Java Assignment 1

Program 1:
Write a Java program to find the common elements between two arrays of integers.

Program:

```
import java.util.Scanner;
class CommonInteger{
    public static void main(String... arg){
        int arr1[]=new int[100];
        int arr2[]=new int[100];
        int n,m;
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        m=sc.nextInt();
        for(int i=0;i<n;i++){
            arr1[i]=sc.nextInt();
        }
        for(int i=0;i<m;i++){
            arr2[i]=sc.nextInt();
        }
        System.out.println("Common elements are ");
        for(int i=0;i<n;i++){
            int k=arr1[i];
            for(int j=0;j<m;j++){
                if(arr2[j]==k){
                    System.out.print(k+" ");
                    break;
                }
            }
        }
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac  CommonInteger.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java CommonInteger.java
10
11
22 33 11 14 45 65 77 89 09 12
11 32 88 79 22 55 10 66 77 12 99
Common elements are
22 11 77 12
```

Program 2:

Write a Java program to print all the LEADERS in the array. Go to the editor

Note: An element is leader if it is greater than all the elements to its right side.

Program:

```
import java.util.*;
public class Leader
{
    public static void main(String... arg){
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        System.out.println("LEADER elements are ");
        for(int i=0;i<n;i++){
            for(int j=i;j<n;j++){
                if(arr[i]<arr[j]){
                    break;
                }
                if(j==n-1){
                    System.out.print(arr[i]+" ");
                }
            }
```

```
        }
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Leader.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Leader.java
10
14 1 12 6 5 10 3 2 7 4
LEADER elements are
14 12 10 7 4
E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 3

Find the sum of the two elements of a given array which is equal to a given integer

Program

```
import java.util.*;
public class Sumequalsint
{
    public static void main(String... arg){
        Scanner sc=new Scanner(System.in);
        int n=sc.nextInt();
        int arr[]=new int[100];
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }

        int ele=sc.nextInt();
        for(int i=0;i<n;i++){
```

```
            int k=ele-arr[i];
            for(int j=0;j<n;j++){
                if(j!=i && arr[j]==k){
                    System.out.println("Numbers are "+arr[i]+"
 "+arr[j]+" and their indices are "+j+" "+i);
                    break;
                }
            }
        }
    }
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Sumequalsint.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Sumequalsint.java
10
4 2 1 6 5 7 8 10 9 12
14
Numbers are 4 10 and their indices are 7 0
Numbers are 2 12 and their indices are 9 1
Numbers are 6 8 and their indices are 6 3
Numbers are 5 9 and their indices are 8 4
Numbers are 8 6 and their indices are 3 6
Numbers are 10 4 and their indices are 0 7
Numbers are 9 5 and their indices are 4 8
Numbers are 12 2 and their indices are 1 9

E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 4:
Write a Java program to compute the average value of an array of integers except the largest and smallest values.

Program:

```
import java.util.*;
```

```
public class Avgexclarsml
{
    public static void main(String arg[])
    {
        int n,arr[]=new int[100];
        Scanner sc=new Scanner (System.in);
        n=sc.nextInt();
        int max=Integer.MIN_VALUE,min=Integer.MAX_VALUE;
        for(int i=0;i<n;i++)
        {
            arr[i]=sc.nextInt();
            if(arr[i]>max)
            {
                max=arr[i];
            }
            if(arr[i]<min){
                min=arr[i];
            }
        }
        int sum=0;
        for(int i=0;i<n;i++)
        {
            if(arr[i]==max||arr[i]==min)
            {
                continue;
            }
            sum+=arr[i];
        }
        System.out.println("the average value of an array of integers
except the largest and smallest values is"+sum/(n-2));
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Avgexclarsml.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Avgexclarsml.java
10
4 1 6 8 22 11 99 102 3 12
the average value of an array of integers except the largest and smallest values is20
```

