BASIC PROGRAMS

Q) Write a java program to perform sum of two numbers?

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

		System.out.println("Enter the First Number  :");
		int a=sc.nextInt();

		System.out.println("Enter the Second Number :");
		int b=sc.nextInt();

		//logic
		int c=a+b;

		System.out.println("Sum of two numbers is ="+c);
	}
}
```

Input:
Enter the First Number:
10
Enter the Second Number:
20

Output:
Sum of two numbers is =30

Input:
Enter the First Number:
5
Enter the Second Number:
10

Output:
Sum of two numbers is =15

Q) Write a java program to perform sum of two numbers without using third variable?

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

		System.out.println("Enter the First Number  :");
		int a=sc.nextInt();

		System.out.println("Enter the Second Number :");
		int b=sc.nextInt();


		System.out.println("Sum of two numbers is ="+(a+b));
	}
}
```

Input:
Enter the First Number:
10
Enter the Second Number:
20

Output:
Sum of two numbers is =30

Input:
Enter the First Number:
5
Enter the Second Number:
10

Output:
Sum of two numbers is =15

Q) Write a java program to perform square of a given number?

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

		System.out.println("Enter the  Number  :");
		int a=sc.nextInt();

		//logic
		int square= n*n;

		System.out.println("Square of a given number is  ="+square);
	}
}
```

Input:
Enter the Number:
5

Output:
Square of a given number is =25

Input:
Enter the Number:
6

Output:
Square of a given number is =36

Q) Write a java program to perform cube of a given number?

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

                System.out.println("Enter the  Number  :");
                int n=sc.nextInt();

                //logic
                int square= n*n*n;

                System.out.println("Cube of a given number is  ="+square);
        }
}
```

Input:
Enter the Number:
5

Output:
Cube of a given number is =125

Input:
Enter the Number:
3

Output:
Cube of a given number is =27

Q) Write a java program to find out area of a circle?

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

		System.out.println("Enter the  Radius  :");
		int radius=sc.nextInt();

		//logic
		double area=3.14*r*r;

		System.out.println("Area of a circle is   ="+area);
	}
}
```

Input:
Enter the Radius:
5

Output:
Area of a circle is = 78.5

Input:
Enter the Radius:
3

Output:
Area of a circle is = 28.26

Q) Write a java program to find out perimeter of a circle?

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

		System.out.println("Enter the  Radius  :");
		int radius=sc.nextInt();

		//logic
		double perimeter=2*3.14*r;

		System.out.println("Perimeter of a circle is   ="+perimeter);
	}
}
```

Input:
Enter the Radius:
5

Output:
Perimeter of circle is= 31.4

Input:
Enter the Radius:
9

Output:
Perimeter of circle is= 56.52

Q) Write a java program to find out area of a triangle?

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

		System.out.println("Enter the  Base  :");
		int base=sc.nextInt();

		System.out.println("Enter the Height :");
		int height=sc.nextInt();

		//logic
		double area=0.5*base*height;

		System.out.println("Area of a triangle is   ="+area);
	}
}
```

Input:
Enter the Base:
5
Enter the Height:
3

Output:
Area of a triangle is = 7.5

Input:
Enter the Base:
6
Enter the Height:
4

Output:
Area of a triangle is = 12.0

Q) Write a java program to perform to find out area of a rectangle?

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

                System.out.println("Enter the  Length  :");
                int l=sc.nextInt();

                System.out.println("Enter the Breadth :");
                int b=sc.nextInt();

                //logic
                double area= l*b;

                System.out.println("Area of a rectangle is   ="+area);
        }
}
```

Input:
Enter the Length
5
Enter the Breadth:
8

Output:
Area of a rectangle is = 40

Input:
Enter the Length
4
Enter the Breadth:
3

Output:
Area of a rectangle is = 12

Q) Write a java program to perform to find out area of a square?

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

		System.out.println("Enter the  Side  :");
		int s=sc.nextInt();

		//logic
		double area= s*s;

		System.out.println("Area of a square is   ="+area);
	}
}
```

Input:
Enter the Side:
5

Output:
Area of a square is =25

Input:
Enter the Side:
5

Output:
Area of a square is =25

Q) Write a java program to perform swapping of two numbers?

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

		System.out.println("Enter the  First Number   :");
		int a=sc.nextInt();

		System.out.println("Enter the Second Number :");
		int b=sc.nextInt();

		System.out.println("Before Swapping a="+a+" and b="+b);


		//logic
		int temp=a;
		a=b;
		b=temp;

		System.out.println("After Swapping a="+a+" and b="+b);
	}
}
```

Input:
Enter the First Number:
10
Enter the Second Number:
20

Output:

Before Swapping a=10 and b=20

After Swapping a=20 and b=10

Q) Write a java program to perform swapping of two numbers without using third variable?

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

		System.out.println("Enter the  First Number  :");
		int a=sc.nextInt();

		System.out.println("Enter the Second Number :");
		int b=sc.nextInt();

		System.out.println("Before Swapping a="+a+" and b="+b);

		//logic
		a=a+b;
		b=a-b;
		a=a-b;

		System.out.println("After Swapping a="+a+" and b="+b);
	}
}
```

Input:
Enter the First Number:
10
Enter the Second Number:
20

Output:

Before Swapping a=10 and b=20

After Swapping a=20 and b=10

Q) Write a java program to find out greatest of two numbers using ternary operator?

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

		System.out.println("Enter the  First Number   :");
		int a=sc.nextInt();

		System.out.println("Enter the Second Number :");
		int b=sc.nextInt();

		//logic
		int max=(a>b) ? a: b;

		System.out.println("Greatest of two numbers is ="+max);
	}
}
```

Input:
Enter the First Number:
10
Enter the Second Number:
20

Output:
Greatest of two numbers is = 20

Input:

Enter the First Number:
100
Enter the Second Number:
20

Output:
Greatest of two numbers is = 100

Q) Write a java program to find out greatest of three numbers using ternary operator?

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

                System.out.println("Enter the  First Number   :");
                int a=sc.nextInt();

                System.out.println("Enter the Second Number :");
                int b=sc.nextInt();

                System.out.println("Enter the Third Number :");
                Int c=sc.nextInt();

                //logic
                int max=(a>b) ? (a>c ? a : c) : (b>c ? b : c);


                System.out.println("Greatest of three numbers is ="+max);
        }
}
```

Input:

Enter the First Number:
10

Enter the Second Number:
30

Enter the Third Number:
20

Output:
Greatest of three numbers is = 30

Q) Write a java program to accept one salary then find out 10% of tax?

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

		System.out.println("Enter the  Salary   :");
		int sal=sc.nextInt();

		//logic
		double tax=(double)tax*10/100;

		System.out.println("Tax deduction is = "+tax);
	}
}
```

Input:
Enter the Salary: 1000

Output:
Tax deduction is =100.0

Input:
Enter the Salary: 1004

Output:
Tax deduction is =100.4

Input:
Enter the Salary: 5000

Output:
Tax deduction is =500.0

Q) Write a java program to convert Celsius to Fahrenheit?

