Scientific Computing with Linux
Open Source Software

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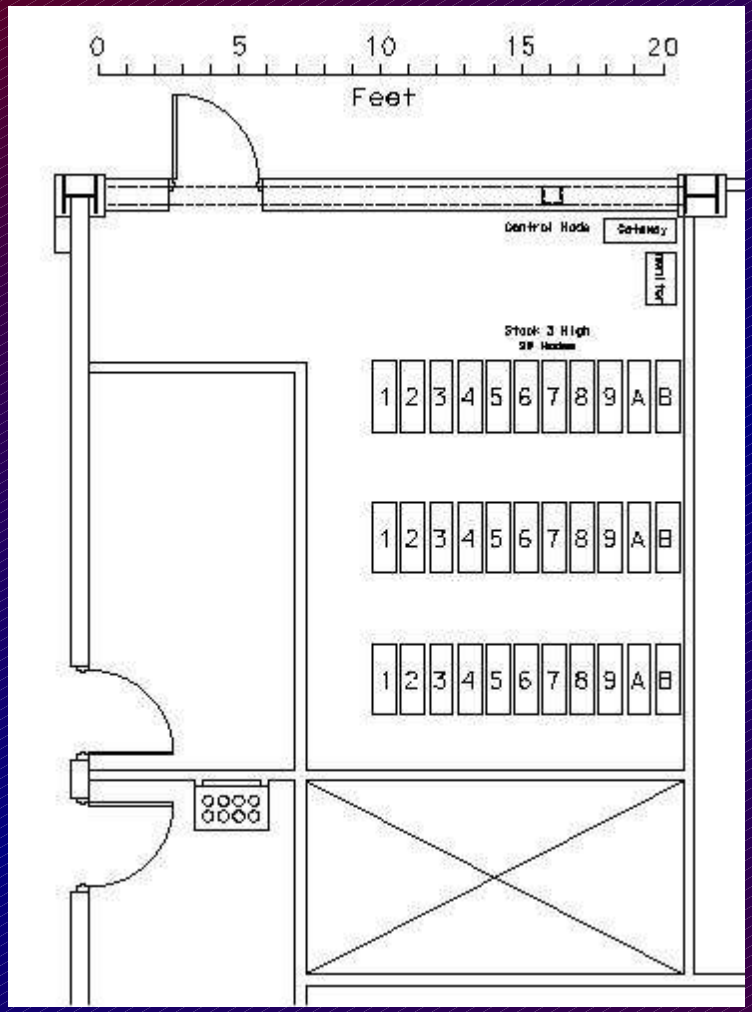
Contents

- Cluster Update
- Interactive Computing with Scilab
- Symbolic Computing with maxima (based on MIT Macsyma)and mathomatic (CAS)
- Figures with XFIG
- Interactive Computing with FELT
- Graphics Libraries
- Mathematical Libraries
- Questions

