Assignment 1

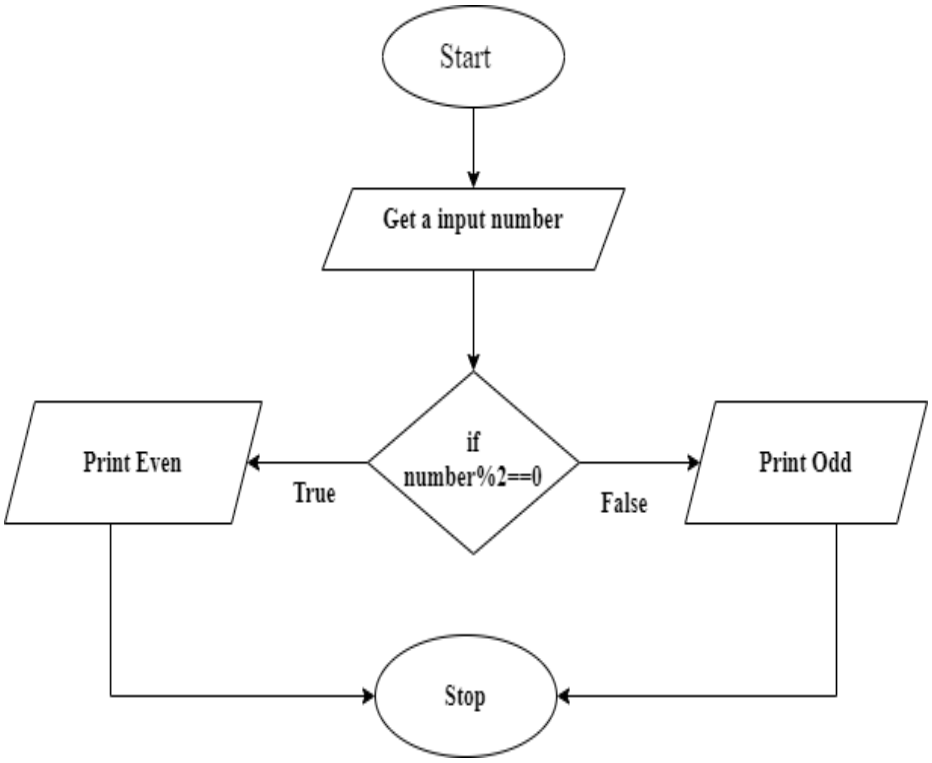
Q.1) Check no is even or odd.

Ans:-

Algorithm-

1) Start
2) Get a input number
3) Check whether it is odd or even using num%2==0
4) If true, print even number. Else, print odd number
5) Stop

Flowchart:-



Program :

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

```
        Scanner sc = new Scanner(System.in);
        System.out.print(" Enter any Numbers to check : ");
        int num = sc.nextInt();
        if(num%2 == 0)
        {
            System.out.println(" Given number "+num+" is Even");
        }
        else
        {
            System.out.println(" Given number "+num+" is Odd");
        }
    }
}
```

Output:-

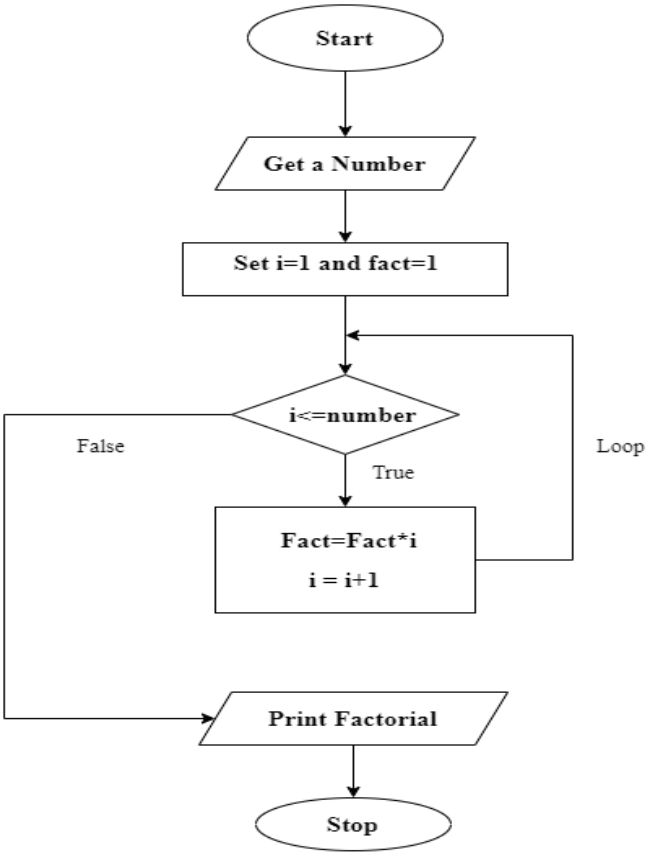
```
E:\cdac\assignments>javac EvenOdd.java
E:\cdac\assignments>java EvenOdd
 Enter any Numbers to check : 34
 Given number 34 is Even

E:\cdac\assignments>java EvenOdd
 Enter any Numbers to check : 33
 Given number 33 is Odd
```

Q.2) Factorial of given number.

Ans- **Algorithm**:-

1) Start
2) Declare variable num, fact=1, i=1
3) Get a input number
4) Repeat until i<=num
   Fact=fact*i
   i++
5) Print factorial
6) Stop

Flowchart:-



Program :

```
import java.util.Scanner;

class Factorial
```

```
{
        public static void main(String args[])
        {
                Scanner sc = new Scanner(System.in);
                System.out.print(" Enter any Numbers to get Factorial : ");
                int num = sc.nextInt();
                int fact=1;
                int i;
                for(i=1;i<=num;i++)
                {
                        fact=fact*i;
                }
                System.out.println("Factorial of "+num+" is "+fact);
        }
}
```

