Gnuplot Overview

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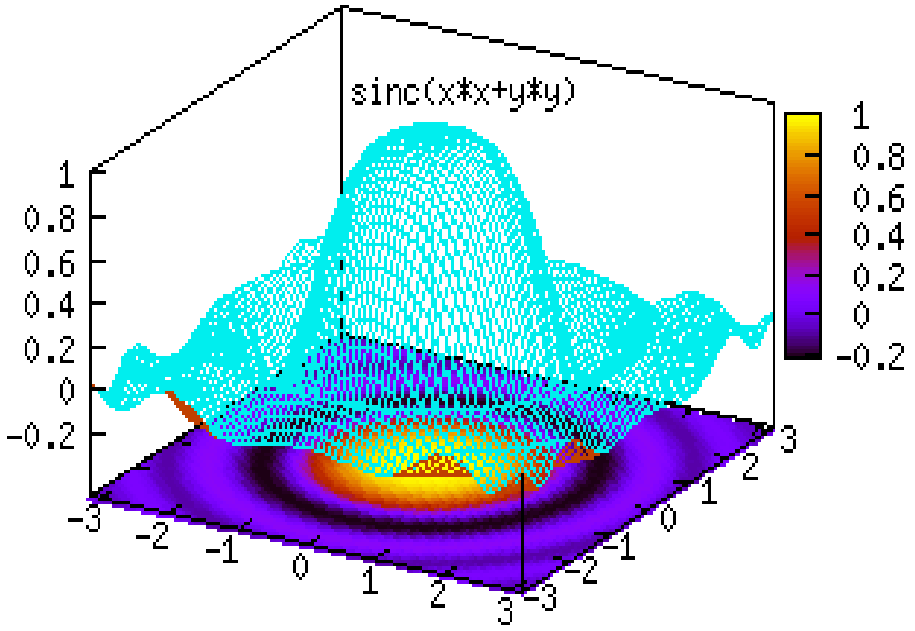
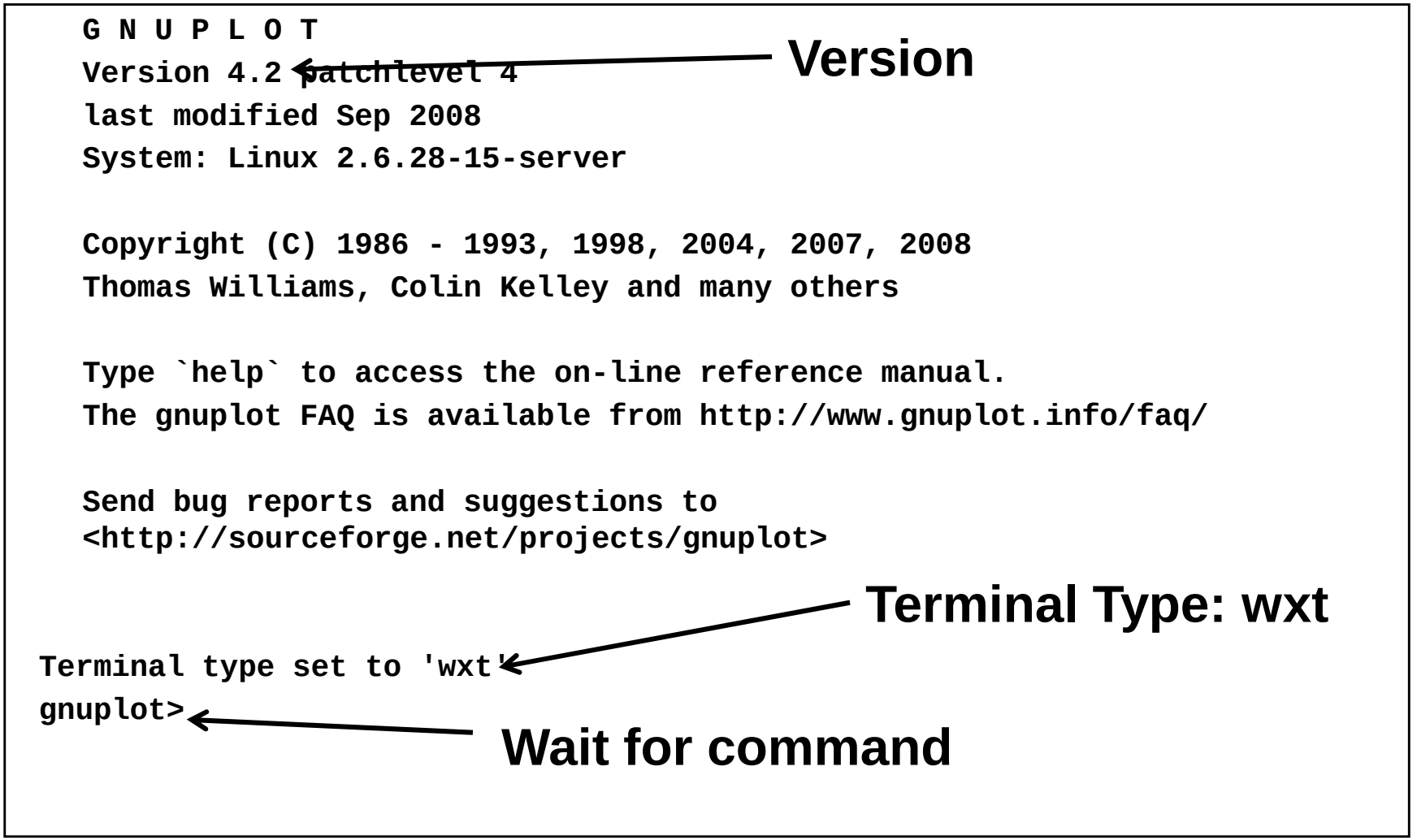
What is Gnuplot?

