ME 701 – Development of Computer Applications In Mechanical Engineering
Homework 1 – The Linux Shell and Version Control – Due 9/29/2014

Problem 1 – Open-Source Software

Think of the things you do routinely on a computer that require specific software packages. Find an open-source solution from the software repository for one of these activities and tell me about it in 100 words or less. For example, I used to do lots of audio recording when I was in high school (not *that* long ago) and used special (and pretty expensive) tools like Cakewalk Sonar. Since then, I've found an open-source package for doing multitrack recording called Ardour that doesn't have all the bells and whistles but, because I can program in C++ and the source code is available, I could, in theory, create any such whistles I need.

Problem 2 – The Command Line

1. Figure out how to display information about your CPU via the command line. This should include at least the processor speed and the number of cores. List your command(s) and the output.
2. Figure out how to list the programs that use the most amount of (1) processing and (2) memory. List your command(s) and the output.

Problem 2 – Simple Shell Scripting

1. Write a bash script that converts a temperature from degrees Fahrenheit to degrees Celcius. (Hint: one way is to use `let`.)
2. Write a bash script that provides a count of the number of files and subdirectories in the current directory. (Hint: use `grep`.)
3. Write a bash script that takes as input the name of a file. The script should move the given file, if it exists, to a directory named trash that is located within your home directory. If the trash directory does not exist, the script should create it. If the given file does not exist, an appropriate error message should be printed.

Problem 3 – Git and Version Control

1. Get a (free) account at GitHub (or googlecode, or another vendor) and create a repository for your shell scripts. Provide me a link to this repository so I can see it.
2. Modify the temperature conversion script to output the temperature in Kelvin, too, and use use `git` (and GitHub, etc.) to track this change.