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

		System.out.println("Enter the  Celsius value   :");
		float cel=sc.nextFloat();

		//logic
		float f= cel * 9/5 +32;

		System.out.println("Fahrenheit value is  = "+f);
	}
}
```

Input:

Enter the Celsius value:
10.5

Output:

Fahrenheit value is = 50.9

Input:

Enter the Celsius value:
5.0

Output:

Fahrenheit value is = 50.9

Q) Write a java program to convert Fahrenheit to Celsius?

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

		System.out.println("Enter the  Temperature   :");
		float temp=sc.nextFloat();

		//logic
		float cel=((temp-32)*5)/9;

		System.out.println("Celsius value is  = "+cel);
	}
}
```

Input:

Enter the Temperature:
40.5

Output:

Celsius value is = 4.72

Input:

Enter the Temperature:
40

Output:

Celsius value is = 4.44

CONTROL STATEMENTS PROGRAMS

Q) Write a java program to check given age is eligible to vote or not?

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

		System.out.println("Enter the  Age :");
		int age=sc.nextInt();

		//logic
		if(age>=18)
			System.out.println("You are eligible to vote");
		else
			System.out.println("You are not eligible to vote");
	}
}
```

Input:

Enter the Age:
25

Output:

You are eligible to vote

Input:

Enter the Age:
5

Output:

You are not eligible to vote

Q) Write a java program to find out greatest of two numbers using if and else statement?

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

		System.out.println("Enter the  First Number  :");
		int a=sc.nextInt();

		System.out.println("Enter the Second Number :");
		int b=sc.nextInt();

		//logic
		if(a>b)
			System.out.println(a+" is greatest");
		else
			System.out.println(b+" is greatest");
	}
}
```

Input:

Enter the First Number:
10

Enter the Second Number:
20

Output:
20 is greatest

Input:

Enter the First Number:
35

Enter the Second Number:
10

Output:
35 is greatest

Q) Write a java program to find out given number is positive or negative?

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

		System.out.println("Enter the  Number  :");
		int n=sc.nextInt();

		if(n==0)
		{
			System.out.prinltn("It is not a +ve or -ve number");
			System.exit(0);
		}

		//logic
		if(n>0)
			System.out.println("It is positive number ");
		else
			System.out.println("It is negative number ");
	}
```

```
}
```

Input:
Enter the Number:
5
Output:
It is positive number

Input:
Enter the Number:
-5
Output:
It is negative number

Input:
Enter the Number:
0
Output:
It is not a +ve or -ve number

Q) Write a java program to find out given number is even or odd?

```
import java.util.*;
class Test
{
	public static void main(String[] args)
	{
		//asking inputs
		Scanner sc=new Scanner(System.in);
		System.out.println("Enter the   Number  :");
		int n=sc.nextInt();

		//logic
		if(n%2==0)
			System.out.println("It is even number ");
		else
			System.out.println("It is odd number ");
	}
}
```

Input:

Enter the Number:
2

Output:

It is even number

Input:

Enter the Number:
5

Output:

It is odd number

Q) Write a java program to find out given number is odd or not?

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

		System.out.println("Enter the   Number  :");
		int n=sc.nextInt();

		//logic
		if(n%2==1 || n%2!=0)
			System.out.println("It is odd number ");
		else
			System.out.println("It is not odd number ");
	}
}
```

Input:
Enter the Number:
3

Output:
It is odd number

Input:
Enter the Number:
4

Output:
It is not odd number

Input:
Enter the Number:
7

Output:
It is odd number

Q) Write a java program to find out given year is Leap year or not?

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

		System.out.println("Enter the   Year  :");
		int year=sc.nextInt();


		//logic
		if(year%4==0)
			System.out.println("It is a Leap Year ");
		else
			System.out.println("It is not a Leap Year ");
	}
}
```

Input:

Enter the Year:
2022

Output:
It is not a Leap year

Input:

Enter the Year:
2024

Output:
It is a Leap year

Q) Write a java program to accept one alphabet then find out given alphabet is a vowel or not?

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

		System.out.println("Enter the   Alphabet  :");
		char ch=sc.next().charAt(0);

		//logic
		if(ch=='a' || ch=='e' || ch=='i' || ch=='o'|| ch=='u')
			System.out.println("It is a Vowel ");
		else
			System.out.println("It is not a Vowel ");
	}
}
```

Input:

Enter the Alphabet:
a

Output:
It is a vowel

Input:
Enter the Alphabet:
e

Output:
It is a vowel

Input:
Enter the Alphabet:
z

Output:
It is not a vowel

Q) Write a java program to accept one alphabet then find out given alphabet is a upper case letter,lower case letter , digit or special symbol?

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

		System.out.println("Enter the   Alphabet  :");
		char ch=sc.next().charAt(0);

		//logic
		if(ch>='A' && ch<='Z')
			System.out.println("It is upper case letter ");
		else	if(ch>='A' && ch<='Z')
			System.out.println("It is lower case letter ");
		else	if(ch>='0' && ch<='9')
			System.out.println("It is digit");
		else
```

```
                    System.out.println("It is Special symbol");
        }
}
```

Input:
Enter the Alphabet:
A
Output:
It is upper case letter

Input:
Enter the Alphabet:
$
Output:
It is special symbol

Input:
Enter the Alphabet:
7
Output:
It is digit

Q) Write a java program to check given alphabet is a vowel or consonant?

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

                System.out.println("Enter the   Alphabet  :");
                char ch=sc.next().charAt(0);
                //logic
                switch(ch)
                {
                        case 'a':  System.out.println("It is Vowel");
                                   break;
                        case 'e':  System.out.println("It is Vowel");
                                   break;
                        case 'i':  System.out.println("It is Vowel");
                                   break;
```

```
                        case 'o':  System.out.println("It is Vowel");
                                   break;
                        case 'u':  System.out.println("It is Vowel");
                                   break;
                        default:  System.out.println("It is Consonant");
                }
        }
}
```

Input:
Enter the Alphabet
a

Output:
It is vowel

Input:
Enter the Alphabet
p

Output:
It is Consonant

Q) Write a java program to display N natural numbers?

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

                System.out.println("Enter number of terms  :");
                int n=sc.nextInt();

                //logic
                for(int i=1;i<=n;i++)
                {
                        System.out.print(i+"  ");
                }
        }
}
```

Input:

Enter number of terms:
10

Output:

1 2 3 4 5 6 7 8 9 10

Input:

Enter number of terms:
20

Output:

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Q) Write a java program to perform sum of N natural numbers?

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

		System.out.println("Enter number of terms  :");
		int n=sc.nextInt();

		//logic
		int sum=0

		for(int i=1;i<=n;i++)
		{
			sum=sum+I;
```

```
                }

                System.out.println("Sum of N natural number is ="+sum);
        }
}
```

Input:

Enter the number of terms:
10

Output:

Sum of N natural number is = 55

Input:

Enter the number of terms:
100

Output:

Sum of N natural number is = 5050

Q) Write a java program to find out factorial of a given number?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                int fact=1;

                //asking inputs
                Scanner sc=new Scanner(System.in);

                System.out.println("Enter the  number  :");
                int n=sc.nextInt();

                //logic
                for(int i=n;i>=1;i--)
                {
```

```
                fact=fact*I;
            }

            System.out.println("Factorial of a given number is  ="+fact);
        }
}
```

Input:

Enter the number:
5

Output:

Factorial of a given number is = 120

Input:

Enter the number:
6

Output:

Factorial of a given number is = 720

Q) Write a java program to perform sum digits of a given number?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
            int rem,sum=0;
            //asking inputs
            Scanner sc=new Scanner(System.in);


            System.out.println("Enter the  number  :");
            int n=sc.nextInt();

            //logic
            while(n>0)
```

```
                {
                        rem=n%10;
                        sum=sum+rem;
                        n=n/10;
                }

                System.out.println("Sum of Digits of a given number  is="+sum);
        }
}
```