- Open source tool for visualizing and analyzing data
- Command line based plotting program
  - 2D and 3D plot
- Supporting platform
  - Windows
  - Linux
  - Unix
  - OSX
  - …

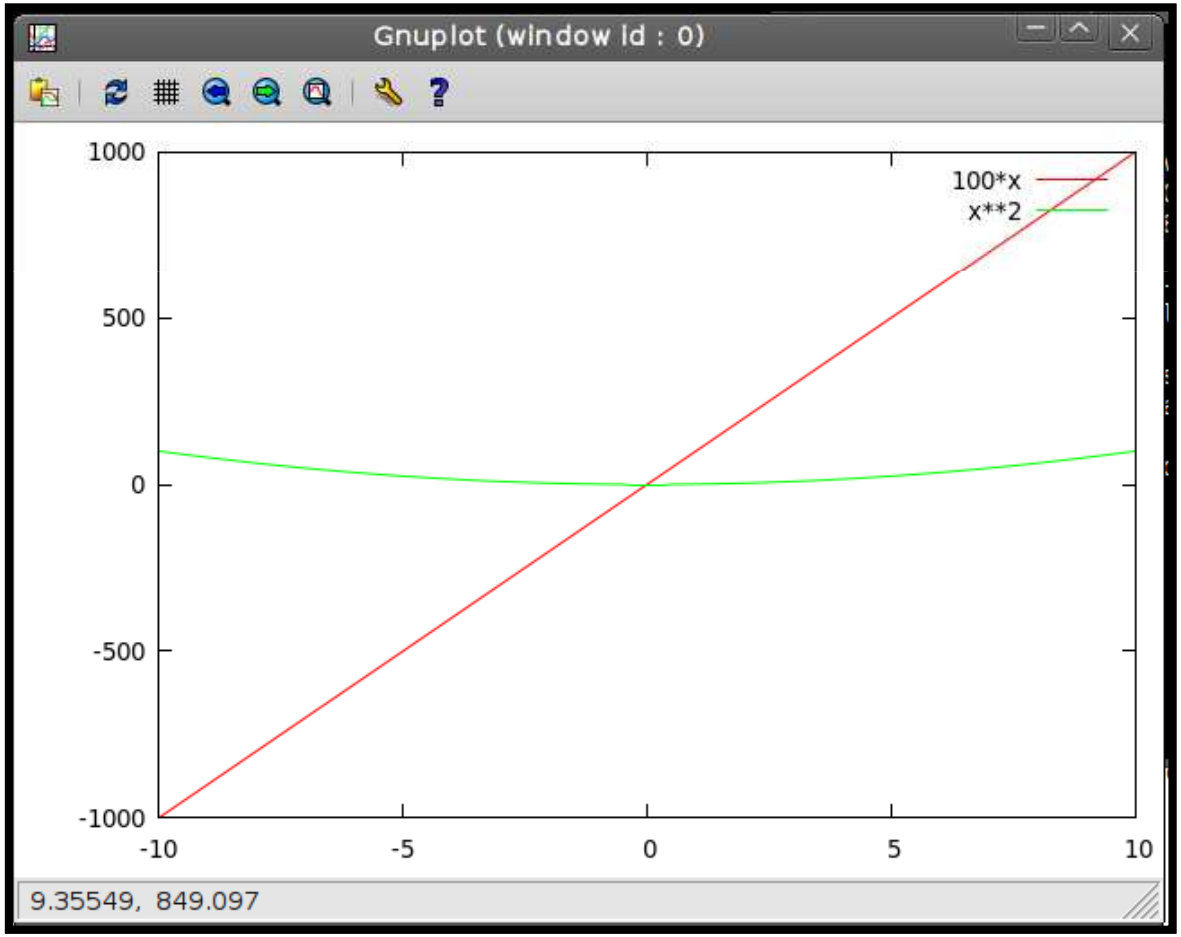


Gnuplot Command Line Interface



Gnuplot Example 1

```
gnuplot> plot 100*x, x**2
```



Gnuplot Add-on Command

- Set X and Y label
  - **gnuplot>** `set xlabel "Value of X"`
  - **gnuplot>** `set ylabel "Value of Y"`
- Set Legend
  - **gnuplot>** `plot x title "y=x", x*x \`
    `title "y=x*x"`
- Set Title
  - **gnuplot>** `set title "Function Y of X"`

Gnuplot Add-on Command