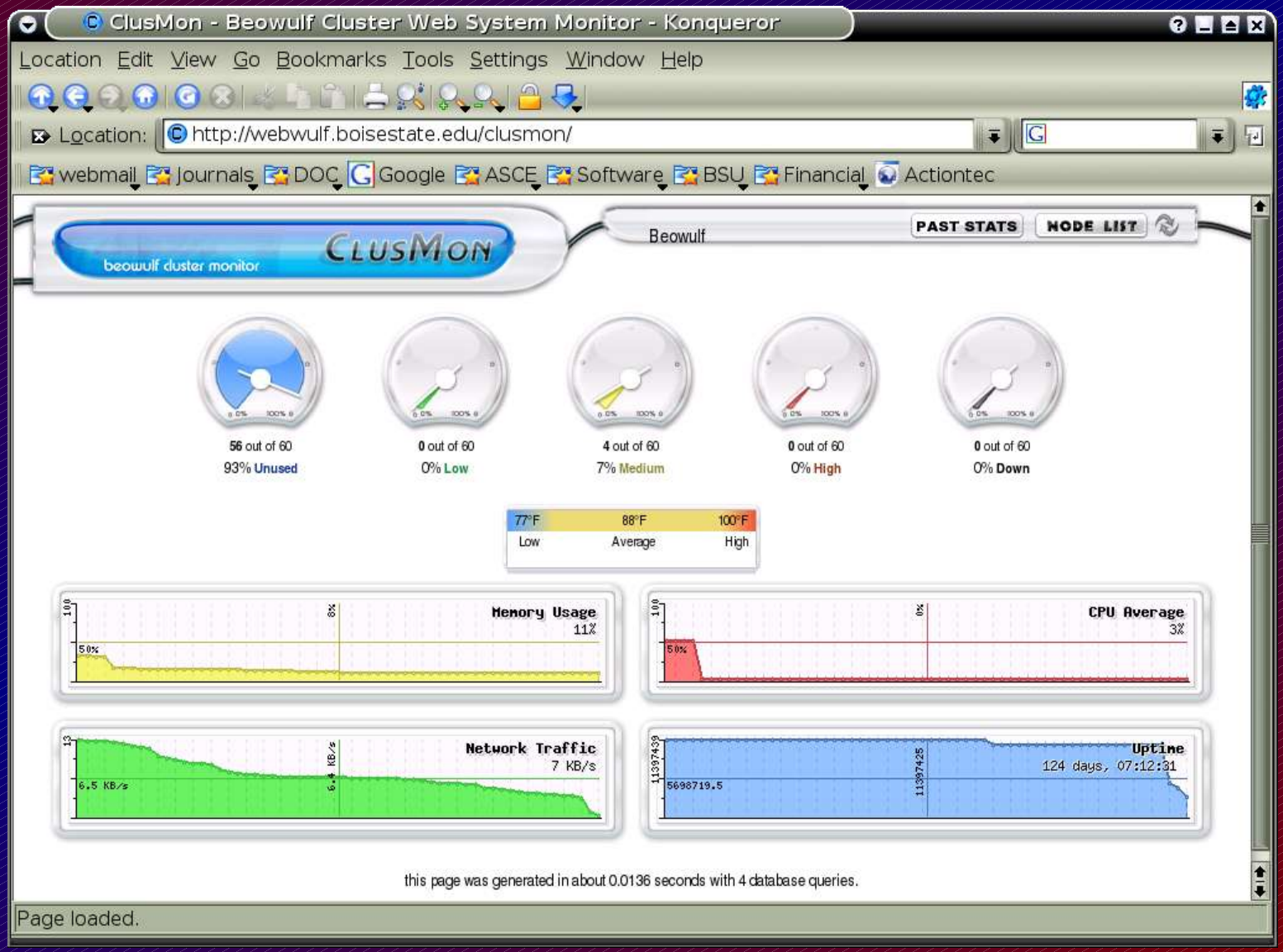
Beowulf Cluster Room



- Master Node
- 64+ Slave Nodes (128 2.4Ghz Xeons, 64GB RAM, 2.56TB disk)
- Giga-Bit Switches connect slave nodes to master node on LAN.
- 2 CPU's per Node, 1GB RAM, 40G Disk

