KNOPPIX/Math
KnxmLauncher
Mathematical software projects

1. 3D-XplorMath-J (http://3d-xplormath.org/j/)
   - Visualization and experimental tool for mathematics
   - 3D-XplorMath-J is a program for visualizing and experimenting with a variety of mathematical objects or "exhibits."
   - Commands
     - 3D-XplorMath-J

2. 4ti2 (http://www.4ti2.de/)
   - Software package for algebraic, geometric and combinatorial problems on linear spaces.
   - Computation of Hilbert bases, Graver bases, toric Groebner bases

[Japanese]

KNOPPIX/Math

• KNOPPIX/Math (http://www.knoppix-math.org/)
• KNOPPIX/Math Documents
Namazu: a Full-Text Search Engine

This index contains 26,369 documents and 2,267,769 keywords.

Last modified: 2010-03-05

Query: Groebner

Display: 20 Select Description: normal Select Sort: by score

Target:
- doc
- man
- jhtml
- teXlive

Results:

References: [ Groebner: 581 ]

Total 581 documents matching your query.

1. man-en.pdf (score: 177)
   Date: Tue, 20 Jul 2010 08:18:18 +0000
   Asir Asir User's Manual Asir-20100206 (Kobe Distribution) February 2010 by Masayuki Noro, Takeshi Shimoyama, Taku Takeshima and Risa/Asir committers Copyright © FUJITSU LABORATORIES LIMITED. 1994-200

2. Singular Manual groebner and std (score: 128)
flash-knoppix
3D-XplorMath-J
4ti2

Usage: graver [options] PROJECT

[Basic options]
 -i, --ignore
 -m, --maxn

[Logging options]
 -n, --logging=0
 -l, --logging=[1]
 -ll, --logging=2
 -lll, --logging=3

[Output options]
 -q, --quiet, --verbose=0 quiet mode
 -v, --verbose=[1]
 -vv, --verbose=2

4ti2 version 1.3.2, Copyright (C) 2006 4ti2 team.
4ti2 comes with ABSOLUTELY NO WARRANTY.
This is free software, and you are welcome to redistribute it under certain conditions.
For details, see the file COPYING.
C.a.R.
ccdlib test program to apply Fourier's Elimination to an H-polyhedron.

>> Input file: 

ccdlib Reference Manual

Komei Fukuda
Institute for Operations Research
and Institute of Theoretical Computer Science
ETH Zentrum, CH-8092 Zurich, Switzerland

[ccdlib ver. 0.94, manual ver. February 7, 2008]

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CoCoA
Coq
DecimalBasic
DrGeo
Eukleides

```
knoppix@Microknoppix:/samples$ more abdul_al_wafa.euk
% This figure is showing Abdul al Wafa’s method to draw
% an equilateral triangle incrbed in a square.
% Copyright (c) Christian Obrecht 2001

box(-1,-1,7,7)
A B C D square
O = barycenter(A,B,C,D)
P = rotation(O,C)
c1 = circle(A,C)
c2 = circle(O,P)
I1 I2 intersection(c1,c2)
E = intersection(line(A,I1),line(D,C))
F = intersection(line(A,I2),line(B,C))

draw(A,B,C,D)
color(lightgray)
draw(segment(A,C)) ; draw(segment(B,D))
color(blue)
draw(c1) ; draw(c2)
color(red)
draw(A,E,F)
knoppix@Microknoppix:/samples$ gv abdul_al_wafa.euk
```
GAP

Information at:  http://www.gap-system.org
Try 'help' for help. See also '?copyright' and '?authors'

Loading the library. Please be patient, this may take a while.
Components:  small 2.1, small2 2.0, small3 2.0, small4 1.0, small5 1.0,
             small6 1.0, small7 1.0, small8 1.0, small9 1.0, small10 0.2,
             id2 3.0, id3 2.1, id4 1.0, id5 1.0, id6 1.0, id9 1.0, id10 0.1,
             trans 1.0, prim 2.1  loaded.
Packages:   CTblLib 1.1.3, TomLib 1.1.2  loaded.
gap>
GNU Octave, version 3.2.4
Copyright (C) 2009 John W. Eaton and others.
This is free software; see the source code for copying conditions.
There is ABSOLUTELY NO WARRANTY; not even for MERCHANTABILITY or
FITNESS FOR A PARTICULAR PURPOSE. For details, type `warranty`.

Octave was configured for "i486-pc-linux-gnu".

Additional information about Octave is available at http://www.octave.org.

