Sage 9.2 Reference Manual: External Packages

Release 9.2

The Sage Development Team

Oct 25, 2020

CONTENTS

4TI2

1.1 Description

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

1.2 License

4ti2 is released under a GPL v2 license.

1.3 Upstream Contact

- Raymond Hemmecke, TU Munich, Germany
- Matthias Köppe, UC Davis, CA, USA

1.4 Dependencies

GLPK, GMP.

TWO

ALABASTER

2.1 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.

THREE

APPNOPE

3.1 Description

Disable App Nap on OS X 10.9

ARB

4.1 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.

4.2 License

GNU General Public License v2+

4.3 Upstream Contact

- Fredrik Johansson: fredrik.johansson@gmail.com

4.4 Dependencies

- FLINT

- MPIR or GMP

- MPFR

4.5 Special Update/Build Instructions

ATLAS

5.1 Description

This spkg builds ATLAS for Sage.

5.2 License

3-clause BSD

5.3 Upstream Contact

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

5.4 Dependencies

- Python

5.5 Special Update/Build Instructions

- src/lapack-x.y.z.tgz: The netlib lapack tarball. If you update this, make sure you also update the LA-PACK_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.

5.5.1 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.

5.5.2 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 direcory "path" are used and ATLAS is not compiled from source. The libraries can be either static (endin 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, P5MMX, PPRO, PII, PIII, PM, CoreSolo, CoreDuo, Core2Solo, Core2, Corei1, Corei2, Atom, P4, P4E, Efficeon, K7, HAMMER, AMD64K10h, AMDDOZER, UNKNOWNx86, IA64Itan, IA64Itan2, USI, USII, USIII, USIV, UST1, UST2, UnknownUS, MIPSR1xK, 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.

ATTRS

6.1 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).

6.2 License

MIT License

6.3 Upstream Contact

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

6.4 Dependencies

Python

AWALI

7.1 Description

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

7.2 License

- GPL 3.0

7.3 Upstream Contact

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

7.4 Dependencies

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

7.5 Special Update/Build Instructions

- None

BABEL

8.1 Description

Internationalization utilities

A collection of tools for internationalizing Python applications.

BARVINOK

9.1 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.

9.2 License

GPL v2

9.3 Upstream Contact

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

BENZENE

10.1 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.

10.2 License

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

10.3 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/

10.4 Dependencies

- None

BLEACH

11.1 Description

An easy safelist-based HTML-sanitizing tool.

11.2 License

Apache License v2

11.3 Upstream Contact

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

11.4 Dependencies

Python, html5lib, six

BLISS 0.73+DEBIAN-1

12.1 Description

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

12.2 License

LGPL

12.3 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.

12.4 Dependencies

None

BOOST

13.1 Description

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

13.2 License

Boost software license (GPL compatible)

13.3 Upstream Contact

Home page: http://boost.org

13.4 Dependencies

None

BOOST

14.1 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.

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

14.2 License

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

14.3 Upstream Contact

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

14.4 Dependencies

None

BRIAL

15.1 Description

BRiAl 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.

15.2 License

GPL version 2 or later

15.3 Upstream Contact

https://github.com/BRiAl/BRiAl

BUCKYGEN

16.1 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.

16.2 License

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

16.3 Upstream Contact

Buckygen was mainly written by Jan Goedgebeur, jan.goedgebeur[at]ugent.be. http://caagt.ugent.be/buckygen/

16.4 Dependencies

- None

BZIP2

17.1 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.

17.2 License

BSD-style

17.3 Upstream Contact

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

17.4 Dependencies

None

17.5 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.

COIN-OR / CBC

18.1 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.

18.2 License

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

18.3 Upstream Contact

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

18.4 Project Home Page

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

CCACHE

19.1 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++.

19.2 License

GNU General Public License version 3 or later

19.3 Upstream Contact

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

CDDLIB

20.1 Description

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

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

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

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

20.2 License

GPL v2

20.3 Upstream Contact

https://github.com/cddlib/cddlib

20.4 Dependencies

- gmp (or its fork mpir)

CERTIFI

21.1 Description

Python package for providing Mozilla's CA Bundle.

21.2 License

ISC

21.3 Upstream Contact

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

21.4 Dependencies

Python, Setuptools

CLIQUER

22.1 Description

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

22.2 License

GNU General Public License v2

22.3 Upstream Contact

Cliquer was mainly written by Sampo Niskanen, sampo.niskanenQiki.fi (Q=@). http://users.tkk.fi/pat/cliquer.html

22.4 Dependencies

- None

22.5 Patches

- autotoolized - see https://github.com/dimpase/autocliquer

CMAKE

23.1 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.

Website: www.cmake.org

23.2 License

CMake is distributed under the OSI-approved BSD 3-clause License.

23.3 Upstream Contact

- cmake-developers@cmake.org

23.4 Dependencies

- curl
- zlib
- bzip2
- xz

TWENTYFOUR

COCOALIB

24.1 Description

CoCoA is a program to compute with numbers and polynomials.

24.2 License

- GPL v3

24.3 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/

24.4 Dependencies

- GMP/MPIR

24.5 Special Update/Build Instructions

None.

COMBINATORIAL DESIGNS

25.1 Description

Data for Combinatorial Designs. Current content:

- The table of MOLS (10 000 integers) from the Handbook of Combinatorial Designs, 2ed.

25.2 License

Public domain.

25.3 Upstream Contact

None

25.4 Dependencies

N/A

COMPILER WRAPPER

26.1 Description

A wrapper for compiler and binutils that sets rpath, removes optimizations on broken archs and gcc versions, and generally helps to compile Sage more easily.

26.2 License

GPL v2+

26.3 Upstream Contact

- https://bitbucket.org/vbraun/compilerwrapper
- Volker Braun <vbraun.name@gmail.com>

26.4 Dependencies

- None

26.5 Special Update/Build Instructions

The src/ subdirectory is a clone of my mercurial repository at https://bitbucket.org/vbraun/compilerwrapper. You can update the source tree with "hg pull -u".

CONFIGURE

27.1 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.

27.2 License

GPLv3+

27.3 Upstream Contact

Automatically generated by Sage, use trac and/or sage-devel for questions.

27.4 Dependencies

None

27.5 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.

CONWAY POLYNOMIALS DATABASE

28.1 Description

Contains a small database of Conway polynomials.

28.2 Dependencies

- Sage library

COXETER3

29.1 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.

29.2 License

GPL

29.3 Upstream Contact

github: https://github.com/tscrim/coxeter

Alas, Fokko Ducloux passed away in 2006.

http://math.univ-lyon1.fr/~ducloux/du_Cloux.html

29.4 Dependencies

None

29.5 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
```

CRYPTOMINISAT

30.1 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.

30.2 License

MIT License

30.3 Upstream Contact

- Authors: Mate Soos
- Email: soos.mate@gmail.com
- Website: http://www.msoos.org/
- Releases: https://github.com/msoos/cryptominisat/releases

30.4 Special Update/Build Instructions

CryptoMiniSat's tarball downloaded from github is called VERSION.tar.gz and should be renamed to cryptominisat-VERSION.tar.gz

CSDP

31.1 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

31.2 License

Common Public License Version 1.0

31.3 Upstream Contact

Dmitrii Pasechnik <dimpase+sage@gmail.com>

31.4 Dependencies

31.5 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 http://github.org/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

CURL

32.1 Description

Multiprotocols data transfer library (and utility).

32.2 License

"MIT style license" : see file "COPYING" at the root of the source tarball, explanations at https://curl.haxx.se/docs/
copyright.html.

32.3 Upstream Contact

According to the file README at the root of the tarball, contact is done by mailing https://curl.haxx.se/mail/

32.4 Dependencies

None listed.

32.5 Special Update/Build Instructions

None.

CVXOPT

33.1 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.

33.2 Upstream Contact

- J. Dahl <dahl.joachim@gmail.com>
- L. Vandenberghe <vandenbe@ee.ucla.edu>

Downloaded from http://cvxopt.org

33.3 License

GPLv3 or later. Includes parts under GPLv2, GNU Lesser General Public License, v2.1. See src/LICENSE for more details. (Sage-compatible)

33.4 Dependencies

- GNU patch
- GSL
- GLPK

33.5 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.

CYCLER

34.1 Description

Cycler is a small break of of matplotlib to deal with "composable cycles". It is a required dependency of matplotlib 1.5.0.

34.2 License

BSD

34.3 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/

34.4 Dependencies

- python
- setuptools
- six

CYPARI2

35.1 Description

A Python interface to the number theory library libpari.

35.2 License

GPL version 2 or later

35.3 Upstream Contact

https://github.com/defeo/cypari2

35.4 Dependencies

- Python
- Cython
- PARI
- cysignals

CYSIGNALS

36.1 Description

Interrupt and signal handling for Cython

36.2 License

LGPL version 3 or later

36.3 Upstream Contact

https://github.com/sagemath/cysignals

36.4 Dependencies

- Python
- Cython
- PARI (optional)

CYTHON

37.1 Description

Cython is a language that makes writing C extensions for the Python language as easy as Python itself. Cython is based on the well-known Pyrex, but supports more cutting edge functionality and optimizations.

The Cython language is very close to the Python language, but Cython additio- nally supports calling C functions and declaring C types on variables and class attributes. This allows the compiler to generate very efficient C code from Cython code.

This makes Cython the ideal language for wrapping for external C libraries, and for fast C modules that speed up the execution of Python code.

Website: http://www.cython.org/

37.2 License

Apache License, Version 2.0

37.3 Upstream Contact

- cython-devel@python.org

37.4 Dependencies

- Python

D3JS

38.1 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.

38.2 License

BSD 3-Clause License

38.3 Upstream Contact

- Author: Mike Bostock (http://bost.ocks.org/mike/)
- Home page: http://d3js.org/

38.4 Dependencies

None.

38.5 Special Update/Build Instructions

Two kind of archives can be downloaded from d3.js website: one with all source code and tests that weights 2,9M (both in zip and tar.gz formats) and one with the final javascript scripts which weights 121K (zip format only). Since testing requires node.js that is not shipped with Sage, we currenlty ship the final js only. Hence we have to transform it from zip to tar.gz format. Running sage-src should do all the repackaging job.

DATABASE_CREMONA_ELLCURVE

39.1 Description

John Cremona's database of elliptic curves

See https://github.com/JohnCremona/ecdata

This is an optional package, not included by default.

39.2 License

Public Domain

39.3 Dependencies

None

39.3.1 Patches

- None

39.4 Upstream Contact

- Author: John Cremona
- Email: john.cremona@gmail.com
- Website: http://homepages.warwick.ac.uk/staff/J.E.Cremona/

39.5 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.

DATABASE_JONES_NUMFIELD

40.1 Description

This is a table of number fields with bounded ramification and degree at most 6.

40.2 License

GPLv2+

40.3 Upstream Contact

sage-devel@googlegroups.com

40.4 Dependencies

None

40.5 Special Update/Build Instructions

Created by taking the original old-style spkg and removing crud from it.

FORTYONE

KOHEL DATABASE

41.1 Description

Database of modular and Hilbert polynomials.

41.2 Upstream Contact

- David Kohel <David.Kohel@univ-amu.fr>

MUTATION CLASS DATABASE

42.1 Description

Contains a database of all exceptional mutation classes of quivers.

Every file in the database is of the form `mutation_classes_n.dig6` for some `n` and

- contains a `cPickle.dump` of a dictionary where
- the keys are tuples representing irreducible exceptional quiver mutation types of rank n, and
- the values are all quivers in the given mutation class stored in canonical form as `(dig6,edges)` where
- `dig6` is the dig6 data of the given `DiGraph`, and
- `edges` are the non-simply-laced edges thereof.
- is obtained by running the function