Input:

Enter the Number:
123

Output:

Sum of digits of a given number is= 6

Input:

Enter the Number:
546

Output:

Sum of digits of a given number is= 15

Q) Write a java program to display reverse of a given number?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                int rem,rev=0;
                //asking inputs
                Scanner sc=new Scanner(System.in);

                System.out.println("Enter the number:");
                int n=sc.nextInt();

                //logic
                while(n>0)
```

```
                {
                        rem=n%10;
                        rev=rev*10+rem;
                        n=n/10;
                }

                System.out.println("Reverse  of a given number is ="+rev);
        }
}
```

Input:

Enter the number:
123

Output:

Reverse of a given number is= 321

Input:

Enter the number:
456

Output:

Reverse of a given number is= 654

Q) Write a java program to check given number is palindrome or not?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                int rem,rev=0,temp;

                //asking inputs
                Scanner sc=new Scanner(System.in);

                System.out.println("Enter the number:");
                int n=sc.nextInt();
```

```
                temp=n;

                //logic
                while(n>0)
                {
                        rem=n%10;
                        rev=rev*10+rem;
                        n=n/10;
                }
                if(temp==rev)
                        System.out.println("It is palindrome number);
                else
                        System.out.println("It is not a palindrome number");
        }
}
```

Input:
Enter the number:
121

Output:
It is palindrome number

Input:
Enter the number:
121

Output:
It is not a palindrome number

Q) Write a java program to check given number is Armstrong or not?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                int rem,sum=0,temp;

                //asking inputs
                Scanner sc=new Scanner(System.in);

                System.out.println("Enter the number:");
                int n=sc.nextInt();
```

```
                temp=n;
                //logic
                while(n>0)
                {
                        rem=n%10;
                        rev=sum+rem*rem*rem;
                        n=n/10;
                }
                if(temp==sum)
                        System.out.println("It is Armstrong number);
                else
                        System.out.println("It is not  Armstrong number");
        }
}
```

Input:
Enter the Number:
121

Output:
It is not Armstrong number

Input:
Enter the Number:
153

Output:
It is Armstrong number

Q) Write a java program to find out Fibonacci series of a given number?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                int a=0,b=1,c;

                //asking inputs
                Scanner sc=new Scanner(System.in);

                System.out.println("Enter the number:");
```

```
                int n=sc.nextInt();

                System.out.print(a+" "+b);
                //logic
                for(int i=1;i<=n;i++)
                {
                        c=a+b;
                        System.out.print(" "+c);
                        a=b;
                        b=c;
                }
        }
}
```

Input:
Enter the number:
5

Output:
0 1 1 2 3 5 8

Input:
Enter the number:
7

Output:
0 1 1 2 3 5 8 13 21

Q) Write a java program to check given number is prime or not?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                int flag=0;

                //asking inputs
                Scanner sc=new Scanner(System.in);
```

```
                System.out.println("Enter the number:");
                int n=sc.nextInt();

                //logic
                for(int i=2;i<=n/2;i++)
                {
                        if(n%i==0)
                        {
                                flag=1;
                                break;
                        }
                }
                if(flag==0)
                        System.out.println("It is a prime number ");
                else
                        System.out.println("It is not a prime number ");
                }
}
```

Input:

Enter the Number:
9

Output:
It is not a prime number

Input:

Enter the Number:
2

Output:
It is a prime number

Q) Write a java program to check given number is perfect or not?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                int sum=0;

                //asking inputs
                Scanner sc=new Scanner(System.in);
```

```
                System.out.println("Enter the number:");
                int n=sc.nextInt();

                //logic
                for(int i=1;i<=n/2;i++)
                {
                        if(n%i==0)
                        {
                                sum=sum+i;
                                // System.out.println(sum);
                        }
                }
                if(sum==n)
                        System.out.println("It is a perfect number ");
                else
                        System.out.println("It is not a perfect number ");
        }
}
```

Input:

Enter the Number:
6

Output:
It is a perfect number

Input:

Enter the Number:
10

Output:
It is not a perfect number

Q) Write a java program to convert Binary to Decimal number?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                int rem,sum=0,i=0;

                //asking inputs
```

```
                Scanner sc=new Scanner(System.in);

                System.out.println("Enter the Binary number:");
                int n=sc.nextInt();

                //logic
                while(n>0)
                {
                        rem=n%10;
                        n=n/10;
                        sum=sum+rem*(int)Math.pow(2,i++);
                }
                System.out.println("Binary to Decimal value is ="+sum);
        }
}
```

Input:

Enter the Binary number:
1010

Output:

Binary to Decimal value is = 10

Input:

Enter the Binary number:
0101

Output:

Binary to Decimal value is = 5

Q) Write a java program to convert Decimal to Binary number?

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                int rem,i=0;
                String sum="";
```

```
                //asking inputs
                Scanner sc=new Scanner(System.in);

                System.out.println("Enter the Decimal number:");
                int n=sc.nextInt();

                //logic
                while(n>0)
                {
                        rem=n%10;
                        n=n/10;
                        sum=rem+sum;
                }
                System.out.println("Decimal to Binary value is ="+sum);
        }
}
```

Input:

Enter the Decimal number:
10

Output:

Decimal to Binary value is = 1010

Input:

Enter the Decimal number:
15

Output:

Decimal to Binary value is = 1111

Question: 1

An Evil number is a positive whole number which has even number of 1's in is binary equivalent.
Example: Binary equivalent of 9's is 1001.Which contains even number of 1's.

Thus 9 is Evil Number.

A few Evil numbers are 3,5,6,9.... .

Design a program to accept a positive whole number 'N' where N>2 and N<100.Find the binary equivalent of the number and count the number of 1's in it and display whether it is an Evil number or not with an appropriate message.

Test your program with the following data.

Example:
INPUT:
N=15

OUTPUT:
Binary Equivalent: 1111
No of 1's is: 4
It is Evil Number

Example:
INPUT:
N=3

OUTPUT:
Binary Equivalent: 1010
No of 1's is: 1
It is not Evil Number

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

		System.out.println("Enter the Decimal number:");
		int n=sc.nextInt();



		//logic
		if(n>2 && n<100)
		{
			//get the converted binary number
			String bin=getBinaryNumber(n);

			System.out.println("Binary Equivalent :"+ bin);

			int cnt=0;
```

```
                    //logic to read all characters one by one from string
                     for(int i=0;i<bin.length();i++)
                    {
                            //compare each character with 1.
                            if(bin.charAt(i)=='1')
                            {
                                    cnt++;
                            }
                    }
                    System.out.println("No of 1s is :"+cnt);

                    if(cnt%2==0)
                            System.out.println("It is Evil Number ");
                    else
                            System.out.println("It is not Evil Number");
            }//end if

            else
            {
                    System.out.println("Number out of Range ");
            }
    }
      //method to convert a number to binary
    public static String getBinaryNumber(int n)
    {
            String sum="";
            while(n>0)
            {
                    int rem=n%2;
                    sum=rem+sum;
                    n=n/2;
            }
            return sum;
    }
}
```

Q) Write a java program to display multiplication table of a given number?

