

**Lab Assignment 04**  
**2022 – 2023 Spring, SENG 102**

**Question1**

Suppose you have two arrays of **int**'s, **arr1** and **arr2**, each containing integers that are sorted in ascending order. Arrays may include same numbers, be at different sizes or not include all numbers within the range.

- a. Write a class, named “Sorter.java” that has static method named “merge”, which receives these two arrays as parameters and returns a reference to a new, sorted array of **int**'s that is the result of merging the given parameters. The resulting array should include all the given integers in ascending sorted order.

**How to Merge:** To do merging, you will need two nested loops. The outer loop will help you iterate over first array. You will pick one element from the first array. The inner loop will help you iterate over the second array. You will pick one element from the second array. Then you will compare the elements. Since the arrays are sorted, you need to iterate(increase the index of) the array which has smaller element. You repeat these steps until to the end of each array.

- b. The “Sorter.java” class should also have the following static methods with given functionalities:
1. **getMax(int sortedArray):** returns the maximum integer value of the sorted array, in any length of array.
  2. **getMin(int sortedArray):** returns the minimum integer value of the sorted array, in any length of array.

Write a runnable “MergeSortTester.java” class, invoke the merge static method from this class to merge two integer arrays. Invoke other methods to get min and max values.

**Example:**

Take the arrays:

1	2	4	7	8	11
---	---	---	---	---	----

3	6	8	9	10	11	12	14
---	---	---	---	----	----	----	----

The resulting array of integers will be:

1	2	3	4	6	7	8	8	9	10	11	11	12	14
---	---	---	---	---	---	---	---	---	----	----	----	----	----

Sample output:

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```
New Array: 1 2 3 4 6 7 8 8 9 10 11 11 12 14  
Max value is: 14  
Min value is: 1
```

The structure of MergeSortTester class is given below:

```
public class MergeSortTester {  
    public static void main(String[] args) {  
        int [] arr1= {1,2,4,7,8,11};  
        int [] arr2= {3,6,8,9,10,11,12,14};  
  
        //invoke the merge() method, get a return value.  
  
        //Print out the returning array.  
  
        //invoke the getMax() method with sorted array, Print out the returning  
integer value.  
  
        //invoke the getMin() method with sorted array, Print out the returning  
integer value.  
  
    }  
}
```

### **Question2**

Suppose you have a String array of strArr which keeps information about the city names in Turkey. Assume that the strArr array has ANKARA and ISTANBUL at the beginning. You may assume the initial elements are sorted in the array.

Write a runnable class, named “CitySorter.java” that reads city names as input from keyboard/user, inserts that city into strArr in lexicographical ascending order. The insertion must be done without any loss. Please make comparisons of the given city names using their Uppercase value. Then, the program prints out all the cities in the array.

The program will continuously run until the user enters “stop” word.

### **Example:**

The sample output is given below:

```
Please enter a city name:
adana
ADANA ANKARA ISTANBUL
Please enter a city name:
izmir
ADANA ANKARA ISTANBUL IZMIR
Please enter a city name:
stop
```

You need to implement the question and upload your Java source file (CitySorter.java) into the available LMS submission.