ECE 2220: System Programming Concepts **Fall 2016**
Problem Set 0 **Due: in class, Friday, August 19**

Assigned reading: Hoover, Chapter 1.

1. Upgrade (or install) Ubuntu (other Linux versions are okay). Open a Unix terminal so you can type on a command line.
    a. Describe your Unix installation (i.e., dual-boot or what type of virtual machine)
    b. What is the OS release number? Ubuntu: "`lsb_release -a`"
    c. What is the version number for the compiler? "`gcc --version`"
    d. What is the version number for the debugger "`gdb --version`"
    e. What is the kernel name and processor type? See "`man uname`".
    f. Is the kernel 32 or 64 bit? (Hint: "`uname -m`" shows `x86_64` for 64 bit. Or try "`file /bin/uname`" or click on "System Settings" and then "Details")
2. Get a Unix account from the college of engineering and science (CES) to use as a backup if your laptop fails. For a CES account send email to coes-unixadm@clemson.edu with a request for a Unix account and give your Clemson username. See http://cecas.clemson.edu/help/ for details and names of the machines.
    a. In a Unix terminal on your laptop, do "**`ssh -X username@access.ces.clemson.edu`**" and then "**`ssh -X apollo02`**" (you can use any apollo machine). Here `username` is your CU id, and if your Unix login name is the same as your CU id, you can skip the `username@`. Repeat question 1.b-f for your CES Unix account. In your home directory, make a directory with a name like `ece222`. Inside the `ece222` directory make two directories with names like `mp1` and `mp2`.
    b. The -X option enables ssh to tunnel graphics commands to your laptop. Verify that when you type gedit, xclock, or xcalc the graphical window is displayed.
    c. ssh to a different Unix machine from the same family but with a different machine number (e.g, if you are on apollo09, ssh to apollo11). Describe why your directories (and files) are the same on any machine in the same family. If you have access to more than one CES family, are they also available on different families?
3. Install Dropbox on your Windows or OS X laptop. If you have Ubuntu, install Dropbox for Ubuntu. Or, explain why you will use a different cloud storage mechanism. (You cannot install Dropbox on the ullab or CES machines). While using one operating system, navigate to your dropbox folder and make a directory with a name like `ece222`, and subdirectories with names like `mp1` and `mp2`. Switch to your other operating system. How long does it take before the folders show up in your dropbox folder (seconds, minutes, hours, days)? Log into your backup CES account, and describe how you transfer files from your Dropbox folder to the backup CES account. (One approach: In Ubuntu and OS X use `sfpt`, in Windows you can use the file transfer window in the SSH program, or use a web browser to go to the dropbox web site.)
4. Briefly explain the Unix commands "`pwd`", "`cd`", "`ls`", "`cp`", "`mv`", "`rm`", "`mkdir`", "`rmdir`", and "`w`". (If you are new to Unix commands see http://linuxcommand.org/lc3_learning_the_shell.php and work the first 5 lessons. Type "`man ls`" in a terminal.)
5. Describe which Unix text/program editor you use to edit C files (e.g., open a terminal and type "`gedit &`" or "`vim`"). Describe how to enable the editor to display line numbers, highlight matching brackets, and enable automatic indentation. Identify what keystroke will jump the cursor to a given line number.

Turn in a paper copy of your solutions in class. Do not submit electronically. While we have a policy for late submission of programming assignments, late submission of homework assignments will not be accepted.