

Lab Assignment 3**2021 – 2022 Spring, CMPE 211/CMPE114 Fundamentals of Programming II****Purpose:**

The purpose of this exercise is:

- To remember and establish how to use arrays.
- To remember and establish how to use loops.

Exercise Lab: This lab is to be done in first hour.

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,
- 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:

```
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.

    }

}
```

Submission

The submission should include two java classes. Please submit single .zip file.