```
Import java.util.Scanner;
class Test
{
    public static void main(String[]  args)
{
```

```
        Scanner sc=new Scanner(System.in);

        System.out.println("Enter the Number :");
        int n=sc.nextInt();

        //logic
        for(int i=1;i<=10;i++)
{
        System.out.println(n+"  *  "+i+"  = "+n*i);
}
}
}
```

Input:

Enter the Number:
5

Output:

5 * 1 = 5
5 * 2 = 10
5 * 3 = 15
5 * 4 = 20
5 * 5 = 25
5 * 6 = 30
5 * 7 = 35
5 * 8 = 40
5 * 9 = 45
5 * 10 = 50

Q)Write a java program to find out power of a given number ?

```
import java.util.*;
public class Test
{
        public static void main(String[] args)
        {
                int result=1;
```

```
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the Base Number :");
                int base=sc.nextInt();

                System.out.println("Enter the Power Number:");
                int power=sc.nextInt();

                for(int i=1;i<=power;i++)
                {
                        result=base*result;
                }
                System.out.println("Power of a Number is ="+result);
        }
}
```

Input:
Enter the Base Number:
5
Enter the Power Number:
3

Output:

Power of a Number is = 125

Q) Write a java program to find out generic root of a given number?

```
import java.util.*;
class Test
{
	public static void main(String[] args)
	{
		Scanner sc=new Scanner(System.in);
		System.out.println("Enter the Number :");
		int n=sc.nextInt();

		int sum,rem;
		while(n>=0)
		{
			sum=0;
			while(n!=0)
			{
				rem=n%10;
				sum=sum+rem;
				n=n/10;
			}//end

			//each display sum of all generic root
			System.out.println(sum);

			if(sum>=10)
				n=sum;
			else
				break;
		}//end
	}
}
```

Input:

Enter the Number:
568

Output:

19
10
1

Q) Write a java program to display prime numbers from 1 to N?

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

		System.out.println("Enter the Number :");
		int n=sc.nextInt();

		for(int i=2;i<=n;i++)
		{
			boolean flag=true;

			for(int j=2;j<i;j++)
			{
				if(i%j==0)
				{
					flag=false;
					break;
				}
			}
			//display all prime numbers
			if(flag==true)
				System.err.print(i+" ");
		}
	}
}
```

Input:

Enter the Number:
100

Output:

2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97

Q) Write a java program to perform addition of two numbers without using Addition (+) operator?

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

		System.out.println("Enter the First Number  :");
		int x=sc.nextInt();

		System.out.println("Enter the Second Number  :");
		int y=sc.nextInt();

		while(y!=0)
		{
			int carry=x&y;
			x=x^y;
			y=carry<<1;
		}
		System.out.println("Sum of two numbers is ="+x);
	}
}
```

Input:

```
Enter the First Number:
10
Enter the Second Number:
20
```

Output:

```
Sum of two numbers is = 30
```

LOOP PATTERNS

Q) Write a java program to print below pattern?

1 1 1 1
2 2 2 2
3 3 3 3
4 4 4 4

```
import java.util.Scanner;
public class Test
{
	public static void main(String[] args)
	{
		int i,j;

		//rows
		for(i=1;i<=4;i++)
		{
			//cols
			for(j=1;j<=4;j++)
			{
				System.out.print(i+" ");
			}
			System.out.println(" ");
		}

	}
}
```

Q) Write a java program to print below pattern?

1 2 3 4
1 2 3 4
1 2 3 4
1 2 3 4

```
import java.util.Scanner;
public class Test
{
	public static void main(String[] args)
	{
		int i,j;

		//rows
		for(i=1;i<=4;i++)
		{
			//cols
			for(j=1;j<=4;j++)
			{
				System.out.print(j+" ");
			}
			System.out.println(" ");
		}

	}
}
```

Q) Write a java program to print below pattern?

```
* * * *
* * * *
* * * *
* * * *
```

```
import java.util.Scanner;
public class Test
{
	public static void main(String[] args)
	{
		int i,j;

		//rows
		for(i=1;i<=4;i++)
		{
			//cols
			for(j=1;j<=4;j++)
			{
				System.out.print("*"+" ");
			}
			System.out.println(" ");
		}

	}
}
```

Q) Write a java program to print below pattern?

4 4 4 4
3 3 3 3
2 2 2 2
1 1 1 1

```
import java.util.Scanner;
public class Test
{
	public static void main(String[] args)
	{
		int i,j;

		//rows
		for(i=4;i>=1;i--)
		{
			//cols
			for(j=1;j<=4;j++)
			{
				System.out.print(i+" ");
			}
			System.out.println(" ");
		}

	}
}
```

Q) Write a java program to print below pattern?

A A A A
B B B B
C C C C
D D D D

```
import java.util.Scanner;
public class Test
{
	public static void main(String[] args)
	{
		char i,j;

		//rows
		for(i='A';i<='D';i++)
		{
			//cols
			for(j='A';j<='D';j++)
			{
				System.out.print(i+" ");
			}
			System.out.println(" ");
		}

	}
}
```

Q) Write a java program to print below pattern?

```
*  *  *  *
*        *
*        *
*  *  *  *
```

```
import java.util.Scanner;
public class Test
{
	public static void main(String[] args)
	{
		int i,j;

		//rows
		for(i=1;i<=4;i++)
		{
			//cols
			for(j=1;j<=4;j++)
			{
				If(i==1 || i==4|| j==1 ||j==4)
					System.out.print("*"+" ");
				else
					System.out.println("-");
			}
			System.out.println(" ");
		}

	}
}
```

Q) Write a java program to print below pattern?

```
*  -  -  -
-  *  -  -
-  -  *  -
-  -  -  *
```

```
import java.util.Scanner;
public class Test
{
	public static void main(String[] args)
	{
		int i,j;

		//rows
		for(i=1;i<=4;i++)
		{
			//cols
			for(j=1;j<=4;j++)
			{
				If(i==j)
					System.out.print("*"+" ");
				else
					System.out.println("-");
			}
			System.out.println(" ");
```

```
            }

        }
}
```

Q) Write a java program to print below pattern?

```
*  -  -  -  *
-  *  -  *  -
-  -  *  -  -
-  *  -  *  -
*  -  -  -  *
```

```
import java.util.Scanner;
public class Test
{
        public static void main(String[] args)
        {
                int i,j;

                //rows
                for(i=1;i<=5;i++)
                {
                        //cols
                        for(j=1;j<=5;j++)
                        {
                                If(i==j || i+j==6)
                                        System.out.print("*"+" ");
                                else
                                        System.out.println("-");
```

```
                }
                System.out.println(" ");
            }

        }
}
```

Q)

1
2 2
3 3 3
4 4 4 4

```
public class Test
{
    public static void main(String[] args)
    {
        int i,j;
        //rows
        for(i=1;i<=4;i++)
        {
            //cols
            for(j=1;j<=i;j++)
            {
                System.out.print(i+" ");
            }
            System.out.println(" ");
        }
    }
}
```

Q)

4 4 4 4
3 3 3
2 2
1

```
public class Test
{
	public static void main(String[] args)
	{
		int i,j;
		//rows
		for(i=4;i>=1;i--)
		{
			//cols
			for(j=1;j<=i;j++)
			{
				System.out.print(i+" ");
			}
			System.out.println(" ");
		}
	}
}
```

Q)

```
* * * *
* * *
* *
*
```

```
public class Test
{
	public static void main(String[] args)
	{
		int i,j;
		//rows
		for(i=4;i>=1;i--)
		{
			//cols
			for(j=1;j<=i;j++)
			{
				System.out.print("*"+" ");
			}
			System.out.println(" ");
		}
	}
}
```

Q)

1
2 4
3 6 9
4 8 12 16