  ```
  sage.combinat.cluster_algebra_quiver.quiver_mutation_type.
  _save_data_dig6(n, types='Exceptional', verbose=False)
  ```

42.2 SPKG Maintainers

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

42.3 Dependencies

- None

FORTYTHREE

ZEROS OF THE RIEMANN ZETA FUNCTION

43.1 Description

Table of zeros of the Riemann zeta function by Andrew Odlyzko.

This package contains the file 'zeros6' with the first 2,001,052 zeros of the Riemann zeta function, accurate to within $4*10^{-9}$.

43.2 Dependencies

- Sage library

FORTYFOUR

DATABASE_STEIN_WATKINS

44.1 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.

44.2 License

Public Domain

44.3 Dependencies

None

44.3.1 Patches

None

FORTYFIVE

DATABASE_STEIN_WATKINS_MINI

45.1 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.

45.2 License

Public Domain

45.3 Dependencies

None

45.3.1 Patches

None

DATABASE_SYMBOLIC_DATA

46.1 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.

46.2 License

GNU General Public License

46.3 Upstream Contact

- Andreas Nareike <nareike@informatik.uni-leipzig.de>

46.4 Dependencies

46.5 Special Update/Build Instructions

List patches that need to be applied and what they do

FORTYSEVEN

DATEUTIL

47.1 Description

The dateutil module provides powerful extensions to the standard datetime module.

47.2 License

Simplified BSD License

47.3 Upstream Contact

Author: Gustavo Niemeyer <gustavo@niemeyer.net> Home page: http://labix.org/python-dateutil

47.4 Dependencies

- Python
- Six

FORTYEIGHT

DECORATOR

48.1 Description

Better living through Python with decorators

FORTYNINE

DEFORMATION

49.1 Description

Deformation is a C library for counting points on hypersurfaces using the deformation method, developed by Sebastian Pancratz.

49.2 License

GLPv3

49.3 Upstream Contact

- Sebastian Pancratz: sebastian.pancratz@gmail.com

DEFUSEDXML

50.1 Description

defusedxml addresses vulnerabilities of XML parsers and XML libraries.

It became a dependency of nbconvert starting with nbconvert 5.4.

50.2 License

Python Software Foundation License (PSFL)

50.3 Upstream Contact

https://pypi.org/project/defusedxml/

50.4 Dependencies

- pip

50.5 Special Update/Build Instructions

None.

DOCUTILS

51.1 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.

51.2 License

Modified BSD

51.3 Upstream Contact

Author: David Goodger Home Page: http://docutils.sourceforge.net/

51.4 Dependencies

None

51.5 Special Update/Build Instructions

None

DOT2TEX

52.1 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/

52.2 License

- MIT

52.3 Upstream Contact

- Kjell Magne Fauske, km@fauskes.net

52.4 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

52.5 Patches

- remove_test_semicolon.patch:

    Remove the failing semicolon test for the open dot2tex issue #5 - https://github.com/kjellmf/dot2tex/issues/5

52.6 Special Update/Build Instructions

Make sure corresponding optional doctests still pass:

    sage -t –long –optional=dot2tex,graphviz,sage src/

FIFTYTHREE

E-ANTIC

53.1 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

53.2 License

e-antic is licensed GPL v3.

53.3 Upstream Contact

- https://github.com/videlec/e-antic

53.4 Dependencies

- GMP/MPIR
- FLINT
- ARB

ECL

54.1 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/

54.2 License

- LGPL V2+ or compatible - for details see

  http://ecls.sourceforge.net/license.html

54.3 Upstream Contact

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

54.4 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.

ECLIB

55.1 Description

mwrank is a program written in C++ for computing Mordell-Weil groups of elliptic curves over Q via 2-descent. It is available as source code in the eclib package, which may be distributed under the GNU General Public License, version 2, or any later version.

mwrank is now only distributed as part of eclib. eclib is also included in Sage, and for most potential users the easiest way to run mwrank is to install Sage (which also of course gives you much much more). I no longer provide a source code distribution of mwrank by itself: use eclib instead.

55.2 License

eclib is licensed GPL v2+.

55.3 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

55.4 Dependencies

- PARI
- NTL
- FLINT

ECM

56.1 Description

GMP-ECM - Elliptic Curve Method for Integer Factorization

Sources can be obtained from http://gforge.inria.fr/projects/ecm/

56.2 License

LGPL V3+

56.3 Upstream Contact

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

56.4 Dependencies

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

56.5 Special Update/Build Instructions

- GMP-ECM comes with a self-tuning feature; we could support that as an option ($SAGE_TUNE_*=yes) in the future.

- ECM currently does not (by itself) use the CC and CFLAGS settings from 'gmp.h' since we pass (other) options in CFLAGS, and CC is set by Sage and might got set by the user. We now at least partially fix that such that "optimized" code generation options ('-mcpu=...', '-mtune=...') are used by gcc. Of course a user can also manually enable them by setting the "global" CFLAGS to e.g. '-march=native' on x86[_64] systems, or '-mcpu=...' and '-mtune=...' on other architectures where "native" isn't supported. Note that this doesn't affect the packages' selection of processor- specific optimized [assembly] code. 'spkg-install' already reads the settings from Sage's and also a system-wide GMP / 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.)

ELLIPTIC_CURVES

57.1 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

57.2 Upstream Contact

57.2.1 cremona_mini

- Author: John Cremona
- Email: john.cremona@gmail.com
- Website: http://johncremona.github.io/ecdata/

57.2.2 ellcurves

- Author: William Stein
- Email: wstein@gmail.com

57.3 Dependencies

- sqlite
- python

ENTRYPOINTS

58.1 Description

Discover and load entry points from installed packages.

58.2 Upstream Contact

https://github.com/takluyver/entrypoints

58.3 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.

FFLAS/FFPACK

59.1 Description

FFLAS-FFPACK is a LGPL-2.1+ source code library for dense linear algebra over word-size finite fields.

http://linalg.org/projects/fflas-ffpack

59.2 License

LGPL V2.1 or later

59.3 SPKG Repository

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

59.4 Upstream Contact

- <ffpack-devel@googlegroups.com>

59.5 Dependencies

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

59.6 Patches

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

FLINT

60.1 Description

FLINT is a C library for doing number theory, maintained by William Hart.

Website: www.flintlib.org

60.2 License

FLINT is licensed GPL v2+.

60.3 Upstream Contact

- flint-devel Gougle Group (http://groups.google.co.uk/group/flint-devel)
- William Hart

60.4 Dependencies

- MPIR
- MPFR
- NTL

FLINTQS

61.1 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

FPLLL

62.1 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

62.2 License

- LGPL V2.1+

62.3 Upstream Contact

- Martin Albrecht <martinralbrecht+fplll@googlemail.com>
- Mailing List https://groups.google.com/forum/#!forum/fplll-devel

62.4 Dependencies

- gmp
- mpfr

FPYLLL

63.1 Description

A Python interface for https://github.com/fplll/fplll

63.2 License

GPL version 2 or later

63.3 Upstream Contact

https://github.com/fplll/fpylll

63.4 Dependencies

- Cython
- fplll
- Sage (optional)
- NumPy (optional)

FREETYPE

64.1 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).

64.2 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.

64.3 Upstream Contact

- home: https://www.freetype.org
- repo:
    - official: http://git.savannah.gnu.org/cgit/freetype
    - mirror: https://github.com/aseprite/freetype2/

64.4 Dependencies

See the `dependencies` file.

FRICAS

65.1 Description

FriCAS is a general purpose computer algebra system.

65.2 License

Modified BSD license.

65.3 Upstream Contact

http://fricas.sourceforge.net/

65.4 Dependencies

- ecl

FROBBY

66.1 Description

The software package Frobby provides a number of computations on monomial ideals. The current main feature is the socle of a monomial ideal, which is largely equivalent to computing the maximal standard monomials, the Alexander dual or the irreducible decomposition.

Operations on monomial ideals are much faster than algorithms designed for ideals in general, which is what makes a specialized library for these operations on monomial ideals useful.

66.2 License

- GPL version 2.0 or later

66.3 Maintainers

- Bjarke Hammersholt Roune (www.broune.com)

66.4 Upstream Contact

- Bjarke Hammersholt Roune (www.broune.com)

66.5 Dependencies

- GMP built with support for C++

66.6 Special Update/Build instructions

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

GAMBIT

67.1 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.

67.2 License

GPL v2+

67.3 Upstream Contact

- Website: http://www.gambit-project.org/
- Mailing List: http://sourceforge.net/p/gambit/mailman/gambit-devel/

67.4 Dependencies

- python
- cython
- setuptools
- IPython
- scipy

GAP

68.1 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.

68.2 Upstream Contact

David Joyner, wdjoyner@gmail.com (on the GAP team, but Steve Linton, sal@dcs.st-and.ac.uk, is basically the lead developer)

68.3 Dependencies

- Readline
- MPIR

68.4 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

68.4.1 Patches

- writeandcheck.patch: fix infinite loop in writeandcheck() when writing an error message fails.

JEAN MICHEL'S GAP 3 DISTRIBUTION

69.1 Description

This package installs Jean Michel's pre-packaged GAP3, which is a minimal GAP3 distribution containing packages that have no equivalent in GAP4.

Below is the full description from Jean Michel's webpage (accessed 23 July 2015).

A pre-packaged GAP3 with everything you need

To help people who are just interested in GAP3 because they need a package which has not been ported to GAP4, I have prepared an easy-to install minimal GAP3 distribution containing an up-to-date versions of the packages:

anusq, arep, autag, chevie, cryst, dce, grim, matrix, meataxe, monoid, nq, pcqa, sisyphos, specht, ve, vkcurve.

These packages have been chosen since most have no equivalent in GAP4. They are autoloaded when starting gap.

This distribution includes only partial lists of small groups, 2-groups, 3-groups, character tables from the Atlas and tables of marks. It does not include either the packages:

anupq, grape, kbmag, xgap, cohomolo, gliss, guava, xmod

which have some equivalent in GAP4. You can get these extra features at

http://www.math.rwth-aachen.de/~Frank.Luebeck/gap/GAP3

In this distribution:

- The on-line help includes the documentation of the included packages.
- The html documentation (htm/index.html) also does.
- The manual (manual.pdf) also does.

69.2 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).

69.3 SPKG Maintainers

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

69.4 Upstream Contact

Jean Michel <jmichel@math.jussieu.fr> http://webusers.imj-prg.fr/~jean.michel/

69.5 Special Update/Build Instructions

The difference between the distributed tarball and Jean Michel's original tarball also contains the binaries

69.5.1 Patches

None

69.6 Dependencies

None

JUPYTER-KERNEL-GAP

70.1 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.

70.2 License

3-Clause BSD License

70.3 Upstream Contact

- https://github.com/gap-packages/jupyter-gap

GAP_PACKAGES

71.1 Description

Several "official" and "undeposited" GAP packages available from http://www.gap-system.org/Packages/packages.html

71.2 Upstream Contact

- Dmitrii Pasechnik, dimpase@gmail.com

- David Joyner, wdjoyner@gmail.com (on the GAP team)

- Steve Linton, sal@dcs.st-and.ac.uk (basically the GAP lead developer)

71.3 Dependencies

- GAP (a standard spkg)

71.4 TODO

The crystallographic group packages are untested/untestable. They rely on polymake and the dependency "cryst" is missing. This needs to be cleaned up.

71.5 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)

GC

72.1 Description

The Boehm-Demers-Weiser conservative garbage collector.

72.2 License

- Permissive BSD + GPL 2.0+

72.3 Upstream Contact

Webpage: http://www.hboehm.info/gc/ Email List: bdwgc@lists.opendylan.org

72.4 Dependencies

None.

72.5 Special Update/Build Instructions

None.

72.5.1 Patches

- cygwin64.patch: let libgc build on Cygwin64.

GCC

73.1 Description

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

73.2 License

GPL version 2 or version 3

73.3 Upstream Contact

http://gcc.gnu.org/

73.4 Dependencies

- zlib
- MPIR
- MPFR
- MPC

73.5 Special Update/Build Instructions

None.

GDB

74.1 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.

74.2 License

GPL v3+

74.3 Upstream Contact

http://www.gnu.org/software/gdb/

74.4 Dependencies

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

74.5 Special Update/Build Instructions

Current version needs makeinfo installed to build successfully.

GF2X

75.1 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/

75.2 License

- GNU GPLv2+.

75.3 Upstream Contact

- Richard Brent

- Pierrick Gaudry

- Emmanuel Thomé

- Paul Zimmermann

75.4 Dependencies

- None

75.5 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.

75.5.1 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.

GFAN

76.1 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.

76.2 License

- GPL version 2 or version 3 (according to the gfan website)

76.3 Upstream Contact

Anders Nedergaard Jensen; for contact info check out http://home.imf.au.dk/jensen/software/gfan/gfan.html

76.4 Dependencies

- GMP/MPIR
- CDDLIB

76.5 Special Update/Build Instructions

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

GFORTRAN

77.1 Description

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

77.2 License

GPL version 2 or version 3

77.3 Upstream Contact

http://gcc.gnu.org/

77.4 Dependencies

- zlib
- MPIR
- MPFR
- MPC

77.5 Special Update/Build Instructions

None.

GIAC

78.1 Description

- Giac is a general purpose Computer algebra system by Bernard Parisse. It consists of:

- a C++ library (libgiac).

- a command line interpreter (icas or giac).

- the built of the FLTK-based GUI (xcas) has been disabled in the spkg-install file.

- The english documentation will be installed in:

  $SAGE_LOCAL/share/giac/doc/en/cascmd_en/index.html

- Author's website with debian, ubuntu, macosx, windows package:

  http://www-fourier.ujf-grenoble.fr/~parisse/giac.html

- The Freebsd port is math/giacxcas

78.2 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

78.3 Upstream Contact

- Bernard Parisse: http://www-fourier.ujf-grenoble.fr/~parisse/giac.html

- Source file (giac-x.y.z-t.tar.gz) in:

  http://www-fourier.ujf-grenoble.fr/~parisse/debian/dists/stable/main/source/

78.4 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.

78.5 Special Update/Build Instructions

- Use spkg-src to update this package

SEVENTYNINE

GIT - THE STUPID CONTENT TRACKER

79.1 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`

79.2 Upstream Contact

- Maintainer: Junio C. Hamano

- Website: http://git-scm.com/

79.3 Dependencies

- zlib

Note: excluding libcurl and expat because they are large and only required if you're communicating with repositories over HTTP. If you need to do so, please use an external version of git.

GIT-TRAC

80.1 Description

This module implements a "git trac" subcommand of the git suite that interfaces with trac over XMLRPC.

80.2 License

GPLv3+

80.3 Upstream Contact

- https://github.com/sagemath/git-trac-command
- Volker Braun <vbraun.name@gmail.com>

80.4 Dependencies

- python 2.7 or 3.3+

80.5 Special Update/Build Instructions

Nothing special, just use the provided setup.py

GIVARO

81.1 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: http://www-lmc.imag.fr/CASYS/LOGICIELS/givaro/

SPKG Repository: https://bitbucket.org/malb/givaro-spkg

81.2 License

- GNU GPL

81.3 Upstream Contact

- Clement Pernet

81.4 Dependencies

- GNU patch
- GMP/MPIR

GLPK

82.1 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

82.2 License

The GLPK package is GPL version 3.

82.3 Upstream Contact

GLPK is currently being maintained by:

- Andrew Makhorin (mao@gnu.org, mao@mai2.rcnet.ru)

http://www.gnu.org/software/glpk/#maintainer

82.4 Dependencies

- GMP/MPIR

- zlib

82.5 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.)

82.5.1 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

GLUCOSE

83.1 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.*

83.2 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).

83.3 Upstream Contact

Website: http://www.labri.fr/perso/lsimon/glucose/

83.4 Dependencies

zlib

83.5 Special Update/Build Instructions

None.

GMP

84.1 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.

84.2 License

- LGPL V3

84.3 Upstream Contact

- http://gmplib.org

EIGHTYFIVE

GMPY2

85.1 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.

GP2C

86.1 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.

86.2 License

GPL version 2+

86.3 Upstream Contact

- http://pari.math.u-bordeaux.fr/

86.4 Dependencies

- PARI
- Perl

GRAPHS

87.1 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.

87.2 Upstream Contact

- For ISGCI:

  H.N. de Ridder (hnridder@graphclasses.org)

- For Andries Brouwer's database:

  The data is taken from from Andries E. Brouwer's website (https://www.win.tue.nl/~aeb/). Anything related to the data should be reported to him directly (aeb@cwi.nl)

  The code used to parse the data and create the .json file is available at https://github.com/nathanncohen/strongly_regular_graphs_database.

87.3 Dependencies

N/A

GSL

88.1 Description

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.

88.2 License

- GPL V3

88.3 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.

88.4 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.)

88.5 Special Update/Build Instructions

HTML5LIB

89.1 Description

HTML parser based on the WHATWG HTML specification.

89.2 License

MIT License

89.3 Upstream Contact

Home Page: https://github.com/html5lib/html5lib-python/issues

89.4 Dependencies

Python, webencodings, six

ICONV

90.1 Description

GNU libiconv is a library that is used to enable different languages, with different characters to be handled properly.

90.2 License

- GPL 3 and LGPL 3. So we can safely link against the library in Sage.

90.3 Upstream Contact

- http://www.gnu.org/software/libiconv/
- Bug reports to bug-gnu-libiconv@gnu.org

90.4 Dependencies

- None for the purposes of Sage, but in general gettext.

90.5 Special Update/Build Instructions

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

IGRAPH

91.1 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.

91.2 License

GPL version 2

91.3 Upstream Contact

http://igraph.org/c/

91.4 Dependencies

- GMP/MPIR

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

91.5 Special Update/Build Instructions

IMAGESIZE

92.1 Description

It parses image files' header and return image size.

IML

93.1 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: http://www.cs.uwaterloo.ca/~astorjoh/iml.html

93.2 License

- GPLv2+

93.3 Upstream Contact

- Zhuliang Chen z4chen@uwaterloo.ca
- Arne Storjohann astorjoh@uwaterloo.ca

93.4 Dependencies

- GMP
- ATLAS

93.5 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.

93.5.1 Patches

- examples.patch: Modified some of the examples.

IMPORTLIB_METADATA

94.1 Description

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

94.2 License

Apache Software License

94.3 Upstream Contact

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

94.4 Dependencies

Python, Setuptools, zipp

NINETYFIVE

IPYKERNEL

95.1 Description

IPython Kernel for Jupyter

This package provides the IPython kernel for Jupyter.

IPYTHON

96.1 Description

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).

96.2 License

BSD

96.3 Upstream Contact

http://ipython.scipy.org/

ipython-dev@scipy.org

ipython-user@scipy.org

IPYTHON_GENUTILS

97.1 Description

Vestigial utilities from IPython

NINETYEIGHT

IPYWIDGETS

98.1 Description

Interactive HTML widgets for Jupyter notebooks and the IPython kernel.

ISL

99.1 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.

99.2 License

isl is released under the MIT license, but depends on the LGPL GMP library.

99.3 Upstream Contact

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

99.4 Citation

