd:

$ sudo pkg install dev-perl/MongoDB

gentoo:

$ sudo emerge dev-perl/MongoDB

If the system package is installed, ./configure will check whether it can be used.
4.1.200 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

Dependencies

readline

type

experimental

Version Information

package-version.txt:

| 1.35 |

Equivalent System Packages

arch:

$ sudo pacman -S perl-Term-ReadLine-Gnu
cpan: install the following packages: perl-Term-ReadLine-Gnu cygwin:

$ apt-cyg install perl-Term-ReadLine-Gnu

Debian/Ubuntu:

$ sudo apt-get install perl-Term-ReadLine-Gnu

Fedora/Redhat/CentOS:

$ sudo yum install perl-Term-ReadLine-Gnu

freebsd:
$ sudo pkg install perl-Term-ReadLine-Gnu

gentoo:
$ sudo emerge perl-Term-ReadLine-Gnu

macports: install the following packages: perl-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
If the system package is installed, ./configure will check whether it can be used.

### 4.1.201 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

- https://github.com/pexpect/pexpect

#### Dependencies

- GNU patch
- Python

#### Type

standard
Version Information

package-version.txt:

```
4.8.0
```

install-requires.txt:

```
pexpect >=4.8.0
```

Equivalent System Packages

conda:

```
$ conda install pexpect python:pexpect
```

macports: install the following packages: pexpect python:pexpect opensuse:

```
$ sudo zypper install pexpect python: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 https://trac.sagemath.org/ticket/29023

4.1.202 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

Version Information

package-version.txt:

```
0.7.5
```

install-requires.txt:

```
pickleshare >=0.7.5
```
Equivalent System Packages

conda:

```
$ conda install pickleshare python:pickleshare
```

macports: install the following packages: pickleshare python:pickleshare opensuse:

```
$ sudo zypper install pickleshare python:pickleshare
```


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.203 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/

Dependencies

- Python

Type

standard
**Version Information**

package-version.txt:

| 8.1.2 |

install-requires.txt:

| pillow >=7.2.0 |

**Equivalent System Packages**

conda:

```
$ conda install python:pillow
```

macports: install the following packages: python:pillow

```
$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

### 4.1.204 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
- Bug Tracking: https://github.com/pypa/pip/issues
- Mailing list: http://groups.google.com/group/python-virtualenv
- Docs: https://pip.pypa.io/
Dependencies

- python
- setuptools

Type

standard

Version Information

package-version.txt:

21.1.2

install-requires.txt:

pip >=20.2.3

Equivalent System Packages

conda:

$ conda install pip3 python:pip python3x-pip

macports: install the following packages: pip3 python:pip python3x-pip Opensuse:

$ sudo zypper install pip3 python:pip python3x-pip


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.205 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

Dependencies

- C compiler + toolchain

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

Version Information

package-version.txt:

0.9.7.p2

Equivalent System Packages

conda:

$ conda install pkgconf pkg-config

Debian/Ubuntu:

$ sudo apt-get install pkgconf pkg-config

Fedora/Redhat/CentOS:

$ sudo yum install pkgconf pkg-config

freebsd:

$ sudo pkg install pkgconf pkg-config

homebrew:

$ brew install pkgconf pkg-config

opensuse:

macports: install the following packages: pkgconf pkg-config

4.1. External Packages (alphabetical order)
$ sudo zypper install pkgconf pkg-config

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.

4.1.206 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

Dependencies

• Python 2.6+

Special Update/Build Instructions

Standard setup.py

• remove_nose.patch: Remove the nose dependency (not actually used)

Type

standard

Version Information

package-version.txt:

1.5.2

install-requires.txt:

pkgconfig >=1.5.1
**Equivalent System Packages**

conda:

```
$ conda install python:pkgconfig
```

macports: install the following packages: python:pkgconfig

```
$ sudo zypper install python:pkgconfig
```

See [https://repology.org/project/python:pkgconfig/versions](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 [https://trac.sagemath.org/ticket/29023](https://trac.sagemath.org/ticket/29023)

### 4.1.207 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](http://dx.doi.org/10.7155/jgaa.00091)

**License**

New BSD License

**Upstream Contact**

- [https://github.com/graph-algorithms/edge-addition-planarity-suite/](https://github.com/graph-algorithms/edge-addition-planarity-suite/)
- John Boyer <John.Boyer.PhD@gmail.com>

**Dependencies**

None

**Special Update/Build Instructions**

The tarballs can be found at, [https://github.com/graph-algorithms/edge-addition-planarity-suite/releases](https://github.com/graph-algorithms/edge-addition-planarity-suite/releases) sage tarball is repackaged after running autogen.sh
Type

standard

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 planarity

Fedora/Redhat/CentOS:

$ sudo yum install planarity

freebsd:

$ sudo pkg install planarity

gentoo:

$ sudo emerge planarity

nix:

$ nix-env --install planarity

opensuse:

$ sudo zypper install planarity

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

If the system package is installed, ./configure will check whether it can be used.
4.1.208 plantri: Generate non-isomorphic sphere-embedded 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

Dependencies

• None

Type

optional

Version Information

package-version.txt:

4.5
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 https://trac.sagemath.org/ticket/27330

4.1.209 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

Version Information

package-version.txt:

```
0.13.1
```

install-requires.txt:

```
pluggy
```

Equivalent System Packages

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023
4.1.210 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

Dependencies
- GMP

Type
optional

Version Information
package-version.txt:

```
5.22.5
```

Equivalent System Packages
macports: install the following packages: polylib opensuse:

```
$ sudo zypper install polylib
```

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 https://trac.sagemath.org/ticket/27330
4.1.211 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;
```

It is strongly recommended to also install JuPyMake:
When JuPyMake is present, Sage is able to use a more robust interface to Polymake.

**Debugging polymake install problems**

```
# apt-get install libdevel-trace-perl
$ cd src
$ perl -d:Trace support/configure.pl
```

**Type**

experimental

**Version Information**

```
package-version.txt:
```

4.4

**Equivalent System Packages**

```
opensuse:
```

```
$ sudo zypper install polymake
```

See [https://repology.org/project/polymake/versions](https://repology.org/project/polymake/versions)

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see [https://trac.sagemath.org/ticket/27330](https://trac.sagemath.org/ticket/27330)

### 4.1.212 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

Dependencies
None

Type
standard

Version Information
package-version.txt:
20170220.p0

Equivalent System Packages
arch:
$ sudo pacman -S sagemath-polytopes-db
conda:
$ conda install sagemath-polytopes-db

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 https://trac.sagemath.org/ticket/27330

4.1.213 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>

Dependencies

None

Type

optional

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 https://trac.sagemath.org/ticket/27330

4.1.214 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: https://arxiv.org/abs/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)

Dependencies

- gmp (or mpir)

Special Update/Build Instructions

Patches

- ptrdiff_t-ppl-1.1.patch: Fixes to compile with gcc 4.9; C++ name lookup issue.
- weak.patch: disable use of weak symbols on Cygwin64.

Type

standard

Version Information

package-version.txt:

1.2.p1

Equivalent System Packages

arch:

```bash
$ sudo pacman -S ppl-devel
```

conda:

```bash
$ conda install ppl-devel
```

Debian/Ubuntu:

```bash
$ sudo apt-get install ppl-devel
```
Fedora/Redhat/CentOS:

```
$ sudo yum install ppl-devel
```

freebsd:

```
$ sudo pkg install ppl-devel
```

gentoo:

```
$ sudo emerge ppl-devel
```

homebrew:

```
$ brew install ppl-devel
```

macports: install the following packages: ppl-devel

```
$ nix-env --install ppl-devel
```

opensuse:

```
$ sudo zypper install ppl-devel
```

void:

```
$ sudo xbps-install ppl-devel
```

See https://repology.org/project/ppl-devel/versions

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

### 4.1.215 pplpy: Python interface to the Parma Polyhedral Library

**Description**

PPL Python wrapper

This Python package provides a wrapper to the C++ Parma Polyhedral 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/videlec/pplpy

Type

standard

Version Information

package-version.txt:

0.8.6

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 python:pplpy


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.216 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

optional

Version Information

package-version.txt:

5.1

Equivalent System Packages

arch:

$ sudo pacman -S primecount

deprecated:

$ sudo apt-get install primecount

opensuse:

$ sudo zypper install primecount

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

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.217 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
Version Information

package-version.txt:

```
0.8.0
```

install-requires.txt:

```
prometheus_client >=0.8.0
```

Equivalent System Packages

conda:

```
$ conda install python:prometheus-client
```

macports: install the following packages: python:prometheus-client opensuse:

```
$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.218 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

Version Information

package-version.txt:

```
3.0.5
```

install-requires.txt:

```
prompt_toolkit >=3.0.5
```
Equivalent System Packages

conda:

```
$ conda install python:prompt-toolkit
```

macports: install the following packages: python:prompt-toolkit opensuse:

```
$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.219 psutil: Python library to retrieve information on processes and system utilization

Description

psutil is a cross-platform library for retrieving information on running processes and system utilization (CPU, memory, disks, network) in Python.

License

3-clause BSD license

Upstream Contact

https://github.com/giampaolo/psutil/

Type

standard

Version Information

package-version.txt:

```
5.2.0.p2
```

install-requires.txt:

```
psutil >=5.2.0
```
Equivalent System Packages

conda:

```
$ conda install psutil python:psutil
```

macports: install the following packages: psutil python:psutil opensuse:

```
$ sudo zypper install psutil python:psutil
```


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.220 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

Dependencies

- Python

Type

standard
Version Information

package-version.txt:

0.5.1.p0

install-requires.txt:

ptyprocess >=0.5.1

Equivalent System Packages

conda:

$ conda install ptyprocess python:ptyprocess

macports: install the following packages: ptyprocess python:ptyprocess opensuse:

$ sudo zypper install ptyprocess python: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 https://trac.sagemath.org/ticket/29023

4.1.221 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
Version Information

package-version.txt:

1.10.0

install-requires.txt:

py

Equivalent System Packages

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.222 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

Version Information

package-version.txt:

2.6.0

install-requires.txt:

pybind11 >=2.5.0
Equivalent System Packages

conda:

```bash
$ conda install python:pybind11
```

documentation:

```bash
$ brew install python:pybind11
```

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.223 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

Version Information

requirements.txt:

```plaintext
pybtex
```

Equivalent System Packages

conda:

```bash
$ conda install python:pybtex
```

macports: install the following packages: python:pybtex
openSUSE:

```bash
$ sudo zypper install python:pybtex
```

4.1. External Packages (alphabetical order)
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 https://trac.sagemath.org/ticket/27330

4.1.224 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

Dependencies

None.

Special Update/Build Instructions

None.

Type

optional

Version Information

package-version.txt:

0.6.3

install-requires.txt:

pycosat >=0.6.3
Equivalent System Packages

conda:

$ conda install pycosat python:pycosat


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.225 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

Version Information

package-version.txt:

2.20

install-requires.txt:

pycparser >=2.20

Equivalent System Packages

conda:

$ conda install pycparser python:pycparser

macports: install the following packages: pycparser python:pycparser opensuse:

$ sudo zypper install pycparser python:pycparser
However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.226 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

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 https://trac.sagemath.org/ticket/29023

4.1.227 pyflakes: Passive checker of Python programs

Description

passive checker of Python programs
License

MIT

Upstream Contact

https://pypi.org/project/pyflakes/

Type

optional

Version Information

requirements.txt:

pyflakes

Equivalent System Packages

conda:

$ conda install pyflakes python:pyflakes

macports: install the following packages: pyflakes python:pyflakes opensuse:

$ sudo zypper install pyflakes python:pyflakes

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

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.228 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

Dependencies

Python

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

Version Information

package-version.txt:

2.3.1.p0

install-requires.txt:

pygments >=2.3.1

Equivalent System Packages

conda:

$ conda install pygments python:pygments

homebrew:

$ brew install pygments python:pygments

macports: install the following packages: pygments python:pygments opensuse:

$ sudo zypper install pygments python: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 https://trac.sagemath.org/ticket/29023

4.1.229 pygraphviz: Python interface to Graphviz

Description

Python interface to Graphviz

License

BSD

Upstream Contact

https://pypi.org/project/pygraphviz/

Type

optional

Version Information

requirements.txt:

pygraphviz

install-requires.txt:

pygraphviz

Equivalent System Packages

conda:

$ conda install python:pygraphviz

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023
4.1.230 pynac: A fork of the symbolic computation software GiNaC that uses Python objects

Description

A modified version of GiNaC that replaces the dependency on CLN by Python.

License

GPL V2+

Upstream Contact

- https://github.com/pynac/pynac
- http://pynac.org
- Burcin Erocal - burcin spam.erocal.org
- William Stein - wstein spam.gmail.com
- Mike Hansen - mhansen spam.gmail.com

Dependencies

Python

Type

standard

Version Information

package-version.txt:

0.7.29.p1

Equivalent System Packages

conda:

$ conda install pynac

Debian/Ubuntu:

$ sudo apt-get install pynac

freebsd:

$ sudo pkg install pynac
See https://repology.org/project/pynac/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.231 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

Dependencies

• pip
• normaliz

Special Update/Build Instructions

Type

optional

Version Information

package-version.txt:

2.14

install-requires.txt:

pynormaliz ==2.14
Equivalent System Packages


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.232 pyopenssl: Python wrapper module around the OpenSSL library

Description

Python wrapper module around the OpenSSL library

License

Apache License, Version 2.0

Upstream Contact

https://pypi.org/project/pyOpenSSL/

Type

optional

Version Information

requirements.txt:

```
service_identity
pyopenssl
```

Equivalent System Packages

conda:

```
$ conda install pyopenssl python:pyopenssl
```

macports: install the following packages: pyopenssl python:pyopenssl opensuse:

```
$ sudo zypper install pyopenssl python:pyopenssl
```


However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330
4.1.233 pyparsing: A Python parsing module

Description
A Python Parsing Module

License
MIT License

Upstream Contact
- Author: Paul McGuire
- Home page: http://pyparsing.wikispaces.com

Dependencies
Python

Type
standard

Version Information
package-version.txt:
2.4.7

install-requires.txt:
pyparsing >=2.3.0

Equivalent System Packages
conda:

$ conda install pyparsing python:pyparsing

opensuse:

$ sudo zypper install pyparsing python:pyparsing

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 https://trac.sagemath.org/ticket/29023

4.1. External Packages (alphabetical order)
4.1.234 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
- psutil
- pyperform
- pytest
- Sphinx
- sphinx-rtd-theme
- tox

Type

standard

Version Information

package-version.txt:

```
0.16.0
```

install-requires.txt:

```
pyrsistent >=0.16.0
```
Equivalent System Packages

conda:

```
$ conda install pyrsistent python:pyrsistent
```

macports: install the following packages: pyrsistent python: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 https://trac.sagemath.org/ticket/29023

4.1.235 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

Version Information

package-version.txt:

```
0.9.7
```

install-requires.txt:

```
pysingular >=0.9.5
```
** Equivalent System Packages **

conda:

```
$ conda install pysingular python:pysingular
```

See [https://repology.org/project/pysingular/versions](https://repology.org/project/pysingular/versions), [https://repology.org/project/python: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 [https://trac.sagemath.org/ticket/29023](https://trac.sagemath.org/ticket/29023)

### 4.1.236 pytest: Simple powerful testing with Python

**Description**

pytest: simple powerful testing with Python

**License**

MIT

**Upstream Contact**

[https://pypi.org/project/pytest/](https://pypi.org/project/pytest/)

**Type**

optional

**Version Information**

requirements.txt:

```
pytest
```

**Equivalent System Packages**

conda:

```
$ conda install python:pytest
```

macports: install the following packages: python:pytest See [https://repology.org/project/python:pytest/versions](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 [https://trac.sagemath.org/ticket/27330](https://trac.sagemath.org/ticket/27330)
4.1.237 python3: The Python programming language

Description
The Python programming language

Upstream Contact
https://www.python.org

Type
standard

Version Information
package-version.txt:
3.9.5

Equivalent System Packages
alpine: install the following packages: python3 python3-devel cygwin:

$ apt-cyg install python3 python3-devel

Debian/Ubuntu:

$ sudo apt-get install python3 python3-devel

Fedora/Redhat/CentOS:

$ sudo yum install python3 python3-devel

freebsd:

$ sudo pkg install python3 python3-devel

homebrew:

$ brew install python3 python3-devel

macports: install the following packages: python3 python3-devel opensuse:

$ sudo zypper install python3 python3-devel

void:

$ sudo xbps-install python3 python3-devel

If the system package is installed, ./configure will check whether it can be used.
4.1.238  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/

Dependencies

- python
- igraph

Special Update/Build Instructions

Type

optional

Version Information

package-version.txt:

0.8.3

install-requires.txt:

python_igraph >=0.7.1999

Equivalent System Packages

conda:

$ conda install python:igraph python:python-igraph


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023
4.1.239 pytz: Timezone definitions for Python

**Description**

World Timezone Definitions for Python

**Special Update/Build Instructions**

The upstream tarball was repackaged after sanitizing the file permissions with

$ chmod go-w

**Type**

standard

**Version Information**

package-version.txt:

```
2020.4
```

install-requires.txt:

```
pytz >= 2020.1
```

**Equivalent System Packages**

conda:

```
$ conda install python:pytz
```

macports: install the following packages: python:pytz opensuse:

```
$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.240 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

Version Information

requirements.txt:

| pyx |

Equivalent System Packages

macports: install the following packages:

| python:pyx |

| opensuse: |

| $ sudo zypper install python: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 https://trac.sagemath.org/ticket/27330

4.1.241 pyzmq: Python bindings for the zeromq networking library

Description

Python bindings for the zeromq networking library.

License

LGPLv3+

Upstream Contact

http://www.zeromq.org

Dependencies

- Python
- Cython
- zeromq
Special Update/Build Instructions

None.

Type

standard

Version Information

package-version.txt:

22.0.3

install-requires.txt:

pyzmq >=19.0.2

Equivalent System Packages

conda:

$ conda install pyzmq python:pyzmq

opensuse:

$ sudo zypper install pyzmq python:pyzmq

See [https://repology.org/project/pyzmq/versions](https://repology.org/project/pyzmq/versions), [https://repology.org/project/python: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 [https://trac.sagemath.org/ticket/29023](https://trac.sagemath.org/ticket/29023)

4.1.242 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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WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT
OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

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

Dependencies

- readline
- saclib

Special Update/Build Instructions

One might need to set MAKE to “make -j1” for this to be built successfully.

Type

experimental

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 https://trac.sagemath.org/ticket/27330

4.1.243 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 halfs-
pace 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


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**

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**

optional

**Version Information**

package-version.txt:

```
2015-src-7.2.0.p1
```

**Equivalent System Packages**

conda:

```
$ conda install qhull
```

homebrew:

```
$ brew install qhull
```

macports: install the following packages: qhull opensuse:

```
$ sudo zypper install qhull
```

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

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330
4.1.244 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

Dependencies

- GNU patch
- iconv
- Readline
- BLAS/LAPACK
- xz
- pcre
- curl
- https-capable SSL

Type

standard

Version Information

package-version.txt:

3.6.3
Equivalent System Packages

arch:

\$ sudo pacman -S R

conda:

\$ conda install R

cygwin:

\$ apt-cyg install R

Debian/Ubuntu:

\$ sudo apt-get install R

Fedora/Redhat/CentOS:

\$ sudo yum install R

freebsd:

\$ sudo pkg install R

gentoo:

\$ sudo emerge R

homebrew:

\$ brew install R

macports: install the following packages: R nix:

\$ nix-env --install R

opensuse:

\$ sudo zypper install R

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.
4.1.245 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

optional

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 https://trac.sagemath.org/ticket/27330

4.1.246 ratpoints: Find rational points on hyperelliptic curves

Description

Michael Stoll’s program which searches for rational points on hyperelliptic curves.
NOTE: the ratpoints package has been assimilated by PARI/GP. Therefore, this package (as Sage package) is deprecated. In the future, it will be removed from Sage.

Upstream Contact

- Author: Michael Stoll
- Email: Michael.Stoll@uni-bayreuth.de
- Website: http://www.mathe2.uni-bayreuth.de/stoll/programs/

Dependencies

- GMP/MPIR
- (GNU) patch

Special Update/Build Instructions

Note on SSE2 instructions

- On several architectures, the SSE2 instructions used by ratpoints cause compiler errors. In the case that ratpoints fails to build with SSE2 instructions enabled, the build is repeated with SSE2 disabled.

Type

standard

Version Information

package-version.txt:

2.1.3.p5

Equivalent System Packages

arch:

$ sudo pacman -S ratpoints

conda:

$ conda install ratpoints

Debian/Ubuntu:

$ sudo apt-get install ratpoints

nix:

$ nix-env --install ratpoints

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

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330
4.1.247 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

Dependencies

- ncurses

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

- 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
Version Information

package-version.txt:

8.0

Equivalent System Packages

arch:

$ sudo pacman -S readline-devel

conda:

$ conda install readline-devel

cygwin:

$ apt-cyg install readline-devel

Debian/Ubuntu:

$ sudo apt-get install readline-devel

Fedora/Redhat/CentOS:

$ sudo yum install readline-devel

freebsd:

$ sudo pkg install readline-devel

homebrew:

$ brew install readline-devel

macports: install the following packages: readline-devel nix:

$ nix-env --install readline-devel

opensuse:

$ sudo zypper install readline-devel

slackware:

$ sudo slackpkg install readline-devel

void:

$ sudo xbps-install readline-devel

See https://repology.org/project/readline-devel/versions

If the system package is installed, ./configure will check whether it can be used.
4.1.248 requests: An HTTP library for Python

Description

Requests is the only Non-GMO HTTP library for Python, safe for human consumption.

Type

standard

Version Information

package-version.txt:

2.13.0

installRequires.txt:

requests >=2.13.0

Equivalent System Packages

conda:

$ conda install requests python:requests

macports: install the following packages: requests python:requests opensuse:

$ sudo zypper install requests python: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 https://trac.sagemath.org/ticket/29023

4.1.249 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

Dependencies

Special Update/Build Instructions

Patches

- setup.patch: takes care of a few parsing issues.
- cygwin.patch: let rpy2 build on Cygwin.

