Program 1
CSCI232
Due 10/7/19

Purpose: To create 3 different sorting classes and use them to sort numbers

Research the following sorting algorithms:
Bubble sort
Radix sort
Cocktail sort

Code these three algorithms. Create a main program that generates 100,000 random numbers between 1 and 500,000. Make 3 copies of this set of numbers. Sort the set of numbers with these 3 sorting algorithms. (Remember - sort the original order of numbers each time – not the already sorted set). Use the StopWatch class that we went over in class to time each sort. Verify that all 3 sorts produce the same sorted numbers. Print out the results of that compare. Print the three run times.

Write up a description of each algorithm and what assumptions you made in coding each. Include in this document a table that shows the Big O of each algorithm and the running time for each algorithm using N= 100,000 numbers. Describe how the runtimes correspond to the Big O numbers for each. Do the number correlate or not? Also, predict how long it will take to run for N=200,000 numbers and 400,000 numbers.

Due: Friday, 10/7 at 11:30pm. No late submissions will be accepted.

Each student will complete and submit this assignment individually.

You *may*

- Share ideas with other people.
- Help other people debug their programs.

You may *NOT*

- Share code with other people.
- Submit code that you did not write.
- Modify someone else's solution and claim it as your own.
- You may not submit screenshots that do not come from the code you submitted

Submission: You will submit the source files, screen shot of output and your writeup of algorithms and results (in a zip file) to brightspace.

Rubric: (50 points)

1. –25 points – coded the 3 algorithms
2. – 10 points – code output shows that the 3 algorithms produced the same sorted output and shows the 3 runtimes
3. – 15 points – Write up contains all that is required above.