```
@incollection{Verdoolaege2010isl,
   author = {Verdoolaege, Sven},
   title = {isl: An Integer Set Library for the Polyhedral Model},
   booktitle = {Mathematical Software - ICMS 2010},
   series = {Lecture Notes in Computer Science},
   editor = {Fukuda, Komei and Hoeven, Joris and Joswig, Michael and
   Takayama, Nobuki},
   publisher = {Springer},
   isbn = {978-3-642-15581-9},
   pages = {299-302},
   volume = {6327},
   year = {2010}
}
```

ITSDANGEROUS

100.1 Description

Various helpers to pass data to untrusted environments and to get it back safe and sound.

JINJA2

101.1 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.

101.2 License

Modified BSD License

101.3 Upstream Contact

Author: Pocoo Team <http://pocoo.org> Homepage: http://jinja.pocoo.org/

101.4 Dependencies

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

101.5 Special Update/Build Instructions

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

JMOL FOR SAGE

102.1 Description

This provides files necessary for Jmol(java) and JSmol (javascript) to operate from the command line and the Notebook. It does not contain the Notebook javascript library jmol_lib.js or changes to Notebook or Sage code.

102.2 License

GPLv2+

102.3 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/

102.4 Dependencies

No build-time dependencies.

The commandline jmol requires java at runtime.

102.5 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

JSONSCHEMA

103.1 Description

jsonschema is an implementation of JSON Schema for Python

103.2 License

MIT License

103.3 Upstream Contact

Home page: http://github.com/Julian/jsonschema

103.4 Dependencies

- Python
- Setuptools
- attrs
- importlib_metadata
- pyrsistent

JUPYMAKE

104.1 Description

The Python module JuPyMake provides an interface to polymake.

104.2 License

- GPL v2

104.3 Upstream Contact

https://github.com/polymake/JuPyMake

104.4 Dependencies

- pip
- polymake

104.5 Special Update/Build Instructions

FIVE

JUPYTER_CLIENT

105.1 Description

Jupyter protocol implementation and client libraries

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.

JUPYTER_CORE

106.1 Description

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

JUPYTERLAB

107.1 Description

An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.

107.2 License

BSD License

107.3 Upstream Contact

Home page: https://jupyter.org/

107.4 Dependencies

- Python
- Setuptools
- jupyter_core
- jupyter_client

JUPYTER WIDGETS JUPYTERLAB EXTENSION

108.1 Description

A JupyterLab extension for Jupyter/IPython widgets.

108.2 License

BSD License

108.3 Upstream Contact

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

108.4 Dependencies

- jupyterlab
- nodejs

KENZO

109.1 Description

Kenzo is a package to compute properties (mainly homology groups) of topological spaces. It allows defining spaces created from others by constuctions like loop spaces, classifying spaces and so on.

109.2 License

GPL

109.3 Upstream Contact

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

109.4 Dependencies

- ECL (Embedded Common Lisp)

KIWISOLVER

110.1 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.

110.2 License

Modified BSD License

110.3 Upstream Contact

https://github.com/nucleic/kiwi

110.4 Dependencies

- python
- setuptools

LATTE_INTEGRALE

111.1 Description

LattE (Lattice point Enumeration) Integrale solves the problems of counting lattice points in and integration over convex polytopes.

111.2 License

GPLv2

111.3 Upstream Contact

Matthias Köppe, UC Davis, CA, USA

111.4 Dependencies

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

LCALC

112.1 Description

Michael Rubinstein's L-function calculator.

112.2 License

- LGPL V2+

112.3 Upstream contact

Michael Rubinstein <mrubinst@uwaterloo.ca>

Sources: http://oto.math.uwaterloo.ca/~mrubinst/L_function_public/L.html

Newer beta version 1.3 (not yet in Sage): http://code.google.com/p/l-calc/

112.4 Dependencies

- GMP/MPIR
- MPFR
- PARI
- GNU patch

112.5 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.)

112.6 Patches

- Makefile.patch:

  We change a lot there, since Lcalc doesn't have a 'configure' script, and hence the Makefile is supposed to be edited to customize Lcalc (build options, locations of headers and libraries etc.). Besides that, we

  – put CXXFLAGS into Lcalc's "CCFLAGS" used for compiling C++,

  – remove some stuff involving LDFLAGS1 and LDFLAGS2, setting just LDFLAGS,

  – use $(MAKE) instead of 'make' in the crude build receipts,

  – use CXXFLAG64 when linking the shared library,

  – now use $(CXX) for compiling and linking C++, which *defaults* to 'g++', but can be overridden by setting the environment variable of the same name. ($(CC) now *defaults* to 'gcc', although currently not really used as far as I can see.)

  – $(INSTALL_DIR) can now be overridden by simply setting the environment variable of the same name.

- Lcommon.h.patch:

  Uncomment the definition of lcalc_to_double(const long double& x). (Necessary for GCC >= 4.6.0, cf. #10892.) Comment from there: The reason is the following code horror from src/src/include/Lcommon.h: [. . .] But somebody who is familiar with the codebase should really rewrite lcalc to not redefine the double() cast, thats just fragile and will sooner or later again fail inside some system headers.

- pari-2.7.patch:

  Various changes to port to newer versions of PARI.

- time.h.patch:

  (Patches src/include/Lcommandline_numbertheory.h) Include also <time.h> in Lcommandline_numbertheory.h (at least required on Cygwin, cf. #9845). This should get reported upstream.

- lcalc-1.23_default_parameters_1.patch: Make Lcalc (1.23) build with GCC 4.9

LIBATOMIC_OPS

113.1 Description

A part of the Boehm-Demers-Weiser conservative garbage collector.

113.2 License

- Permissive BSD + GPL 2.0+

113.3 Upstream Contact

- Webpage: http://www.hboehm.info/gc/
- Email List: bdwgc@lists.opendylan.org

113.4 Dependencies

None.

113.5 Special Update/Build Instructions

None.

LIBBRAIDING

114.1 Description

libbraiding is a library to compute several properties of braids, including centralizer and conjugacy check.

114.2 License

GPLv3+

114.3 SPKG Maintainers

- Miguel Marco

114.4 Upstream Contact

Miguel Marco (mmarco@unizar.es)

LIBFFI

115.1 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.

115.2 License

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115.3 Upstream Contact

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

GD

116.1 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.

116.2 License

- Custom (BSD-ish)

116.3 Upstream Contact

- Pierre Joye (http://blog.thepimp.net)
- http://libgd.bitbucket.org/

116.4 Dependencies

- libpng
- freetype
- iconv

116.5 Special Update/Build Instructions

See spkg-src script.

LIBHOMFLY

117.1 Description

libhomfly is a library to compute the homfly polynomial of knots and links.

117.2 License

Public domain

117.3 SPKG Maintainers

- Miguel Marco

117.4 Upstream Contact

Miguel Marco (mmarco@unizar.es)

117.5 Dependencies

- gc

LIBOGG

118.1 Description

libogg is the official reference library for the Ogg multimedia container format, and the native file and stream format for the Xiph.org multimedia codecs. As with all Xiph.org technology is it an open format free for anyone to use.

Website: http://www.xiph.org/ogg

118.2 License

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118.3 Upstream Contact

The Xiph.org mailing lists - see http://lists.xiph.org/mailman/listinfo

118.4 Dependencies

This spkg provides dependencies for

- the Sage library

118.5 Special Update/Build Instructions

- No changes went into src.

LIBPNG

119.1 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

119.2 License

The libpng license - see http://www.libpng.org/pub/png/src/libpng-LICENSE.txt

119.3 Upstream Contact

The png mailing lists - see http://www.libpng.org/pub/png/pngmisc.html#lists

119.4 Dependencies

This spkg depends on:

- libz

119.5 Special Update/Build Instructions

- On old versions of Darwin, the symbolic links libpng.* created by libpng16 may interfere with a system-wide libPng.dylib.

    – the following is very likely to be obsolete in 2014 —

    This system-wide library is likely to be a different version and on top of that, the symbols exported there are prefixed with "_cg" (for "Core Graphics"). So even if by chance the functionalities of the two libraries were interchangeable, libraries or applications looking for one and being presented the other won't find the symbols they expect. Note the uppercase "P" which could prevent this conflict; unfortunately, the default filesystem used by Apple is case-insensitive.

Note there would be no problem if the system-wide library was not looked for when Sage is being built or run, but that's not the case either; it is at least looked for by the "ImageIO" framework:

- when Python is built with Mac OS extensions, fixed in #4008;

- when Mercurial is built because it uses $EDITOR, cf. #4678;

- when R is built and it finds `-lpng`, cf. #4409 and #11696.

– this is no longer done, as of #27186 —

As not all of these problems are easily dealt with and new ones may arise, we chose to delete the $SAGE_LOCAL/lib/libpng.* symlinks. Therefore, some packages like Tachyon, which by default look for `-lpng` are patched to look for `-lpng16` instead.

LIBFFI

120.1 Description

C++ library for semigroups and monoids; used in GAP's package Semigroups.

120.2 License

GPL-3.0

120.3 Upstream Contact

http://james-d-mitchell.github.io/libsemigroups https://github.com/james-d-mitchell/libsemigroups

LIBTHEORA

121.1 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

121.2 License

Copyright (c) 2002, Xiph.org Foundation

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121.3 Upstream Contact

The Xiph.org mailing lists - see http://lists.xiph.org/mailman/listinfo

121.4 Dependencies

This spkg depends on

- libogg
- libpng

This spkg provides dependencies for

- the Sage library

121.5 Special Update/Build Instructions

- No changes went into src.

LIDIA

122.1 Description

A library for computational number theory.

Abandoned upstream and has disappeared from the web at TU Darmstadt.

We use as our new upstream a version minimally maintained for the LattE project.

https://www.math.ucdavis.edu/~latte/software/packages/lidia/current/lidia-2.3.0+latte-patches-2014-10-04.tar.gz

122.2 License

lidia is released under the GPL, or so it is claimed. See https://groups.google.com/forum/#!msg/sage-devel/kTxgPSqrbUM/5Txj3_IKhlQJ and https://lists.debian.org/debian-legal/2007/07/msg00120.html

122.3 Upstream Contact

Matthias Köppe, UC Davis, CA, USA

122.4 Dependencies

GMP.

LIE

123.1 Description

LiE is the name of a software package that enables mathematicians and physicists to perform computations of a Lie group theoretic nature. It focuses on the representation theory of complex semisimple (reductive) Lie groups and algebras, and on the structure of their Weyl groups and root systems.

LiE does not compute directly with elements of the Lie groups and algebras themselves; it rather computes with weights, roots, characters and similar objects. Some specialities of LiE are: tensor product decompositions, branching to subgroups, Weyl group orbits, reduced elements in Weyl groups, distinguished coset representatives and much more. These operations have been compiled into the program which results in fast execution: typically one or two orders of magnitude faster than similar programs written in a general purpose program.

The LiE programming language makes it possible to customise and extend the package with more mathematical functions. A user manual is provided containing many examples.