Cluster Room

Conrad Kennington's Cluster Monitor MS Computer Science



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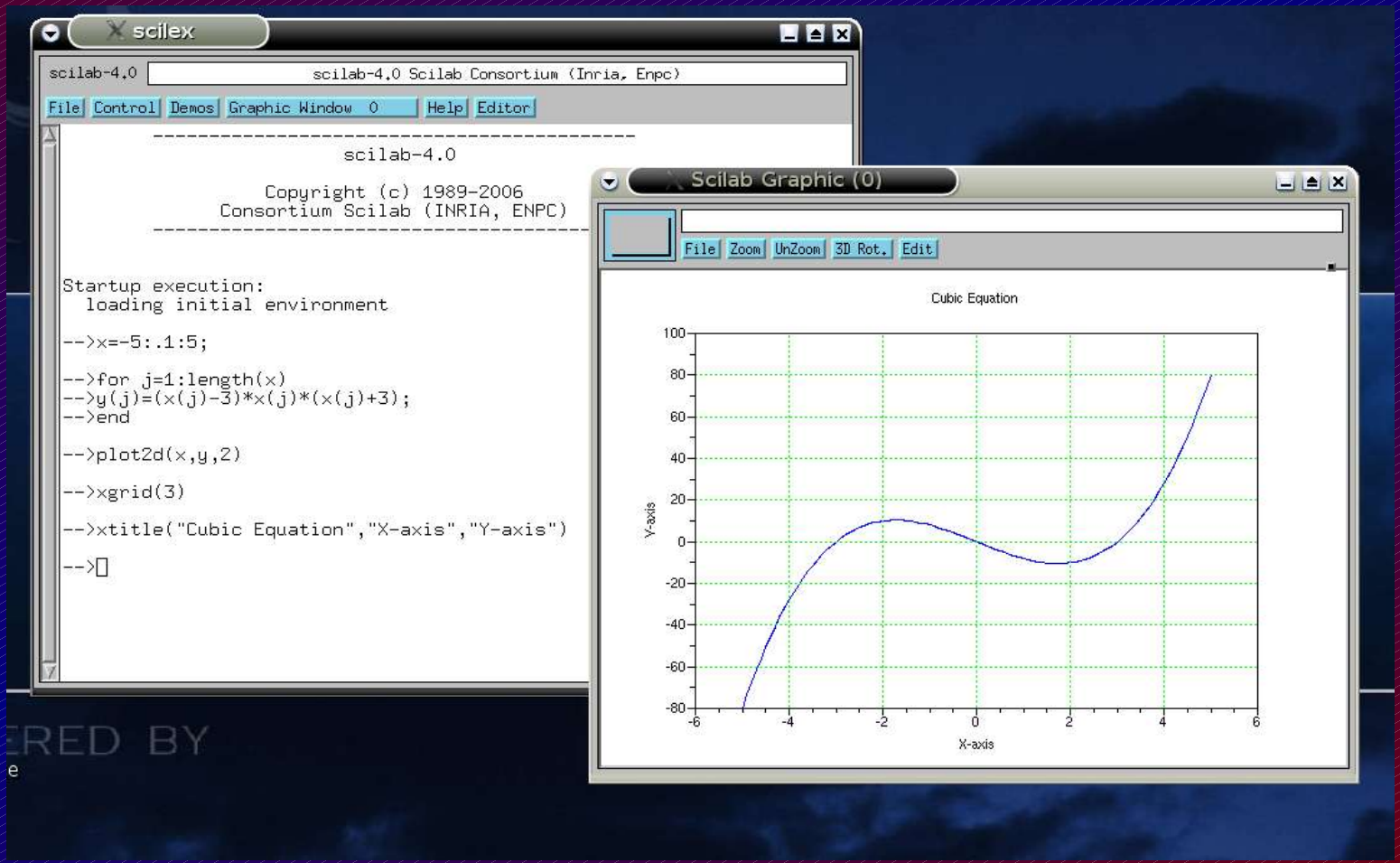
Scilab

INRIA (France, many contributors)
http://www.scilab.org

- Interactive, Linear Algebra, Polynomials, Statistics, Sound, Help Facility, . . .
- Toolboxes include: Signal Processing, Fractals, Wavelets, Color.
- Dynamic Systems: Sicos (animations)
- Graphics: Simple plots, 3-D plotting of surfaces, pixal image plots in color.
- Export Graphics to XFIG (CAD program, can prepare journal quality images).