```
public class Test
{
	public static void main(String[] args)
	{
		int i,j;
		//rows
		for(i=1;i<=4;i++)
		{
			//cols
			for(j=1;j<=i;j++)
			{
				System.out.print(i*j+" ");
			}
			System.out.println(" ");
		}
	}
}
```

Q)

1
2 3
4 5 6
7 8 9 10

```
public class Test
{
	public static void main(String[] args)
	{
		int i,j,k=1;
		//rows
		for(i=1;i<=4;i++)
		{
			//cols
			for(j=1;j<=i;j++)
			{
				System.out.print((k++)+" ");
			}
			System.out.println(" ");
		}
	}
```

```
}
```

Q)

```
2
4   6
8   10   12
14  16   18  20
```

```
public class Test
{
        public static void main(String[] args)
        {
                int i,j,k=2;
                //rows
                for(i=1;i<=4;i++)
                {


                        //right side elements
                        for(j=1;j<=i;j++)
                        {
                                System.out.print(k+"  ");
```

```
                        k=k+2;
                }
                System.out.println(" ");
            }
        }
}
```

Q)

```
1
3   5
7   9   11
13  15  17  19
```

```
public class Test
{
    public static void main(String[] args)
    {
        int i,j,k=1;
        //rows
        for(i=1;i<=4;i++)
        {
            //right side elements
            for(j=1;j<=i;j++)
            {
```

```
                        System.out.print(k+"  ");
                        k=k+2;
                    }
                    System.out.println(" ");
                }
            }
}
```

Q)

```
      1
    2 2
  3 3 3
4 4 4 4
```

```
public class Test
{
        public static void main(String[] args)
        {
                int i,j;
                //rows
                for(i=1;i<=4;i++)
                {
                        //space
                        for(j=4;j>i;j--)
                        {
                                System.out.print("  ");
                        }

                        //right side elements
```

```
                        for(j=1;j<=i;j++)
                        {
                                System.out.print(i+" ");
                        }
                        System.out.println(" ");
                }
        }
}
```

Q)

```
    *
   * *
  * * *
* * * *
```

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


                int i,j;
                //rows
                for(i=1;i<=4;i++)
                {
                        //space
                        for(j=4;j>i;j--)
                        {
                                System.out.print("  ");
```

```
                        }

                        //right side elements
                        for(j=1;j<=i;j++)
                        {
                                System.out.print(i+" ");
                        }
                        System.out.println(" ");
                }
        }
}
```

Q)

```
4 4 4 4
  3 3 3
    2 2
      1
```

```
public class Test
{
        public static void main(String[] args)
        {
                int i,j;
                //rows
                for(i=4;i>=1;i--)
                {
                        //space
                        for(j=4;j>i;j--)
                        {
```

```
                        System.out.print("  ");
                }

                //right side elements
                for(j=1;j<=i;j++)
                {
                        System.out.print(i+" ");
                }
                System.out.println(" ");
        }
    }
}
```

Q)

```
   1
  2 2
 3 3 3
4 4 4 4
 3 3 3
  2 2
   1
```

```
public class Test
{
    public static void main(String[] args)
    {
        int i,j;
        //rows
        for(i=1;i<=4;i++)
        {
            for(j=4;j>i;j--)
            {
                System.out.print(" ");

            }
            for(j=1;j<=i;j++)
```

```
                {
                        System.out.print(i+" ");
                }
                System.out.println(" ");
        }
        for(i=3;i>=1;i--)
        {
                for(j=4;j>i;j--)
                {
                        System.out.print(" ");

                }
                for(j=1;j<=i;j++)
                {
                        System.out.print(i+" ");
                }
                System.out.println(" ");
        }
    }
}
```

Q)

```
    1
   222
  33333
4444444
```

```
public class Test
{
        public static void main(String[] args)
        {
                int i,j;
                //rows
                for(i=1;i<=4;i++)
                {

                        for(j=4;j>i;j--)
                        {
                                System.out.print(" ");

                        }

                        //left side elements
```

```
                    for(j=1;j<=i;j++)
                    {
                            System.out.print(i+"");
                    }

                    //right side elements
                    for(j=i-1;j>=1;j--)
                    {
                            System.out.print(i+"");
                    }

                    System.out.println(" ");
            }

        }
}
```

Q)

```
    1
   121
  12321
1234321

public class Test
{
        public static void main(String[] args)
        {
                int i,j;
                //rows
                for(i=1;i<=4;i++)
                {

                        for(j=4;j>i;j--)
                        {
                                System.out.print(" ");

                        }
```

```
                        //left side elements
                        for(j=1;j<=i;j++)
                        {
                                System.out.print(j+"");
                        }

                        //right side elements
                        for(j=i-1;j>=1;j--)
                        {
                                System.out.print(j+"");
                        }

                        System.out.println(" ");
                }

        }
}
```

Q)

```
1234321
 12321
  121
   1
```

```
public class Test
{
        public static void main(String[] args)
        {
                int i,j;
                //rows
                for(i=4;i>=1;i--)
                {

                        for(j=4;j>i;j--)
                        {
```

```
                        System.out.print(" ");

                    }

                    //left side elements
                    for(j=1;j<=i;j++)
                    {
                        System.out.print(j+"");
                    }

                    //right side elements
                    for(j=i-1;j>=1;j--)
                    {
                        System.out.print(j+"");
                    }

                    System.out.println(" ");
                }

        }
}
```

Q)

```
    A
   ABA
  ABCBA
ABCDCBA

public class Test
{
        public static void main(String[] args)
        {
                char i,j;
                //rows
                for(i='A';i<='D';i++)
                {
```

```
                    for(j='D';j>i;j--)
                    {
                            System.out.print(" ");

                    }

                    //left side elements
                    for(j='A';j<=i;j++)
                    {
                            System.out.print(j+"");
                    }

                    //right side elements
                    for(j=(char) (i-1);j>='A';j--)
                    {
                            System.out.print(j+"");
                    }

                    System.out.println(" ");
            }

        }
}
```

Q) Write a java program to display prime numbers loop pattern?

```
2
3 5
7 11 13
17 19 23 29
```

```
import java.util.*;
public class Test
{
        public static void main(String args[])
        {
                int counter = 2;

                for (int i = 1; i <=4; i++)
                {
                        for (int j = 1; j <= i; j++)
                        {
                                /* find next prime number by incrementing counter and */
```

```
                        while(!isPrimeNumber(counter))
                        {
                                counter++;
                        }
                        System.out.print(counter+" ");
                        counter++;
                }
                System.out.println();
        }
    }

    public static boolean isPrimeNumber(int num)
    {
        int c=0;
        for (int i = 1; i <= num; i++)
        {
            if (num % i == 0)
            c++;
        }
        if (c==2)
            return true;
        else
            return false;
    }
}
```

ARRAYS

Q) Write a java program to accept array elements and display them?

```
import java.util.*;
public class Test
{
	public static void main(String args[])
	{
		Scanner sc=new Scanner(System.in);
		System.out.println("Enter the Array Size: ");
		int size=sc.nextInt();

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

```
                //inserting elements
                for(int i=0;i<size;i++)
                {
                        System.out.println("Enter the element of arr["+i+"] :");
                        arr[i]=sc.nextInt();
                }

                System.out.println("Given Elements are : ");

                //displaying elements
                for(int i=0;i<size;i++)
                {
                        System.out.print(arr[i]+" ");
                }
        }
}
```

Input:
Enter the Array Size:
2
Enter the element of arr[0]:
6
Enter the element of arr[1]:
10

Output:
Given Elements are :
6 10

Q) Write a java program to perform sum of array elements ?

