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Subject: DSA

Lab#3 Tasks

➔Task#1:

Write a Java Code an Array of length 100 and fill it with Random int Values for testing purpose.

```
import java.util.Random;
public class Task1_RandomIntValues {

	public static void main(String[] args) {
		int array[] = new int[100];

		for (int i = 0; i < array.length; i++)
			array[i] = new Random().nextInt(array.length);
		int line = 0;
		System.out.println("Printing Array Values: ");
		for (int i : array) {
			System.out.print(i + " ");
			line++;
			if (line % 20 == 0)
				System.out.println();
		}
	}
}
```

```
<terminated> Task1_RandomIntValues [Java Application] C:\Program Files\Java\jre1.8.0_261\bin\javaw.exe (Jan 21,
Printing Array Values:
99 48 52 44 39 16 74 79 34 34 98 98 4 26 9 49 23 24 91 96
29 7 16 79 54 81 6 12 25 20 78 68 32 2 24 40 73 83 3 22
66 78 84 21 11 28 84 37 93 76 29 27 52 90 28 88 73 76 37 13
13 55 26 44 81 18 41 40 32 20 81 7 37 99 71 55 50 5 38 16
88 60 25 11 7 68 96 92 64 37 15 22 52 0 70 34 12 71 37 21
```

➔Task#2:

Write a Java program to check if two arrays are equal.

```
import java.util.Arrays;
public class Task2_EqualArrays {

	public static void main(String[] args) {
```

```
        int array1[]= {2,5,4,7,8};
        int array2[]= {2,5,1,7,8};

        if (Arrays.equals(array1, array2))
            System.out.println("Arrays are equal.");
        else
            System.out.println("Arrays are not equal!");
    }
```

```
}
<terminated> Task2_EqualArrays [Java App
Arrays are not equal!
```

➔Task#3:
Use all of the array method discussed above in your java code but array should not be of type integer.

```
import java.util.Arrays;
public class Task3_NotIntegerArray {

    public static void main(String[] args) {
        String array1[]=
{"19sw42","19sw43","19sw44","19sw45"};
        String array2[]=
{"19sw42","19sw43","19sw46","19sw45"};

        if (Arrays.equals(array1, array2))
            System.out.println("Arrays are equal.");
        else
            System.out.println("Arrays are not equal!");
    }
    }
```

```
<terminated> Task3_NotIntegerArray [Jav
Arrays are not equal!
```

➔ Task#4:

Write a method in java with float as its return type that takes array as input and return average as output.

```
public class Task4_Average {
	public static float average(int[] array) {
if(array.length==0) return -1;
		float average, sum = 0;
		for (int i = 0; i < array.length; i++)
			sum += array[i];
		average = sum / array.length;
		return average;
	}

	public static void main(String[] args) {
		int array[]= new int[100];
		for (int i = 0; i < array.length; i++)
			array[i]=i+1;

		System.out.println("Average of first 100 numbers is
"+average(array));
	}

}
```

```
<terminated> Task4_Average [Java Application] C:\Program Files\Java\jre1.8
Average of first 100 numbers is 50.5
```

➔ Task#5:

Write a method in Java program to find 2nd largest element in an array. Method should take array as input and return index.

```
public class Task5_2ndLargestNum {
	public static int secondLargest(int[] array) {
		if (array.length == 0)
			return -1;
		int index = 0, newIndex=0;
		ArrayList list = new ArrayList();
		for (int i = 0; i < array.length; i++)
			list.add(array[i]);
		newIndex = list.indexOf(Collections.max(list));
		list.remove(newIndex);
```

```
        index = list.indexOf(Collections.max(list));

        if (index >= newIndex)
            return index + 1;

        return index;
    }

    public static void main(String[] args) {
        int array[] = { 2, 4, 1, 17, 6, 12 };

        System.out.println("2nd Largest element in array is
at index " + secondLargest(array));
    }

}
```

```
<terminated> Task5_2ndLargestNum [Java Application] C:\Program Files\Java\jre1.8.
2nd Largest element in array is at index 5
```

➔ Task#6:
Write a java program to sort an array (Two dimensional array).

```
import java.util.Arrays;
public class Task6_Sort2DArray {
    public static void sort2D(int[][] array) {
        if (array.length == 0) return;
        int length = array.length;
        for (int i = 0; i < length; i++)
            Arrays.sort(array[i]);
        int newArray[] = new int[length * array[0].length];
        for (int i = 0; i < length; i++)
            System.arraycopy(array[i], 0, newArray, i *
array[i].length, array[i].length);

        Arrays.sort(newArray);
        for (int i = 0; i < length; i++)
            for (int j = 0; j < array[i].length; j++)
                array[i][j] = newArray[j +
(array[i].length * i)];
    }
```

```
    public static void main(String[] args) {
        int[][] array = { { 5, 3, 1 }, { 4, 2, 6 }, { 11,
0, 34 } };
        System.out.println("2D Array before sorting: ");
        System.out.println(Arrays.toString(array[0]) + "\n"
+ Arrays.toString(array[1])+
"\n"+Arrays.toString(array[2]));
        sort2D(array);
        System.out.println("2DArray after sorting: ");
        System.out.println(Arrays.toString(array[0]) + "\n"
+ Arrays.toString(array[1])+
"\n"+Arrays.toString(array[2]));

    }
```

```
<terminated> Task6_Sort2DArray [Java Applicatior
2D Array before sorting:
[5, 3, 1]
[4, 2, 6]
[11, 0, 34]
2DArray after sorting:
[0, 1, 2]
[3, 4, 5]
[6, 11, 34]
```

➔ Task#7:

Write a java program to remove duplicate elements of a given array and return the new length of the array.

Sample array: [20,20,30,40,50,50,50]

Output:

New array= 20,30,40,50

Length = 4

```
public class Task7_RemoveDuplicate {
    public static int[] removeDuplicate(int[] array) {
        if (array.length == 0)
            return array;
        int newLength = array.length;
        for (int i = 0; i < newLength - 1; i++)
```

```
                for (int j = i + 1; j < newLength; j++) {
                    if (array[j] == array[i]) {
                        for (int k = j; k < newLength - 1;
k++)
                            array[k] = array[k + 1];
                        int newArray[] = array;
                        array = new int[newLength - 1];
                        System.arraycopy(newArray, 0, array,
0, array.length);
                        newLength = array.length;
                        j--;
                    }
                }
            return array;
        }

        public static void main(String[] args) {
            int[] array = { 20, 20, 30, 40, 50, 50, 50, 40, 40
};
            System.out.println("Old Array:");
            System.out.println(Arrays.toString(array));
            array = removeDuplicate(array);
            System.out.println("\nnew Array:");
            System.out.println(Arrays.toString(array));
            System.out.println("\nNew Length= " +
array.length);

        }
```

```
<terminated> Task7_RemoveDuplicate [Java Application] C:\Program Files\J
Old Array:
[20, 20, 30, 40, 50, 50, 50, 40, 40]

new Array:
[20, 30, 40, 50]

New Length= 4
```