- Set X and Y range
  - **gnuplot>** `set xrange [0:15]`
  - **gnuplot>** `set yrange [0:500]`
- Set Xtics and Ytics range
  - **gnuplot>** `set xtics 1.5`
  - **gnuplot>** `set ytics 2`
- Set grid
  - **gnuplot>** `set grid`
  - **gnuplot>** `unset grid`

Gnuplot Add-on Command

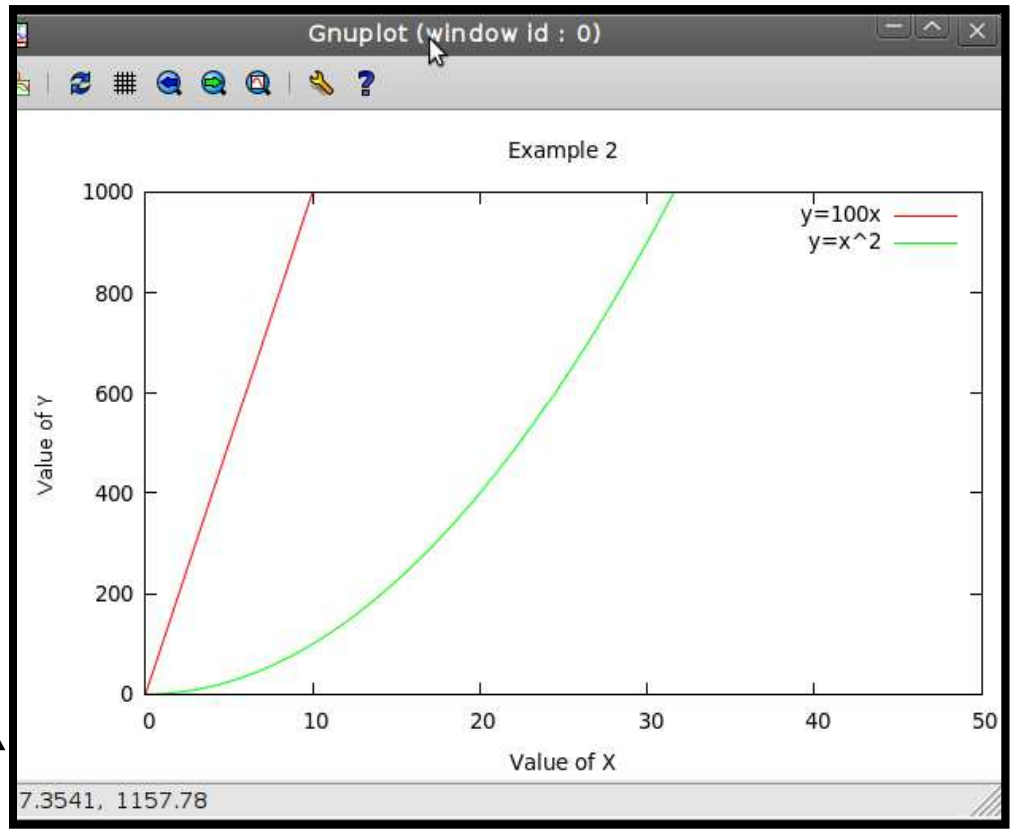
- Reploting
  - **gnuplot>** `replot`

Gnuplot Example 2

```
gnuplot> set xlabel "Value of X"
gnuplot> set ylabel "Value of Y"
gnuplot> set title "Example 2"
gnuplot> set xrange [0:50]
gnuplot> set yrange [0:1000]
gnuplot> plot 100*x title "y=100x", \ x**2
  title "y=x^2"
```