Please contribute if you find this software.
For more information, visit http://www.octave.org/

Report bugs to <bug@octave.org> (but first read http://www.octave.org/bugs.html to learn

For information about changes from previous

octave:1> np=64; a=linspace(-5,5,np); b=a;
octave:2> for i=1:np; for j=1:np; c(i,j)=sin(a(i)*b(j));
octave:3> mesh(a,b,c)
octave:4>
GNU TeXmacs

Thank you for using this program. You may find a few useful comments in the file "TEXMACS". If you want more help, you can find help on the websites:

http://www.texmacs.org
http://www.gnu.org

You will find more information there. If you like the program, you might consider supporting it:

http://www.texmacs.org/donation

Help.

For help about how to use the program, refer to the file "FAQ". For help about how to use the website, refer to the file "FAQ-WEBSITE".

Support.

If you like the program, you might consider supporting it:

http://www.texmacs.org/donation

File Edit Insert Text Format Document View Go Tools Help

using Lisp GNU Common Lisp (GCL) GCL 2.6.7 (a.k.a. GCL)
Distributed under the GNU Public License. See the file COPYING.
Dedicated to the memory of William Schelter.
The function bug_report() provides bug reporting information.

(%i1) diff(x^n x, x, 3);

(%o1) x^{n+1}(x^n \log(x) (\log(x) + 1) + x^n)^3 + x^{n+1} \left( x^{n-1} \left( \log(x) + \frac{x-1}{x} \right)^3 + x^n \log(x) (\log(x) + 1)^3 + x^2 \log(x) (\log(x) + 1)^3 + x^{n-1} \left( \log(x) - \frac{x-1}{x} \right)^3 + x^n \log(x) (\log(x) + 1)^3 + x^{n-1} \left( \log(x) - \frac{x-1}{x} \right)^3 + x^n \log(x) (\log(x) + 1)^3 + x^{n-1} \left( \log(x) - \frac{x-1}{x} \right)^3 \right)

(%i2) integrate(1/(x^3+1), x);

(%o2) - \frac{\log(x^3 - 1)}{6} + \frac{\arctan \left( \frac{2x - 1}{\sqrt{3}} \right)}{\sqrt{3}} + \frac{\log(x + 1)}{3}

(%i3) }
GeoGebra
GeoProof

Theorems

Names    Descriptions
Pythagore  $a^2 + b^2 = c^2$
Ceva      bidule

Studied properties

Add    are collinear

Hypothesis

Goals

Input in natural language
Segment created.
Geomview
gfan

Gfan version 0.4: A User’s Manual
Anders Nørdgaard Jensen
May 31, 2009

A presentation of the Gfan software package
Anders Nørdgaard Jensen
Department of Mathematical Sciences, University of Aarhus and
Institute for Operations Research, ETH Zurich
8th April 2005

Abstract.
Gfan is a new software package for computing Gröbner bases of polynomial ideals in \( \mathbb{Q}[x_1,\ldots,x_n] \). We give a short description of this package. Some technical details are given to give the reader an idea of what the software can do.

1 Background
Hyplane
KNOT
Kali
Installing .feprc
Welcome to fep! Editmode is emacs
I'm a front end processor for sm1
History will be saved to .feprhistory

Release 3.050615 (C) N. Takayama

gc 6.8-255 (C) Boehm, Demers, Xerox, SGI, HP,
GNU MP 4.1 (C) Free Software Foundation,
OpenXM RFC100, 101, 103 (C) OpenXM developing team.
This software may be freely distributed with no warranty expressed.
See OpenXM/Copyright/Copyright.generic
Info: http://www.math.kobe-u.ac.jp/KAN, kan@math.kobe-u.ac.jp. ? for help.

Ready

sm1>macro package : module1.sm1, 1994 -- Nov 8, 1998
sm1>
Kig

Did you know...

Kig can extends its object set using external macros. You can find some interesting macros on the Kig website:
LiE

LiE version 2.2.2 created on Nov 28 2007 at 13:53:37
Authors: Arjeh M. Cohen, Marc van Leeuwen, Bert Lisser.
Purpose: development CWI

type '?help' for help information
type '?' for a list of help entries.
> ?help
> diagram(E8)

0 2
\ |

0-0-0-0-0-0-0-0-0

1 3 4 5 6 7 8

E8

>
Macaulay2

+ M2 --no-readline --print-width 79
Macaulay2, version 1.3.1
with packages: ConwayPolynomials, Elimination, Integral
PrimaryDecomposition, ReesAlgebra, Schur

i1 : R=ZZ/5[x,y,z];
in2 : describe R
ZZ
o2 = -- [x..z, Degrees => {3
      5

i3 :
Maxima

Maxima can perform calculations to arbitrary precision. The following example computes