Output:-

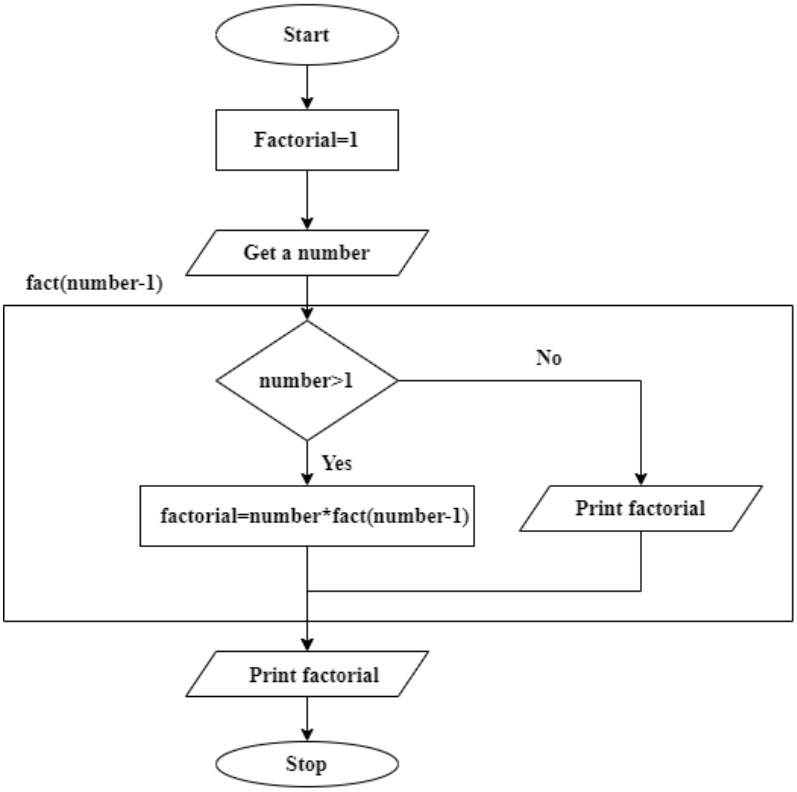
```
E:\cdac\assignments>javac Factorial.java
E:\cdac\assignments>java Factorial
 Enter any Numbers to get Factorial : 5
Factorial of 5 is 120

E:\cdac\assignments>java Factorial
 Enter any Numbers to get Factorial : 4
Factorial of 4 is 24
```

Q.3) Factorial using recursion

Ans: **Algorithm-**

1) Start
2) Declare varible fact=1
3) Get a number from user
4) Call method facto(number) recursively until value of number>1
5) Print factorial
6) Stop

Flowchart:



Program:-

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

```
	{
		Scanner sc = new Scanner(System.in);
		System.out.print("Enter a number for factorial = ");
		int num=sc.nextInt();
		long fact = facto(num);
		System.out.println(" Factorial of " + num + " = " + fact);
	}
	public static long facto(int num)
	{
		if (num > 1)
			return num * facto(num-1);
		else
			return 1;
	}
}
```

Output:-

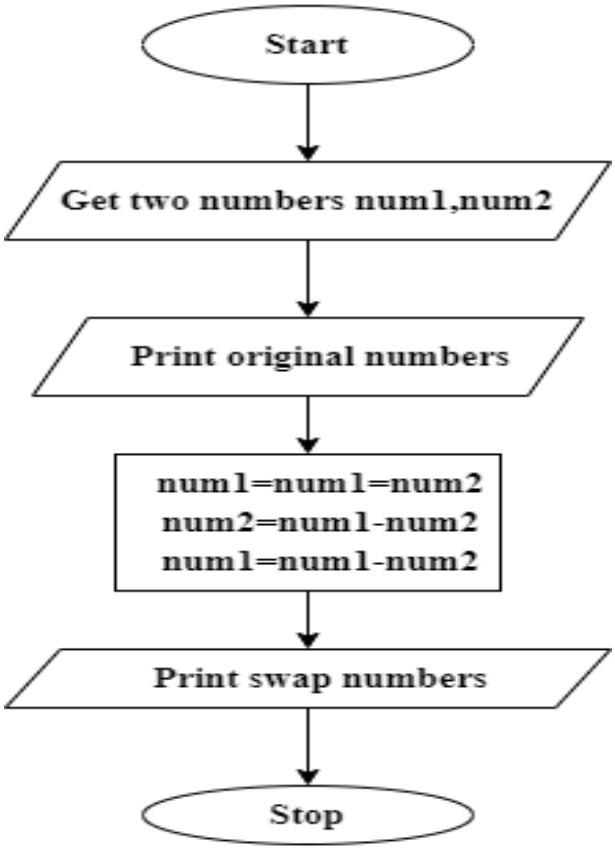
```
E:\cdac\assignments>javac FactRec.java
E:\cdac\assignments>java FactRec
Enter a number for factorial = 3
 Factorial of 3 = 6

E:\cdac\assignments>java FactRec
Enter a number for factorial = 5
 Factorial of 5 = 120
```

Q.4) Swap two numbers without using third variable.

Ans: **Algorithm**:-

1) Start
2) Get two numbers num1,num2
3) Print unswap numbers
   Num1=num1+num2
   Num2=num1-num2
   Num1=num1-num2
4) Print swap numbers
5) Stop

Flowchart:-



Program:

```
import java.util.Scanner;
class SwapTwo
{
	public static void main(String args[])
	{
		Scanner sc = new Scanner(System.in);
		System.out.println(" Enter two numbers to swap : ");
		int a = sc.nextInt();
		int b = sc.nextInt();
		System.out.println(" Before Swapping a = "+a+" b = "+b);
		a = a + b;
		b = a - b;
		a = a - b;
		System.out.println(" After Swapping a = "+a+" b = "+b);
	}
}
```

Output:-

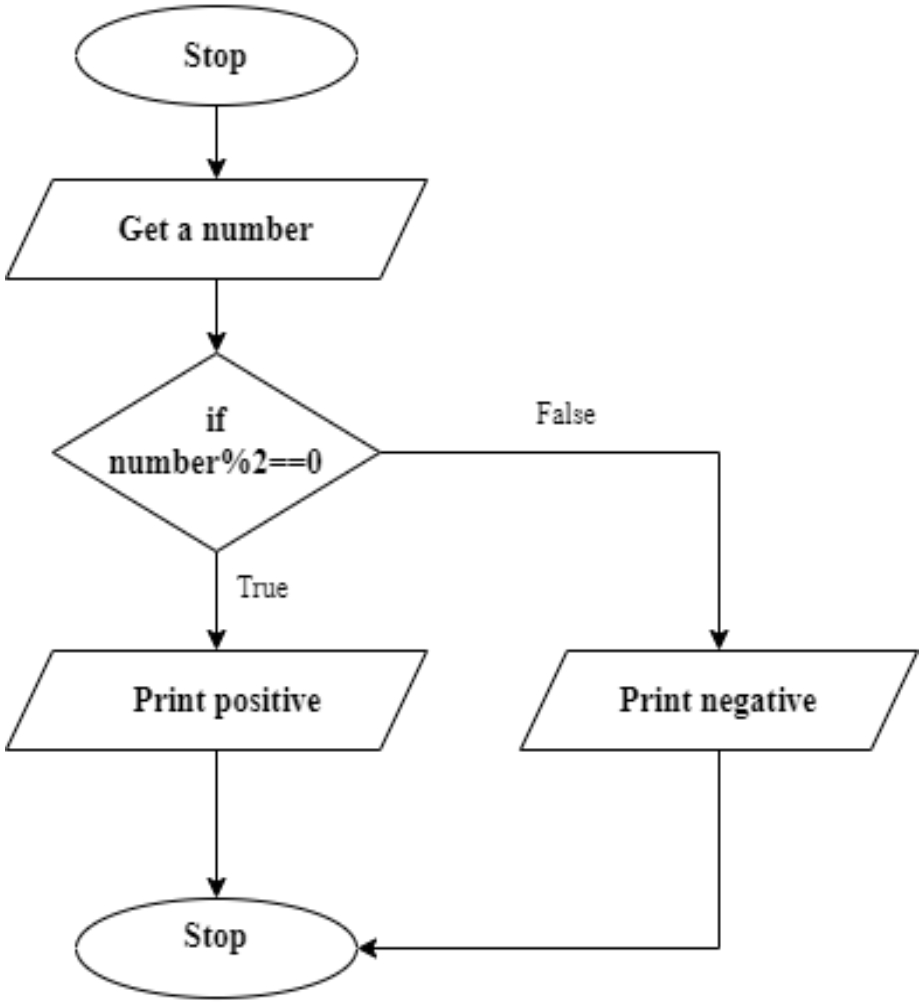
```
E:\cdac\assignments>javac SwapTwo.java
E:\cdac\assignments>java SwapTwo
 Enter two numbers to swap : 34 65
 Before Swapping a = 34 b = 65
 After Swapping a = 65 b = 34
```

