Physics 609—Computational Physics
Homework 1—Due Thursday, September 11, 2014

1) Prepare a data file with one column of numbers δt. A range $0.01 \leq \delta t \leq 0.5$ would be particularly convenient, but it is not required. Explain how you prepared the file.

2) Prepare a second data file with two columns of numbers. This file should contain δt and $0.25\delta t^2$. Show the commands you used to create the second data file.

3) Graph your data, preferably using axis, with the x-axis properly labeled δt using a Greek symbol for δ. You may label the y-axis as error. Put a title on the graph that is your name (first and last).

4) Graph the same data, but this time make a log-log plot. (This is very easy to do using axis, but you don't have to use axis.)

5) Prepare a data file with two columns of numbers x and $\exp(-.5x)$, where x takes on values between 0 and 10 in increments of 0.1. Explain how you prepared the file.

6) Graph the data showing individual points plotted as diamonds.

7) Replot the same data as a semi-log plot with the y-axis logarithmic and the points connected by a solid line.

8) Using awk, prepare a temperature conversion command that will convert Farenheit to Celsius and Celsius to Farenheit. By now you should know that it is often easier to put awk commands in a file than to type them on the command line. I suggest you use this approach for this problem and show the contents of your awk file.

Suitable input would be:
25.2 C
45.1 F

Your output should look like:
25.2 C is xxxx F
45.1 F is yyyy C
where xxxx and yyyy are the correctly converted values.