CS 315 Homework 4

Due Tuesday, October 30, 2018 by 11:59 pm

First, STUDY **chapter 11** in your text.

Then create a class called **SortingComparisons** that has a main that will display a table of the number of comparisons made by 3 sorting algorithms on arrays of random integers with values between 100 and 1000 (inclusive of the endpoints).

The sorting algorithms are bubble sort, merge sort, and quick sort and are to be implemented as static methods within the class.

Each algorithm should count the number of comparisons it makes while sorting one of the arrays so that the main can display those counts.

The main should start a for loop that will loop 4 times starting at 1. **Each time** through the loop, three arrays of size 10^i should be created where i is the index of the loop. All three arrays should be filled with the SAME random integers generated during **that** pass through the loop. Each pass through the loop will generate a different set of random integers. Pass a full array to bubble sort, the other to merge sort, and the last to quick sort. Once each method provides a count of comparisons, the main should list the results as follows:

Number of Elements	Bubble Sort	Merge Sort	Quick Sort
10	xxx	xxx	xxx
100	xxx	xxx	xxx
1000	xxx	xxx	xxx
10000	xxx	xxx	xxx

Note that the x's in the table are not printed but are there as placeholders for the actual number of comparisons.

Use the printf method of System.out to format the table nicely.

Create a method that will take the three arrays as parameters and will fill them with the random integers and just call this method inside of the loop.

I suggest that you test your sorting algorithms by printing their results on the array of size 10 to make sure that they are working correctly before running the simulation.

When you are done, zip up the file and upload the zip onto Canvas.