Q.5) Check given numbers whether it is positive or negative

Ans: **Algorithm**:

1) Stop
2) Get a number
3) Check number%2==0
   If true, print positive
   Else print negative
4) Stop

Flowchart:



Program:

```
import java.util.Scanner;
class Positive
{
	public static void main(String args[])
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter any Numbers to check : ");
		int num = sc.nextInt();
		if(num > 0)
			System.out.println(" Given number "+num+" is Positive");
		else
			System.out.println(" Given number "+num+" is Negative");
	}
}
```

Output:-

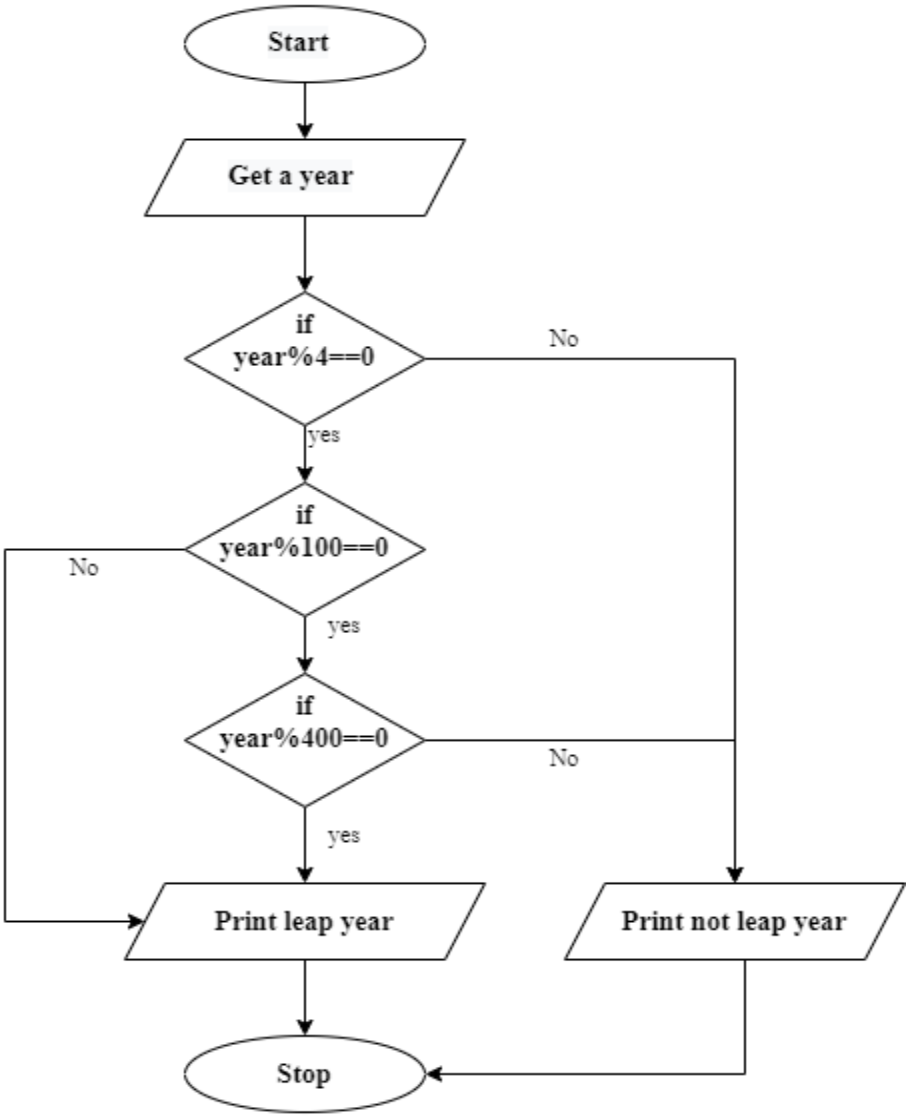
```
E:\cdac\assignments>javac Positive.java
E:\cdac\assignments>java Positive
 Enter any Numbers to check : 45
 Given number 45 is Positive

E:\cdac\assignments>java Positive
 Enter any Numbers to check : -56
 Given number -56 is Negative
```

Q.6) Leap year

Ans: **Algorithm**:-

1. Start
2. Get a input year
3. Check year divible by 4, if true go to step 4. else Go to step 7
4. Check year divisible by 100, if true go to step 5, else go to step 6
5. Check year divisible by 400, if true go to step 6, else go to step 7
6. Print leap year
7. Print not leap year
8. Stop

Flowchart:-



Program:-

```
import java.util.Scanner;
class Leap
{
	public static void main(String args[])
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter any year to check : ");
		int yr = sc.nextInt();
		if (((yr % 4 == 0) && (yr % 100!= 0)) || (yr%400 == 0))
			System.out.println(yr+" year is a leap year");
		else
			System.out.println(yr+" year is not a leap year");
	}
}
```

Output:-

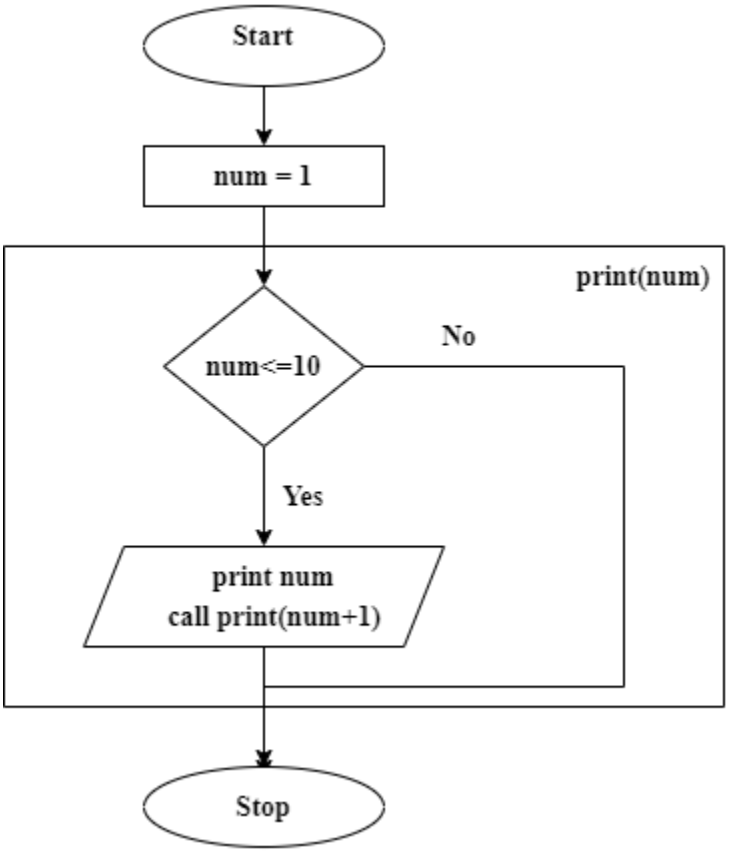
```
E:\cdac\assignments>java Leap
 Enter any year to check : 2020
2020 year is a leap year

E:\cdac\assignments>java Leap
 Enter any year to check : 2022
2022 year is not a leap year
```