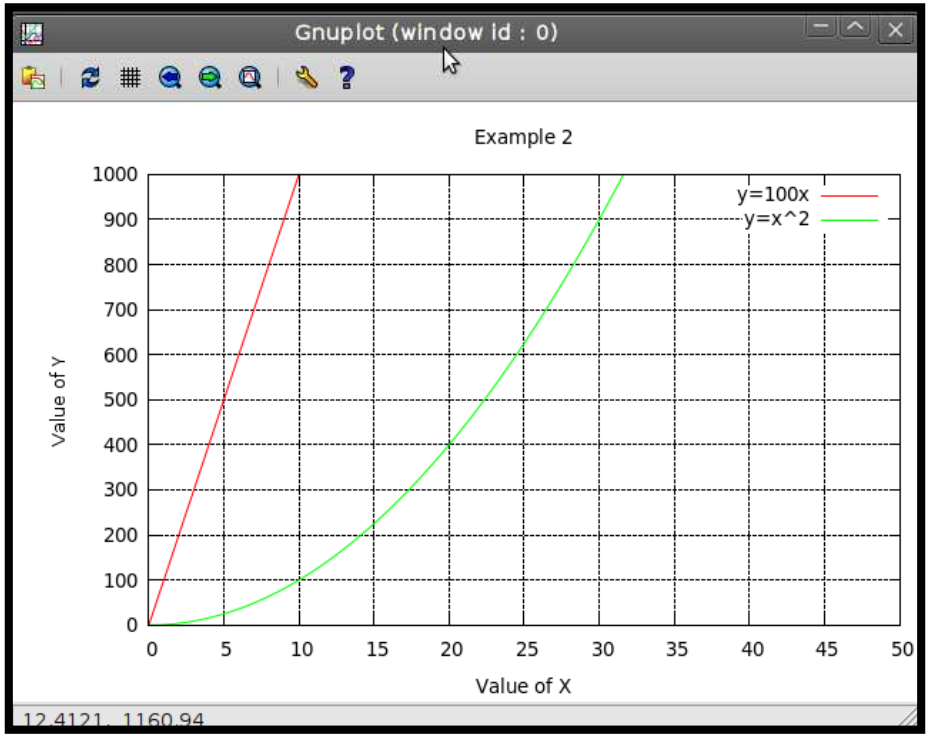
Gnuplot Example 2: Output

```
set xlabel "Value of X"

set ylabel "Value of Y"

set title "Example 2"

set xrange [0:50]

set yrange [0:1000]

plot 100*x title "y=100x",\
     x**2 title "y=x^2"
```