LiE establishes an interactive environment from which commands can be given that involve basic programming primitives and powerful built-in functions. These commands are read by an interpreter built into the package and passed to the core of the system. This core consists of programs representing some 100 mathematical functions. The interpreter offers on-line facilities which explain operations and functions, and which give background information about Lie group theoretical concepts and about currently valid definitions and values.

(from http://www-math.univ-poitiers.fr/~maavl/LiE/description.html)

123.2 License

GNU Lesser General Public License (LGPL), version unspecified

123.3 Upstream Contact

- Marc van Leeuwen, http://www-math.univ-poitiers.fr/~maavl/

123.4 Dependencies

- readline

- ncurses

- bison (not included in this package or in Sage!)

LINBOX

124.1 Description

From http://linalg.org/: 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.

124.2 License

LGPL V2 or later

124.3 Upstream Contact

- <linbox-devel@googlegroups.com>
- <linbox-use@googlegroups.com>

124.4 SPKG Repository

https://bitbucket.org/malb/linbox-spkg

124.5 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

124.6 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.)

LRCALC

125.1 Description

Littlewood-Richardson Calculator

http://math.rutgers.edu/~asbuch/lrcalc/

125.2 License

GNU General Public License V2+

125.3 Upstream Contact

Anders S. Buch (asbuch@math.rutgers.edu)

https://bitbucket.org/asbuch/lrcalc

LRSLIB

126.1 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

126.2 License

lrslib is released under a GPL v2+ license.

126.3 Upstream Contact

David Avis, avis at cs dot mcgill dot edu.

126.4 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.)

126.5 Special Update/Build Instructions

M4RI

127.1 Description

M4RI: Library for matrix multiplication, reduction and inversion over GF(2). (See also m4ri/README for a brief overview.)

127.2 License

- GNU General Public License Version 2 or later (see src/COPYING)

127.3 Upstream Contact

- Authors: Martin Albrecht et al.
- Email: <m4ri-devel@googlegroups.com>
- Website: https://bitbucket.org/malb/m4ri

127.4 Dependencies

- libPNG

127.5 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.

M4RIE

128.1 Description

M4RIE: Library for matrix multiplication, reduction and inversion over GF(2^k) for 2 <= k <= 10.

128.2 License

- GNU General Public License Version 2 or later (see src/COPYING)

128.3 Upstream Contact

- Authors: Martin Albrecht
- Email: <m4ri-devel@googlegroups.com>
- Website: http://m4ri.sagemath.org

128.4 Dependencies

- M4RI
- Givaro

MARKUPSAFE

129.1 Description

Implements a XML/HTML/XHTML Markup safe string for Python

129.2 License

Simplified BSD

129.3 Upstream Contact

Home page: http://github.com/mitsuhiko/markupsafe

129.4 Dependencies

Python, setuptools

MATHJAX

130.1 Description

MathJax is a JavaScript library for displaying mathematical formulas. Mathjax is used by both sagenb and ipython notebooks.

130.2 License

Apache License, version 2.0

130.3 Upstream Contact

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

130.4 Dependencies

None.

130.5 Special Update/Build Instructions

None.

130.6 Patches

- nopng_config.patch: prevent font warning messages since png files are removed. See section "Trimming II – not strictly necessary" of https://github.com/mathjax/MathJax-docs/wiki/Guide%3A-reducing-size-of-a-mathjax-installation

MATPLOTLIB

131.1 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.

131.2 License

The Matplotlib license - see http://matplotlib.sourceforge.net/users/license.html: Matplotlib only uses BSD compatible code, and its license is based on the PSF license. See the Open Source Initiative licenses page for details on individual licenses. Non-BSD compatible licenses (eg LGPL) are acceptable in matplotlib Toolkits. For a discussion of the motivations behind the licencing choice, see Licenses.

131.3 Upstream Contact

The matplotlib mailing lists: see http://sourceforge.net/projects/matplotlib

131.4 Dependencies

- python
- numpy
- setuptools (>= 0.7)
- freetype
- patch (used in spkg-install)
- dateutil
- pyparsing
- tornado
- kiwisolver

131.5 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

MAXIMA

132.1 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

132.2 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.

132.3 Upstream Contact

- The Maxima mailing list - see http://maxima.sourceforge.net/maximalist.html

132.4 Dependencies

- ECL (Embedded Common Lisp)

132.5 Special Update/Build Instructions

1. Go to http://sourceforge.net/projects/maxima/files/Maxima-source/ and download the source tarball maxima-x.y.z.tar.gz; place it in the upstream/ directory.

2. Update package-version.txt and run 'sage –package fix-checksum'.

3. Make sure the patches still apply cleanly, and update them if necessary.

4. Test the resulting package.

All patch files in the patches/ directory are applied. Descriptions of these patches are either in the patch files themselves or below.

- 0001-taylor2-Avoid-blowing-the-stack-when-diff-expand-isn.patch: Fix for Maxima bug #2520 (abs_integrate fails on abs(sin(x)) and abs(cos(x))). Introduced in Trac #13364 (Upgrade Maxima to 5.29.1).

- build-fasl.patch: Build a fasl library for ecl in addition to an executable program. Introduced in Trac #16178 (Build maxima fasl without asdf).

- infodir.patch: Correct the path to the Info directory. Introduced in Trac #11348 (maxima test fails when install tree is moved).

- matrixexp.patch: Fix matrixexp(matrix([%i*%pi])), which broke after Maxima 5.29.1. Introduced in Trac #13973.

- maxima.system.patch: Set `c::*compile-in-constants*` to t. Introduced in Trac #11966 (OS X 10.7 Lion: Maxima fails to build).

- undoing_true_false_printing_patch.patch: Revert an upstream change causing '?' to be printed around some words. Introduced in Trac #13364 (Upgrade Maxima to 5.29.1).

MCQD 1.0

133.1 Description

MaxCliqueDyn is a fast exact algorithm for finding a maximum clique in an undirected graph.

133.2 License

GPL 3

133.3 Upstream Contact

MCQD is currently being maintained by Janez Konc. https://gitlab.com/janezkonc/mcqd

133.4 Dependencies

None

SHAREDMEATAXE

134.1 Description

SharedMeatAxe 1.0 is an autotoolized shared library version of C MeatAxe 2.4.24, a set of programs for computing with modular representations. The package comprises a shared library "libmtx", as well as several executables.

See http://users.minet.uni-jena.de/~king/SharedMeatAxe/ for the package documentation.

134.2 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.

134.3 Upstream contact

- Simon King <simon.king@uni-jena.de>

MISTUNE

135.1 Description

The fastest markdown parser in pure Python

135.2 License

BSD License

135.3 Upstream Contact

Home Page: https://github.com/lepture/mistune

135.4 Dependencies

Python, Cython, Pip

MODULAR DECOMPOSITION

136.1 Description

This is an implementation of a modular decomposition algorithm.

http://www.liafa.jussieu.fr/~fm/ (in french)

136.2 License

GPL

136.3 Upstream Contact

Fabien de Montgolfier

http://www.liafa.jussieu.fr/~fm/

136.4 Dependencies

None

136.5 Patches

None

MPC

137.1 Description

From http://www.multiprecision.org/mpc: GNU MPC is a C library for the arithmetic of complex numbers with arbitrarily high precision and correct rounding of the result. It extends the principles of the IEEE-754 standard for fixed precision real floating point numbers to complex numbers, providing well-defined semantics for every operation. At the same time, speed of operation at high precision is a major design goal.

137.2 License

LGPLv3+ for the code and GFDLv1.3+ (with no invariant sections) for the documentation.

137.3 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

137.4 Dependencies

- MPIR
- MPFR

137.5 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.

MPFI

138.1 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.

138.2 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.

138.3 Upstream Contact

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

138.4 Dependencies

- GMP
- MPFR

MPFR

139.1 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).

139.2 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!

139.3 Upstream Contact

The MPFR website is located at http://mpfr.org/

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

139.4 Dependencies

- GMP/MPIR
- GNU patch

139.5 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`.)

139.6 TODO

- `--disable-thread-safe` should be switched to `--enable-thread-safe`, need to check that this works on the buildbot machines

MPFRCX

140.1 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.

140.2 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+).

140.3 Upstream Contact

The MPFRCX website is located at http://www.multiprecision.org/mpfrcx .

MPIR

141.1 Description

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

141.2 License

- LGPL V3+

141.3 Upstream Contact

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

141.4 Dependencies

- iconv
- GNU patch

141.5 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)
- 3.0.0-644faf502c56f97d9accd301965fc57d6ec70868 was created by running the spkg-src script.

MPMATH

142.1 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.

142.2 Upstream Contact

- Author: Fredrik Johansson
- Email: fredrik.johansson@gmail.com
- Website: https://github.com/fredrik-johansson/mpmath/

142.3 Dependencies

- Python

NAUTY

143.1 Description

Nauty has various tools for finding the automorphism group of a graph, generating non-isomorphic graphs with certain properties, etc.

143.2 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)

143.3 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.

143.4 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/

NBCONVERT

144.1 Description

Converting Jupyter Notebooks

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

FIVE

NBFORMAT

145.1 Description

The Jupyter Notebook format

This package contains the base implementation of the Jupyter Notebook format, and Python APIs for working with notebooks.

NCURSES

146.1 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

146.2 License

- MIT-style

146.3 Upstream Contact

- bug-ncurses@gnu.org

146.4 Dependencies

None

146.5 Special Update/Build Instructions

None

NETWORKX

147.1 Description

NetworkX (NX) is a Python package for the creation, manipulation, and study of the structure, dynamics, and functions of complex networks.

147.2 License

BSD

147.3 Upstream Contact

https://networkx.github.io/

NINJA_BUILD

148.1 Description

Ninja is a small build system with a focus on speed.

148.2 License

Apache License 2.0

148.3 Upstream Contact

https://ninja-build.org/

148.4 Dependencies

None

NINE

NODEENV

149.1 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.

149.2 License

BSD License

149.3 Upstream Contact

Home page: https://github.com/ekalinin/nodeenv

149.4 Dependencies

- Python

NODE.JS

150.1 Description

Node.js® is a JavaScript runtime built on Chrome's V8 JavaScript engine.

It is installed into an isolated nodeenv.

150.2 License

MIT License

150.3 Upstream Contact

Home page: https://nodejs.org/

150.4 Dependencies

- nodeenv

NORMALIZ

151.1 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/

151.2 License

- GPL v3

151.3 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

151.4 Dependencies

- GMP/MPIR
- boost

151.5 Special Update/Build Instructions

- The spkg currently disables features that require packages SCIP and CoCoA, for which we don't have packages (yet).

NOSE

152.1 Description

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