Program 5:

```
import java.util.Scanner;
class Removeduplicates{
    public static void main(String... arg){
        int arr1[]=new int[100];

        int n;
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();

        for(int i=0;i<n;i++){
            arr1[i]=sc.nextInt();
        }

        for(int i=0;i<n;i++){
            int k=arr1[i];
            for(int j=i+1;j<n;j++){
                if(arr1[j]==k){
                    arr1[j]=arr1[n-1];
                    n--;
                    j--;
                }
            }
        }
        System.out.println("Array without duplicates ");
        for(int i=0;i<n;i++){
            System.out.print(arr1[i]+" ");
        }
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Removeduplicates.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Removeduplicates.java
10
45 12 32 45 76 12 98 32 12 77
Array without duplicates
45 12 32 77 76 98
```

Program 6:

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

Program

```
import java.util.Scanner;
class Secondlarge{
    public static void main(String... arg){
        int arr1[]=new int[100];

        int n;
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();

        for(int i=0;i<n;i++){
            arr1[i]=sc.nextInt();
        }

        int max1=arr1[0],max2=arr1[0];
        for(int i=1;i<n;i++){
            if(arr1[i]>max2 && max1>max2){
                max2=arr1[i];
            }
            else if(arr1[i]>max1){
                max1=arr1[i];
            }
        }
```

```
        System.out.print("second largest element in an array is
"+max2);

    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Secondlarge.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Secondlarge.java
10
34 11 56 73 10 98 18 38 55 87
second largest element in an array is 87
E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 7:

Write a Java program to segregate all 0s on left side and all 1s on right side of a given array of 0s and 1s.

```
import java.util.*;
public class LR01
{
    public static void main(String... arg){

        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        int s=0,e=n-1,t;
        while(s<e){
            while(arr[s]==0 && s<e){
```

```
                s++;
            }
            while(arr[e]==1 && s<e){
                e--;
            }
            if(s<e){
                t=arr[s];
                arr[s]=arr[e];
                arr[e]=t;
            }

        }
        System.out.print("Re arranged array is ");
        for(int i=0;i<n;i++){
            System.out.print(arr[i]+" ");
        }
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac LR01.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java LR01.java
10
0 1 1 0 0 1 1 1 0 0
Re arranged array is 0 0 0 0 0 1 1 1 1 1
```

Program 8:

Write a Java program to arrange the elements of a given array of integers where all positive integers appear before all the negative integers

```
import java.util.*;
public class Posneg
```

```
{
     public static void main(String... arg){

        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        int s=0,e=n-1,t;
        while(s<e){
            while(arr[s]>0 && s<e){
                s++;
            }
            while(arr[e]<0 && s<e){
                e--;
            }
            if(s<e){
                t=arr[s];
                arr[s]=arr[e];
                arr[e]=t;
            }

        }
        System.out.print("Re arranged array is ");
        for(int i=0;i<n;i++){
            System.out.print(arr[i]+" ");
        }
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Posneg.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Posneg.java
10
4 -2 1 2 -5 -7 12 98 -9 -98
Re arranged array is 4 98 1 2 12 -7 -5 -2 -9 -98
```

Program 9:

Write a Java program to find a missing number in an array.

```
import java.util.*;
import java.io.*;
class Missingnum{
    public static void main(String... arg)
    {
        int n;
        int arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        int sum,sum1=0;
        sum=sc.nextInt();
        for(int i=0;i<n;i++){
            sum1+=arr[i];
        }
        if(sum1==sum){
            System.out.println("no missing element");

        }
        else{
            System.out.println("missing element is "+(sum-sum1));
        }
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Missingnum.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Missingnum.java
10
4 34 23 87 11 10 20 9 1 2
208
missing element is 7
```

Program 10:

Write a Java program to convert an array to ArrayList

Program:

```
import java.util.*;
class ArraytoArrayList{
    public static void main(String... arg){
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        ArrayList<Integer> arr1=new ArrayList<Integer>();
        for(int i=0;i<n;i++){
            arr1.add(new Integer(arr[i]));
        }
        System.out.println("array to ArrayList");
        System.out.println(arr1);
    }
}
```

```
10
3 4 5 7 2 99 22 54 11 46
array to ArrayList
[3, 4, 5, 7, 2, 99, 22, 54, 11, 46]