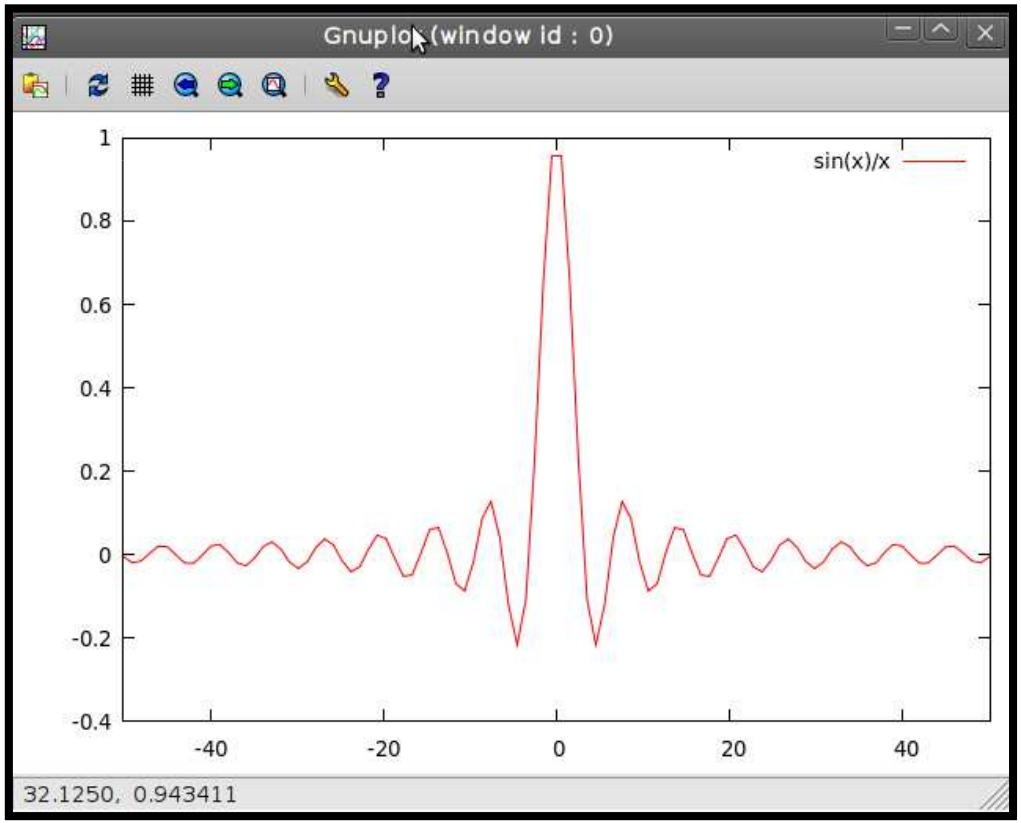
Gnuplot Example 2: More command

```
gnuplot> set xtics 5
gnuplot> set ytics 100
gnuplot> set grid
gnuplot> replot
```



Plot Sinc Function: sin(x)/x

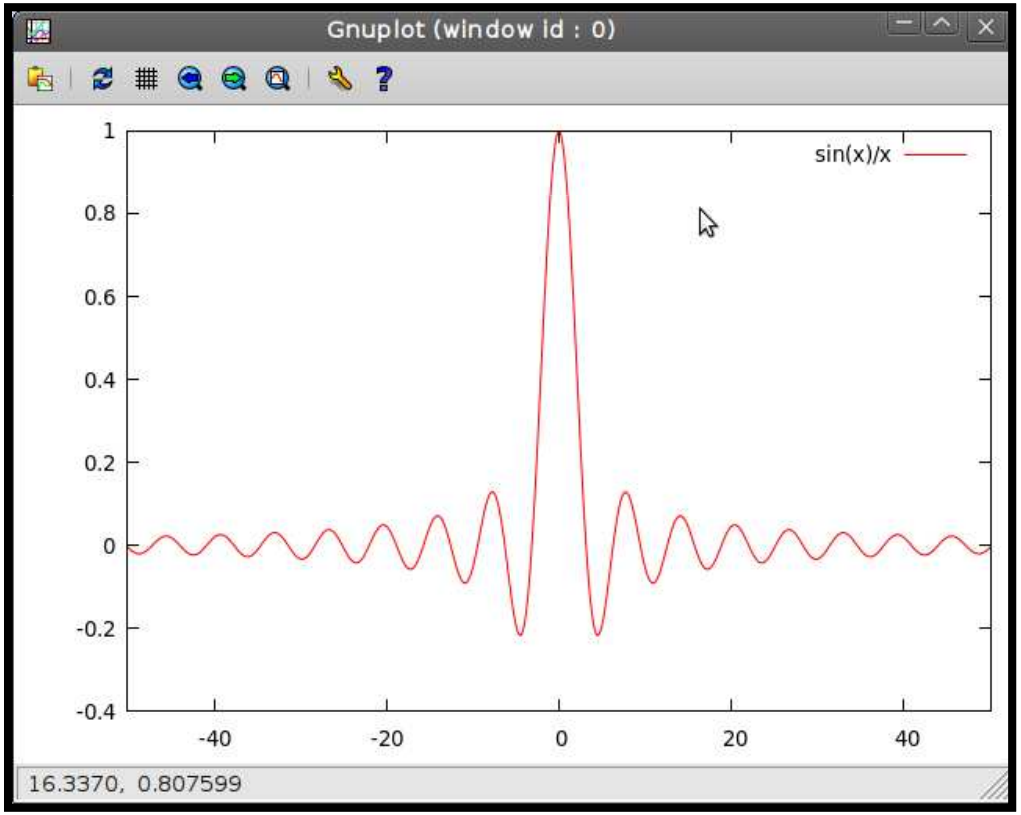
```
gnuplot> set xrange [-50:50]
gnuplot> plot sin(x)/x
```