152.2 License

GNU LGPL

152.3 Upstream Contact

Author: Jason Pellerin Home Page: http://readthedocs.org/docs/nose/

> see also https://github.com/nose-devs/nose

152.4 Dependencies

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

152.5 Special Update/Build Instructions

None.

NOTEBOOK

153.1 Description

The Jupyter HTML notebook is a web-based notebook environment for interactive computing.

NOTEDOWN

154.1 Description

Notedown is a simple tool to create IPython notebooks from markdown.

154.2 License

BSD 2-Clause License

154.3 Upstream Contact

Author: Aaron O'Leary Home page: https://github.com/aaren/notedown

154.4 Dependencies

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

FIVE

NTL

155.1 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/

155.2 License

- GNU LGPLv2.1+

155.3 Upstream Contact

- Victor Shoup - for contact info see http://www.shoup.net/

155.4 Dependencies

- gmp
- gf2x

155.5 Special Update/Build Instructions

- None

NUMPY

156.1 Description

This package adds numerical linear algebra and other numerical computing capabilities to python.

156.2 Upstream Contact

- Travis Oliphant
- Fernando Perez
- Brian Granger

156.3 Dependencies

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

156.4 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.

OPENBLAS

157.1 Description

OpenBLAS is an optimized BLAS library based on GotoBLAS2 1.13 BSD version.

157.2 License

3-clause BSD license

157.3 SPKG Repository

GitHub page: https://github.com/xianyi/OpenBLAS

Releases: https://github.com/xianyi/OpenBLAS/releases

157.4 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

OPENSSL

158.1 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.

158.2 License

- Custom GPL-incompatible license

158.3 Upstream Contact

- http://openssl.org/
- http://openssl.org/support/community.html

158.3.1 Patches

- src/config: patched to fix a problem on Solaris.

P_GROUP_COHOMOLOGY

159.1 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/

159.2 License

Copyright (C) 2018 Simon A. King <simon.king@uni-jena.de> Copyright (C) 2011 Simon A. King <simon.king@uni-jena.de> Copyright (C) 2009 Simon A. King <simon.king@nuigalway.ie> and

David J. Green <david.green@uni-jena.de>

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The full text of the GPL is available at:

http://www.gnu.org/licenses/

The package includes a data base of cohomology rings of the groups of order 64 and provides access to a data base of cohomology rings of the groups of order 128 and 243, located at

http://cohomology.uni-jena.de/db/

These data bases are distributed under the Creative Commons Attribution-Share Alike 3.0 License. The full text of this licence is available at

http://creativecommons.org/licenses/by-sa/3.0/

159.3 SPKG Maintainers

Simon A. King <simon.king@uni-jena.de>

159.4 Upstream Contact

Simon A. King <simon.king@uni-jena.de> David J. Green <david.green@uni-jena.de>

159.5 Acknowledgements

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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 Novermber 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 greatful to John Palmieri for his help on making p_group_cohomology work with python-3.

159.6 Dependencies

- The SharedMeatAxe needs to be installed, as a build time dependency.

  This can be met by installing the meataxe spkg

159.7 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`.

159.8 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/.

PACKAGING

160.1 Description

Core utilities for Python packages

PALP

161.1 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.

161.2 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.

161.3 Upstream Contact

- Author: Harald Skarke (skarke@maths.ox.ac.uk)

- Home page: http://hep.itp.tuwien.ac.at/~kreuzer/CY/CYpalp.html

PANDOC

162.1 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.

PANDOC_ATTRIBUTES

163.1 Description

This is a simple parser / emitter for pandoc block attributes, intended for use with pandocfilters.

163.2 License

BSD 2-Clause License

163.3 Upstream Contact

- Author: Aaron O'Leary
- Home page: https://github.com/aaren/pandoc-attributes

163.4 Dependencies

- Python
- setuptools
- pandocfilters

163.5 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

PANDOCFILTERS

164.1 Description

A python module for writing pandoc filters.

164.2 License

BSD 3-Clause License

164.3 Upstream Contact

Author: John MacFarlane Home page: https://github.com/jgm/pandocfilters

164.4 Dependencies

- Python

164.5 Special Update/Build Instructions

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

PARI

165.1 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.

165.2 License

GPL version 2+

165.3 Upstream Contact

- http://pari.math.u-bordeaux.fr/

165.4 Dependencies

- Perl

- MPIR or GMP

- Readline

- GNU patch (shipped with Sage)

165.5 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".

PARI_ELLDATA

166.1 Description

PARI/GP version of J. E. Cremona Elliptic Curve Data, needed by ellsearch and ellidentify.

166.2 License

GNU General Public License (GPL version 2 or any later version).

166.3 Upstream Contact

http://pari.math.u-bordeaux.fr/

166.4 Dependencies

- Installation: None
- Runtime: PARI/GP

PARI_GALDATA

167.1 Description

PARI package "galdata": Needed by polgalois to compute Galois group in degrees 8 through 11.

167.2 License

GPL version 2+

167.3 Upstream Contact

http://pari.math.u-bordeaux.fr/

167.4 Dependencies

None (package contains data files only)

PARI_GALPOL

168.1 Description

PARI package of the GALPOL database of polynomials defining Galois extensions of the rationals, accessed by galoisgetpol, galoisgetgroup, galoisgetname.

168.2 License

GNU General Public License (GPL version 2 or any later version).

168.3 Upstream Contact

http://pari.math.u-bordeaux.fr/

168.4 Dependencies

- Installation: None
- Runtime: PARI/GP

NINE

PARI_JUPYTER

169.1 Description

A Jupyter kernel for PARI/GP

169.2 License

GPL version 3 or later

169.3 Upstream Contact

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

169.4 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

PARI_ELLDATA

170.1 Description

Repackaging of the historical megrez number field tables (errors fixed, 1/10th the size, easier to use).

170.2 License

GNU General Public License (GPL version 2 or any later version).

170.3 Upstream Contact

http://pari.math.u-bordeaux.fr/

170.4 Dependencies

- Installation: None
- Runtime: PARI/GP

PARI_SEADATA

171.1 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).

171.2 License

GNU General Public License (GPL version 2 or any later version).

171.3 Upstream Contact

http://pari.math.u-bordeaux.fr/

171.4 Dependencies

- Installation: None
- Runtime: PARI/GP

PARI_SEADATA_SMALL

172.1 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.

172.2 License

GPL version 2+

172.3 Upstream Contact

http://pari.math.u-bordeaux.fr/

172.4 Dependencies

None (package contains data files only)

PATCH

173.1 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 acceptble to some versions of the 'patch' command, such as the 'patch' command that comes with Solaris.

173.2 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.

173.3 Upstream Contact

Main web site: http://savannah.gnu.org/projects/patch/ Bug database at http://savannah.gnu.org/bugs/?group=patch Submit bugs at http://savannah.gnu.org/bugs/?func=additem&group=patch Mailing lists bug-patch@gnu.org

173.4 Dependencies

None

173.5 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.

PATH.PY

174.1 Description

A module wrapper for os.path

PCRE

175.1 Description

Perl-compatible regular expressions library.

175.2 License

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

175.3 Upstream Contact

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

175.4 Dependencies

None listed.

175.5 Special Update/Build Instructions

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

PERL_CPAN_POLYMAKE_PREREQ

176.1 Description

This script package represents all Perl packages that are prerequisites for polymake.

176.2 License

Various free software licenses

PERL_TERM_READLINE_GNU

177.1 Description

Perl extension for the GNU Readline/History Library

Available on CPAN

177.2 License

The Perl 5 License (Artistic 1 & GPL 1)

177.3 Upstream Contact

Hiroo HAYASHI

177.4 Dependencies

readline

PEXPECT

178.1 Description

Pexpect is a pure Python module for spawning child applications; controlling them; and responding to expected patterns in their output.

178.2 License

ISC license: http://opensource.org/licenses/isc-license.txt This license is approved by the OSI and FSF as GPL-compatible.

178.3 Upstream Contact

- http://pexpect.readthedocs.org/en/stable/
- https://github.com/pexpect/pexpect

178.4 Dependencies

- GNU patch
- Python

PICKLESHARE

179.1 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.

PILLOW

180.1 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.

180.2 License

Standard PIL License

180.3 Upstream Contact

- Author: Alex Clark <aclark@aclark.net>
- Homepage: http://python-imaging.github.io/

180.4 Dependencies

- Python

PIP

181.1 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.

181.2 License

MIT

181.3 Upstream Contact

- Project Page: https://github.com/pypa/pip
- Install howto: https://pip.pypa.io/en/latest/installing.html
- Changelog: https://pip.pypa.io/en/latest/news.html
- Bug Tracking: https://github.com/pypa/pip/issues
- Mailing list: http://groups.google.com/group/python-virtualenv
- Docs: https://pip.pypa.io/

181.4 Dependencies

- python
- setuptools

PKGCONF

182.1 Description

Pkgconf is an implementation of the pkg-config spec with minimal dependencies.

182.2 License

ISC License (equivalent to Simplified BSD)

182.3 Upstream Contact

https://github.com/pkgconf/pkgconf

182.4 Dependencies

- C compiler + toolchain

182.5 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.

PKGCONFIG

183.1 Description

Pkgconfig is a Python module to interface with the pkg-config command line tool.

183.2 License

MIT License

183.3 Upstream Contact

https://github.com/matze/pkgconfig

183.4 Dependencies

- Python 2.6+

183.5 Special Update/Build Instructions

Standard setup.py

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

PLANARITY

184.1 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

184.2 License

New BSD License

184.3 Upstream Contact

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

184.4 Dependencies

None

184.5 Special Update/Build Instructions

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

One change was made to the upstream code:

- extern.patch - declare variables declared in headers as extern.

  https://github.com/graph-algorithms/edge-addition-planarity-suite/pull/3

PLANTRI

185.1 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.

185.2 License

Plantri is distributed without a license.

185.3 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

185.4 Dependencies

- None

POLYLIB

186.1 Description

The Polyhedral Library (PolyLib for short) operates on objects made up of unions of polyhedra of any dimension. polylib is a C library.

186.2 License

GPL v3

186.3 Upstream Contact

- https://groups.google.com/forum/#!forum/isl-development

186.4 Dependencies

- GMP

POLYMAKE

187.1 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.

187.2 License

- GPL v3

187.3 Upstream Contact

- https://polymake.org/

187.4 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 required.

These are not provided by a Sage package. The script package perl_cpan_polymake_prereq will signal an error at build time if these 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;
```