Scilab Plot Cubic Equation



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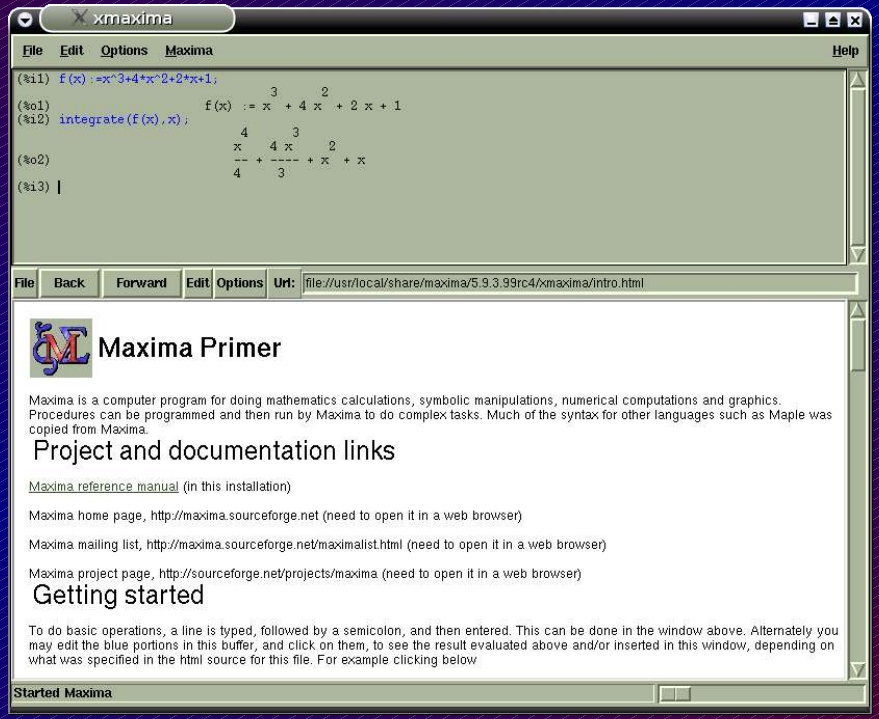
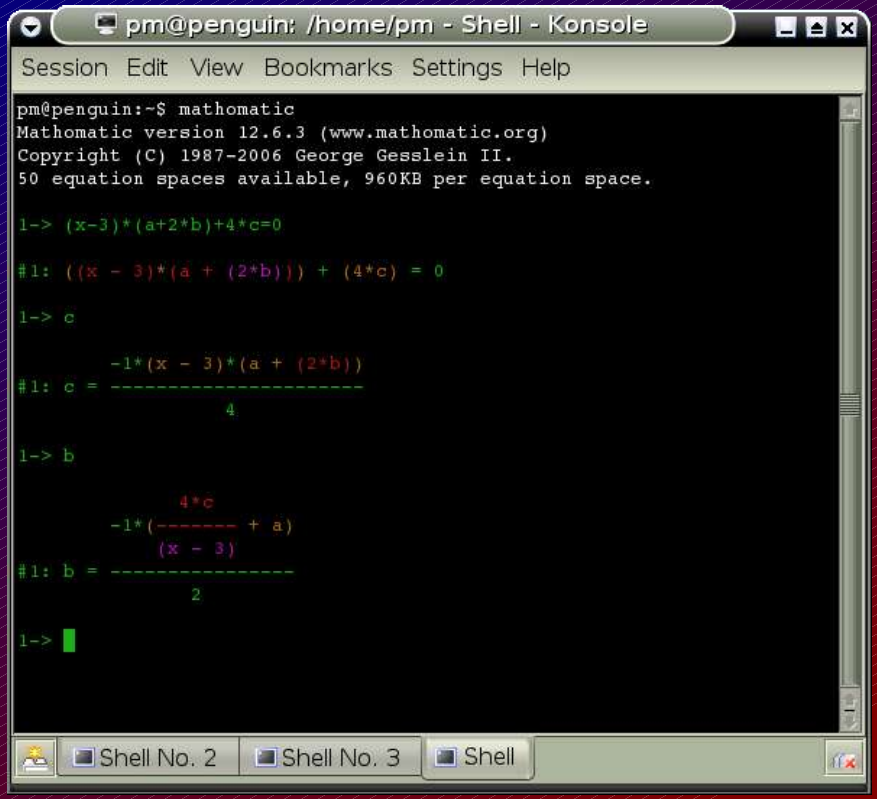
Symbolic Processing