Q.7) Print 1 to 10 without loop

Ans: **Algorithm**:-

1. Start
2. Call print metho
3. Define a method print
    a. Check num<=10 if true print and
    recursively call print method with num-1, else exit
4. Stop

Flowchart:-



Program:

```
public class Print1to10
{
	public static void main(String[] args)
	{
		printNum(1);
	}
	public static void printNum(int num)
	{
		if (num <= 10)
		{
		System.out.println(num);
		printNum(num+1);
		}
	}
}
```

Output:-

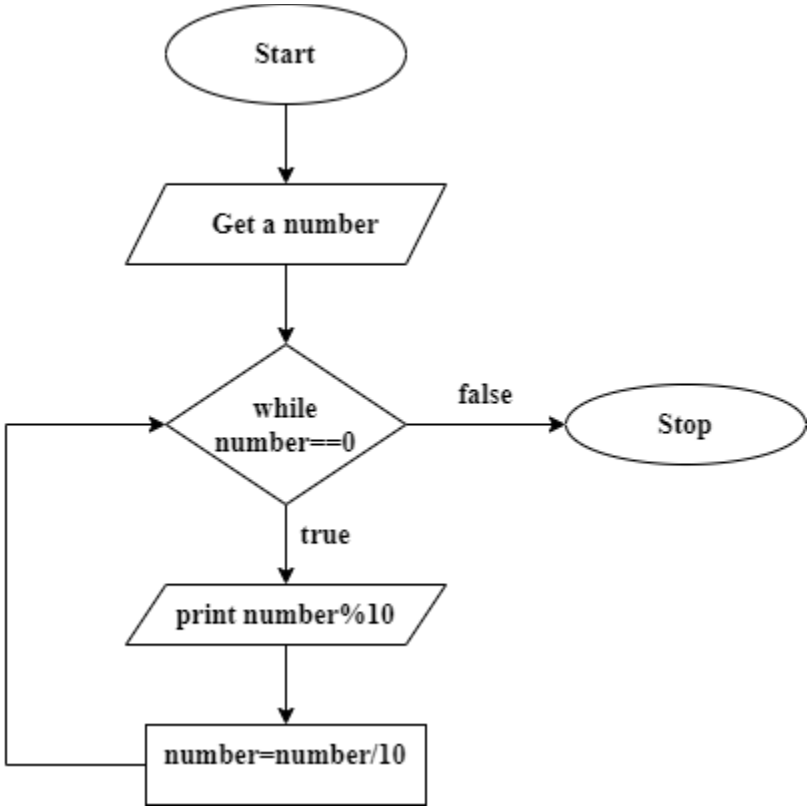
```
E:\cdac\assignments>javac Print1to10.java
E:\cdac\assignments>java Print1to10
1   2   3   4   5   6   7   8   9   10
```

Q.8) Print the digit of given number.

Ans: **Algorithm-**

1) Start
2) Get a number
3) Print the the value of number%10
4) Number=number/10;
5) Repeat step 3 to 4 until number is not equal to zero
6) Stop

Flowchart:-



Program:-

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

		Scanner sc = new Scanner(System.in);
		System.out.println(" Enter any number ");
		int num = sc.nextInt();
		while(num!=0)
		{
			System.out.println(num%10);
			num=num/10;
		}
	}
}
```

Output:-

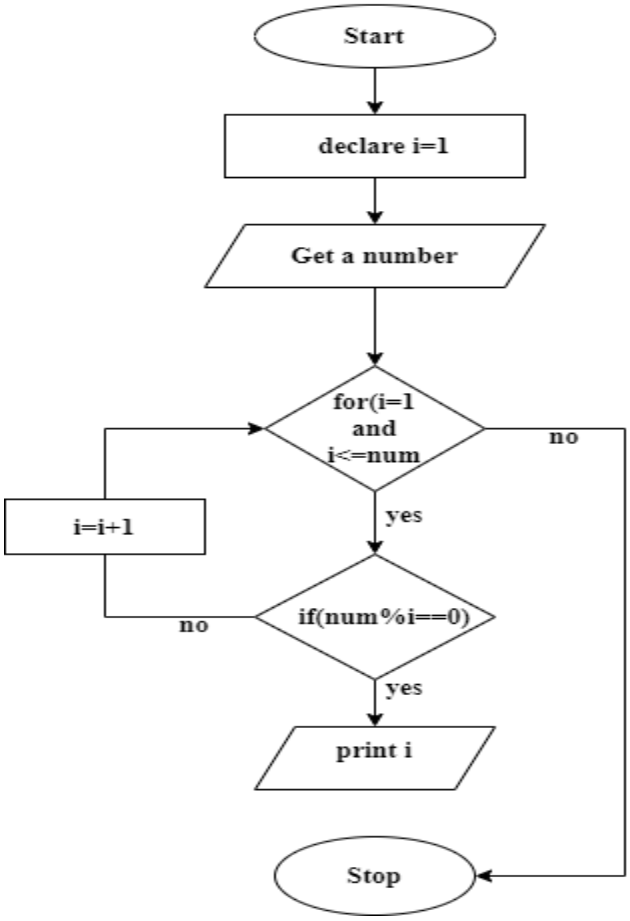
```
E:\cdac\assignments>javac Digit.java

E:\cdac\assignments>java Digit
 Enter any number = 2356
 Digits of number are = 6  5  3  2
```

Q.9) Factor of given number

Ans: **Algorithm-**

1) Start
2) Get a number
3) Declare i=1
4) Check number%i==0 if true print i and increment the valur of i
5) Repeat step 4 until i<=number
6) Stop

Flowchart:-



Program:-

import java.util.*;

public class Factor

