Sage Reference Manual

Release 7.2

The Sage Development Team

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Welcome to Sage's Reference Manual!

This manual is a thematic index of all of Sage's features. It also contains many examples that illustrate their use, all of them systematically tested with each release.

Enjoy Sage!

CHAPTER

ONE

USER INTERFACE

- Command Line Interface (REPL)
- Web Notebook

CHAPTER

TWO

GRAPHICS

- 2D Graphics
- 3D Graphics

CHAPTER

THREE

MATHEMATICS

3.1 Parents, Elements and Categories

- Basic Infrastructure
- Coercion
- Categories
- Base Classes for Rings and Related Objects

3.2 Standard Rings and Fields

- Integers, Rationals, etc.
- Real and Complex Numbers
- Finite Rings and Fields
- Algebraic Numbers
- Polynomials
- Formal Power Series
- Function Fields
- p-Adic Numbers
- Quaternion Algebras

3.3 Linear Algebra

- Matrices and Spaces of Matrices
- Vectors and Modules
- Tensors on free modules of finite rank

3.4 Other Algebraic Structures

- Monoids

- Groups
- Semirings
- Algebras

3.5 Discrete Mathematics

- Combinatorics
- Graph Theory
- Quivers
- Matroid Theory
- Discrete Dynamics
- Coding Theory
- Game Theory

3.6 Calculus

- Symbolic Calculus
- Mathematical Constants
- Elementary and Special Functions
- Asymptotic Expansions (experimental)

3.7 Geometry and Topology

- Combinatorial Geometry
- Cell Complexes and their Homology
- Differential Forms
- Manifolds
- Parametrized Surfaces
- Knot Theory

3.8 Number Theory, Algebraic Geometry

- Diophantine approximation
- Quadratic Forms
- L-Functions
- Schemes
- Elliptic, Plane, and Hyperelliptic Curves

- Arithmetic Subgroups of SL_2(Z)
- General Hecke Algebras and Hecke Modules
- Modular Symbols
- Modular Forms
- Modular Forms for Hecke Triangle Groups
- Modular Abelian Varieties
- Miscellaneous Modular-Form-Related Modules

3.9 Logic

- Symbolic Logic
- SAT solvers

3.10 Probability and Statistics

- Probability
- Statistics
- Quantitative Finance

3.11 Miscellaneous

- Cryptography
- Numerical Optimization
- Databases
- Games

CHAPTER

FOUR

PROGRAMMING

- Data Structures
- Utilities
- Test Framework
- Parallel Computing

4.1 Interfaces

- Interpreter Interfaces
- C/C++ Library Interfaces

CHAPTER

FIVE

GENERAL INFORMATION

- History and License
- genindex
- modindex
- search