187.5 Debugging polymake install problems

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

REFLEXIVE POLYTOPES DATABASES

188.1 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.

188.2 License

GPL

188.3 Dependencies

None

PARMA POLYHEDRA LIBRARY

189.1 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

189.2 License

GPL v3+

189.3 Upstream Contact

- http://www.cs.unipr.it/ppl/
- BUGSENG srl (http://bugseng.com)

Core Development Team

- Roberto Bagnara (University of Parma)
- Patricia M. Hill (University of Parma)
- Enea Zaffanella (University of Parma)

189.4 Dependencies

- gmp (or mpir)

189.5 Special Update/Build Instructions

189.5.1 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.

PPLPY

190.1 Description

PPL Python wrapper

This Python package provides a wrapper to the C++ Parma Polyhedra Library (PPL).

The whole package started as a fork of a tiny part of the Sage software.

190.2 License

GPL version 3

190.3 Upstream Contact

- https://github.com/videlec/pplpy

PRIMECOUNT

191.1 Description

primecount is a C++ implementation of several algorithms for counting primes maintained by Kim Walisch.

Website: https://github.com/kimwalisch/primecount/

191.2 License

primecount is licensed BSD 2

191.3 Upstream Contact

- https://github.com/kimwalisch/primecount/

PROMETHEUS_CLIENT

192.1 Description

The official Python 2 and 3 client for Prometheus (see https://prometheus.io), an open-source systems monitoring and alerting toolkit.

PROMPT_TOOLKIT

193.1 Description

Library for building powerful interactive command lines in Python

https://pypi.python.org/pypi/prompt_toolkit

PSUTIL

194.1 Description

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

194.2 License

3-clause BSD license

194.3 Upstream Contact

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

PTYPROCESS

195.1 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.

195.2 License

Ptyprocess is under the ISC license, as code derived from Pexpect.

> http://opensource.org/licenses/ISC

195.3 Upstream Contact

https://github.com/pexpect/ptyprocess

195.4 Dependencies

- Python

PYBIND11

196.1 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.

196.2 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.

196.3 Upstream Contact

https://github.com/pybind/pybind11

PYCOSAT

197.1 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.

197.2 License

MIT

197.3 Upstream Contact

- PicoSAT: http://fmv.jku.at/picosat/

- pycosat: https://github.com/ContinuumIO/pycosat

197.4 Dependencies

None.

197.5 Special Update/Build Instructions

None.

PYCYGWIN

198.1 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.

198.2 Website

https://github.com/embray/PyCygwin

PYGMENTS

199.1 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

199.2 License

Modified BSD

199.3 Upstream Contact

- Author: Georg Brandl

- Home Page: http://pygments.org

199.4 Dependencies

Python

199.5 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).

PYNAC

200.1 Description

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

200.2 License

GPL V2+

200.3 Upstream Contact

- Burcin Erocal - burcin spam.erocal.org
- William Stein - wstein spam.gmail.com
- Mike Hansen - mhansen spam.gmail.com

200.4 Dependencies

Python

200.5 Special Update/Build Instructions

If build fails trying to run autoheader, run

>   autoreconf -i –force

in the src directory.

PYNORMALIZ

201.1 Description

The Python module PyNormaliz provides wrappers for normaliz.

201.2 License

- GPL v2 or later

201.3 Upstream Contact

https://github.com/sebasguts/PyNormaliz

201.4 Dependencies

- pip
- normaliz

201.5 Special Update/Build Instructions

TWO

PYPARSING

202.1 Description

A Python Parsing Module

202.2 License

MIT License

202.3 Upstream Contact

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

202.4 Dependencies

Python

PYRSISTENT

203.1 Description

Pyrsistent is a number of persistent collections (by some referred to as functional data structures). Persistent in the sense that they are immutable.

203.2 License

MIT License

203.3 Upstream Contact

Home page: http://github.com/tobgu/pyrsistent/

203.4 Dependencies

- Python
- Setuptools
- hypothesis
- memory-profiler
- psutil
- pyperform
- pytest
- Sphinx
- sphinx-rtd-theme
- tox

PYSINGULAR

204.1 Description

A basic interface to call Singular from python

This python module is meant to be used in Singulars Jupyter interface.

204.2 License

GPL version 2 or later

204.3 Upstream Contact

- https://github.com/sebasguts/SingularPython

PYTHON-IGRAPH

205.1 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.