```
{
	public static void main(String[] args)
	{
		System.out.print("Enter a number to get factors = ");
		Scanner sc=new Scanner(System.in);
		int num = sc.nextInt();
		System.out.print(" Factors of " + num + " are: ");
		for (int i = 1; i <= num; ++i)
		{
			if(num % i == 0)
			{
				System.out.print(i + " ");
			}
		}
	}
}
```

Output:-

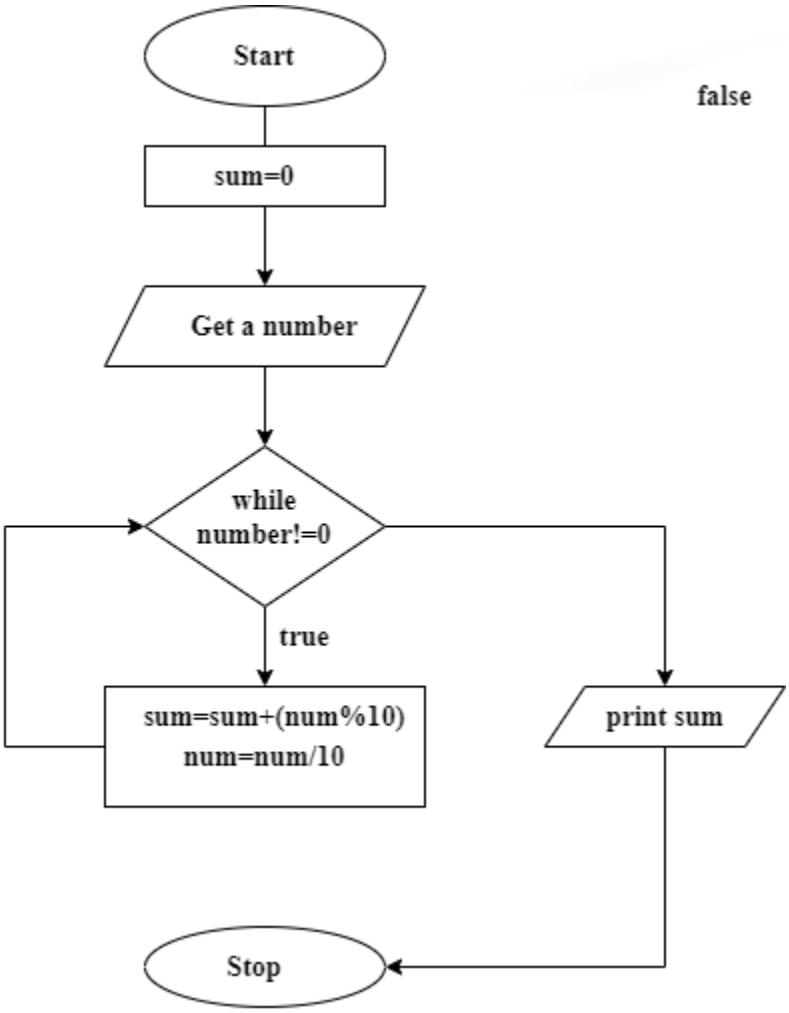
```
E:\cdac\assignments>javac Factor.java
E:\cdac\assignments>java Factor
Enter a number to get factors = 45
 Factors of 45 are: 1 3 5 9 15 45
```

Q.10) Sum of digit of given number

Ans: **Algorithm**:-

1) Start
2) Get a number
3) Set sum=1
4) While(number!=0)
   Sum=sum+(number%10)
   Num=num/10
5) Print sum
6) Stop

Flowchart:-



Program:-

```
import java.util.Scanner;
class DigitSum
{
	public static void main(String args[])
	{
		Scanner sc = new Scanner(System.in);
		System.out.println(" Enter any number ");
		int num = sc.nextInt();
		int sum=0;
		while(num!=0)
		{
			sum=sum+(num%10);
			num=num/10;
		}
		System.out.println(" sum = "+sum);
	}
}
```

Output:-

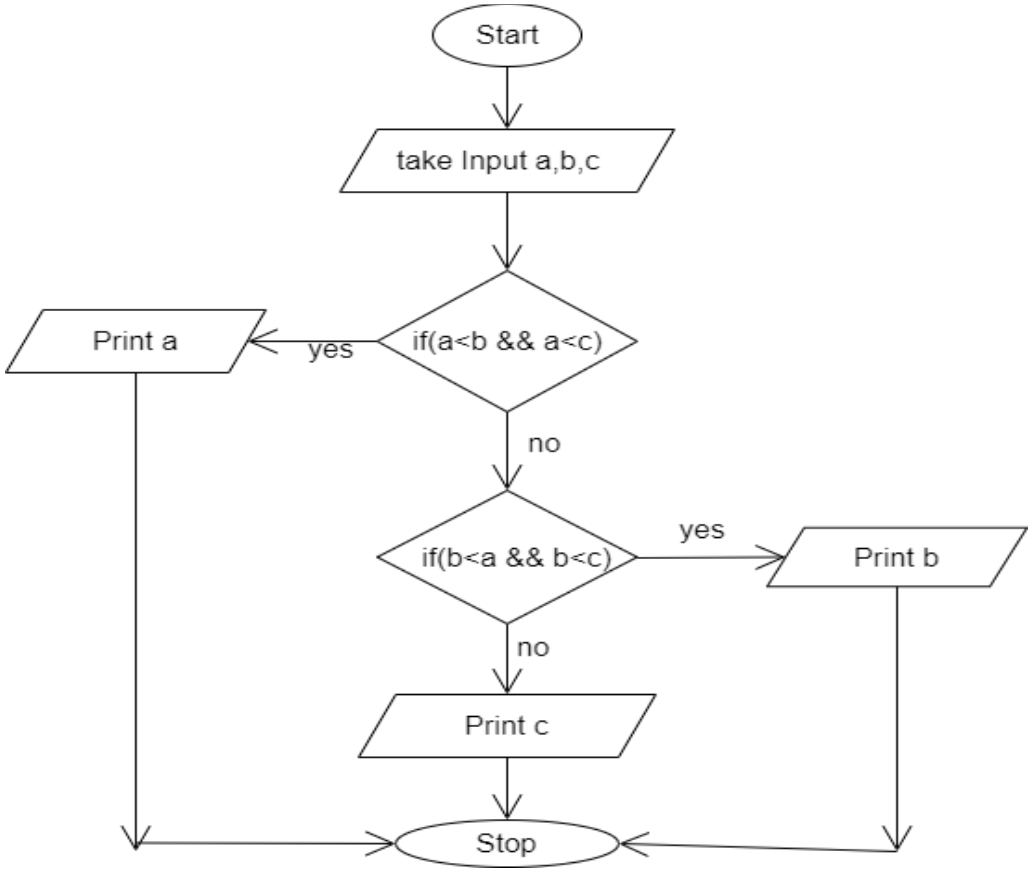
```
E:\cdac\assignments>javac DigitSum.java
E:\cdac\assignments>java DigitSum
 Enter any number =5346
 sum = 18
```

Q.11) Smallest of three numbers

Ans: **Algorithm**:-

1. Start
2. Get three numbers from user
3. Check if a<b and a<c, if true print a and exit else go to step 4
4. Check if b<a and b<c, if true print b and exit else go to step 5
5. Print c
6. Stop

Flowchart:-



Program:-