- \( \text{solve}([x+y=1, y-z=3, z+x=5], [x,y,z]) \) returns \( \text{result} \)
- \( \text{solve}(x^2 - 2x - 1 = 0, x) \) produces \( \text{result} \)

Linear Algebra

For example, matrices can be entered and manipulated. Click these two lines:

- \( A \times B \times C \) gives \( \text{result} \)
- \( A \times B \) gives the product \( \text{result} \)
- \( A^{-1} \) gives the inverse \( \text{result} \)
- \( \text{determinant}(A) \) gives \( \text{result} \)
- \( \text{det}([1,3], [1,3]) \) gives \( \text{result} \)

The matrices can then be added, for example:

- \( A + B + C \) gives \( \text{result} \)
- \( A + B \) gives the sum \( \text{result} \), and multiplied.
- \( A \times B \times C \) gives the product \( \text{result} \)
- \( A^{-1} \) gives the inverse \( \text{result} \)
- \( \text{determinant}(A) \) gives \( \text{result} \)
- \( \text{det}([1,3], [1,3]) \) gives \( \text{result} \)

Maxima 5.17.1 http://maxima.sourceforge.net
Using Lisp GNU Common Lisp (GCL) GCL 2.6.7 (aka GCL)
Distributed under the GNU Public License. See the file COPYING.
Dedicated to the memory of William Schelter.
The function bug_report() provides bug reporting information.

(%i1) integrate(1/(x^3-1),x);
(%o1)  \frac{\log (x^2 - x + 1)}{6} + \frac{\arctan \left( \frac{2 x - 1}{\sqrt{3}} \right)}{\sqrt{3}} + \frac{\log (x + 1)}{3}
(%i2) diff(x^x,x);
(%o2) x^x \left( x \log (x) (\log(x) + x^{-1}) \right)
(%i3)
**MD-jeep** is a software for solving distance geometry problems. It is able to solve a subclass of instances of the problem for which a discrete reformulation can be supplied. We refer to this subclass of instances as the *Discretizable Molecular Distance Geometry Problem (DMDGP)*. We employ a *Branch & Prune (BP)* algorithm for the solution of DMDGPs.

**MD-jeep** is the result of a strong collaboration between the authors and Maculan. Many details regarding the discionary of publications (the list of the most recent papers) can be found on the website.

**MD-jeep** is distributed under the GNU General Public License. If you have any questions or comments regarding the software, please let us know!

```
mdjeep
```

- **name**
- **MD-jeep version 0.1**
- **test problems 1**

Normaliz 2.2

Winfried Bruns, Bogdan Ichim
With contributions by Christof Soeger
Copyright (C) 2007, 2008, 2009

Enter the input file name or `-?` for help.
NZMATH

NZMATH is a Python based number theory oriented calculation system. It is developed at Tokyo Metropolitan University. Copyright (c) 2003-, NZMATH development group, all right reserved. Type "help", "copyright", "credits" or "license" for more information.
OpenDX Data Explorer

Where To Begin

Tutorials I and II are designed so that you can proceed from one topic to another in whatever order you choose.

If you have not used Data Explorer before, we recommend that you start here with Tutorial I, which will quickly introduce you to many of the basic features of the user interface, as well as to many of the most commonly used Data Explorer functions.

If you already know how to run Data Explorer and want more information on how to edit and create visual programs, you can start with Tutorial II: Editing and Creating Visual Programs. You may also start directly with any of the topics listed at the beginning of that tutorial.

If you need to learn how to start Data Explorer, see Starting Data Explorer.

Tutorial I consists of three parts:

- Starting Data Explorer
- Opening and Executing a Visual Program
- Controlling the Appearance of an Object: The Image Window
PARI/GP

GP/PARI CALCULATOR Version 2.3.4 (released)
i486 running linux (ix86/GMP-4.2.2 kernel) 32-bit version
compiled: Jul 24 2008, gcc-4.3.1 (Debian 4.3.1-7)
(readline v5.2 enabled, extended help not available)

Copyright (C) 2000-2006 The PARI Group

PARI/GP is free software, covered by the GNU General Public License, and comes WITHOUT ANY WARRANTY WHATSOEVER.

Type ? for help, \q to quit.
Type ?12 for how to get moral (and possibly technical) support.

parisize = 4000000, primelimit = 500000
?