205.2 License

GPL version 2

205.3 Upstream Contact

http://igraph.org/python/

205.4 Dependencies

- python
- igraph

205.5 Special Update/Build Instructions

PYTHON-OPENID

206.1 Description

OpenID support for servers and consumers.

This is a set of Python packages to support use of the OpenID decentralized identity system in your application. Want to enable single sign-on for your web site? Use the openid.consumer package. Want to run your own OpenID server? Check out openid.server. Includes example code and support for a variety of storage back-ends.

PYTZ

207.1 Description

World Timezone Definitions for Python

207.2 Special Update/Build Instructions

The upstream tarball was repackaged after sanitizing the file permissions with

$ chmod go-w

PYX

208.1 Description

Python package for the generation of PostScript, PDF, and SVG files

https://pypi.python.org/pypi/PyX

PYZMQ

209.1 Description

Python bindings for the zeromq networking library.

209.2 License

LGPLv3+

209.3 Upstream Contact

http://www.zeromq.org

209.4 Dependencies

- Python
- Cython
- zeromq

209.5 Special Update/Build Instructions

None.

QEPCAD

210.1 Description

Qepcad is an implementation of quantifier elimination by partial cylindrical algebraic decomposition

210.2 License

QEPCAD B Copyright (c) 1990, 2008, Hoon Hong & Chris Brown (contact wcbrown@usna.edu)

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210.3 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

210.4 Dependencies

- readline

- saclib

210.5 Special Update/Build Instructions

One might need to set MAKE to "make -j1" fo this to be built successfully.

QHULL

211.1 Description

From the README.txt of Qhull:

Qhull computes convex hulls, Delaunay triangulations, Voronoi diagrams, furthest-site Voronoi diagrams, and half-space intersections about a point. It runs in 2-d, 3-d, 4-d, or higher. It implements the Quickhull algorithm for computing convex hulls. Qhull handles round-off errors from floating point arithmetic. It can approximate a convex hull.

The program includes options for hull volume, facet area, partial hulls, input transformations, randomization, tracing, multiple output formats, and execution statistics.

Further notes:

The qhull library is already shipped with the Python library scipy (from version 1.4), see

- http://docs.scipy.org/doc/scipy/reference/generated/scipy.spatial.ConvexHull.html

- http://docs.scipy.org/doc/scipy/reference/generated/scipy.spatial.Delaunay.html

- http://docs.scipy.org/doc/scipy/reference/generated/scipy.spatial.Voronoi.html

There is also the Python interface Pyhull available on PyPI https://pypi.python.org/pypi/pyhull (see also documentation at http://pythonhosted.org/pyhull/).

211.2 Upstream Contact

- C. Bradford Barber bradb@shore.net or qhull@qhull.org

211.3 Dependencies

Can be compiled with Qt support, but the Sage version currently doesn't try to do this.

211.4 License

Not a standard license, but Sage compatible. See the COPYING.txt file in the source directory for details.

R

212.1 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/)

212.2 License

- GPL v2 or GPL v3

212.3 Upstream Contact

- R mailing list, #R in IRC

212.4 Dependencies

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

R_JUPYTER

213.1 Description

This package installs IRkernel, the R Jupyter kernel.

It gets installed via R's package installer on top of Jupyter.

213.2 License

MIT

213.3 Upstream Contact

- https://github.com/IRkernel/IRkernel

- https://irkernel.github.io/

213.4 Dependencies

- R

- notebook

RATPOINTS

214.1 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.

214.2 Upstream Contact

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

214.3 Dependencies

- GMP/MPIR
- (GNU) patch

214.4 Special Update/Build Instructions

214.4.1 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.

READLINE

215.1 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

215.2 License

- GPL V3+

215.3 Upstream Contact

- Chet Ramey at http://cnswww.cns.cwru.edu/~chet

215.4 Dependencies

- ncurses

215.5 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.

215.6 Patches

- 0001-macports.patch: Changes to shobj.conf for OS/X, from macports:

  https://trac.macports.org/browser/trunk/dports/devel/readline/files/patch-shobj-conf.diff

- 0002-ltinfo.patch: We build readline using ncurses, and for that it needs to be told to link with libtinfo (part of ncurses).

REQUESTS

216.1 Description

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

RPY2

217.1 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.

Website: http://rpy.sourceforge.net/rpy2.html

217.2 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

217.3 Upstream Contact

- http://rpy.sourceforge.net/maillist.html

217.4 Dependencies

217.5 Special Update/Build Instructions

217.5.1 Patches

- setup.patch: takes care of a few parsing issues.

- cygwin.patch: let rpy2 build on Cygwin.

RST2IPYNB

218.1 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.

218.2 License

BSD 3-Clause License

218.3 Upstream Contact

Authors: Scott Sievert and Nicolas M. Thiéry Home page: https://github.com/nthiery/rst-to-ipynb

218.4 Dependencies

- notedown
- pandoc

218.5 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.

RUBIKS.SPKG

219.1 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.math.ucf.edu/~reid/Rubik/optimal_solver.html

- optimal - uses many pre-computed tables to find an optimal solution to the 3x3x3 Rubik's cube

Dik T. Winter (MIT License)

- cube - uses Kociemba's algorithm to iteratively find a short solution to the 3x3x3 Rubik's cube

- size222 - solves a 2x2x2 Rubik's cube

Eric Dietz (GPL) https://web.archive.org/web/20121212175710/http://www.wrongway.org/?rubiksource

- cu2 - A fast, non-optimal 2x2x2 solver

- cubex - A fast, non-optimal 3x3x3 solver

- mcube - A fast, non-optimal 4x4x4 solver

RW

220.1 Description

rw is a program that calculates rank-width and rank-decompositions.

http://pholia.tdi.informatik.uni-frankfurt.de/~philipp/software/rw.shtml

220.2 License

GPL version 2 or later

220.3 Upstream Contact

Philipp Klaus Krause (philipp@informatik.uni-frankfurt.de)

SACLIB

221.1 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.

221.2 License

Saclib 2.2 Copyright (c) 1993, 2008, RISC-Linz (contact wcbrown@usna.edu)

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221.3 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

221.4 Dependencies

None.

SAGE_SWS2RST

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 Sage-Math 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.

SAGENB_EXPORT

223.1 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.

https://github.com/vbraun/ExportSageNB

SAGETEX

224.1 Description

The SageTeX package allows you to embed code, results of computations, and plots from Sage into LaTeX documents.

224.2 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.

224.3 SPKG Maintainers

Dan Drake (dr.dan.drake at gmail) and SageMath developers (sage-devel@googlegroups.com)

224.4 Upstream Contact

Author: Dan Drake. Web: https://github.com/sagemath/sagetex

224.5 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.

224.6 Notes

To use SageTeX, both Sage and LaTeX need to know about it. SageTeX comes standard with Sage, so you only need to make sure LaTeX can find what it needs. Full details are in the Sage installation guide at http://doc.sagemath.org/html/en/installation/ and http://doc.sagemath.org/html/en/tutorial/sagetex.html .

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

SCANDIR

225.1 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.

SCIPOPTSUITE

226.1 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.

226.2 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

226.3 SPKG Maintainers

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

226.4 Upstream Contact

http://scip.zib.de/doc/html/AUTHORS.shtml

226.5 Dependencies

cmake

226.6 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

SCIPY

227.1 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.

227.2 License

SciPy's license is free for both commercial and non-commercial use, under the BSD terms. See http://www.scipy.org/License_Compatibility

227.3 Upstream Contact

> http://www.scipy.org/

227.4 Dependencies

- Python, which in Sage has numerous dependencies
- Numpy
- Fortran
- GNU patch

227.5 Special Update/Build Instructions

- None.

EIGHT

SEND2TRASH

228.1 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).

SETUPTOOLS

229.1 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/

229.2 License

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

229.3 Upstream Contact

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

229.4 Dependencies

- python

229.5 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

SETUPTOOLS_SCM

230.1 Description

the blessed package to manage your versions by scm tags

SIMPLEGENERIC

231.1 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.

SINGULAR

232.1 Description

Singular is a computer algebra system for polynomial computations, with special emphasis on commutative and non-commutative algebra, algebraic geometry, and singularity theory.

232.2 License

GPLv2 or GPLv3

232.3 Upstream Contact

libsingular-devel@mathematik.uni-kl.de

http://www.singular.uni-kl.de/

232.4 Dependencies

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

232.5 Special Update/Build Instructions

See spkg-src to create the source tarball.

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.

JUPYTER-KERNEL-SINGULAR

233.1 Description

A Jupyter kernel for singular

This is a beta version of a jupyter kernel for Singular.

233.2 License

GPL version 2 or later

233.3 Upstream Contact

- https://github.com/sebasguts/jupyter_kernel_singular

FOUR

SIP

234.1 Description

Python extension module generator for C and C++ libraries

234.2 Upstream contact

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

234.3 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/.

SIROCCO

235.1 Description

sirocco is a library to compute topologically certified root continuation of bivariate polynomials.

235.2 License

GPLv3+

235.3 SPKG Maintainers

- Miguel Marco

235.4 Upstream Contact

Miguel Marco (mmarco@unizar.es)

235.5 Dependencies

- gcc

SIX

236.1 Description

Python 2 and 3 compatibility utilities

236.2 License

MIT License

236.3 Upstream Contact

- Author: Benjamin Peterson
- Home page: http://pypi.python.org/pypi/six/

236.4 Dependencies

Python

SNOWBALLSTEMMER

237.1 Description

This package provides 16 stemmer algorithms (15 + Poerter English stemmer) generated from Snowball algorithms.

It includes following language algorithms:

- Danish

- Dutch

- English (Standard, Porter)

- Finnish

- French

- German

- Hungarian

- Italian

- Norwegian

- Portuguese

- Romanian

- Russian

- Spanish

- Swedish

- Turkish

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

SPEAKLATER

238.1 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.

SPHINX

239.1 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.

239.2 License

Modified BSD; see e.g. its egg-info file for other options

239.3 Upstream Contact

- Author: Georg Brandl
- Home Page: http://sphinx.pocoo.org, see also http://pypi.python.org/pypi/Sphinx

239.4 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)

239.5 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.

SPHINXCONTRIB-WEBSUPPORT

240.1 Description

Sphinx API for Web Apps

sphinxcontrib-websupport provides a Python API to easily integrate Sphinx documentation into your Web application.

240.2 License

BSD

SQLITE

241.1 Description

SQLite is a software library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine.

241.2 License

Public Domain

241.3 Upstream contact

- http://www.sqlite.org

241.4 Dependencies

- readline

241.5 Special Update/Build Instructions

- Use the autoconf version of sqlite.

TWO

SUITESPARSE

SuiteSparse is a collection of software to deal with sparse matrix. It is hosted at http://faculty.cse.tamu.edu/davis/suitesparse.html

This spkg does a minimal install of suitesparse disabling the following

- metis

- GraphBLAS (need cmake)

- Mongoose (need cmake)

An external metis package can be used but we just disable its use.

Patches:

- The first patch disable the building of package using cmake.

- The second patch make sure we use sage's blas/lapack on OS X. By default suitesparse discard any configurations to use the accelerate framework.

The building of metis is diabled by passing MY_METIS_LIB=none to make (any value would have done) We also configure cholmod so it doesn't require metis by passing CHOLMOD_CONFIG=-DNPARTITION to make.