```
import java.util.Scanner;

class SmallThree

{
```

```
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter Three Numbers to check Smallest : ");
		int a = sc.nextInt();
		int b = sc.nextInt();
		int c = sc.nextInt();
		if(a<b && a<c)
		{
			System.out.println(a+" is the smallest number");
		}else
		if(b<a && b<c)
			System.out.println(b+" is the smallest number");
		else
			System.out.println(c+" is the smallest number");
	}
}
```

Output:-

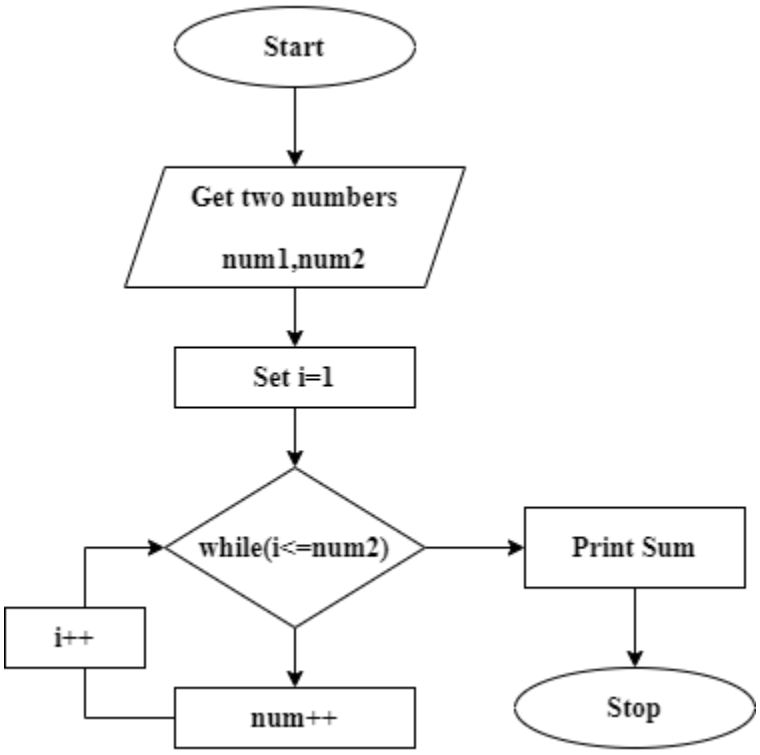
```
E:\cdac\assignments>javac SmallThree.java
E:\cdac\assignments>java SmallThree
 Enter Three Numbers to check Smallest : 23 12 44
12 is the smallest number
```

Q.12) Addition without arithmetic operator

Ans: **Algorithm:-**

1. Start
2. Get two number
3. Call addNum(num1,num2) method
4. For(i=1;i<=num2;i++)
    a. Num1++
5. Print Sum
6. Stop

Flowchart:-



Program:-

```
import java.util.Scanner;
class Add
{
```

```
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter first number = ");
		int num1 = sc.nextInt();
		System.out.print(" Enter second number = ");
		int num2 = sc.nextInt();
		int sum=addNum(num1,num2);
		System.out.println("Sum of "+num1+" and "+num2+" = "+sum);
	}
	public static int addNum(int a, int b)
	{
		for(int i = 1; i <= b; i++)
			a++;
		return a;
	}
}
```

Output:-

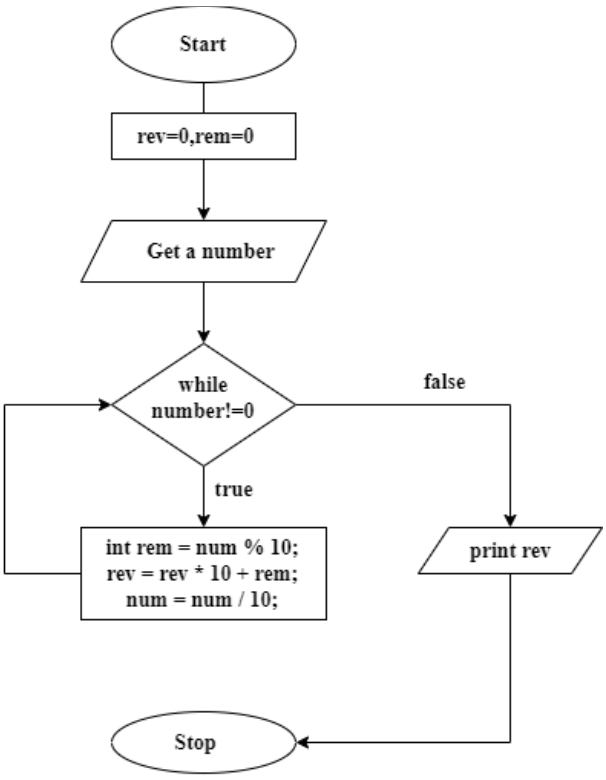
```
E:\cdac\assignments>javac Add.java
E:\cdac\assignments>java Add
 Enter first number = 12
 Enter second number = 23
Sum of 12 and 23 = 35
```

Q.13) Reverse a given number

Ans: **Algorithm-**

1) Start
2) Get a number
3) Set rem=0, rev=0
4) While(number!=0)
    a. int rem = num % 10
    b. rev = rev * 10 + rem
    c. num = num / 10
5) Print rev
6) Stop

Flowchart:-



Program:-

```
import java.util.Scanner;

class NumRev
```

```
{
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter any number to get reverse = ");
		int num = sc.nextInt();
		int rev=0;
		System.out.println(" Original Number: " + num);
		while(num != 0)
		{
			int rem = num % 10;
			rev = rev * 10 + rem;
			num = num / 10;
		}
		System.out.println(" Reversed Number: " + rev);
	}
}
```

Output:-

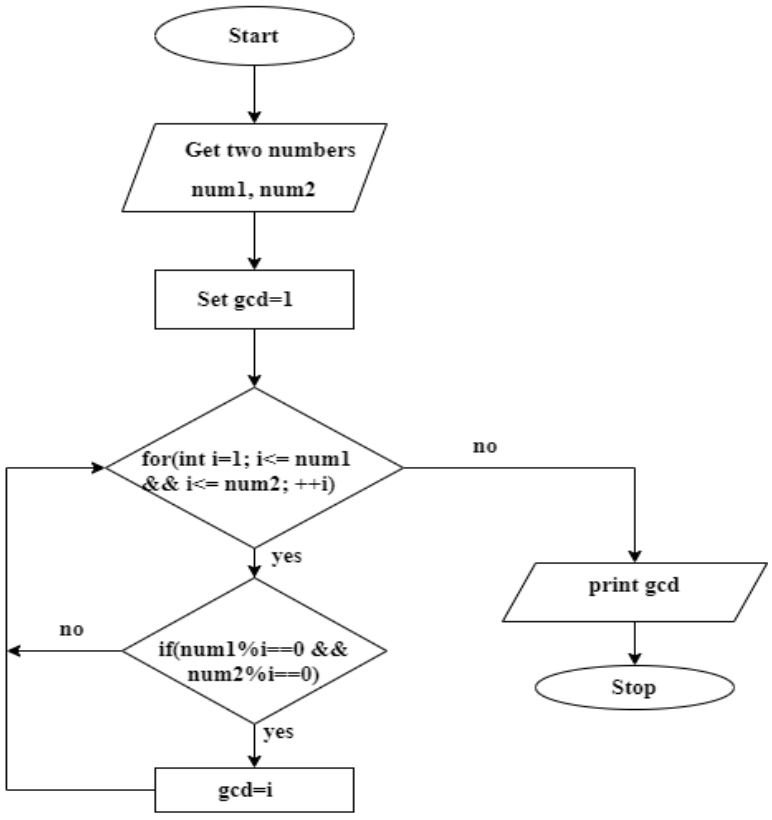
```
E:\cdac\assignments>javac NumRev.java
E:\cdac\assignments>java NumRev
 Enter any number to get reverse = 5645
 Original Number: 5645
 Reversed Number: 5465
```

Q.14) GCD of two number

Ans: **Algorithm**:-

1) Start
2) Get two number num1,num2
3) Set gcd=1
4) for(int i=1; i<= num1 && i<= num2; ++i)
   if(num1%i==0 && num2%i==0)
   set gcd=i
5) Print GCD
6) Stop

Flowchart:-



Program:-