```
import java.util.*;
public class Test
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the Array Size: ");
                int size=sc.nextInt();
```

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

                //inserting elements
                for(int i=0;i<size;i++)
                {
                        System.out.println("Enter the element of arr["+i+"] :");
                        arr[i]=sc.nextInt();
                }

                int sum=0;
                //logic
                for(int i=0;i<size;i++)
                {
                        sum=sum+arr[i];
                }

                System.out.println("Sum of array elements is ="+sum);
        }
}
```

Input:
Enter the Array Size:
2
Enter the element of arr[0]:
6
Enter the element of arr[1]:
10

Output:
Sum of array elements is = 16

Q) Write a java program to display array elements in reverse order?

```
import java.util.*;
public class Test
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the Array Size: ");
                int size=sc.nextInt();
```

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

                //inserting elements
                for(int i=0;i<size;i++)
                {
                        System.out.println("Enter the element of arr["+i+"] :");
                        arr[i]=sc.nextInt();
                }
                System.out.println("Reverse of a given number is :");
                //displaying elements
                for(int i=size-1;i>=0;i--)
                {
                        System.out.print(arr[i]+" ");
                }

        }
}
```

Input:
Enter the Array Size:
3
Enter the element of arr[0]:
6
Enter the element of arr[1]:
10
Enter the element of arr[2]:
1

Output:
Reverse of a given number is = 1 10 6

Q) Write a java program to find out least or smallest element in a given array?

```
import java.util.*;
public class Test
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the Array Size: ");
                int size=sc.nextInt();
```

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

                //inserting elements
                for(int i=0;i<size;i++)
                {
                        System.out.println("Enter the element of arr["+i+"] :");
                        arr[i]=sc.nextInt();
                }

                int small=arr[0];

                //logic
                for(int i=0;i<size;i++)
                {
                        if(arr[i]<small)
                        {
                                small=arr[i];
                        }
                }
                System.out.println("Least Element in a given array is ="+small);
        }
}
```

Input:

```
Enter the Array Size:
3
Enter the element of arr[0]:
6
Enter the element of arr[1]:
10
Enter the element of arr[2]:
1
```

Output:

```
Least element in a given array is = 1
```

Q) Write a java program to find out highest or largest element in a given array?

```
import java.util.*;
public class Test
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the Array Size: ");
                int size=sc.nextInt();
```

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

                //inserting elements
                for(int i=0;i<size;i++)
                {
                        System.out.println("Enter the element of arr["+i+"] :");
                        arr[i]=sc.nextInt();
                }

                int big=arr[0];

                //logic
                for(int i=0;i<size;i++)
                {
                        if(arr[i]<big)
                        {
                                small=arr[i];
                        }
                }
                System.out.println("Largest Element in a given array is ="+big);
        }
}
```

Input:
Enter the Array Size:
3
Enter the element of arr[0]:
6
Enter the element of arr[1]:
10
Enter the element of arr[2]:
1
Output:
Largest element in a given array is = 10

Q) Write a java program to display array elements in sorting order i.e ascending order?

```
import java.util.*;
public class Test
{
        public static void main(String args[])
        {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the Array Size: ");
```

```
                int size=sc.nextInt();

                int[] arr=new int[size];

                //inserting elements
                for(int i=0;i<size;i++)
                {
                        System.out.println("Enter the element of arr["+i+"] :");
                        arr[i]=sc.nextInt();
                }

                //ascending logic
                for(int i=0;i<size;i++)
                {
                        for(int j=0;j<size;j++)
                        {
                                if(arr[i]<arr[j])
                                {
                                        int temp=arr[i];
                                        arr[i] = arr[j];
                                        arr[j] = temp;
                                }
                        }
                }
                //displaying elements
                for(int i=0;i<size;i++)
                {
                        System.out.print(arr[i]+" ");
                }
        }
}
```

Input : 2 5 4 6 1
Output : 1 2 4 5 6

Q) Write a java program to display array elements in sorting order i.e descending order?

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

```
                System.out.println("Enter the Array Size: ");
                int size=sc.nextInt();

                int[] arr=new int[size];

                //inserting elements
                for(int i=0;i<size;i++)
                {
                        System.out.println("Enter the element of arr["+i+"] :");
                        arr[i]=sc.nextInt();
                }

                //descending logic
                for(int i=0;i<size;i++)
                {
                        for(int j=0;j<size;j++)
                        {
                                if(arr[i]>arr[j])
                                {
                                        int temp=arr[i];
                                        arr[i] = arr[j];
                                        arr[j] = temp;
                                }
                        }
                }
                //displaying elements
                for(int i=0;i<size;i++)
                {
                        System.out.print(arr[i]+" ");
                }
        }
}
```

Input : 2 5 4 6 1
Output : 6 5 4 2 1

Q) Write a java program to find out number of even and odd elements in a given array?

```
import java.util.*;
public class Test
{
        public static void main(String args[])
        {
```

```
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the Array Size: ");
                int size=sc.nextInt();

                int[] arr=new int[size];

                //inserting elements
                for(int i=0;i<size;i++)
                {
                        System.out.println("Enter the element of arr["+i+"] :");
                        arr[i]=sc.nextInt();
                }

                int even=0,odd=0;
                //Logic
                for(int i=0;i<size;i++)
                {
                        if(arr[i]%2==0)
                                even++;
                        else
                                odd++;
                }
                System.out.println("No of Even element is ="+even);
                System.out.println("No of Odd element is ="+odd);
        }
}
```

Input: 1 5 6 4 7 3

Output:

No of Even element is: 2
No of Odd element is: 4

Q) Write a java program to find out sum of even and odd elements in a given array?

```
import java.util.*;
public class Test
{
        public static void main(String args[])
```

```
	{
		Scanner sc=new Scanner(System.in);
		System.out.println("Enter the Array Size: ");
		int size=sc.nextInt();

		int[] arr=new int[size];

		//inserting elements
		for(int i=0;i<size;i++)
		{
			System.out.println("Enter the element of arr["+i+"] :");
			arr[i]=sc.nextInt();
		}

		int even=0,odd=0;
		//Logic
		for(int i=0;i<size;i++)
		{
			if(arr[i]%2==0)
				even=even+arr[i];
			else
				odd=odd+arr[i];
		}
		System.out.println("Sum of Even element is ="+even);
		System.out.println("Sum of Odd element is ="+odd);
	}
}
```

Input: 1 5 6 4 7 3

Output:

Sum of Even element is: 10
Sum of Odd element is: 16

Q) Write a java program to find out number of occurrence of a given number in array?

Input : 2 1 3 5 1 4 1 3 5 9
Enter the element: 1

Output:
No of Occurrence is : 3

```
import java.util.*;
public class Test
{
	public static void main(String args[])
	{
		Scanner sc=new Scanner(System.in);
		System.out.println("Enter the Array Size: ");
		int size=sc.nextInt();

		int[] arr=new int[size];

		//inserting elements
		for(int i=0;i<size;i++)
		{
			System.out.println("Enter the element of arr["+i+"] :");
			arr[i]=sc.nextInt();
		}
		//Asking element
		System.out.println("Enter the element : ");
		int ele=sc.nextInt();

		int cnt=0;
		//Logic
		for(int i=0;i<size;i++)
		{
			if(arr[i]==ele)
			{
				cnt++;
			}
		}
		System.out.println("No of occurance of a given element is ="+cnt);
	}
}
```

Q) Write a Java program to find out duplicate elements from Array?

