

This is the final lab for A290/A590 - UNIX and C. Its goal is to assess whether you have learned the important topics of the class. This includes both UNIX and C topics. This lab looks much longer than it actually is.

Assigned: 12:00, 26 February 2009

Due: 12:00, 27 February 2009

NO EXTENSIONS

1. Please briefly describe the following UNIX commands and symbols, including a list of some interesting options for each, if available. The first should help you with the rest:
man, wget, cat, less, cd, pwd, grep, ls, cp, mv, ssh, —, *, rm, tar, bzip2, pushd, popd, cut, sort, uniq
2. How would one change the mode on a file so that only the owner can read, write, and execute the file, but no other user can do more than read the file? Give two answers, for each of symbolic and octal values.
3. What would the find command be to find all ordinary files modified within the last 2 hours that have an extension of txt?
4. How would you list all the files in a directory that are NOT text files (text files use the .txt extension)?
5. Write a function which takes as argument an amount of change under \$1, as an integer value, and prints out the minimum number of coins needed to make that change.
6. Write a similar function to above, but instead of printing the coins used within the function, return the necessary values to print after the function returns. Use one of the methods discussed in class.
7. The standard deviation σ of a list of N numbers x_i is defined as

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \bar{x})^2}$$

where \bar{x} is defined as the average of the x_i . Define a function which takes an array of doubles, and a value for N , and returns the standard deviation of the values. Make sure you define a second function which actually calculates the average.

8. Do not actually write code for this, but conceptually how would you go about determining the largest value an int can hold, by direct calculation, assuming you don't know the size of an integer prior to runtime. You don't have to know exactly how to do this, but you should be able to describe it at least in general terms.
9. Write a function that returns the largest value in an array of integers.