COW – Sorting and Recursion

The work below is what will need to be submitted. But in addition to that, work through the Recursion activities in codingbat. You do not need to turn anything in for this. But many of your Recursion Quiz/Test questions will be based on the codingbat problems.

Level 1

Complete the getFirstHalf and getSecondHalf methods in the Sorter Class. Each method takes in an array and returns the corresponding first and second half. If the array has an even number of elements then each method returns exactly half. If the array has an odd number of elements then the getFirstHalf method returns one less than the getSecondHalf method. Ex:

{1, 3, 5, 2, 8, 7} – first half {1, 3, 5}, second half {2, 8, 7}
{1, 3, 5, 2, 8, 7, 4} – first half {1, 3, 5}, second half {2, 8, 7, 4}

Level 2

Fix the code in the selectionSort method. Do this by making four and only four changes to the code.

Level 3

Fix the code in the insersionSort method. Do this by making four and only four changes to the code.

Level 4

Complete the code in the compareTo method of the following classes. If the two items are equal then a 0 is returned. If the item sent to the compareTo method is lesser then return a positive number. If the item sent to the compareTo method is greater then return a negative number.

1. **Student – which ever student has the higher GPA is greater**
2. **Copier – a working copier is always better than a non-working copier. Two non-working copiers are equally as bad. A faster working copier is better than a slower copier.**
3. **Car – a newer car is greater than an older car. If two cars came out the same year then, a car whose name comes before another cars name is greater. If two cars came out the same year and have the same name, then the car with the larger price is greater.**
4. **Dancer – which ever dancer has the highest average of all their scores with the highest and lowest scores not counted.**

Level 5

Complete the merge method in the Sorter Class. The merge method takes in two arrays that are already sorted and combines them into a larger array in sorted order.
Ex: ({1, 4, 5}, {2, 3, 6}) returns {1, 2, 3, 4, 5, 6}

Level 6

Complete the pivot method in the Sorter Class. In the pivot method, all elements less than the first card at the end get swapped with elements greater than the first card . The first card is placed in the middle in between those two groups of cards.

Ex: {4, 1, 8, 3, 5, 2, 9, 0} becomes {2, 1, 0, 3, 4, 5, 9, 8}

Notice in the example above that the elements are not necessarily sorted. It is only that all elements smaller than the pivot wind up before it and all elements greater than the pivot wind up after it.