Reading GPRC: /etc/gprc ...Done.
Processing

```java
/**
 * Space Junk
 * by Ira Greenberg.
 * Zoom suggestion: by Danny Greenberg.
 * Rotating cube in space using a custom Cube class.
 * Color controlled by light sources. Move the mouse left
 * and right to zoom.
 */

import processing.opengl.*;
// Used for overall rotation
float ang;

// Cube count: lower/raise to test P3D/OpenGL performance
int limit = 500;

// Array for all cubes
Cube[] cubes = new Cube[limit];

void setup() {
  size[1024, 768, OPENGL];
  ang = 0;
  for(int i=0; i<limit; i++)
    cubes[i] = new Cube(3);
}
```
Welcome to PyGeo

What is PyGeo?

Quoting from the PyGeo Overview document:

PyGeo is most fundamentally a framework for the creation of dynamic geometric constructions - I.e. constructions which embody defined and persistent geometric relationships responsive to real time on-screen interactivity.

PyGeo is, further, an implementation of this underlying abstract framework - exposing a range of geometric objects as the building blocks for virtual, dynamic geometric constructions.

The focus is away from Euclidean geometry and metrics, and toward later geometric and mathematical developments - particularly those connected with projective geometry of real space, and the geometry of complex numbers on the plane and on the unit (Riemann) sphere.

News:

January 2006. Once again, new release for the new year. Download

Quote:
Qhull

Qhull computes the convex hull, Delaunay triangulation, Voronoi diagram, furthest-site Delaunay triangulation, and furthest-site Voronoi diagram in two-dimensional to higher dimensions. Qhull implements the Quickhull algorithm for convex hulls, and has been tested to thousands of decimal places.

Qhull does not support constrained Delaunay triangulation and generation of non-convex objects, or medium-sized inputs.

A serious bug was found in Qhull 2003.1. Please upgrade.

- News and Bugs about Qhull 2010.1 2010/01/14
- Download Qhull
- Examples of Qhull output
- Gitorious C++ interface to Qhull
- How is Qhull used?
- CiteSeer and Google Scholar references
- Google Qhull, Qhull Images, Qhull Videos
- MATLAB uses Qhull for their convex hulls. (search voronoin, MATLAB R14)
- The Debian build of GNU Octave
- Mathematica's Delaunay interface
- geomview for 2-D and 4-D output

knoppix@Microknoppix:~$ rbox 1000 s | qhull Tv G FA > output

qhull output completed. Verifying that 1000 points are below 2.1e-15 of the nearest facet.

knoppix@Microknoppix:~$ geomview output
R commander

```r
library(relimp, pos=4)
showData(Nations, placement='20+200', font=getRcmdr('logFont'),
         maxwidth=80, maxheight=30, suppress.X11.warnings=FALSE)
Hist(Nations$GDP, scale="frequency", breaks="Sturges", col="darkgray")
```

```
> Nations <- read.table("/home/trace\n+   na.strings="NA", dec=".",

> fix(Nations)

> library(relimp, pos=4)

> showData(Nations, placement=
+   maxwidth=80, maxheight=30,

> Hist(Nations$GDP, scale="frequen
```
Reduce

1: \int \frac{1}{x^3 + 1} \, dx

\frac{2 \sqrt{3 \arctan \left( \frac{2x - 1}{\sqrt{3}} \right)} - \log (x^2 - x + 1) + 2 \log (x + 1)}{6}

2: (x + y + z)^2

x^2 + 2xy + 2xz + y^2 + 2yz + z^2

3: u := (x + y + z)^2

u := x^2 + 2xy + 2xz + y^2 + 2yz + z^2

4: df(WS, x);

2(x + y + z)

5:
Welcome to fep! Editmode is emacs
I'm a front end processor for asir
History will be saved to .fephistory
This is Risa/Asir, Version 20100714 (Kobe Distribution).
Copyright (C) 1994-2000, all rights reserved, FUJITSU LABORATORIES LIMITED.
GC 6.8 copyright 1988-2006, H-J. Boehm, A. J. Demers, Xerox, SGI, HP.
Debug windows of owl servers will not be opened.
OpenXM/Risa/Asir-Contrib(20100204), Copyright 2004 by S. Crone.
helph(); [html help], ox_help(0); ox_help("<em id="key">key</em>"),
for help messages (unix version only).
http://www.math.kobe-u.ac.jp/OpenXM/Current/doc/
[1363] import("mt_graph.rr");
[1452] mtg.plot3d(x^2-y^2);
domain=[[[-10,10],[-10,10]]]: Xmin=-10,Xmax=10, Ymin=-10, Ymax=10;
Mesh size is 20 x 20. mesh=20
Fmax is 100.00000000000000000000000000000000
$=-5.00000000000000000000000000000000, @=62.50000000000000000000000
[x^2-y^2,[[xmin,-10],[xmax,10],[ymin,-10],[ymax,10]]]
[1453]
Yellow Whitney's umbrella:

```python
u, v = var('u,v')
fx = u*v
fy = u
fz = v^2
parametric_plot3d([fx, fy, fz], (u, -1, 1), (v, -1, 1),
                  frame=False, color="yellow")
```

