

Gnuplot

Bernt Arne Ødegaard

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1 Gnuplot

Purpose: Plotting mathematical relationships, either directly from a mathematical function specification, or from interpolating data.

1.1 Using Gnuplot

Gnuplot is a free and widely available package that can still be used to create all but the most complicated figures. There are versions of `gnuplot` for M(es)S-DOS as well as on UNIX workstations.

How to start and use `gnuplot` will depend on your computing environment. I will stick to the X windows case, where you start `gnuplot` by typing

```
gnuplot
```

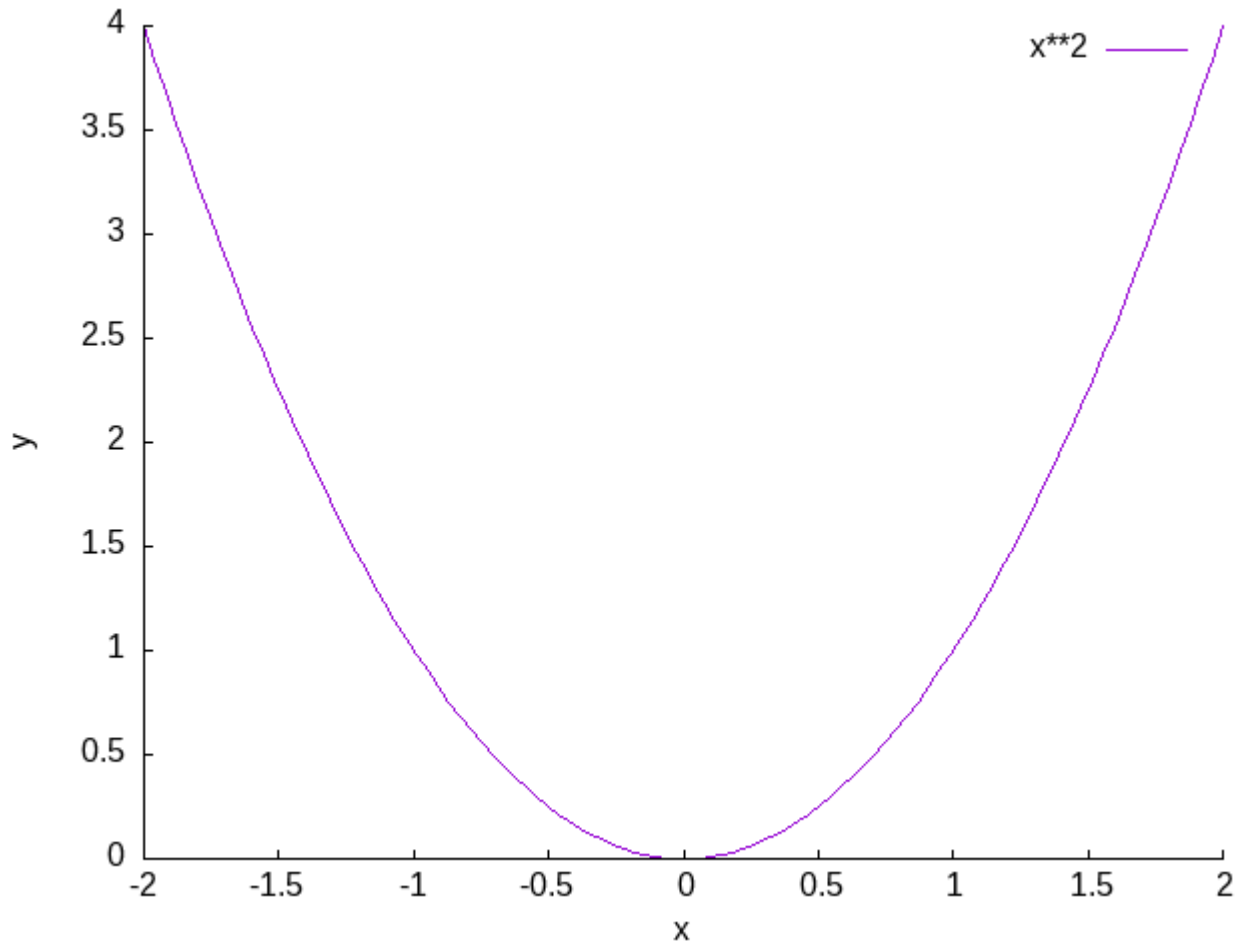
in a `xterm` window. This will start `gnuplot` and give a prompt:

```
gnuplot>
```

You can now give plotting commands, e.g.

```
plot [x=-2:2] x**2
```

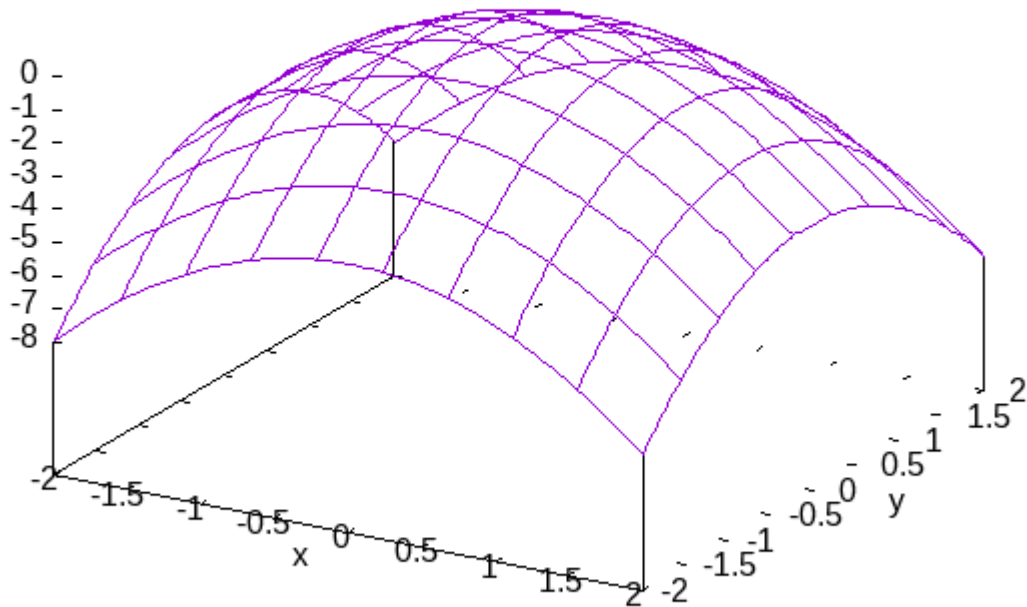
results in the following picture shown in a separate window on the screen:



For a more advanced example, here is a 3-dimensional plot

```
splot [y=-2:2] [x=-2:2] -(x**2+y**2)
```

$$-(x^{**2}+y^{**2})$$



As you see, acceptable plots can be produced at little effort.

You have already seen examples of the two-dimensional and three-dimensional capabilities. As for how you can produce these, **Gnuplot** plots two types of information:

1. Mathematical formulas, such as x^{**2} above.

Very complicated formulas can be used, and all the standard mathematical functions, such as $\sin(x)$, $\exp(x)$, $\log(x)$, ... are available.

2. Data files.

Usually, will have to create special ASCII files for input to **gnuplot**. This is the standard way of doing things on UNIX, where data files are usually sent through the plumbing, but may be more uncommon for people used to spreadsheets