```
import java.util.Scanner;

class Gcd
```

```
{
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter first number = ");
		int num1 = sc.nextInt();
		System.out.print(" Enter second number = ");
		int num2 = sc.nextInt();
		int gcd = 1;
		for(int i=1; i<= num1 && i<= num2; ++i)
		{
			if(num1%i==0 && num2%i==0)
			gcd = i;
		}
		System.out.println(" GCD of " + num1 +" and " + num2 + " = " + gcd);
	}
}
```

Output:-

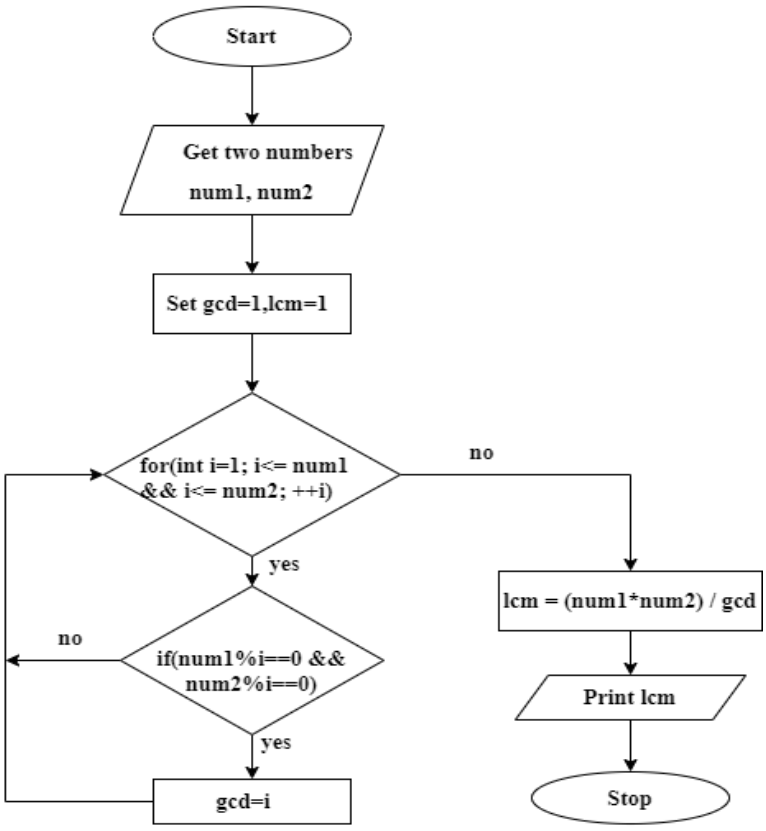
```
E:\cdac\assignments>java Gcd
 Enter first number = 45
 Enter second number = 18
 GCD of 45 and 18 = 9
```

Q.15) LCM of two numbers

Ans: **Algorithm**:-

1) Start
2) Get two number num1,num2
3) Set gcd=1
4) for(int i=1; i<= num1 && i<= num2; ++i)
   if(num1%i==0 && num2%i==0)
   set gcd=i
5) lcm=(num1*num2)/gcd
6) print LCM
7) Stop

Flowchart:-



Program:-

import java.util.Scanner;

```
class Lcm
{
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter first number = ");
		int num1 = sc.nextInt();
		System.out.print(" Enter second number = ");
		int num2 = sc.nextInt();
		int gcd = 1;
		for(int i=1; i<= num1 && i<= num2; ++i)
		{
			if(num1%i==0 && num2%i==0)
			gcd = i;
		}
		int lcm = (num1*num2) / gcd;
		System.out.println("The LCM of "+num1+" and "+num2+" is "+lcm);
	}
}
```

Output:-

```
E:\cdac\assignments>java Lcm
 Enter first number = 45
 Enter second number = 18
The LCM of 45 and 18 is 90
```

Q.17) Check Palindrome number or not.

Ans: **Algorithm**:-

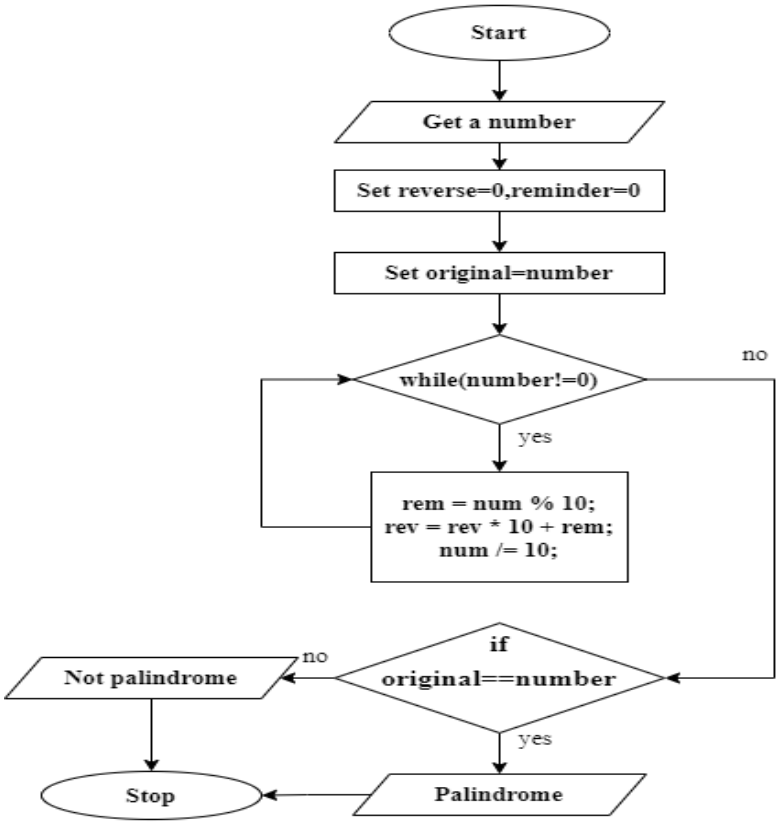
1) Start
2) Get a number
3) Set reverse=0 and reminder=0
4) Set original=number
5) Check number!=0 if true go to 5 else goto 7
6) rem = num % 10;

   rev = rev * 10 + rem;

   num /= 10;

7) check if original==number if true print palindrome else print not palindrome
8) stop

Flowchart:-



Program:-