```
import java.util.Scanner;
public class Test
```

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

		int[] arr={3,4,1,1,7,8,4};

		System.out.println("Duplicate Elements are :");

		//finding duplicate elements
		for(int i=0;i<arr.length;i++)
		{
			for(int j=i+1;j<arr.length;j++)
			{
				if(arr[i]==arr[j])
				{
					System.out.print(arr[i]+" ");
				}
			}
		}
	}
}
```

Output:

Duplicate Elements are: 4 1

Input:

int[] arr={5,7,8,1,3,3,5,7};

Output:

Duplicate elements are : 5 7 3

Q) Write a java program to display Distinct/Unique elements from array?

public class Test

```
{
	public static void main(String[] args)
	{
		int[] arr={3,2,2,5,6,1,1};

		System.out.println("Unique Elements are : ");

		//Logic for unique elements
		for(int i=0;i<arr.length;i++)
		{
			int cnt=0;
			for(int j=0;j<arr.length;j++)
			{
				if(arr[i]==arr[j])
				{
					cnt++;
				}
			}
			if(cnt==1)
			System.out.print(arr[i]+" ");
		}
	}
}
```

Output:

Unique Elements are: 3 5 6

Input:

Int[] arr={4,5,6,3,2,1,1,5,9};

Output:

Distinct Elements are: 4 6 3 2 9

Q) Write a java program to display array elements in sorting order?

```
import java.util.Arrays;
public class Test
{
	public static void main(String[] args)
	{
		int[] arr={6,1,2,8,9,4,5};

		Arrays.sort(arr);

		//for each loop
		for(int i:arr)
		{
			System.out.print(i+" ");
		}
	}
}
```

Output:
1 2 4 5 6 8 9

Q) Write a java program to display first highest element from array?

```
import java.util.Arrays;
public class Test
{
	public static void main(String[] args)
	{
		int[] arr={6,1,2,8,9,4,5};

		Arrays.sort(arr);

		System.out.print("First Highest Element is :"+ arr[arr.length-1]);
	}
}
```

Output:
First Highest Element is : 9

Q) Write a java program to display second highest element from array?

```
import java.util.Arrays;
public class Test
{
	public static void main(String[] args)
	{
		int[] arr={6,1,2,8,9,4,5};

		Arrays.sort(arr);

		System.out.print("Second Highest Element is :"+ arr[arr.length-2]);
	}
}
```

Output:
Second Highest Element is: 8

Q) Write a java program to display third highest element from array?

```
import java.util.Arrays;
public class Test
{
	public static void main(String[] args)
	{
		int[] arr={6,1,2,8,9,4,5};

		Arrays.sort(arr);

		System.out.print("Third Highest Element is :"+ arr[arr.length-3]);
	}
}
```

Output:
Third Highest Element is: 6

Q) Write a java program to find out all the pairs of Integer elements in array whose sum is equals to given number?

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

            int[] arr={6,1,2,8,9,4,5};

           //Reading the number
            System.out.println("Enter the number: ");
            int num = sc.nextInt();

            System.out.println("The array created is: "+Arrays.toString(arr));

            System.out.println("indicates of the elements whose sum is: "+num);

            for(int i=0; i<arr.length; i++)
            {
                 for (int j=i; j<arr.length; j++)
                {
                        if((arr[i]+arr[j])== num && i!=j)
                        {
                          System.out.println(arr[i]+" + "+arr[j]+" = "+num);
                        }
                }
            }
        }
}
```

Input:
Enter the number: 8

Output:
The array created is: 6,1,2,8,9,4,5
Indicates of the elements whose sum is:
6 + 2 = 8

Q) Write a program to print all the LEADERS in the array. An element is leader if it is greater than all the elements to its right side. And the rightmost element is always a leader.

For example int the array {16, 17, 4, 3, 5, 2}, leaders are 17, 5 and 2?

```
public class Test
{
	public static void main(String[] args)
	{
		int[] arr={6,1,2,18,9,4,5};

		 for (int i = 0; i < arr.length; i++)
		{
			int j;
			for (j = i+1; j < arr.length; j++)
			{
				if (arr[i] <=arr[j])
				 break;
			}
			if (j == arr.length) // the loop didn't break
				System.out.print(arr[i]+" ");
		}
	}
}
```

Output:
18 9 5

Q) You are given a list of n-1 integers and these integers are in the range of 1 to n. There are no duplicates in the list. One of the integers is missing in the list. Write an efficient code to find the missing integer.
Example:

Input: arr[] = {1, 2, 4, 6, 3, 7, 8}
Output: 5
Explanation: The missing number from 1 to 8 is 5

```
public class Test
{
	public static void main(String[] args)
	{
		int[] arr={1,2,4,5,6};

		int expected_elements=arr.length+1;

		int total= expected_elements*(expected_elements+1)/2;

		//sum of all the elements
		int sum=0;
		for(int i:arr)
		{
			sum=sum+i;
		}
		System.out.println("Missing No is :"+(total-sum));
	}
}
```

STRING PROGRAMS

Q) Write a java program to find out length of the String?

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

		//asking inputs
		System.out.println("Enter the String :");
		String str=sc.nextLine();

		System.out.println("Length of the String is ="+str.length());
	}
}
```

Input:
Enter the String:
Ihub

Output:
Length of the String is = 4

Input:
Enter the String:
Training

Output:
Length of the String is = 8

Q) Write a java program to concatenate two Strings?

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

		//asking inputs
		System.out.println("Enter the First String :");
		String str1=sc.nextLine();

		System.out.println("Enter the Second String :");
		String str2=sc.nextLine();

		String concat_str=str1.concat(str2);
		System.out.println("Concatenate String is : "+concat_str);
	}
}
```

Input:
Enter the First String:
Ihub
Enter the Second String:
Training

Output:
Concatenate String is : IhubTraining

Input:
Enter the First String:
Java
Enter the Second String:
Training

Output:
Concatenate String is : JavaTraining

Q) Write a java program to compare two strings?

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

		//asking inputs
		System.out.println("Enter the First String :");
		String str1=sc.nextLine();

		//asking inputs
		System.out.println("Enter the Second String :");
		String str2=sc.nextLine();

		boolean compare_str=str1.equals(str2);
		if(compare_str)
			System.out.println("Both are equal");
		else
			System.out.println("Both are not equal");
	}
}
```

Input:
Enter the First String:
hi
Enter the Second String:
hi

Output:
Both are equal

Input:

Enter the First String:
hello
Enter the Second String:
HELLO

Output:
Both are not equal

Q) Write a java program to display reverse of a String?

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

		//asking inputs
		System.out.println("Enter the String :");
		String str=sc.nextLine();

		//convert String to char array
		char[] carr=str.toCharArray();

		//reading characters in reverse order
		for(int i=carr.length-1;i>=0;i--)
		{
			System.out.print(carr[i]);
		}
	}
}
```

Input:
Enter the String:
This Is Java

Ouptut:
avaJ sI sihT

Input:

Enter the String:
Ihub Training

Ouptut:
gniniarT buhI

Q) Write a java program to display reverser of a String?

Example:

Input:
This Is Java Class
Output:
Class Java Is This

Example:

Input:
Java Class
Output:
Class Java

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

		//asking inputs
		System.out.println("Enter the String :");
		String str=sc.nextLine();

		//convert String to String array
		String[] sarr=str.split(" ");

		//read  string from array in reverse order
		for(int i=sarr.length-1;i>=0;i--)
		{
```

```
                    System.out.print(sarr[i]+" ");
                }
        }
}
```

Q) Write a java program to display reverse of a sentence in a String?