Plot Sinc Function - sin(x)/x

- Adding more sample points

```
gnuplot> set samples 2000
gnuplot> plot sin(x)/x
```



Plot graph from text file

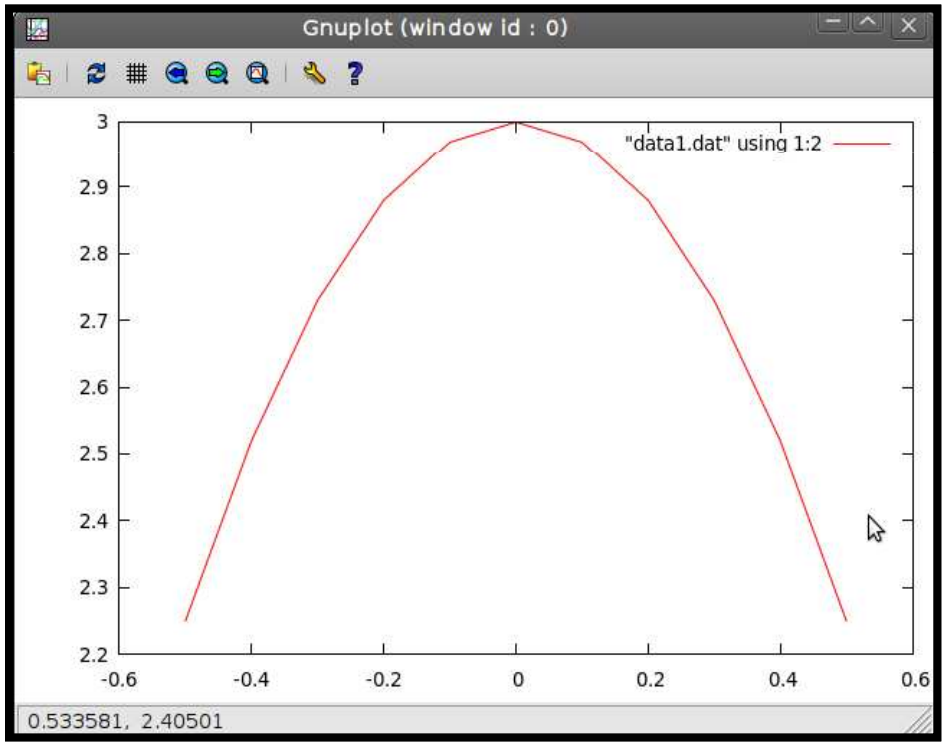
- File "data1.dat" contains:

X	Y1	Y2	Y3
-0.5000	2.2500	1.2990	-0.1250
-0.4000	2.5200	1.0998	-0.2600
-0.3000	2.7300	0.8585	-0.3650
-0.2000	2.8800	0.5879	-0.4400
-0.1000	2.9700	0.2985	-0.4850
0.0000	3.0000	-0.0000	-0.5000
0.1000	2.9700	-0.2985	-0.4850
0.2000	2.8800	-0.5879	-0.4400
0.3000	2.7300	-0.8585	-0.3650
0.4000	2.5200	-1.0998	-0.2600
0.5000	2.2500	-1.2990	-0.1250

Plot graph from text file: (X, Y1)