Other configurations are self explanatory.

License: because SuiteSparse is a collection, it comes with a variety of licenses. Find below a copy of the "LICENSES.txt" shipped with SuiteSparse.

242.1 AMD/Doc/License.txt

AMD, Copyright (c), 1996-2015, Timothy A. Davis, Patrick R. Amestoy, and Iain S. Duff. All Rights Reserved.

Availability:

http://www.suitesparse.com

AMD License: BSD 3-clause:

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242.2 BTF/Doc/License.txt

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242.3 CAMD/Doc/License.txt

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ABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR
OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF
THE POSSIBILITY OF SUCH DAMAGE.

Availability:

http://www.suitesparse.com

242.4 CCOLAMD/Doc/License.txt

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based on COLAMD by Davis, Stefan Larimore, in collaboration with Esmond Ng, and John Gilbert.
http://www.suitesparse.com

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SURF

243.1 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.

243.2 License

GPL version 2 or later

243.3 Upstream Contact

http://surf.sourceforge.net (although the project is essentially dead)

243.4 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.

SYMMETRICA

244.1 Description

Symmetrica is a program developed by Lehrstuhl Mathematik II of the University of Bayreuth. It has routines to handle the following topics

- ordinary representation theory of the symmetric group and related groups (2/11/04)

- ordinary representation theory of the classical groups

- modular representation theory of the symmetric group

- projective representation theory of the symmetric group

- combinatorics of tableaux

- symmetric functions and polynomials (7/22/04)

- commutative and non commutative Schubert polynomials

- operations of finite groups.

- ordinary representation theory of Hecke algebras of type A_n

For more details check http://www.algorithm.uni-bayreuth.de/en/research/SYMMETRICA

Updated package on https://gitlab.com/sagemath/symmetrica/-/releases with changes to modernize the source and the build system.

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244.3 Upstream Contact

- (passed away in 2013) Axel Kohnert - see http://www.mathe2.uni-bayreuth.de/axel/

SYMPOW

245.1 Description

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- See the file src/COPYING

245.3 Upstream Contact

SYMPOW does not appear to be maintained any longer, so there is no upstream web site. Mark Watkins, the package author, now works at Magma. Previous (possibly still usable) email is watkins@maths.usyd.edu.au

245.4 Dependencies

- GNU patch

245.5 Special Update/Build Instructions

- Some of the code is very dubious, and it is anyones guess really what the compiler does with it. For example, the following line exists in src/eulerfactors.c:

  if ((HECKE) && (d==1)) return hecke_good(p,ap,m,v);

  But since hecke_good is defined as returning void, it's hard to know exactly how this code behaves. I would not be surprised by any bugs that might show up. I (David Kirkby) would personally not trust this code much at all.

- This is a difficult package to maintain. A 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.

SYMPY

246.1 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.

246.2 Website

http://sympy.org/

246.3 License

New BSD: http://www.opensource.org/licenses/bsd-license.php

246.4 Upstream Contact

sympy mailinglist: http://groups.google.com/group/sympy

246.5 Dependencies

- Python 2.5 or later

246.6 Special Update/Build Instructions

- A simple script can be used to ease the updating of the SPKG. See the README.

TACHYON

247.1 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.

247.2 License

Copyright (c) 1994-2010 John E. Stone All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.

2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.

3. The name of the author may not be used to endorse or promote products derived from this software without specific prior written permission.

247.3 Upstream Contact

- http://jedi.ks.uiuc.edu/~johns/raytracer/
- John Stone <johns@ks.uiuc.edu>

247.4 Dependencies

This spkg depends on:

- libpng

247.5 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

TDLIB

248.1 Description

Providing algorithms concerning treedecompositions

website: http://www.tdi.informatik.uni-frankfurt.de/~lukas/tdlib.html

248.2 License

GNU General Public License v2

248.3 SPKG Maintainers

Lukas Larisch (larisch@informatik.uni-frankfurt.de)

248.4 Upstream Contact

- Lukas Larisch (larisch@informatik.uni-frankfurt.de)
- git-repo: git://pholia.tdi.cs.uni-frankfurt.de/git/tdlib

248.5 Dependencies

- None

TERMCAP

249.1 Description

A library of C functions that enable programs to send control strings to terminals in a way independent of the terminal type.

249.2 License

GPL version 2

249.3 Upstream Contact

Please report any bugs in this library to bug-gnu-emacs@prep.ai.mit.edu

249.4 Dependencies

- GNU patch

249.5 Special Update/Build Instructions

None

TERMINADO

250.1 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).

TESTPATH

251.1 Description

Testpath is a collection of utilities for testing code which uses and manipulates the filesystem and system commands

TEXLIVE

252.1 Description

TeX Live is an easy way to get up and running with the TeX document production system. It provides a comprehensive TeX system with binaries for most flavors of Unix, including GNU/Linux, and also Windows. It includes all the major TeX-related programs, macro packages, and fonts that are free software, including support for many languages around the world.

This package installs all texlive packages required to build Sage. If necessary, texlive itself is installed.

252.2 License

Various FSF-approved free software licenses. See https://www.tug.org/texlive/copying.html for details.

252.3 Upstream Contact

Home page: https://www.tug.org/texlive

252.4 Dependencies

- python

252.5 Special Update/Build Instructions

This package requires internet access to download texlive packages for the TeX mirrors.

THEBE

253.1 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).

253.2 License

MIT

253.3 Upstream Contact

- Home page: https://oreillymedia.github.io/thebe/
- Source: https://github.com/oreillymedia/thebe/

253.4 Dependencies

None.

253.5 Special Update/Build Instructions

There are no release numbers, hence find the latest commit, download https://github.com/oreillymedia/thebe/archive/ \protect\T1\textdollar%7BCOMMIT%7D.zip and rename it thebe-${COMMIT:0:8}.zip

THREE.JS

254.1 Description

Three.js is a JavaScript library to display 3D graphics in the browser.

254.2 License

MIT License

254.3 Upstream Contact

Home page: http://threejs.org

254.4 Dependencies

None.

254.5 Special Update/Build Instructions

None.

TIDES

255.1 Description

TIDES is a library for integration of ODE's with high precision.

255.2 License

GPLv3+

255.3 Upstream Contact

- Marcos Rodriguez (marcos@unizar.es)

255.4 Dependencies

- gcc
- mpfr
- gmp

255.5 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.

TOPCOM

256.1 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.

256.2 License

GPL v2

256.3 Upstream Contact

```
Prof. Dr. Jörg Rambau <Joerg.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
```

256.4 Dependencies

- gmp, libcdd

256.5 Special Update/Build Instructions

See spkg-src

TORNADO

257.1 Description

Python web framework and asynchronous networking library

257.2 License

Apache License

257.3 Upstream Contact

Home page: http://www.tornadoweb.org

257.4 Dependencies

Python

TOX AUTOMATION PROJECT

258.1 Description

Command line driven CI frontend and development task automation tool.

The Sage library uses tox as an entry point for testing and linting. See `src/tox.ini` and `sage --advanced`.

Sage-the-distribution uses tox for portability testing. See `SAGE_ROOT/tox.ini`.

258.2 License

- MIT License

258.3 Upstream Contact

https://pypi.org/project/tox/

TRAITLETS

259.1 Description

Traitlets Python config system

A configuration system for Python applications.

PYTZ

260.1 Description

World Timezone Definitions for Python

260.2 Special Update/Build Instructions

The upstream tarball was repackaged after sanitizing the file permissions with

$ chmod go-w

VALGRIND

261.1 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).

261.2 License

Valgrind is Open Source / Free Software, and is freely available under the GNU General Public License, version 2.

261.3 Upstream Contact

- http://www.valgrind.org/
- valgrind-user, valgrind-devel mailing lists

261.4 Dependencies

- None

261.5 Special Build Instructions

- To build on OS X, you need to use Apple's compiler. FSF GCC is unsupported.

261.5.1 Patches

- None.

VCVERSIONER

262.1 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.

262.2 License

Python Software Foundation License

262.3 Upstream Contact

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

262.4 Dependencies

Python, Setuptools

WCWIDTH

263.1 Description

Measures number of Terminal column cells of wide-character codes

https://pypi.python.org/pypi/wcwidth

FOUR

WEBENCODINGS

264.1 Description

Character encoding aliases for legacy web content.

264.2 License

BSD License

264.3 Upstream Contact

Home Page: https://github.com/gsnedders/python-webencodings

264.4 Dependencies

Python

FIVE

WIDGETSNBEXTENSION

265.1 Description

Interactive HTML widgets for Jupyter notebooks.

XZ

266.1 Description

XZ Utils is free general-purpose data compression software with a high compression ratio.

266.2 License

Some parts public domain, other parts GNU LGPLv2.1, GNU GPLv2, or GNU GPLv3.

266.3 Upstream Contact

http://tukaani.org/xz/

266.4 Dependencies

YASM

267.1 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

267.2 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.

267.3 Upstream Contact

- https://yasm.tortall.net

267.4 Dependencies

- none

ZEROMQ

268.1 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.

268.2 License

LGPLv3+

268.3 Upstream Contact

http://www.zeromq.org

268.4 Dependencies

A working compiler.

268.5 Special Update/Build Instructions

N/A

ZIPP

269.1 Description

A pathlib-compatible Zipfile object wrapper. A backport of the Path object.

269.2 License

MIT License

269.3 Upstream Contact

Home page: https://github.com/jaraco/zipp

269.4 Dependencies

Python, Setuptools

ZLIB

270.1 Description

Massively Spiffy Yet Delicately Unobtrusive Compression Library (Also Free, Not to Mention Unencumbered by Patents)

270.2 License

- Modified BSD.

270.3 Upstream Contact

- http://www.zlib.net/

270.4 Dependencies

- None

270.5 Special Update/Build Instructions

270.5.1 Patches

- cygwin_symbols.patch: remove undefined symbols on Cygwin.

ZN_POLY

271.1 Description

zn_poly is a C library for polynomial arithmetic in Z/nZ[x], where n is any modulus that fits into an unsigned long.

Website: https://gitlab.com/sagemath/zn_poly

Note: Original website is at http://cims.nyu.edu/~harvey/zn_poly/ but is no longer maintained. Sage maintains an "official" continuation of the project at the above link.

271.2 License

GPL V2 or V3. Some of the code has been copied from other projects - see the file src/COPYING for details.

271.3 Upstream Contact

- David Harvey
- E. M. Bray <erik.m.bray@gmail.com>

271.4 Dependencies

- GMP/MPIR
- (some) Python (to create the Makefile)
- GNU patch
- NTL apparently only if we configured zn_poly differently (same for FLINT)

271.5 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.

271.5.1 Patches

- All patches from Sage have been merged into upstream. These include:

- makemakefile.py.patch:

  Improves the Python script creating the Makeefile 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 irrealistic 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.

ZOPE.INTERFACE

272.1 Description

This package is intended to be independently reusable in any Python project. It is maintained by the Zope Toolkit project.

This package provides an implementation of "object interfaces" for Python. Interfaces are a mechanism for labeling objects as conforming to a given API or contract. So, this package can be considered as implementation of the Design By Contract methodology support in Python.

For detailed documentation, please see http://docs.zope.org/zope.interface

THREE

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