

## LAB ASSESSMENT 3

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### DataProcessor.java

```
public class DataProcessor {
    // Prints the generic array
    public static <T> void printArray(T[] array) {
        if (array.length == 0) {
            System.out.println("Array is empty");
        }

        for (T element : array) {
            System.out.print(element + " ");
        }
    }

    // Swap values in index1 and index2 of generic array
    public static <T> void swap(T[] array, int index1, int
index2) {
        // Generic temporary variable temp
        T temp = array[index1];
        array[index1] = array[index2];
        array[index2] = temp;
        printArray(array);
    }

    // Find the maximum element of the generic array using
comparator
    // T must extend Comparable, to have compareTo method
    public static <T extends Comparable<T>> T findMax(T[]
array) {
        T max = array[0];

        for (T element : array) {
            // returns positive integer if calling object is
greater than max
            if (element.compareTo(max) > 0) {
                max = element;
            }
        }
    }
}
```

```

        }
    }

    return max;
}

```

## **Main.java**

```

public class Main {
    public static void main(String[] args) {
        System.out.println("For Integers:");
        Integer[] numbers = { 5, 10, 1, 3, 15 };

        System.out.println("Before Swap");
        DataProcessor.printArray(numbers);
        System.out.println("");

        System.out.println("After Swap");
        // Swap indexes may be out of bounds
        try {
            DataProcessor.swap(numbers, 1, 3);
        } catch (IndexOutOfBoundsException e) {
            System.out.println("Swap index out of bounds");
        }
        System.out.println("");

        // Array may be empty
        try {
            System.out.println("Max Element: " +
DataProcessor.findMax(numbers));
        } catch (IndexOutOfBoundsException e) {
            System.out.println("Cannot find max element, array
is empty");
        }

        System.out.println("");
        System.out.println("For Strings:");
        String[] strings = { "abc", "computer", "zebra",
"cat", "wolf" };

        System.out.println("Before Swap");
        DataProcessor.printArray(strings);
        System.out.println("");
    }
}

```

```

        System.out.println("After Swap");
        // Swap indexes may be out of bounds
        try {
            DataProcessor.swap(strings, 1, 3);
        } catch (ArrayIndexOutOfBoundsException e) {
            System.out.println("Swap index out of bounds");
        }

        System.out.println("");
        // Array may be empty
        try {
            System.out.println("Max Element: " +
DataProcessor.findMax(strings));
        } catch (IndexOutOfBoundsException e) {
            System.out.println("Cannot find max element, array
is empty");
        }
    }
}

```

## Output

```

PS C:\Users\batch1\Documents\22MCA0223> & 'D:\Program Files\Java\jdk-18.0.1\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\batch1\AppData
\Roaming\Code\User\workspaceStorage\c1b9e4d7e595e2ffb2887fe48cd6cc70\redhat.java\jdt_ws\22MCA0223_f4b4ac1e\bin' 'Main'
For Integers:
Before Swap
5 10 1 3 15
After Swap
5 3 1 10 15
Max Element: 15

For Strings:
Before Swap
abc computer zebra cat wolf
After Swap
abc cat zebra computer wolf
Max Element: zebra
PS C:\Users\batch1\Documents\22MCA0223>

```