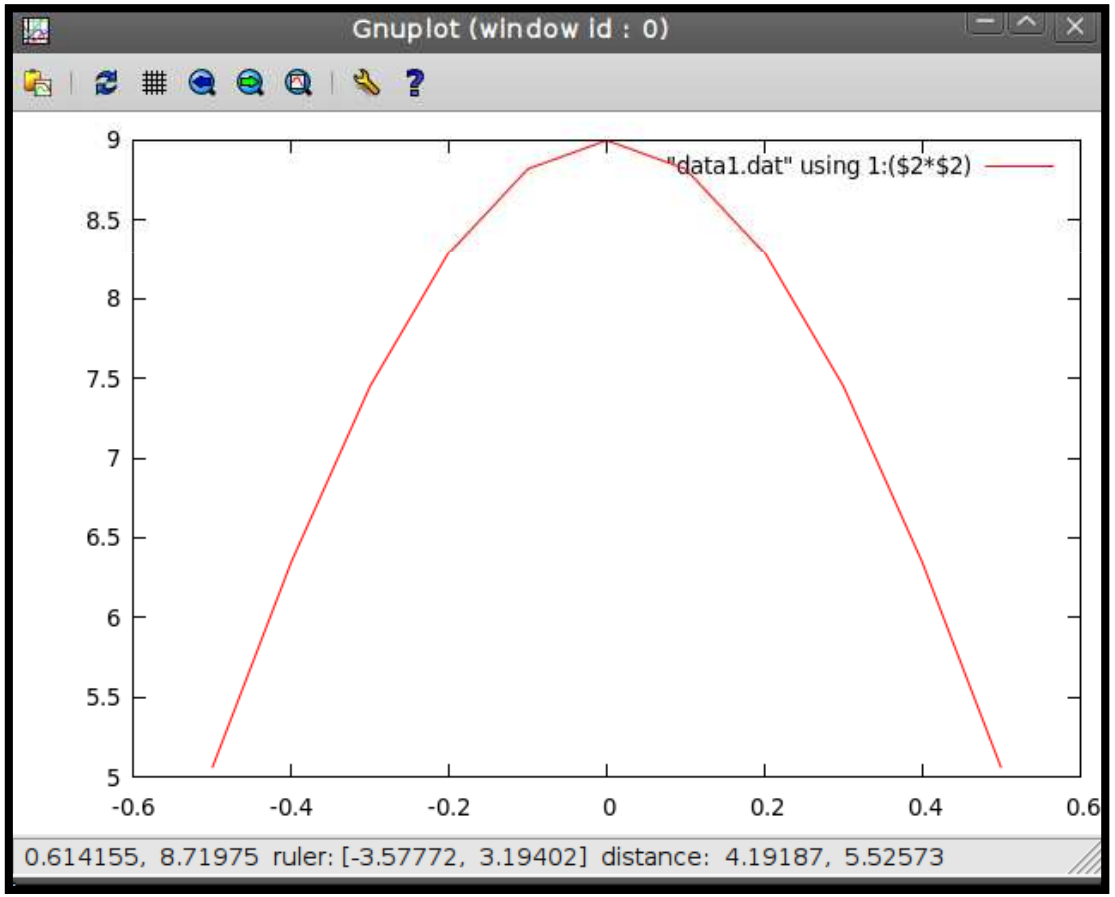
```
gnuplot> plot "data1.dat" using 1:2 with line
```

1	2	3	4
X	Y1	Y2	Y3
-0.5000	2.2500	1.2990	-0.1250
-0.4000	2.5200	1.0998	-0.2600
-0.3000	2.7300	0.8585	-0.3650
-0.2000	2.8800	0.5879	-0.4400
-0.1000	2.9700	0.2985	-0.4850
0.0000	3.0000	-0.0000	-0.5000
0.1000	2.9700	-0.2985	-0.4850
0.2000	2.8800	-0.5879	-0.4400
0.3000	2.7300	-0.8585	-0.3650
0.4000	2.5200	-1.0998	-0.2600
0.5000	2.2500	-1.2990	-0.1250



Plot graph from text file: (X, Y1^2)

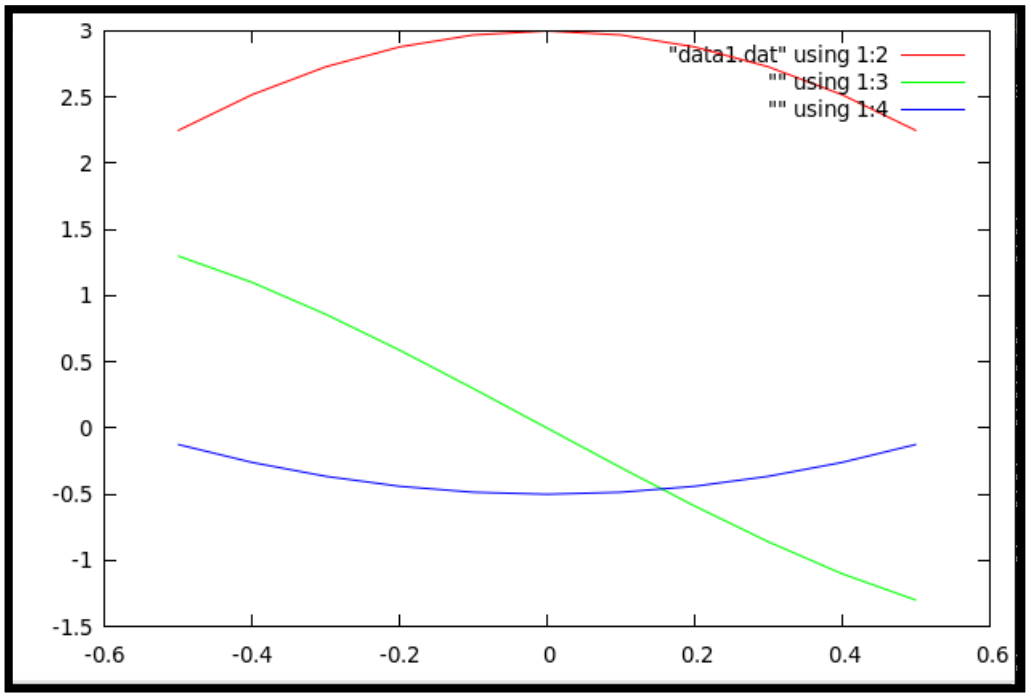
```
gnuplot> plot "data1.dat" using 1:($2*$2) with line
```



