Assignment Week 1 Java Overview

Program 1: Write a Java program to find the common elements between two arrays (String values)

```
import java.util.Scanner;
import java.util.HashSet;
import java.util.List;
import java.util.ArrayList;
import java.util.Arrays;

public class _01_CommonElementsInArrays {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the size of the array1");
        int arr1Len = scanner.nextInt();
        System.out.println("Enter the size of the array2");
        int arr2Len = scanner.nextInt();
        System.out.println("Enter the elements of the array1");
        String arr1[] = new String[arr1Len];
        for (int i = 0; i < arr1Len; i++) {
            arr1[i] = scanner.next();
        }
        System.out.println("Enter the elements of the array2");
        String arr2[] = new String[arr2Len];
        for (int i = 0; i < arr2Len; i++) {
            arr2[i] = scanner.next();
        }
        scanner.close();
        System.out.println("Common elements of array1 and array2: " + findCommonElements(arr1,
arr2));
    }

    private static List<String> findCommonElements(String[] array1, String[] array2) {
        HashSet<String> arr1 = new HashSet<>(Arrays.asList(array1));

        List<String> commonElements = new ArrayList<>();
        int arr2Len = array2.length;
        for (int i = 0; i < arr2Len; i++) {
            if (arr1.contains(array2[i])) {
                commonElements.add(array2[i]);
            }
        }
        return commonElements;
    }
}
```

Output:

```
Enter the size of the array1
5
Enter the size of the array2
6
Enter the elements of the array1
aa
bb
cc
dd
ee
Enter the elements of the array2
xy
aa
cc
ef
bb
zz
Common elements of array1 and array2: [aa, cc, bb]
```

Program 2: Write a Java program to find the second largest element in an array.

```
import java.util.Arrays;
import java.util.Scanner;

public class _02_SecondLargestElement {

    public static void main(String[] args) {
        int arraySize, array[];
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter array size: ");
        arraySize = scanner.nextInt();
        array = new int[arraySize];
        System.out.println("Enter array elements: ");
        for (int i = 0; i < arraySize; i++) {
            array[i] = scanner.nextInt();
        }
        scanner.close();

        int secondLargestElement = findSecondLargestElement(array);
        if (secondLargestElement != Integer.MIN_VALUE) {
            System.out.println("Second largest element in " + Arrays.toString(array) + " is: "
+ secondLargestElement);
        } else {
            System.out.println("Array does not have enough elements to find second largest.");
        }
    }

    private static int findSecondLargestElement(int[] array) {
        int firstLargest = Integer.MIN_VALUE;
        int secondLargest = Integer.MIN_VALUE;

        for (int element : array) {
            if (element > firstLargest) {
                secondLargest = firstLargest;
                firstLargest = element;
            } else if (element > secondLargest && element != firstLargest) {
                secondLargest = element;
            }
        }

        return secondLargest;
    }
```

}

Output:

```
Enter array size:
6
Enter array elements:
20
13
24
1
56
7
Second largest element in [20, 13, 24, 1, 56, 7] is: 24
```

Program 3: Write a Java program to print all sub-arrays with 0 sum present in each array of integers.

```
import java.util.ArrayList;
import java.util.Arrays;
import java.util.HashMap;
import java.util.Scanner;

public class _03_SubarraysWithZeroSum {

    public static void main(String[] args) {
        int arraySize, array[];
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter array size: ");
        arraySize = scanner.nextInt();
        array = new int[arraySize];
        System.out.println("Enter array elements: ");
        for (int i = 0; i < arraySize; i++) {
            array[i] = scanner.nextInt();
        }
        scanner.close();

        findSubarraysWithZeroSum(array);
    }

    private static void findSubarraysWithZeroSum(int[] array) {
        HashMap<Integer, ArrayList<Integer>> sumMap = new HashMap<>();

        int sum = 0;

        for (int i = 0; i < array.length; i++) {
            sum += array[i];

            if (sum == 0) {
                System.out.println("Subarrays with 0 sum: " +
Arrays.toString(Arrays.copyOfRange(array, 0, i + 1)));
            }

            ArrayList<Integer> sumIndexList = sumMap.getOrDefault(sum, new ArrayList<>());
            if (sumMap.containsKey(sum)) {
                int sumIndexListSize = sumIndexList.size();
                for (int j = 0; j < sumIndexListSize; j++) {
```

```
                    int prevIndex = sumIndexList.get(j);
                    System.out.println("Subarrays with 0 sum: " +
Arrays.toString(Arrays.copyOfRange(array, prevIndex+1, i + 1)));
                }
            }
            sumIndexList.add(i);
            sumMap.put(sum, sumIndexList);
        }
    }
}
```

Output:

```
Enter array size:
10
Enter array elements:
1 3 -7 3 2 3 1 -3 -2 -2
Subarrays with 0 sum: [1, 3, -7, 3]
Subarrays with 0 sum: [3, -7, 3, 2, 3, 1, -3, -2]
```