Lab 4
CSCI232
Assignment due 10/2, at 11:30pm
Work alone – not with partners

Purpose: To understand MergeSort and QuickSort

1. Programming: Create a program that uses an array of 100,000 random numbers and sorts it with MergeSort and QuickSort. Use StopWatch to time each sort. Write a paragraph telling the times of each and what are your findings of the comparison in both time and space. (Why is one faster than the other? To what magnitude in relation to N?)
2. Do Not Program: a) Using the MergeSort code, draw a tree showing the recursive calls to sort(). b) Using the QuickSort code, show the trace of the method calls to sort(). (Assume it has already been shuffled).
   Use the following set of numbers for both a and b:
   [16 5 11 2 1 15 8 14 7 12 3 9 4 6 13 10]
3. Show the TA your progress on program 1.

Due: Wednesday, 9/25 at 11:30pm

Note: each person is to work individually. You can talk with those around you to do item 2 but I want to make sure everyone is writing programs on their own this time.

Submission You will submit the source files for main and paragraph for 1. For 2m write up your answers and submit to brightspace – either a picture or scan of your handwritten answer or a file from the computer. (Do not turn anything in to the TAs). Zip the files together and name them: <first/last name>.zip.
For 3, the TAs will use the attendance sheet to grade 3 (no submission needed) for each person.

Rubric:

1. – 4 pts (1 pt each for running each sort, 2 pts for paragraph)
2. – 10 pts (3 pts each for showing work for each of the 2 sorts, 3 pts for correct tree for MergeSort and 3 pts for correct trace of code for QuickSort)
3. – 6 pts (3 pts shows you have started, 3 pts shows you have written one sort)