- xmaxima
  - http://maxima.sourceforege.net
  - Like Maple (MIT Macsyma)
- mathomatic
  - http://mathomatic.orgserve.de/math
  - CAS Computer Algebra System





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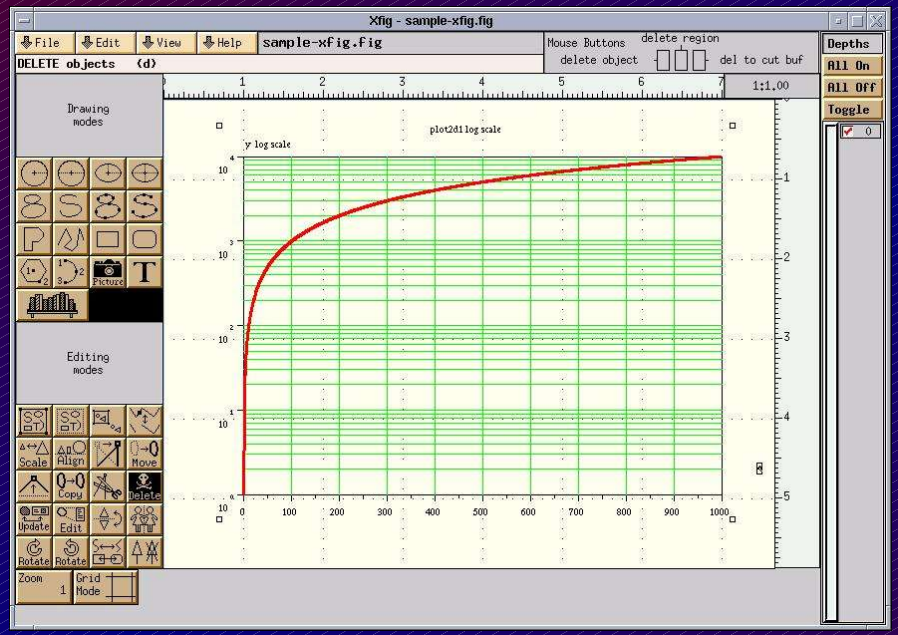
XFIG

Supo Sutanthavibul, Brian Smith (LBL), Brian King, et al.

http://www.xfig.org



- CAD Program
- Manipulate graphical entities
- Original drawings, or draft on an exported figure from Scilab
- File Names: foobar.fig

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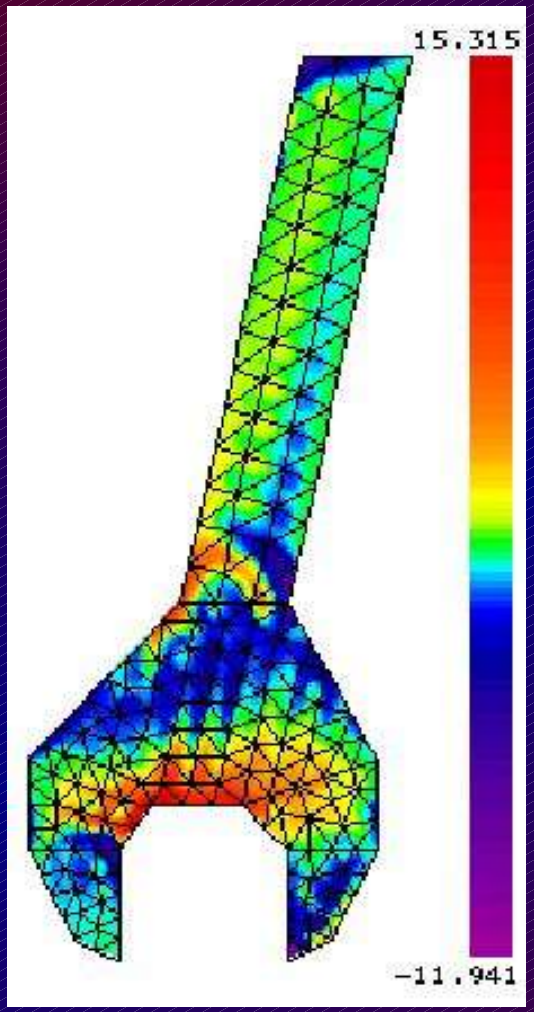
Finite Elements with FELT

