CS 325 - Algorithms - Summer 2014 - Programming Assignment 1

Directions: This assignment will be due on Thursday, July 17th in class. You may program in any language that you choose.

Write two programs to sort a list. One program should be the brute-force approach to sorting (go through the list, take the smallest element, put it first, repeat on the remaining list). The other program should be an implementation of mergesort.

Note that the brute-force algorithm will take $O(n^2)$ time while the mergesort algorithm will take $O(n \log n)$ time.

Run your algorithms for lists of 1 to 1,000 elements (Run each algorithm 1000 times). To generate these lists, you may create your own random lists on integers from -1,000 to 1,000. Or you may take the lists from the website: http://www.random.org/integers/?mode=advanced.

What to turn in:

- A one-page print out of the important pieces of your code.

- A plot of running times for each algorithm. Your y-axis should represent time and the x-axis should represent the number of elements in your list.

- Interpolate: with each algorithm, how many elements could you sort in one hour?