evaluate
Scilab

```
Startup execution:
loading initial environment

-->data = read ('data.txt', -1, 2)  
data =  
  1. 2.  3.  4.  5.  6.  7.  8.  9.  10.

-->plot(data(:,1), data(:,2))

WARNING: Due to your configuration limitations, Scilab switched in a mode where mixing uicontrols and graphics is not available. Type 'help usecanvas' for more information.

-->`
```
Scratch
Singular

A Computer Algebra System for Polynomial Computations / version 3-1-1
by: G.-M. Greuel, G. Pfister, H. Schoenemann
FB Mathematik der Universität, D-67653 Kaiserslautern

> LIB "poly.lib";

// ** loaded /usr/share/Singular/LIB/poly.lib (12443,2010-01-19)
// ** loaded /usr/share/Singular/LIB/ring.lib (12231,2009-11-02)
// ** loaded /usr/share/Singular/LIB/primdec.lib (12508,2010-02-03)
// ** loaded /usr/share/Singular/LIB/absfact.lib (12231,2009-11-02)
// ** loaded /usr/share/Singular/LIB/triang.lib (12231,2009-11-02)
// ** loaded /usr/share/Singular/LIB/matrix.lib (12231,2009-11-02)
// ** loaded /usr/share/Singular/LIB/nctools.lib (12231,2009-11-02)
// ** loaded /usr/share/Singular/LIB/random.lib (12231,2009-11-02)
// ** loaded /usr/share/Singular/LIB/elim.lib (12231,2009-11-02)
// ** loaded /usr/share/Singular/LIB/inout.lib (12541,2010-02-09)
// ** loaded /usr/share/Singular/LIB/general.lib (12231,2009-11-02)

> ring r=32003,(a,b,c,d,e,f),lp;
> ideal I=cyclic(6);
> option(prot);
> int t=timer;
> system("--ticks-per-sec", 100);
> ideal sI=std(I);

---**: **. *singular* Top L1 (Singular Interaction:run)------------------

Mark set
Skeleton: Implementation of Double Description Method

Skeleton is a new fast implementation of Double Description Method (DDM) for solving the vertex and facet enumeration problems for convex polyhedra. Recent enhancements make it extremely fast compared to other implementations of DDM. The source code of Skeleton 02.01.02 is available at http://www.uic.unn.ru/~zny/skeleton.

Skeleton online
You can try skeleton online. Thanks to Sergey V.

MATLAB wrapper for Skeleton

Related Software and Links
- Komei Fukuda’s CDD: another implementation
- David Avis’ lrs, the reverse search algorithm
- Done
Sollya

Sollya is a tool environment for safe floating-point code development. It is particularly targeted to the automatized implementation of mathematical floating-point libraries (Libm). Amongst other features, it offers a certified infinity (supremum) norm and a fast Remez algorithm.

Sollya is developed by Arénaire and written by Christoph Lauter, Sylvain Chevillard, M. Joldes and N. Jourden.

Sollya provides you:

- a certified infinity (supremum) norm for computation
- an automatized implementer for approximation
- a fast implementation of Remez algorithm for construction
- a full-featured programming language adapted to floating-point arithmetic
- a faithful-rounding, multi-precision evaluator of expressions
- a highly accurate and fast floating-point infinity (supremum) norm
- support for floating-point rounding operators and
- a special floating-point minimax procedure.

Basic MathML input and output support, interfaces for extending Sollya with your own code.