Example

Input:
Enter the String:
This Is Java Class

Output:
sihT sI avaJ ssalC

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

                //asking inputs
                System.out.println("Enter the String :");
                String str=sc.nextLine();

                //convert String to String array
                String[] sarr=str.split(" ");

                //reading string one by one from array
                for(String s:sarr)
                {
                        //convert each string to char array
                        char[] carr=s.toCharArray();

                        //reading characters in reverse order
```

```
                        for(int i=carr.length-1;i>=0;i--)
                        {
                                System.out.print(carr[i]);
                        }
                        //space after each word
                        System.out.print(" ");
                }
        }
}
```

Q) Write a java program to display reverse of a String?

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

                System.out.println("Enter the String :");
                String str=sc.nextLine();

                StringBuffer sb=new StringBuffer(str);

                System.out.println("Reverse of a string is ="+sb.reverse().toString());
        }
}
```

Input:

Enter the String:
This Is Java Class

Output:

Reverse of a string is = ssalC avaJ sI sihT

Input:

Enter the String:
IHUB

Output:

Reverse of a string is = BUHI

Q) Write a java program to remove duplicate characters from String?

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

		System.out.println("Enter the String :");
		String str=sc.nextLine();

		StringBuffer sb=new StringBuffer();

		str.chars().distinct().forEach(c->sb.append((char)c));
		System.out.println(sb);
	}
}
```

Input:

Enter the String:
Google

Output:
Gogle

Input:

Enter the String

Hello

Output:
Helo

Q) Write a java program to display duplicate characters from String?

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

		System.out.println("Enter the String :");
		String str=sc.nextLine();

		String characters="";
		String duplicates="";

		//reading one by one character from string
		for(int i=0;i<str.length();i++)
		{
			//converting each character to String
			String current=Character.toString(str.charAt(i));

			//checking String is available or not.
			if(characters.contains(current))
			{
				//checking string is not present in duplicates variable
				if(!duplicates.contains(current))
				{
					//add the string
					duplicates+=current;
				}
```

```
                        }
                        characters+=current;
                }
                System.out.println(duplicates);
        }
}
```

Input:
Enter the String:
google

Output:
og

Q) Write an efficient program to test if two given String is a rotation of each other or not,

Ex:
If the given String is "XYZ" and "ZXY" then your function should return true.
But if the input is "XYZ" and "YXZ" then return false.

Example:

Input:
Please enter original string: XYZ
Please enter rotation string: ZXY

Output:
XYZ and ZXY are rotation to each other.

Example:

Input:
Please enter original string: XYZ
Please enter rotation string: ABC

Output:
Sorry, they are not rotation of another.

Example:

Input:

Please enter original string: XYZ
Please enter rotation string: ZYX

Output:
Sorry, they are not rotation of another.

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

		//asking inputes
		System.out.println("Please enter original String");
		String input = sc.nextLine();

		System.out.println("Please enter rotation of String");
		String rotation = sc.nextLine();

		if (checkRotatation(input, rotation))
		{
			System.out.println(input + " and " + rotation + " are rotation of each
			other");
		}
		else
		{
			System.out.println("Sorry, they are not rotation of another");
		}
		sc.close();
	}
	public static boolean checkRotatation(String original, String rotation)
	{
```

```
		if (original.length() != rotation.length())
		{
			return false;
		}
		String concatenated = original + original;

		//checing rotation string in concatenated string
		if (concatenated.indexOf(rotation) != -1)
		{
			return true;
		}
		return false;
	}
}
```

Q) Write an efficient program to print all permutations of a given String in Java/C/Python or any programming language of your choice.

For example
If given input is "123" then your program should print all 6 permutations
e.g. "123", "132", "213", "231", "312" and "321".

```
public class Test
 {
	public static void main(String args[])
	{
		permutation("123");
	}

	public static void permutation(String input)
	{
		permutation("", input);
	}
	private static void permutation(String perm, String word)
	{
		if (word.isEmpty())
		{
			System.err.println(perm + word);
		}
		else
		{
```

```
                    for (int i = 0; i<word.length(); i++)
                    {
                        permutation(perm + word.charAt(i),
                        word.substring(0, i) + word.substring(i + 1, word.length()));
                    }
                }
        }
}
```

Q) Write a java program to find out duplicate occurrence in a given String?

Example

Input:
I am am Learning java java

Output:
I=1 , am=2, Learning=1, java=2

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                findDuplicatesWords("I am am Learning java java");
        }

        public static void findDuplicatesWords(String str)
        {
                LinkedHashMap<String,Integer> lhm=new LinkedHashMap<String,Integer>();

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

                for(String tempString: s)
```

```
                {
                        if(lhm.get(tempString)!=null)
                        {
                                lhm.put(tempString,lhm.get(tempString)+1);
                        }
                        else
                        {
                                lhm.put(tempString,1);
                        }
                }
                System.out.println(lhm);
        }
}
```

Q) Write a java program to find out number of characters occurrence in String?

Example

Input:
java

Output:
J=1, a=2, v=1

```
import java.util.*;
class Test
{
        public static void main(String[] args)
        {
                findDuplicatesCharacters("java");
        }

        public static void findDuplicatesCharacters(String str)
        {
        LinkedHashMap<Character,Integer> lhm=new LinkedHashMap<Character,Integer>();

                for(int i=0;i<str.length();i++)
                {
```

```
                        char c=str.charAt(i);
                        if(lhm.get(c)!=null)
                        {
                                lhm.put(c,lhm.get(c)+1);
                        }
                        else
                        {
                                lhm.put(c,1);
                        }
                }
                System.out.println(lhm);
        }
}
```

Q) Write a java program to check given string is well formed/Balanced or not?

Example:

Input:
([{}])

Output:
Balanced

```
import java.util.*;
public class Test
{
        public static void main(String[] args)
        {
                String expr = "([{}])";

                // Function call
                if (areBracketsBalanced(expr))
                        System.out.println("Balanced ");
                else
                        System.out.println("Not Balanced ");
        }
```

```
// function to check if brackets are balanced
static boolean areBracketsBalanced(String expr)
{
	// Using ArrayDeque is faster than using Stack class
	Deque<Character> stack= new ArrayDeque<Character>();

	// Traversing the Expression
	for (int i = 0; i < expr.length(); i++)
	{
		char x = expr.charAt(i);

		if (x == '(' || x == '[' || x == '{')
		{
			// Push the element in the stack
			stack.push(x);
		}



		// If stack is empty
		if (stack.isEmpty())
		{
				return false;
		}

		char check;
		switch (x)
		{
		case ')':
					check = stack.pop();
					if (check == '{' || check == '[')
						return false;
					break;

		case '}':
					check = stack.pop();
					if (check == '(' || check == '[')
						return false;
					break;

		case ']':
					check = stack.pop();
```

```
                                        if (check == '(' || check == '{')
                                                return false;
                                        break;
                        }
                }
                // Check Empty Stack
                return (stack.isEmpty());
        }
}
```

Example:

Input:
([{}])

Output:
Not Balanced