by Jason Gobat and Darren Atkinson
http://felt.sourceforge.net



- Static and Dynamic
- Choice of Elements
- Choice of Materials
- VELVET: CAD Input
- Stress, Strain, Displacement
- Choice of Output Formats

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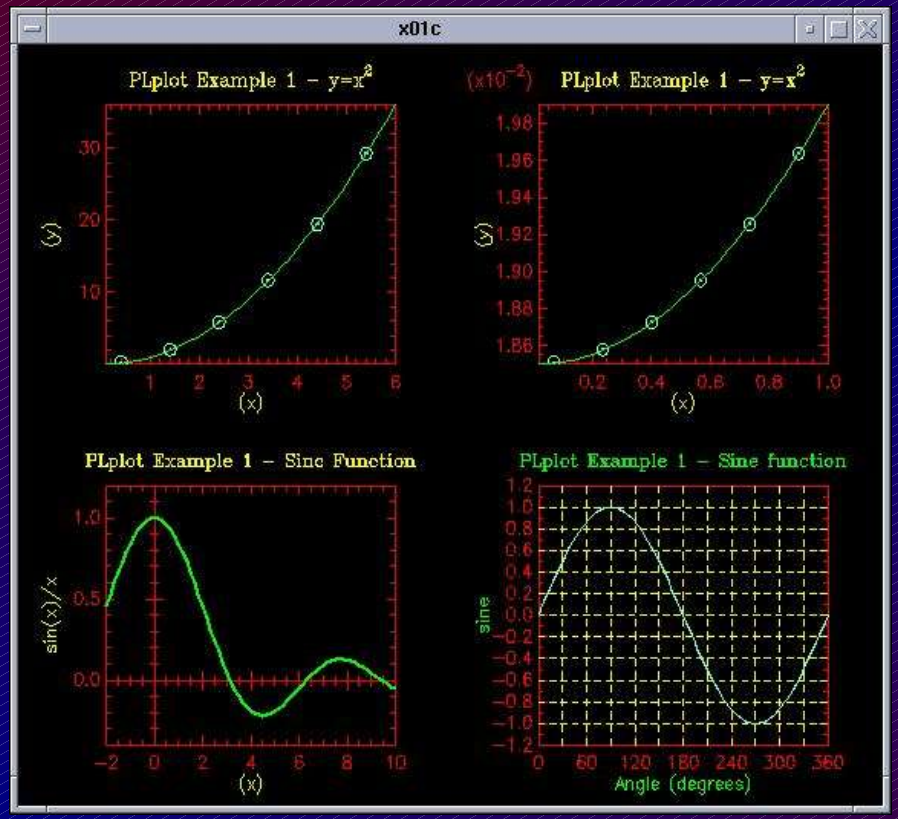
PLPLOT

M. LeBrun, G. Furnish, A. Irwin, R. Laboissiere, J. Cardoso

http:plplot.sourceforge.net



- Graphics Library for C, C++, Fortran, TCL, TK, JAVA, Octave, Python . . .
- Graphs, Surface Plots, Contour, Perspective, Color
- Well Documented (postscript, html)

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Mathematical Libraries

When you need a function or subroutine to compute from C or Fortran

- LAPACK: Linear Algebra, (C and Fortran, get the book from SIAM)
- BLAS: Basic Linear Algebra Subroutines
- GAMS: Guide to Available Mathematical Software Web Page
- NETLIB: Web Page for downloads
- NIST: Web Page with more links to sites like GAMS

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