Download Sollya:

- Sollya 2.0 has been released and can be downloaded.
- A weekly build (last compiled on 08/08/2010) of the latest development version is available through:

License

The Sollya tool is Copyright (C) 2006-2010 by

Sylvain Chevillard

Christoph Lauter

M. Joldes

N. Jourden

April 20, 2010
SnapPea

Cross-platform SnapPy

Marc Culler and Nathan Dunfield's SnapPy is
a user interface to the SnapPea kernel which runs on Mac OS X, Linux, and Windows. SnapPy
domains and cusp neighborhoods with a powerful command-line interface based on the Python

SnapPy is already the preferred user interface for SnapPea. In the not-too-distant future its capabilities
Mac OS X interface (see below), at which point the older Mac OS X interface will be retired.

A revised SnapPea kernel is also available.

Mac OS X SnapPea

The older SnapPea for Mac OS X, while still incomplete, supports enough features that you may find
include: cusped census, knot and link entry, drilling and filling, symmetry group, fundamental group. Dave
SnapPea also remains available.

SnapPea for Windows

A. C. Manoharan has updated his SnapPea PC for Windows 7. It continues to run well on Windows

Questions? Contact Jeff Weeks

[Return to Geometry Games home]
Step
Surf
Eine Septik mit 99 Singularitäten

Oliver Labs konstruierte im Rahmen seiner Dissertation in Mainz 2004 eine Fläche vom Grad 7 (Septik) mit 99 Singularitäten (derzeit Weltrekord; bisher ist aber kein Grund bekannt, aus dem es nicht sogar eine Septik mit 104 Singularitäten geben könnte). Labs' Fläche hat die Symmetrie eines regelmäßigen 7-Ecks. Man sieht dies recht gut, wenn man die Fläche von 'oben' betrachtet:

Zur Suche nach der Fläche hat O. Labs das Computeralgebra Programm SINGULAR (Uni Kaiserslautern) benutzt, dessen besondere Stärke in Anwendungen auf algebraischen Geometrie und Singularitäten liegt.

Dabei hat er ausgenutzt, dass man in endlichen Zahlensystemen rechnen kann: Von der Uhr kennen wir dies; 24 Uhr entspricht 0 Uhr, 24 Uhr + 1 Stunde ist nicht 25 Uhr, sondern 1 Uhr.

Coloring Gallery Info Animate
Surfex
Surface Evolver

The Surface Evolver
Version 2.30
January 1, 2008

(My Surface Evolver is an interactive program for the modelling of liquid surfaces shared available free of charge.)

- Download the Surface Evolver for various systems.
- Browse Surface Evolver documentation.
- Surface Evolver examples:
  - General examples
  - Ball Grid Array examples
  - Gull Wing Lead examples
  - Tombstone examples
  - Six-part Surface Evolver examples
  - Viewer program evviewer and forth in the evolution
  - Some other people's pages
    - N.I.S.T. Solder Interface
    - Morwen Thistledown
    - Jim Hoffmann's LEAP

Download Surface Evolver
Done
Teruaki
XaoS
Yorick
1 Quick Introduction

1. Please select "Edit" — "Information" in the menu to set data of an ideal.
   - "server" is the name of the machine which executes anonymous Risa/Asir server.
   - local host
   - "generators" are generators of an ideal
     \[ \{x^2+y^2-2z^2+1, xy+y^2-1\} \]
   - "clist" is a list of variables
     \[ \{x, y, z\} \]
   - "order" is a monomial order
     \[ \text{Ex integer} \]
       - 0: total degree reverse lex order
       - 1: total degree lex order
       - 2: lex order
     \[ \text{Ex matrix: \{(1, 0, 0), (0, 1, 0), (0, 0, 1)\}. When "clist" is \{x, y, z\}, this matrix order means the lex order such as } x > y > z. \]

   These input in "generators", "clist" and "order" must follow Risa/Asir's syntax. For example, the input \[ \{(x+y, 2z+1)\} \]
   means the list of polynomials \( x + y \) and \( 2z + 1 \).

2. When you click a ball (ball stands for a S-pair), the system starts to divide the S-pair standing for the ball by the current intermediate Groebner basis. Polynomials in the bottom window are intermediate Groebner basis. The meaning of colors of balls is as follows:
   - red : remaining S-pair
   - gray : S-pair eliminated by division
   - white : S-pair eliminated by Buchberger's criterion (criterion 1)
   - grey : S-pair eliminated by Gebauer, Miller criterion (criterion 2)

3. When you click the next button, the system automatically selects a S-pair by the current strategy and divides the S-pair. You can select the strategy from "Strategy" in the menu. When you click the start button, the system switches to the automatic mode and automatically divides S-pairs till you click the stop button.

4. When you (or the system) eliminate all red balls, the computation stops, and you get Groebner basis in the bottom window.
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