E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 11:

Write a Java program to check if a given array contains a subarray with 0 sum.

```
import java.util.*;
public class Subarr
{
   public static void main(String... arg){
```

```
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        Set<Integer> s=new HashSet<Integer>();
        int sum=0;
        for(int i=0;i<n;i++){
        sum+=arr[i];
        if(arr[i]==0|| sum==0|| s.contains(sum)){
            System.out.println("Does the said array contain a
subarray with 0 sum: true");
            System.exit(0);
        }
        s.add(sum);
        }
        System.out.println("no subarray with sum 0");
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Subarr.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Subarr.java
10
5 7 2 -2 34 -5 12 -12 56 90
Does the said array contain a subarray with 0 sum: true

E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 12:

Write a Java program to find all the unique triplets such that sum of all the three elements [x, y, z (x ≤ y ≤ z)] equal to a specified number.
Sample array: [1, -2, 0, 5, -1, -4]
Target value: 2.

```
import java.util.*;
public class Trplets
{
    public static void main(){
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        ArrayList<List<Integer>> list=new ArrayList<List<Integer>>();
        int tar=sc.nextInt();
        for(int i=0;i<n;i++){
            for(int j =i;j<n;j++){
                for(int k=j;k<n;k++){
                    ArrayList<Integer> list2=new
ArrayList<Integer>();
                    if(i!=j &&j!=k && k!=i &&
arr[i]+arr[j]+arr[k]==tar){
                        list2.add(arr[i]);
                        list2.add(arr[j]);
                        list2.add(arr[k]);
                        list.add(list2);
                    }

                }
            }
        }
        System.out.println(list);
        for(List<Integer> i:list){
            System.out.println(i);
        }
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Trplets.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Trplets.java
10
4 3 -4 1 -3 2 0 -5 5 -1
2
[[4, 3, -5], [4, -4, 2], [4, 1, -3], [3, -3, 2], [3, 0, -1], [-4, 1, 5], [1, 2, -1], [-3, 0, 5], [2, -5, 5]]
[4, 3, -5]
[4, -4, 2]
[4, 1, -3]
[3, -3, 2]
[3, 0, -1]
[-4, 1, 5]
[1, 2, -1]
[-3, 0, 5]
[2, -5, 5]

E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 13:

Find the rotation count in a given rotated sorted array of integers

```
import java.util.*;
public class Rotation
{
    public static void main(String... arg){
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        int min=arr[0];
        int ind=0;
        for(int i=0;i<n;i++){
            if(arr[i]<min){
                ind=i;
                min=arr[i];
            }
        }
```

```
        System.out.println("No of rotations required="+ind);
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Rotation.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Rotation.java
10
5 6 7 8 9 10 1 2 3 4
No of rotations required=6

E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 14:
Write a Java program to shuffle a given array of integers.

```
import java.util.*;
public class Shuffle
{
    public static int[] Swap(int arr[],int i,int j){
        int t=arr[i];
        arr[i]=arr[j];
        arr[j]=t;
        return arr;
    }
    public static void main(String... arg){
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }

        for(int i=0;i<n;i++){
```

```
            Random rand=new Random();
            int j=rand.nextInt(n-i)+i;
            Swap(arr,i,j);

        }
        for(int i=0;i<n;i++){
            System.out.print(arr[i]+" ");
        }
    }


}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Shuffle.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Shuffle.java
10
4 2 3 1 6 7 8 9 10 5
9 6 10 3 8 7 2 1 4 5
E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 15:

Write a Java program to get the difference between the largest and smallest values in an array of integers. The length of the array must be 1 and above

```
import java.util.*;
public class Diference
{
    public static void main(String... arg){
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
```

```
        }
        if(n<=1){
            System.out.println("insufficient array");
            System.exit(0);
        }
        int min=arr[0],max=arr[0];
        for(int i=0;i<n;i++){
            if(arr[i]>max){
                max=arr[i];
            }
            if(arr[i]<min){
                min=arr[i];
            }

        }
        System.out.println("Difference is "+(max-min));
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Diference.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Diference.java
10
4 5 2 1 9 7 5 10 12 6
Difference is 11

E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 16:
Write a Java program to check if an array of integers without 0 and -1.

