ASSIGNMENT 2 ADS

1.Printing Patterns
Problem: Write a Java program to print patterns such as a right triangle of stars.

Test Cases:

Input: n = 3
Output:
*
**

Input: n = 5
Output:
*
**

```
class StarPattern{
  static void starp(int n){

  if(n<=0){
  return;
  }

     System.out.print("*");
     starp(n-1);
  }


  public static void main(String[] args){
    Scanner sc=new Scanner(System.in);
    System.out.print("Enter num : ");
```

```
    int num=sc.nextInt();
    System.out.print(starp(num));
  }
}
```

2.Remove Array Duplicates
Problem: Write a Java program to remove duplicates from a sorted array and return the new length of the array.

Test Cases:

Input: arr = [1, 1, 2]
Output: 2
Input: arr = [0, 0, 1, 1, 2, 2, 3, 3]
Output: 4

```
class Que2DupticateArray{

    static int dupliArray(int a[],int i,int j){
    if(i>=a.length-1){
    return -1; //no found
    }
    if(j>=a.length){
        return dupliArray(a,i+1,i+2);
    }

    if(a[i]==a[j]){
     return a[j];
    }
    return dupliArray(a,i,j+1);
    }

    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter size Array : ");
        int size=sc.nextInt();
```

```
        int arr[]=new int[size];

        System.out.print("Enter elements : ");
        for(int i=0;i<size;i++){
            arr[i]=sc.nextInt();
        }
       // int arr[]={1,1,2,3};
    System.out.print("Count of duplicate: "+dupliArray(arr,0,1)

 }
}
```

3.Remove White Spaces from String
Problem: Write a Java program to remove all white spaces from a given string.

Test Cases:

Input: "Hello World"
Output: "HelloWorld"
Input: " Java   Programming "
Output: "JavaProgramming"

```
import java.util.*;
class Que3RemoveSpace{
   static String findSpecialChar(String str){
     if(str.length()==0){
         System.out.print("String Empty");
     return str;
     }
     return str.replaceAll("\\s","");
     }


  public static void main(String[] args){
   Scanner sc=new Scanner(System.in);
   System.out.print("Enter String: ");
```

```
   String str=sc.nextLine();
 // String str="Hello@Hii!&";
  System.out.print(findSpecialChar( str));

}
}
```

4.Reverse a String
Problem: Write a Java program to reverse a given string.

Test Cases:

Input: "hello"
Output: "olleh"
Input: "Java"
Output: "avaJ"

```
class Que4ReverseString{
   static String revString(String str){
     if(str.length()<=0){
     return "";
     }
     else{
     StringBuilder sb=new StringBuilder();
     sb.append(str);
      sb.reverse();
      return sb.toString();
     }
   }
  public static void main(String[] args){
   String s="Hello World";
   System.out.print(revString(s));
  }
}
```

5.Reverse Array in Place
Problem: Write a Java program to reverse an array in place.

Test Cases:

Input: arr = [1, 2, 3, 4]
Output: [4, 3, 2, 1]
Input: arr = [7, 8, 9]
Output: [9, 8, 7]

```
import java.util.*;
class Que5ReverseArray{
   static void revArray(int a[]){
   if(a.length<0){
   return;
   }
    for (int i=a.length-1;i>=0;i--){
    System.out.print(a[i]+" ");
   }

   }
   public static void main(String[] args){
       Scanner sc=new Scanner(System.in);
       System.out.println("Enter size : ");
       int size=sc.nextInt();
       int arr[]=new int[size];
       System.out.print("Enter elements : ");
        for(int i=0;i<size;i++){
            arr[i]=sc.nextInt();
        }
    //int arr[]={1,1,2,3};
    revArray(arr);

   }
}
```

6.Reverse Words in a String
Problem: Write a Java program to reverse the words in a given sentence.

Test Cases:

Input: "Hello World"
Output: "World Hello"
Input: "Java Programming"
Output: "Programming Java"

```
import java.util.*;

class Que6ReverseWord{

public static void main(String[] args){
    Scanner sc=new Scanner(System.in);
    System.out.print("Enter String : ");
    String str=sc.nextLine();

    String arr[]=str.split(" ");


    for(int i=arr.length-1;i>=0;i--){
        System.out.print(arr[i]+" ");
    }

}
}
```

7.Reverse a Number
Problem: Write a Java program to reverse a given number.

Test Cases:

Input: 12345
Output: 54321

Input: -9876
Output: -6789

```
import java.util.*;
class Que7ReverseNumber{

    public static void main(String[] args){

        Scanner sc=new Scanner(System.in);
        System.out.print("Enter Number : ");
        int num=sc.nextInt();
        int rev=0,rem;
        while(num!=0){
            rem=num%10;
            rev=rev*10+rem;
            num/=10;
        }
        System.out.print("Revere: "+rev);

    }
}
```

8.Array Manipulation

Problem: Perform a series of operations to manipulate an array based on range update queries. Each query adds a value to a range of indices.

Test Cases:

```
0  50 50 50
```

```
0 50  120  120
```

Input: n = 5, queries = [[1, 2, 100], [2, 5, 100], [3, 4, 100]]

Output: 200

Input: n = 4, queries = [[1, 3, 50], [2, 4, 70]]

Output: 120

```
import java.util.*;
class Que8ArrayManupulation{
    public static void main(String[] args) {
        Scanner sc= new Scanner(System.in);

        int size = sc.nextInt();
        int queries = sc.nextInt();
        int[] arr = new int[size];
        int max=0;

        for(int i=0;i<queries;i++){

            int fIndex =sc.nextInt()-1;
            int sIndex =sc.nextInt()-1;
            int num =sc.nextInt();

            for(int j=fIndex;j<=sIndex;j++){
                arr[j]+=num;

                max=arr[j]>max? arr[j]:max;
            }
        }

        System.out.println("Max Number : "+max);

    }
}
```

9.String Palindrome

Problem: Write a Java program to check if a given string is a palindrome.

Test Cases:

Input: "madam"

Output: true

Input: "hello"

Output: false

Here’s a continuation of the list of assignment questions starting from question 21, with two test cases for each:

```
import java.util.*;
class Que9StringPalindrome{

  public static void main(String[] args){
    Scanner sc=new Scanner(System.in);
    System.out.print("Enter String : ");
    String str=sc.nextLine();

    StringBuilder s=new StringBuilder(str);
    s.reverse();

    if(str.equals(s.toString())){

        System.out.print("True");
    }else{
        System.out.print("False");
    }
  }
}
```

10.Array Left Rotation

Problem: Write a Java program to rotate an array to the left by d positions.

Test Cases:

Input: arr = [1, 2, 3, 4, 5], d = 2

Output: [3, 4, 5, 1, 2]

Input: arr = [10, 20, 30, 40], d = 1

Output: [20, 30, 40, 10]

```
import java.util.*;
class Que10LeftRotation{

    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter size : ");
        int size=sc.nextInt();
        System.out.print("Enter element : ");
        int arr[]=new int[size];

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

        System.out.print("Enter index rotation : ");
        int d=sc.nextInt();

        int i=d;
        while(true){
            System.out.print(arr[i]+" ");
            i=(i+1)%size;

            if(i==d-1){            //upto index=1
                System.out.println(arr[d-1]);
                break;
            }
        }
```

```
        }
    }
```