Plot graph from text file

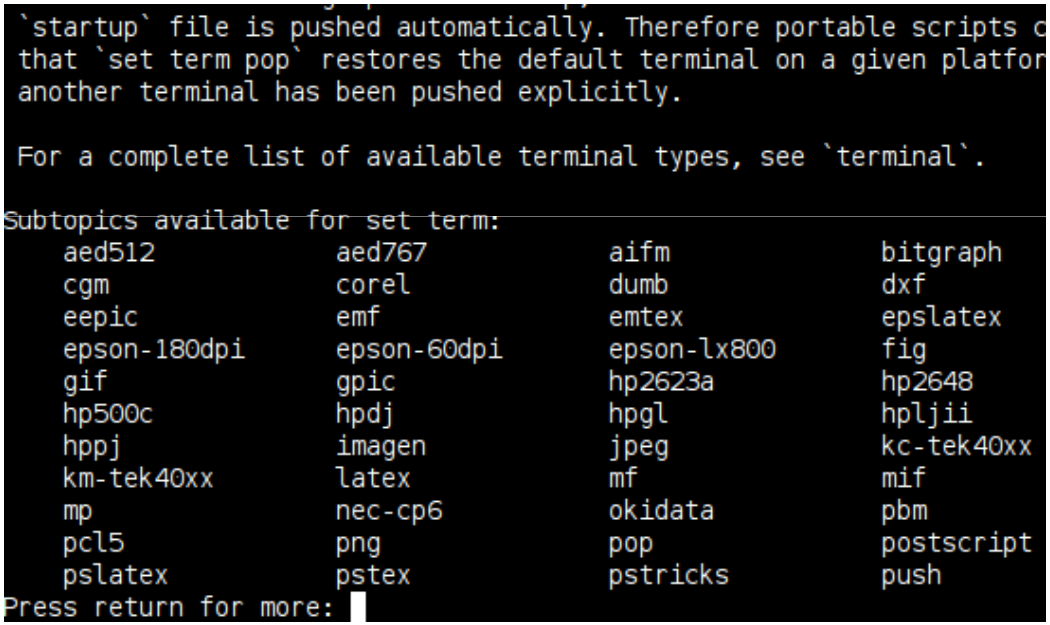
- Plot: (X, Y1) (X, Y2) and (X, Y3)

```
gnuplot> plot "data1.dat" using 1:2 with line, \
              "data1.dat" using 1:3 with line, \
              "" using 1:4 with line
```



Save the output to file

- Supported Output File Formats
  - postscript
  - jpeg
  - png
  - gif
  - …



- Help
  - `gnuplot> help set term`

Save the output to file: jpeg

- Save the output to "example3.jpg"

```
gnuplot> set samples 2000
gnuplot> set xrange [-50:50]
gnuplot> plot sin(x)/x

gnuplot> set term jpeg
gnuplot> set output "example3.jpg"
gnuplot> replot
```

- Restore back to normal plot (plot on screen)

```
gnuplot> set term wxt
```

Summary

- **plot** "data1.dat" using 1:2 w l
- set **xrange** [0:100]
- set **yrange** [0:60]
- set **xlabel** "x value"
- set **ylabel** "y value"
- set **title** "graph1“
- set **xtics** 1.5
- set **ytics** 20
- set **samples** 2000
- **replot**

Summary

- set **term** jpeg
- set output "example3.jpg"

Other related commands, please follow the link in the references.

References

- http://www.gnuplot.info/
- http://t16web.lanl.gov/Kawano/gnuplot/index-e.html
- http://www.gnuplot.info/screenshots/index.html#screenshots