Type

standard

Version Information

package-version.txt:

3.3.6

install-requires.txt:

rpy2 >=3.3, <3.4

Equivalent System Packages

conda:

$ conda install rpy2

See https://repology.org/project/rpy2/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 https://trac.sagemath.org/ticket/29023
4.1.250 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

Dependencies

- notedown
- pandoc

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

Version Information

package-version.txt:

```
0.2.2.p0
```

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 https://trac.sagemath.org/ticket/29023

4.1.251 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


- cu2 - A fast, non-optimal 2x2x2 solver
- cubex - A fast, non-optimal 3x3x3 solver
- mcube - A fast, non-optimal 4x4x4 solver

Type

optional

Version Information

package-version.txt:

20070912.p21

Equivalent System Packages

arch:

$ sudo pacman -S rubiks

conda:

$ conda install 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 https://trac.sagemath.org/ticket/27330

### 4.1.252 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

**Version Information**

package-version.txt:

```
0.9
```

**Equivalent System Packages**

**arch:**

```
$ sudo pacman -S rw
```

**conda:**

```
$ conda install rw
```

**Debian/Ubuntu:**

```
$ sudo apt-get install rw
```

**Fedora/Redhat/CentOS:**

```
$ sudo yum install rw
```

**freebsd:**

```
```
$ sudo pkg install rw

nix:

$ nix-env --install rw

void:

$ sudo xbps-install rw

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

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

### 4.1.253 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
Dependencies

None.

Type

optional

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 https://trac.sagemath.org/ticket/27330

4.1.254 sage_conf: Configuration module for the SageMath library

Description

This 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 envi-
  ronment variables

This version of the package is generated by the Sage distribution’s configure script. Downstream packagers and
advanced developers and users may want to provide their own implementation of the 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 /sage_conf.

Type

standard

Version Information

package-version.txt:

9.4

Equivalent System Packages

However, these system packages will not be used for building Sage because spkg-config.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.255 Sage: Open Source Mathematics Software: Build system of the Sage documentation

About SageMath

“Creating a Viable Open Source Alternative to Magma, Maple, Mathematica, and MATLAB”

Copyright (C) 2005-2020 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 is the build system of the Sage documentation, based on Sphinx.
Type
standard

Version Information

package-version.txt:

9.4

install-requires.txt:

sage_docbuild

Equivalent System Packages

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.256 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

Version Information

requirements.txt:

sage-flatsurf
Equivalent System Packages

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.257 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

Version Information

package-version.txt:

9.0b12

install-requires.txt:

sage_numerical_backends_coin >=9.0b12

Equivalent System Packages


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023
4.1.258 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

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 https://trac.sagemath.org/ticket/29023

4.1.259 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

**Version Information**

package-version.txt:

```
9.3.1
```

install-requires.txt:

```
sage_numerical_backends_gurobi >=9.0.0
```

**Equivalent System Packages**


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

**4.1.260 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 https://trac.sagemath.org/ticket/28838 to provide a way to convert pedagogical material written available in Sage worksheet format.
Type

optional

Version Information

package-version.txt:

| 9.4 |

install-requires.txt:

| sage_sws2rst |

Equivalent System Packages

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.261 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

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 https://trac.sagemath.org/ticket/29023

4.1.262 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


The directory $SAGE_ROOT/local/share/doc/sagetex contains documentation and an example file. See $SAGE_ROOT/local/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

Version Information

package-version.txt:

3.5

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 https://trac.sagemath.org/ticket/29023

4.1.263 scandir: Fast file system iteration for Python

Description

scandir, a better directory iterator and faster os.walk()

scandir() is a directory iteration function like os.listdir(), except that instead of returning a list of bare filenames, it yields DirEntry objects that include file type and stat information along with the name. Using scandir() increases the speed of os.walk() by 2-20 times (depending on the platform and file system) by avoiding unnecessary calls to os.stat() in most cases.

Type

standard

Version Information

package-version.txt:

1.9.0

install-requires.txt:

scandir >=1.9.0
Equivalent System Packages

conda:

```bash
$ conda install python:scandir
```

macports: install the following packages: python:scandir opensuse:

```bash
$ sudo zypper install python:scandir
```

See https://repology.org/project/python:scandir/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 https://trac.sagemath.org/ticket/29023

4.1.264 scipoptsuite: Mixed integer programming solver

Description

SCIP is currently one of the fastest non-commercial 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

ZIB Academic License

The ZIB Academic License allows the use of software distributed under this license without charge for research purposes as a member of a non-commercial and academic institution, e.g., a university. The software is available with its source code.

http://scip.zib.de/academic.txt

SPKG Maintainers

- Martin Albrecht (original spkg)
- Matthias Koeppe (updates for new spkg style)

Upstream Contact

**Dependencies**

cmake

**Special Update/Build Instructions**

We do not have permission to redistribute SCIP or SoPlex. Hence, you must download it yourself from http://scip.zib.de and put the tarball `scipoptsuite-VERSION.tgz` in `$SAGE_ROOT/upstream`, renaming it to `scipoptsuite-VERSION-do-not-distribute.tgz`.

**Type**

experimental

**Version Information**

package-version.txt:

```
5.0.1
```

**Equivalent System Packages**

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 https://trac.sagemath.org/ticket/27330

**4.1.265 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

Version Information

package-version.txt:

1.6.3

install-requires.txt:

scipy >=1.5, <1.8

Equivalent System Packages

conda:

$ conda install python:scipy

homebrew:

$ brew install python:scipy

macports: install the following packages: python:scipy opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023
4.1.266 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.

Send2Trash is a small package that sends files to the Trash (or Recycle Bin) natively and on all platforms. On OS X, it uses native FSMoveObjectToTrashSync Cocoa calls, on Windows, it uses native (and ugly) SHFileOperation win32 calls. On other platforms, if PyGObject and GIO are available, it will use this. Otherwise, it will fallback to its own implementation of the trash specifications from freedesktop.org.

ctypes is used to access native libraries, so no compilation is necessary.

Send2Trash supports Python 2.7 and up (Python 3 is supported).

Type

standard

Version Information

package-version.txt:

1.5.0

install-requires.txt:

send2trash >=1.5.0

Equivalent System Packages

conda:

$ conda install send2trash python:send2trash

macports: install the following packages: send2trash python:send2trash opensuse:

$ sudo zypper install send2trash python:send2trash


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023
4.1.267 setuptools: Build system for Python packages

Description

setuptools is a collection of enhancements to the Python distutils (for Python 2.6 and up) that allow you to more easily build and distribute Python packages, especially ones that have dependencies on other packages.

Website: http://pypi.python.org/pypi/setuptools/

License

PSF or ZPL, i.e Python Software Foundation License or Zope Public License

Upstream Contact

• Phillip J. Eby (distutils-sig@python.org)

Dependencies

• python

Build Instructions/Changes

The following patches are in the patches subdirectory. The patches are applied during the build process.

• pkg_resources.py.patch: silence warning about permissions.
  • easy_install_lock.patch: lock the easy_install.pth file to allow simultaneous installation

Type

standard

Version Information

package-version.txt:

56.2.0

install-requires.txt:

setuptools >=49.6.0
Equivalent System Packages

conda:

```bash
$ conda install python:setuptools
```

macports: install the following packages: python:setuptools opensuse:

```bash
$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.268 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

Version Information

package-version.txt:

```
6.0.1
```

install-requires.txt:

```
setuptools_scm >=4.1.2
```
Equivalent System Packages

conda:

```bash
$ conda install python:setuptools-scm
```

macports: install the following packages: python:setuptools-scm opensuse:

```bash
$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.269 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.

