gnuplot-iostream : A C++ interface for Gnuplot (author: Dan Stahlke (dan(at)stahlke.org))

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Overview

What is gnuplot-iostream?

- ∗ It is a c++ interface to gnuplot, developed by Dan Stahlke.
- ∗ "This interface allows gnuplot to be controlled from c++ and is designed to be the lowest hanging fruit. In other words, if you know how gnuplot works it should only take 30 seconds to learn this library." - Dan Stahlke

Overview

Are there any other tools to plot when using c++? Why gnuplot-iostream?

- Yes. There are many other tools - many are at a higher level of abstraction and use MATLAB like syntax.

- However, Gnuplot is a powerful tool and will be taught in UN5390. It will be expected to be used in assignments. One way is to write shell script where you run the c++ code, produce a .dat file, run the gnuplot script in which you read the .dat file and plot. gnuplot-iostream provides an alternate method where you embed gnuplot commands directly in your code.

- The advantage of using gnuplot-iostream is that you do not need to know any additional syntax. The existing gnuplot scripts can be used directly (as will be shown in the example). Another advantage is that it can take in a wide number of data types - std::vectors, armadillo

Prerequisites

What are the prerequisites in order to use gnuplot-iostream?

- c++
- Gnuplot
- Makefile
- package installer : apt-get (Linux), brew (Mac OS)

Setting up gnuplot-iostream

I assume that Gnuplot is already installed on the system.

- git clone https://github.com/dstahlke/gnuplot-iostream.git
- In the c++ code when including the header gnuplot-iostream.h, either give the location of the cloned repository or copy the header into the folder where the c++ code is. This is a header only library and only the file gnuplot-iostream.h is required. All other files are provided as example codes.
- [1] For Linux: sudo apt-get install libboost-all-dev
- [1] For Mac OS: brew install boost, brew install boost-build

[1] I emailed the author and confirmed that gnuplot-iostream has dependency on boost even if neither my gnuplot script nor my c++ code has dependency on it.

Running gnuplot-iostream

- Makefile : when you run make, both the example codes which I have provided will be compiled and the output .eps images will be produced in the same folder.

- test_gnuplot_iostream_1.cpp : this is a minimum working example (mwe). It has a very simple gnuplot command to plot a sine wave.

- test_gnuplot_iostream_2.cpp : this code contains a gnuplot script provided at superior.research.mtu.edu/tips. The sole purpose of providing this script in the example was to show how an existing gnuplot script can be used without changing the syntax.

- single_data_set_single_file.dat : input data file for the gnuplot script.

Running gnuplot-iostream

- Note: Although I say the gnuplot syntax remains the same there are two subtle changes to be made. Add an escape character before double quotes (e.g. write (backslash)"Helvetica(backslash)" instead of "Helvetica") and add a newline (e.g. (backslash)n) at the end of each statement.

Other things to know

- The author has provided more detailed and advanced examples.
- The Makefile I have provided was created by modifying the Makefile provided by the author.
- std::vector, armadillo and other data types are supported as well !! (although I have not had a chance to experiment with them or any of the advance examples provided)

Thank You