Problems

This homework has several parts related to dealing with numbers in arrays.

We want to sort an array given to us using different sorting methods, in both ascending and descending order. We also want to able to merge two sorted arrays into a bigger sorted arrays.

What to do

- Write a program with several methods to accomplish the tasks given below.
- Write a method that randomly generates an array containing a given number of integers.
- Write a method that sorts an array of integers using Bubblesort. Allow it to sort in ascending as well as descending order.
- Write a method that sorts an array of integers using Selectionsort. Allow it to sort in ascending as well as descending order.
- Write a method that takes as input two sorted integer arrays, merges them to produce a larger sorted array and return this larger array. The two arrays may both be sorted in ascending order, or both in descending order.
- Write any other helper methods you need.
- Main Method: In the main method, you will generate random arrays and make calls to the other methods to sort them, merge them, print them, etc.
  - Generate two random arrays, each containing 20 integers. Sort these arrays using Bubblesort and Selectionsort. For both sorting algorithms, sort them once in ascending order and then in descending order. Print the arrays before and after sorting, so we know that they got sorted right.
  - Now, merge these two sorted lists into a big 40 element sorted array. Print the arrays before merging and the merged array. You will perform merging twice: once when both the smaller arrays are sorted in ascending order, and once when both the smaller arrays are sorted in descending order.
What to hand in


1. Have a title to your writeup: Don’t simply use “Homework 7” as the title. Make sure you include your name as an author. Have a section for each of the problems.

2. Write one or more paragraphs describing your approach to solving each problem in its own subsection.

3. Please take one or more screenshots of your console, to give us an idea of what your program accomplishes. You should integrate the screenshots within your write-up as figure(s), with appropriate caption(s). Describe the figure(s) briefly.

4. Upload the Java program to Blackboard.

5. Please hand in a printed copy of your writeup along with the program. We will check your program by running it. So, provide appropriate prompts so that it’s easy for us to test.