Type

standard

Version Information

package-version.txt:

56.2.0

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 https://trac.sagemath.org/ticket/29023

4.1.270 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

**Version Information**

package-version.txt:

```
0.8.1.p0
```

install-requires.txt:

```
simplegeneric >=0.8.1
```

**Equivalent System Packages**

conda:

```
$ conda install simplegeneric python:simplegeneric
```

macports: install the following packages: simplegeneric python:simplegeneric opensuse:

```
$ sudo zypper install simplegeneric python:simplegeneric
```

See [https://repology.org/project/simplegeneric/versions](https://repology.org/project/simplegeneric/versions), [https://repology.org/project/python: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 [https://trac.sagemath.org/ticket/29023](https://trac.sagemath.org/ticket/29023)

### 4.1.271 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/

Dependencies

• GNU patch
• readline
• GMP/MPIR
• MPFR
• NTL
• FLINT

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

Version Information

package-version.txt:

4.2.0p3

Equivalent System Packages

conda:

$ conda install singular

Debian/Ubuntu:

$ sudo apt-get install singular

freebsd:
$ sudo pkg install singular

homebrew:

$ brew install singular

macports: install the following packages: singular nix:

$ nix-env --install singular

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

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.272 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

Version Information

package-version.txt:

0.9.7

install-requires.txt:

singular_jupyter >=0.9.7
Equivalent System Packages

conda:

$ conda install jupyter-singular python:jupyter-kernel-singular


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.273 sip: Python extension module generator for C and C++ libraries

Description

Python extension module generator for C and C++ libraries

Upstream contact

- https://www.riverbankcomputing.com/software/sip/
- https://pypi.python.org/pypi/SIP

License

SIP is released under the GPL v2, GPL v3 licenses, and under a license similar to the BSD license.

SIP is copyright (c) Riverbank Computing Limited. Its homepage is https://www.riverbankcomputing.com/software/sip/.

Type

optional

Version Information

package-version.txt:

4.18

Equivalent System Packages

conda:

$ conda install python:sip

homebrew:

$ brew install python:sip
macports: install the following packages: python:sip See https://repology.org/project/python:sip/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.274 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 (mmmarco@unizar.es)

Dependencies

• gcc

Type

optional

Version Information

package-version.txt:

2.0.2

Equivalent System Packages

arch:

$ sudo pacman -S sirocco

opensuse:

$ sudo zypper install sirocco
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 https://trac.sagemath.org/ticket/27330

### 4.1.275 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

**Version Information**

package-version.txt:

```
1.15.0
```

install-requires.txt:

```
six >=1.15.0
```

**Equivalent System Packages**

conda:

```
$ conda install python:six
```

macports: install the following packages: python:six opensuse:

```
$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

### 4.1.276 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

#### 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 https://trac.sagemath.org/ticket/27330
4.1.277 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

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 https://trac.sagemath.org/ticket/31180
snappy
# cypari 2.4.0 has a broken sdist, https://trac.sagemath.org/ticket/31180
cypari !=2.4.0
# An optional database (110M uncompressed)
snappy_15_knots
```

Equivalent System Packages

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.278 snowballstemmer: Stemmer algorithms for natural language processing in Python

Description

This package provides 16 stemmer algorithms (15 + Poerter English stemmer) generated from Snowball algorithms. It includes following language algorithms:

- Danish
This is a pure Python stemming library. If PyStemmer is available, this module uses it to accelerate.

**Type**

standard

**Version Information**

package-version.txt:

```
1.2.1.p0
```

install-requires.txt:

```
snowballstemmer >=1.2.1
```

**Equivalent System Packages**

conda:

```
$ conda install python:snowballstemmer
```

macports: install the following packages: python:snowballstemmer opensuse:

```
$ sudo zypper install python:snowballstemmer
```

See [https://repology.org/project/python:snowballstemmer/versions](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 [https://trac.sagemath.org/ticket/29023](https://trac.sagemath.org/ticket/29023)
4.1.279  speaklater: Lazy strings for Python

Description

Implements a lazy string for python useful for use with gettext
A module that provides lazy strings for translations. Basically you get an object that appears to be a string but changes
the value every time the value is evaluated based on a callable you provide.
For example you can have a global lazy_gettext function that returns a lazy string with the value of the current set
language.

Type

optional

Version Information

collection.version: 1.3.p0

install-requires.txt:
speaklater >=1.3

Equivalent System Packages

conda:

$ conda install speaklater python:speaklater

macports: install the following packages: speaklater python:speaklater opensuse:

$ sudo zypper install speaklater python:speaklater

See https://repology.org/project/speaklater/versions, https://repology.org/project/python:speaklater/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 https://trac.sagemath.org/ticket/29023

4.1.280  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

- six >= 1.4
- Jinja2 >= 2.3
- Pygments >= 2.0
- docutils >= 0.11
- snowballstemmer >= 1.1
- babel >= 1.3
- setuptools / distribute
- Python
- GNU patch (shipped with Sage)

Special Update/Build Instructions

- The script create_grammar_pickle.py creates the file Grammar2.7.pickle in site-packages/Sphinx-…/sphinx/pycode/. This helps to avoid race conditions when building the documentation in parallel.

Type

standard

Version Information

package-version.txt:

```
4.0.1.p0
```

install-requires.txt:

```
sphinx >= 4, < 4.2
```
Equivalent System Packages

conda:

$ conda install python:sphinx

homebrew:

$ brew install python:sphinx

macports: install the following packages:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.281 sphinxcontrib_applehelp: Sphinx extension which outputs Apple help book

Description

Sphinx extension which outputs Apple help book

License

BSD

Type

standard

Version Information

package-version.txt:

1.0.2

install-requires.txt:

sphinxcontrib_applehelp >=1.0.2
Equivalent System Packages

conda:

$ conda install python:sphinxcontrib-applehelp

macports: install the following packages: python:sphinxcontrib-applehelp

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.282 sphinxcontrib_devhelp: Sphinx extension which outputs Devhelp documents

Description

Sphinx extension which outputs Devhelp documents

License

BSD

Type

standard

Version Information

package-version.txt:

1.0.2

install-requires.txt:

sphinxcontrib_devhelp >=1.0.2

Equivalent System Packages

conda:

$ conda install python:sphinxcontrib-devhelp

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023
4.1.283 sphinxcontrib_htmlhelp: Sphinx extension which outputs HTML help book

Description

Sphinx extension which outputs HTML help book

License

BSD

Type

standard

Version Information

package-version.txt:

1.0.3

install-requires.txt:

sphinxcontrib_htmlhelp >=1.0.3

Equivalent System Packages

conda:

$ conda install python:sphinxcontrib-htmlhelp

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.284 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

Version Information

package-version.txt:

1.0.1

install-requires.txt:

sphinxcontrib_jsmath >=1.0.1

Equivalent System Packages

conda:

$ conda install python:sphinxcontrib-jsmath

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.285 sphinxcontrib_qthelp: Sphinx extension which outputs QtHelp documents

Description

Sphinx extension which outputs QtHelp documents

License

BSD

Type

standard
Version Information

package-version.txt:

1.0.3

install-requires.txt:

sphinxcontrib_qthelp >=1.0.3

Equivalent System Packages

conda:

$ conda install python:sphinxcontrib-qthelp

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.286 sphinxcontrib_serializinghtml: Sphinx extension which outputs serialized HTML files

Description

Sphinx extension which outputs serialized HTML files

License

BSD

Type

standard

Version Information

package-version.txt:

1.1.4

install-requires.txt:

sphinxcontrib_serializinghtml >=1.1.4
Equivalent System Packages

conda:

$ conda install python:sphinxcontrib-serializinghtml

macports: install the following packages: python:sphinxcontrib-serializinghtml opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.287 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

Version Information

package-version.txt:

1.2.1

install-requires.txt:

sphinxcontrib_websupport >=1.2.1

Equivalent System Packages

conda:

$ conda install python:sphinxcontrib-websupport

macports: install the following packages: python:sphinxcontrib-websupport opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

### 4.1.288 sqlalchmy: A database abstraction library

**Description**

Database Abstraction Library

**License**

MIT

**Upstream Contact**

https://pypi.org/project/SQLAlchemy/

**Type**

optional

**Version Information**

requirements.txt:

```
sqlalchemy
```

**Equivalent System Packages**

conda:

```
$ conda install python:sqlalchemy
```

macports: install the following packages: python:sqlalchemy opensuse:

```
$ sudo zypper install python: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 https://trac.sagemath.org/ticket/27330
4.1.289 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

Version Information

package-version.txt:

3290000

Equivalent System Packages

arch:

$ sudo pacman -S sqlite-devel

conda:

$ conda install sqlite-devel

cygwin:

$ apt-cyg install sqlite-devel

Debian/Ubuntu:
$ sudo apt-get install sqlite-devel

Fedora/Redhat/CentOS:

$ sudo yum install sqlite-devel

freebsd:

$ sudo pkg install sqlite-devel

genoot:

$ sudo emerge sqlite-devel

homebrew:

$ brew install sqlite-devel

macports: install the following packages: sqlite-devel nix:

$ nix-env --install sqlite-devel

opensuse:

$ sudo zypper install sqlite-devel

slackware:

$ sudo slackpkg install sqlite-devel

void:

$ sudo xbps-install sqlite-devel

See https://repology.org/project/sqlite-devel/versions

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

### 4.1.290 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.

4.1. External Packages (alphabetical order)
The building of metis is disabled 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.

License: because SuiteSparse is a collection, it comes with a variety of licenses. Find below a copy of the “LICENSES.txt” shipped with SuiteSparse.

**AMD/Licenses.txt**

AMD, Copyright (c), 1996-2015, Timothy A. Davis, Patrick R. Amestoy, and Iain S. Duff. All Rights Reserved.

Availability:

http://www.suitesparse.com

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Mongoose License

Mongoose, Copyright 2018, Timothy A. Davis, Scott P. Kolodziej, William W. Hager, S. Nuri Yeralan

Licensed under the GNU GENERAL PUBLIC LICENSE, Version 3, 29 June 2007

Type

standard
Version Information

package-version.txt:

5.10.1

Equivalent System Packages

arch:

$ sudo pacman -S suitesparse

conda:

$ conda install suitesparse

cygwin:

$ apt-cyg install suitesparse

Debian/Ubuntu:

$ sudo apt-get install suitesparse

Fedora/Redhat/CentOS:

$ sudo yum install suitesparse

freebsd:

$ sudo pkg install suitesparse

gentoo:

$ sudo emerge suitesparse

homebrew:

$ brew install suitesparse

macports: install the following packages: suitesparse opensuse:

$ sudo zypper install suitesparse

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

If the system package is installed, ./configure will check whether it can be used.
4.1.291 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

Version Information

package-version.txt:

```
1.0.6-gcc6
```
Equivalent System Packages

opensuse:

```sh
$ sudo zypper install surf-alggeo
```

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 https://trac.sagemath.org/ticket/27330

4.1.292 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

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 https://trac.sagemath.org/ticket/27330
4.1.293 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

Version Information
package-version.txt:

0.7.0

Equivalent System Packages
conda:
$ conda install symengine

freebsd:
$ sudo pkg install symengine

gentoo:
$ sudo emerge 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 https://trac.sagemath.org/ticket/27330
4.1.294 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**

optional

**Version Information**

package-version.txt:

```
0.7.0.post2
```

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 https://trac.sagemath.org/ticket/29023

4.1.295 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](http://www.algorithm.uni-bayreuth.de/en/research/SYMMETRICA)

Updated package on [https://gitlab.com/sagemath/symmetrica/-/releases](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/](http://www.mathe2.uni-bayreuth.de/axel/)

**Type**

standard

**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 symmetrica

Fedora/Redhat/CentOS:

$ sudo yum install symmetrica
freebsd:

```bash
$ sudo pkg install symmetrica
```

gentoo:

```bash
$ sudo emerge symmetrica
```

nix:

```bash
$ nix-env --install symmetrica
```

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

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

### 4.1.296 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`:

```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 trac ticket (#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 http://trac.sagemath.org/sage_trac/ticket/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

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 sympow

nix:

$ nix-env --install sympow

opensuse:

$ sudo zypper install sympow

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

If the system package is installed, ./configure will check whether it can be used.
4.1.297 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

Version Information

package-version.txt:

1.8

install-requires.txt:

sympy >=1.6, <2.0
Equivalent System Packages

conda:

```
$ conda install python:sympy
```

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.298 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

Copyright (c) 1994-2010 John E. Stone All rights reserved.

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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

Version Information

package-version.txt:

0.98.9.p7

Equivalent System Packages

arch:

$ sudo pacman -S tachyon tachyon-opengl

conda:

$ conda install tachyon tachyon-opengl

Debian/Ubuntu:

$ sudo apt-get install tachyon tachyon-opengl

Fedora/Redhat/CentOS:
$ sudo yum install tachyon tachyon-opengl

freebsd:

$ sudo pkg install tachyon tachyon-opengl

gentoo:

$ sudo emerge tachyon tachyon-opengl

nix:

$ nix-env --install tachyon tachyon-opengl

opensuse:

$ sudo zypper install tachyon tachyon-opengl

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.

4.1.299 tdl: 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

Version Information

package-version.txt:

```plaintext
0.3.1.p0
```

Equivalent System Packages

arch:

```bash
$ sudo pacman -S python: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 https://trac.sagemath.org/ticket/27330

4.1.300 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

Version Information

package-version.txt:

```plaintext
0.8.3
```

install-requires.txt:

```plaintext
terminado >=0.8.3
```
Equivalent System Packages

conda:

```
$ conda install terminado python:terminado
```

macports: install the following packages: terminado python: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 https://trac.sagemath.org/ticket/29023

4.1.301 testpath: Testing utilities for filesystem-related code

Description

Testpath is a collection of utilities for testing code which uses and manipulates the filesystem and system commands

Type

standard

Version Information

package-version.txt:

```
0.4.4
```

install-requires.txt:

```
testpath >=0.4.4
```

Equivalent System Packages

conda:

```
$ conda install testpath python:testpath
```

macports: install the following packages: testpath python:testpath See https://repology.org/project/testpath/versions, https://repology.org/project/python:testpath/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 https://trac.sagemath.org/ticket/29023
4.1.302 texlive: A comprehensive TeX system

Description

TeXLive 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

Version Information

Equivalent System Packages

macports: install the following packages: texlive See https://repology.org/project/texlive/versions

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.303 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

Version Information

package-version.txt:

| 1.6.3 |

install-requires.txt:

| texttable >=1.6.3 |

Equivalent System Packages

macports: install the following packages: texttable python: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 https://trac.sagemath.org/ticket/29023

4.1.304 thebe: Add live Jupyter interaction to static websites

Description

Jupyter javascript plugin for static sites. Thebe takes the Jupyter front end, and make it work outside of the notebook context.

This is used by Sage’s Sphinx-based documentation build system to produce html documentation that can be turned live (see https://trac.sagemath.org/ticket/20690).
License

MIT

Upstream Contact

- Home page: https://oreillymedia.github.io/thebe/
- Source: https://github.com/oreillymedia/thebe/

Dependencies

None.

Special Update/Build Instructions

There are no release numbers, hence find the latest commit, download https://github.com/oreillymedia/thebe/archive/$\text{COMMIT}.zip and rename it thebe-$\{\text{COMMIT:0:8}\}.zip

Type

standard

Version Information

package-version.txt:

9624e0a0.p0

Equivalent System Packages

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

However, these system packages will not be used for building Sage because spkg-configure.m4 has not been written for this package; see https://trac.sagemath.org/ticket/27330

4.1.305 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

Version Information

package-version.txt:

r122.p0

Equivalent System Packages

conda:

$ conda install threejs threejs-sage

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 https://trac.sagemath.org/ticket/27330

4.1.306 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

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 https://trac.sagemath.org/ticket/27330

4.1.307 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

Version Information
package-version.txt:
0.10.2

install-requires.txt:
toml

Equivalent System Packages
However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.308 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

Prof. Dr. Jörg Rambau <Jörg.Rambau@uni-bayreuth.de>
Lehrstuhl für Wirtschaftsmathematik
Raum FAN-D.1.29 (Sekretariat: FAN-D.1.30)
Universität Bayreuth
D-95440 Bayreuth
Germany
Tel: +49-921-55-7350, Fax: +49-921-55-7352
http://www.rambau.wm.uni-bayreuth.de

Dependencies

- gmp, libcdd

Special Update/Build Instructions

See spkg-src

Type

optional

Version Information

package-version.txt:

0.17.7

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 https://trac.sagemath.org/ticket/27330

4.1.309 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

Version Information

package-version.txt:

6.0.4

install-requires.txt:

tornado >= 6.0.4

Equivalent System Packages

conda:

$ conda install python:tornado

macports: install the following packages: python:tornado opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

4.1.310 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

Version Information
package-version.txt:
3.23.1

install-requires.txt:
 tox

Equivalent System Packages
conda:
$ conda install tox
cygwin:
$ apt-cyg install tox
Debian/Ubuntu:
$ sudo apt-get install tox
Fedora/Redhat/CentOS:
$ sudo yum install tox
freebsd:
$ sudo pkg install tox
gentoo:
$ sudo emerge tox
homebrew:
$ brew install tox
macports: install the following packages: tox slackware:

```
$ sudo slackpkg install tox
```

void:

```
$ sudo xbps-install tox
```

See [https://repology.org/project/tox/versions](https://repology.org/project/tox/versions)

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

### 4.1.311 traitlets: A configuration system for Python applications

**Description**

Traitlets Python config system

A configuration system for Python applications.

**Type**

standard

**Version Information**

package-version.txt:

```
4.3.3
```

install-requires.txt:

```
traitlets >=4.3.3
```

**Equivalent System Packages**

conda:

```
$ conda install traitlets python:traitlets
```

macports: install the following packages: traitlets python:traitlets opensuse:

```
$ sudo zypper install traitlets python:traitlets
```

See [https://repology.org/project/traitlets/versions](https://repology.org/project/traitlets/versions), [https://repology.org/project/python: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 [https://trac.sagemath.org/ticket/29023](https://trac.sagemath.org/ticket/29023)
4.1.312 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

Version Information

package-version.txt:

3.10.0.0

install-requires.txt:

typing-extensions

Equivalent System Packages

However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.313 tzlocal: Python timezone information for the local timezone

Description

tzinfo object for the local timezone
Type

standard

Version Information

package-version.txt:

2.1

install-requires.txt:

tzlocal >=2.1

Equivalent System Packages

conda:

$ conda install tzlocal python:tzlocal

macports: install the following packages: tzlocal python:tzlocal opensuse:

$ sudo zypper install tzlocal python: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 https://trac.sagemath.org/ticket/29023

4.1.314 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/](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

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
```

See [https://repology.org/project/valgrind/versions](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 [https://trac.sagemath.org/ticket/27330](https://trac.sagemath.org/ticket/27330)
4.1.315 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

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 python:vcversioner

macports: install the following packages: vcversioner python:vcversioner opensuse:

$ sudo zypper install vcversioner python:vcversioner


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023
4.1.316 virtualenv: Virtual Python Environment builder

Description
Virtual Python Environment builder

License
MIT

Upstream Contact
https://pypi.org/project/virtualenv/

Type
standard

Version Information

package-version.txt:
20.4.7

install-requires.txt:
virtualenv

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

4.1.317 wcwidth: Python support for wide characters in a terminal

Description
Measures number of Terminal column cells of wide-character codes

https://pypi.python.org/pypi/wcwidth
Type

standard

Version Information

package-version.txt:

0.1.7.p0

install-requires.txt:

wcwidth >=0.1.7

Equivalent System Packages

conda:

$ conda install wcwidth python:wcwidth

macports: install the following packages: wcwidth python:wcwidth opensuse:

$ sudo zypper install wcwidth python:wcwidth


However, these system packages will not be used for building Sage because using Python site-packages is not supported by the Sage distribution; see https://trac.sagemath.org/ticket/29023

4.1.318 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

**Version Information**

package-version.txt:

0.5.1

install-requires.txt:

webencodings >=0.5.1

**Equivalent System Packages**

conda:

$ conda install python:webencodings

macports: install the following packages: python:webencodings opensuse:

$ sudo zypper install python: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 https://trac.sagemath.org/ticket/29023

**4.1.319 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

Version Information

package-version.txt:

0.36.2

install-requires.txt:

# https://trac.sagemath.org/ticket/31050 - version constraint for macOS Big Sur support
wheel >=0.36.2

Equivalent System Packages

conda:

$ conda install wheel python:wheel

macports: install the following packages: wheel python:wheel opensuse:

$ sudo zypper install wheel python: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 https://trac.sagemath.org/ticket/29023

4.1.320 widgetsnbextension: Jupyter notebook extension for interactive HTML widgets

Description

Interactive HTML widgets for Jupyter notebooks.

Type

standard
Version Information

package-version.txt:

3.5.1.p0

install-requires.txt:

widgetsnbextension >=3.5.1

Equivalent System Packages

arch:

$ sudo pacman -S python3-jupyter_widgetsnbextension

conda:

$ conda install python3-jupyter_widgetsnbextension

Fedora/Redhat/CentOS:

$ sudo yum install python3-jupyter_widgetsnbextension

freebsd:

$ sudo pkg install python3-jupyter_widgetsnbextension

gentoo:

$ sudo emerge python3-jupyter_widgetsnbextension

macports: install the following packages: python3-jupyter_widgetsnbextension

opensuse:

$ sudo zypper install python3-jupyter_widgetsnbextension

void:

$ sudo xbps-install python3-jupyter_widgetsnbextension

See https://repology.org/project/python3-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 https://trac.sagemath.org/ticket/29023
4.1.321 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

Version Information

package-version.txt:

5.2.2.p0

Equivalent System Packages

conda:

$ conda install xz liblzma-devel

cygwin:

$ apt-cyg install xz liblzma-devel

Debian/Ubuntu:

$ sudo apt-get install xz liblzma-devel

Fedora/Redhat/CentOS:

$ sudo yum install xz liblzma-devel

homebrew:

$ brew install xz liblzma-devel

macports: install the following packages: xz liblzma-devel opensuse:
$ sudo zypper install xz liblzma-devel

 slackware:

 $ sudo slackpkg install xz liblzma-devel

 void:

 $ sudo xbps-install xz liblzma-devel

See https://repology.org/project/xz/versions, https://repology.org/project/liblzma-devel/versions

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

### 4.1.322 yasm: An assembler for the x86 and AMD64 instruction sets

**Description**

Yasm is a complete rewrite of the NASM assembler under the “new” BSD License (some portions are under other licenses, see COPYING for details).

