## CSCI 230 -- Makeup Assignment

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

You can use this assignment to earn up to 10 points for a missing pop quiz, a missing in-class exercise, or a missing lab. If you did not miss any assignment, you can use it to earn up to 5 extra credit points.

Which assignment do you need to make up (or EC if applicable)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Given a data file of integer values, write a program to find the total number of inversions. If value i comes before value j in the file and value i is larger than value j then it is an inversion. We need to count all such pairs in the file and output it to the screen. This count would tell us how closely the file is sorted. For example, the file with 1 9 6 4 5 has 5 inversions: (9, 6), (9, 4), (9, 5), (6, 4), (6, 5).

You need to provide two different algorithms to solve this problem, a simple O(n^2) algorithm with a nested loop and a fast divide-and-conquer algorithm. Once you confirm that they work on a small file like the 5 values above, run the two data files, small1k.txt and large100k.txt, used in PA 4.

What is the running time for your fast divide-and-conquer algorithm? You can either do a running time analysis or an experimental analysis by collecting run times.

Copy/paste your source code and output below.

**Save as PDF format and submit this file.**