Gaston

A gnuplot library for Julia

M. Bazdresch

March 30, 2012

Note: At the moment this document is a draft, under development. Gaston has been tested on Linux (Ubuntu 10.04), with gnuplot 4.6 and wxwindows. It only supports the wxt terminal.

1 Installation

See README file.

2 2-D plotting

Plotting proceeds in steps:

1. Create or select a figure with `figure(i)`, where `i` is a positive integer.
2. Add sets of coordinates and configure each set, with `addcoords(x,y,conf`. Here, `x` and `y` are vectors, and `conf` configures the plot and line styles, markers, legend, color, etc. Repeat this step for each set of coordinates you wish to include in the figure.
3. Add a configuration for the entire figure (axis), with `addconf(conf)`, where `conf` contains the figure configuration.
4. Issue the `plot()` command.

To modifiy a plot's configuration, create a default configuration with, for example, `c = Curve_conf()`, modifity `c`'s fields, and then issue `addcoords` with `c`.

To modify a figure's (axis) configuration, create a default configuration with, for example, `a = Axes_conf()`, modify its fields, and then issue `addconf(a)`.

See the file `gastondemo.jl` for many examples of all different kinds of plotting that Gaston supports.

Several rules apply:

- You can create as many figures, each with as many plots as desired.
- Generally, if you don't provide some of the data, it will be inferred. For example, calling `addcoords` with a single vector `y` will assume the `x` coordinate is `1:length(y)` and set up the default plot configuration.
- If you call `addcoords` with matrix arguments, each column will be interpreted as a different plot.
- Calling `addcoords` will create a new figure if none have been created yet.
- Calling `plot()` without an axis configuration will just use one by default.
- Gnuplot only provides mouse interaction support for the current figure. To use the mouse in a previously created figure `i`, just issue command `figure(i)`. This will also bring the figure to the front.

2.1 Error bars and lines

To add error bars or lines, just call `addcoords` with one or two extra coordinates, and configure the plotstyle accordingly.

3 3-D plotting

The same rules apply, except that `addcoords` should be called as `addcoords(x,y,Z)`, where `Z` is a matrix whose element `j,k` corresponds to some function of `x[j],y[k]`.

For convenience, a function `meshgrid` is provided. Called with `x`, `y` coordinates and a function `f`, it will return a matrix that may be used to plot `f`.

4 Image plotting

To plot a matrix `Z` as a figure, use `addoords` with empty `x`, `y` coordinates and `Z` as third argument, and set the plotstyle to `"image"`.

Note that there is a single command to plot, which is `plot()`. According to the type of coordinates and plotstyle, it will figure out how to plot.