```
import java.util.*;
public class Without01
{
    public static void main(String... arg){
```

```
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        int flag=1;
        for(int i=0;i<n;i++){
            if(arr[i]==0 || arr[i]==1){
                flag=0;
                break;
            }

        }
        if(flag==0){
            System.out.println("contains 0 or 1");
        }
        else
        System.out.println("no 0 and 1 ");
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>java Without01.java
10
10 3 4 2 1 8 7 29 11 23
contains 0 or 1
```

Program 17:

Write a Java program to count the number of possible triangles from a given unsorted array of positive integers.

```
import java.util.*;
public class Triangles
{
```

```
    public static void main(String... arg){
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        int count=0;
        for(int i=0;i<n;i++){
            for(int j=i+1;j<n;j++)
            {
                for(int k=j+1;k<n;k++){
                    if(i!=j && j!=k && k!=i && arr[i]+arr[j]>arr[k]
&& arr[j]+arr[k]>arr[i] && arr[k]+arr[i]>arr[j]){
                        count++;
                    }
                }
            }
        }
        System.out.println("no of triangles are "+count);
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Triangles.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Triangles.java
10
1 2 3 4 5 6 7 8 9 10
no of triangles are 50

E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 18:

Write a Java program to find all combination of four elements of a given array whose sum is equal to a given value

```
import java.util.*;
public class Sum4
{
    public static void main(String... arg){
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();

        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        int ele=sc.nextInt();

        for(int i=0;i<n;i++){
            for(int j=i+1;j<n;j++){
                for(int k=j+1;k<n;k++)
                {
                    for(int l=k+1;l<n;l++){
                    if(arr[i]+arr[j]+arr[k]+arr[l]==ele){
                        System.out.println("Comb "+arr[i]+"
"+arr[j]+" "+arr[k]+" "+arr[l]);
                    }

                    }
                }

            }
        }
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>java Sum4.java
10
1 2 3 4 5 6 7 8 9 10
14
Comb 1 2 3 8
Comb 1 2 4 7
Comb 1 2 5 6
Comb 1 3 4 6
Comb 2 3 4 5

E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 19:

Write a Java program to replace each element of the array with product of every other element in a given array of integers.

```
import java.util.*;
public class Prod
{
    public static void main(String... arg){
        int n,arr[]=new int[100],arr1[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        for( int i=0;i<n;i++){
            int p=1;
            for(int j=0;j<n;j++){
                if(i!=j){
                    p*=arr[j];
                }
            }
            arr1[i]=p;
        }
```

```
        for(int i=0;i<n;i++){
            System.out.println(arr1[i]+" ");
        }
    }

}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>javac Prod.java

E:\books and pdfs\sem4 pdfs\java lab\arrays>java Prod.java
10
1 2 3 4 5 6 7 8 9 10
Array elements are:
3628800 1814400 1209600 907200 725760 604800 518400 453600 403200 362880
E:\books and pdfs\sem4 pdfs\java lab\arrays>
```

Program 20:
Write a Java program to rearrange a given array of unique elements such that every second element of the array is greater than its left and right elements.

```
import java.util.*;
public class Secondele
{
    public static void main(String... arg){
        int n,arr[]=new int[100];
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++){
            arr[i]=sc.nextInt();
        }
        int t;
        for(int i=1;i<n;i+=2){
        if(arr[i]<arr[i-1]){
            t=arr[i];
            arr[i]=arr[i-1];
            arr[i-1]=t;
```

```
        }
        if(arr[i]<arr[i+1]){
            t=arr[i];
            arr[i]=arr[i+1];
            arr[i+1]=t;
        }
        }
        for(int i=0;i<n;i++){
            System.out.print(arr[i]+" ");
        }
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\arrays>java Secondele.java
10
1 2 3 4 5 6 7 8 9 10
1 3 2 5 4 7 6 9 8 10
E:\books and pdfs\sem4 pdfs\java lab\arrays>
```