Yasm currently supports the x86 and AMD64 instruction sets, accepts NASM and GAS assembler syntaxes, outputs binary, ELF32, ELF64, 32 and 64-bit Mach-O, RDOFF2, COFF, Win32, and Win64 object formats, and generates source debugging information in STABS, DWARF 2, and CodeView 8 formats.

Yasm can be easily integrated into Visual Studio 2005/2008 and 2010 for assembly of NASM or GAS syntax code into Win32 or Win64 object files.

See https://yasm.tortall.net

**License**

Yasm is licensed under the 2-clause and 3-clause “revised” BSD licenses, with one exception: the Bit::Vector module used by the mainline version of Yasm to implement its large integer and machine-independent floating point support is triple-licensed under the Artistic license, GPL, and LGPL. The “yasm-nextgen” codebase uses a different BSD-licensed implementation and is thus entirely under BSD-equivalent licenses. The full text of the licenses are provided in the Yasm source distribution.

**Upstream Contact**

- https://yasm.tortall.net

**Dependencies**

- none
Type

standard

Version Information

package-version.txt:

1.3.0.p0

Equivalent System Packages

alpine: install the following packages: yasm conda:

$ conda install yasm

cygwin:

$ apt-cyg install yasm

Debian/Ubuntu:

$ sudo apt-get install yasm

Fedora/Redhat/CentOS:

$ sudo yum install yasm

freebsd:

$ sudo pkg install yasm

homebrew:

$ brew install yasm

macports: install the following packages: yasm opensuse:

$ sudo zypper install yasm

slackware:

$ sudo slackpkg install yasm

void:

$ sudo xbps-install yasm

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

If the system package is installed, ./configure will check whether it can be used.
4.1.323 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

Version Information

package-version.txt:

4.2.5

Equivalent System Packages

conda:

$ conda install zeromq-devel

cygwin:

$ apt-cyg install zeromq-devel

Debian/Ubuntu:

$ sudo apt-get install zmq-devel

Fedora/Redhat/CentOS:
$ sudo yum install zeromq-devel

freebsd:
$ sudo pkg install zeromq-devel

temporary:
$ brew install zeromq-devel

macports: install the following packages: zeromq-devel opensuse:
$ sudo zypper install zeromq-devel

void:
$ sudo xbps-install zeromq-devel

See https://repology.org/project/zeromq-devel/versions
If the system package is installed, ./configure will check whether it can be used.

4.1.324 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
Version Information

package-version.txt:

| 0.5.2 |

install-requires.txt:

| zipp >=0.5.2 |

Equivalent System Packages

conda:

$ conda install python:zipp

macports: install the following packages: python: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 https://trac.sagemath.org/ticket/29023

4.1.325 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/

Dependencies

• None

Special Update/Build Instructions

Patches

• cygwin_symbols.patch: remove undefined symbols on Cygwin.
Type

standard

Version Information

package-version.txt:

1.2.11.p0

Equivalent System Packages

conda:

$ conda install zlib

cygwin:

$ apt-cyg install zlib

Debian/Ubuntu:

$ sudo apt-get install zlib

Fedora/Redhat/CentOS:

$ sudo yum install zlib

homebrew:

$ brew install zlib

macports: install the following packages: zlib opensuse:

$ sudo zypper install zlib

slackware:

$ sudo slackpkg install zlib

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

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

4.1.326 zn_poly: C library for polynomial arithmetic in \( \mathbb{Z}/n\mathbb{Z}[x] \)

Description

zn_poly is a C library for polynomial arithmetic in \( \mathbb{Z}/n\mathbb{Z}[x] \), where \( n \) is any modulus that fits into an unsigned long.

Website: https://gitlab.com/sagemath/zn_poly

Note: Original website is at https://web.maths.unsw.edu.au/~davidharvey/code/zn_poly/ but is no longer maintained. Sage maintains an “official” continuation of the project at the above link.
License

GPL V2 or V3. Some of the code has been copied from other projects - see the file src/COPYING for details.

Upstream Contact

• David Harvey
• E. M. Bray <erik.m.bray@gmail.com>

Dependencies

• GMP/MPIR
• (some) Python (to create the Makefile)
• GNU patch
• NTL apparently only if we configured zn_poly differently (same for FLINT)

Special Update/Build Instructions

• Make sure the patches still apply.
  Especially changes in `makemakefile.py` may also require changes to `spkg-install` (and perhaps also `spkg-check`).
• There’s also a --use-flint option to `configure`; no idea what it does, and we currently don’t use it either.
• TODO:
  • Use `make install` instead of manually “installing” (copying and symlinking) the [shared] libraries and header files. This requires further tweaking of `makemakefile.py`, since it currently only installs a static library and the headers.
  • If everything’s fine, i.e., no problems arise, some comments and especially some code I currently just commented out can certainly be removed. (-leif, 04/2012)
  • The version number “0.9.p11” is used as a doctest in the function `package_versions` in `sage/misc/packages.py`, so if this package gets upgraded, that doctest needs to be changed.

Patches

• All patches from Sage have been merged into upstream. These include:
  • `makemakefile.py`.patch:
    Improves the Python script creating the Makefile for better use at least within Sage; see patch for details. (Last modified at #12433, which added and changed a lot.)
  • `profiler.c`.patch, `zn_poly.h`.patch:
    Fix potential redefinition of `ulong` (in combination with other headers).
  • `mpn_mulmid-tune.c`.patch, `mulmid-tune.c`.patch, `mul-tune.c`.patch:
    Fix “jump into scope of identifier with variably modified type” errors. (See #8771.)
• mpn_mulmid-test.c.patch:
  Fix a potential problem when the value of ZNP_mpn_smp_kara_thresh is SIZE_MAX, this is usually unrealistic but can happen at least on linux on power7 with gcc-4.7.1 (see #14098).
• fix_fudge_factor_in_nuss-test.c.patch:
  As the name says; fix provided by upstream (David Harvey); see #13947.

**Type**

standard

**Version Information**

package-version.txt:

0.9.2

**Equivalent System Packages**

arch:

$ sudo pacman -S zn-poly libzn-poly

conda:

$ conda install zn-poly libzn-poly

Debian/Ubuntu:

$ sudo apt-get install zn-poly libzn-poly

Fedora/Redhat/CentOS:

$ sudo yum install zn-poly libzn-poly

freebsd:

$ sudo pkg install zn-poly libzn-poly

nix:

$ nix-env --install zn-poly libzn-poly

opensuse:

$ sudo zypper install zn-poly libzn-poly

See [https://repology.org/project/zn-poly/versions](https://repology.org/project/zn-poly/versions), [https://repology.org/project/libzn-poly/versions](https://repology.org/project/libzn-poly/versions)
If the system package is installed, ./configure will check whether it can be used.