```
import java.util.Scanner;
class Palindrome
{
	public static void main(String[] args)
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter any number = ");
		int num = sc.nextInt();
		int rev = 0, rem;
		int original = num;
		while (num != 0)
		{
			rem = num % 10;
			rev = rev * 10 + rem;
			num /= 10;
		}
		if (original == rev)
		{
			System.out.println(original + " is Palindrome.");
		}
		else
		{
			System.out.println(original + " is not Palindrome.");
		}
```

```
        }
}
```

Output:-

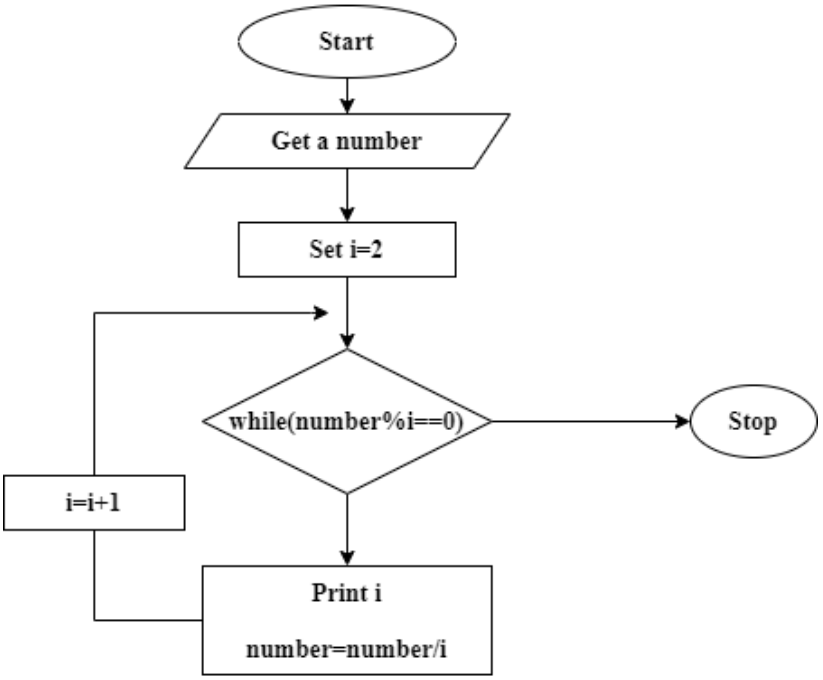
```
E:\cdac\assignments>java Palindrome
 Enter any number = 12321
12321 is Palindrome.

E:\cdac\assignments>java Palindrome
 Enter any number = 3456
3456 is not Palindrome.
```

Q.18) Prime Factor of given number

Ans: **Algorithm**:-

1. Start
2. Enter the Number.
3. Take i=2.
4. Check the Input Number is greater than Then enter in loop.
    a. while(Number is greater than 1)
    b. Check the condn if(Number%i==0)
    c. if it is true enter in bracket.
    d. print(i) value on terminal
    e. Number=Number/I else i++ then loop will iteration again
5. Stop

Flowchart-



Program:-

```
import java.util.Scanner;

public class PrimeFactor

{
```

```
	public static void main(String args[])
	{
		int number;
		Scanner sc = new Scanner(System.in);
		System.out.print("Enter a number =");
		number = sc.nextInt();
		for(int i = 2; i<=number; i++)
		{
			while(number%i == 0)
			{
				System.out.println(i+" ");
				number = number/i;
			}
		}
	}
}
```

Output:-

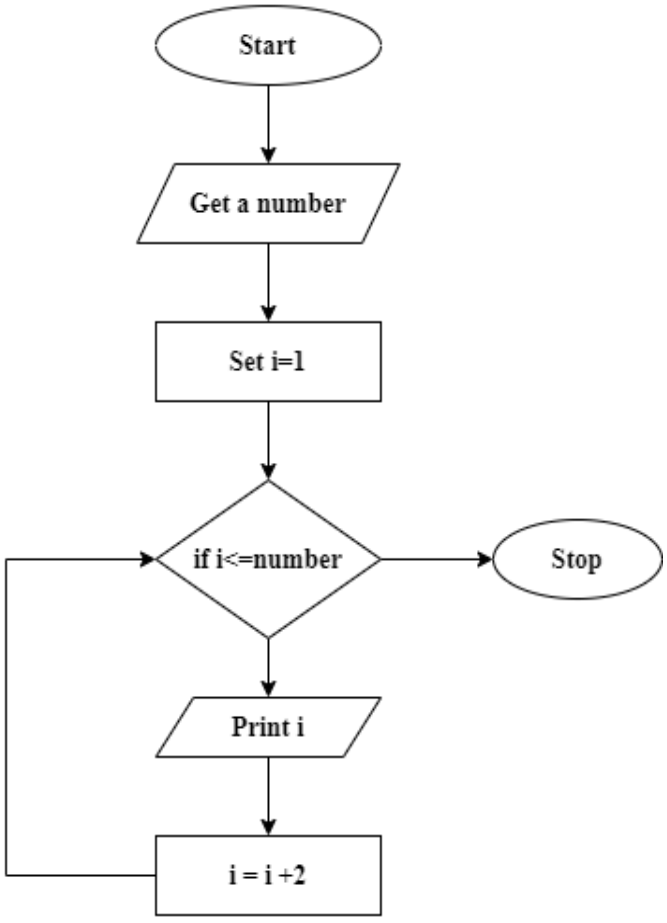
```
E:\cdac\assignments>java PrimeFactor
Enter a number =30
2  3  5
E:\cdac\assignments>java PrimeFactor
Enter a number =28
2  2  7
```

Q.19) Even series

Ans: **Algorithm**:-

1. Start
2. Get a number from user upto which they want to print even number
3. Set i=2
4. If i<=number, print i and i=i+2. Else go to step 6
5. Repeat step 4 until i<=number
6. Stop

Flowchart:-



Program :-

```
import java.util.Scanner;

class EvenSeries
```

```
{
	public static void main(String args[])
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter Numbers upto which you want to print even no : ");
		int num = sc.nextInt();
		for(int i=2; i<=num; i=i+2)
		{
			if(i%2 == 0)
			{
				System.out.println(i);
			}
		}
	}
}
```

Output:-

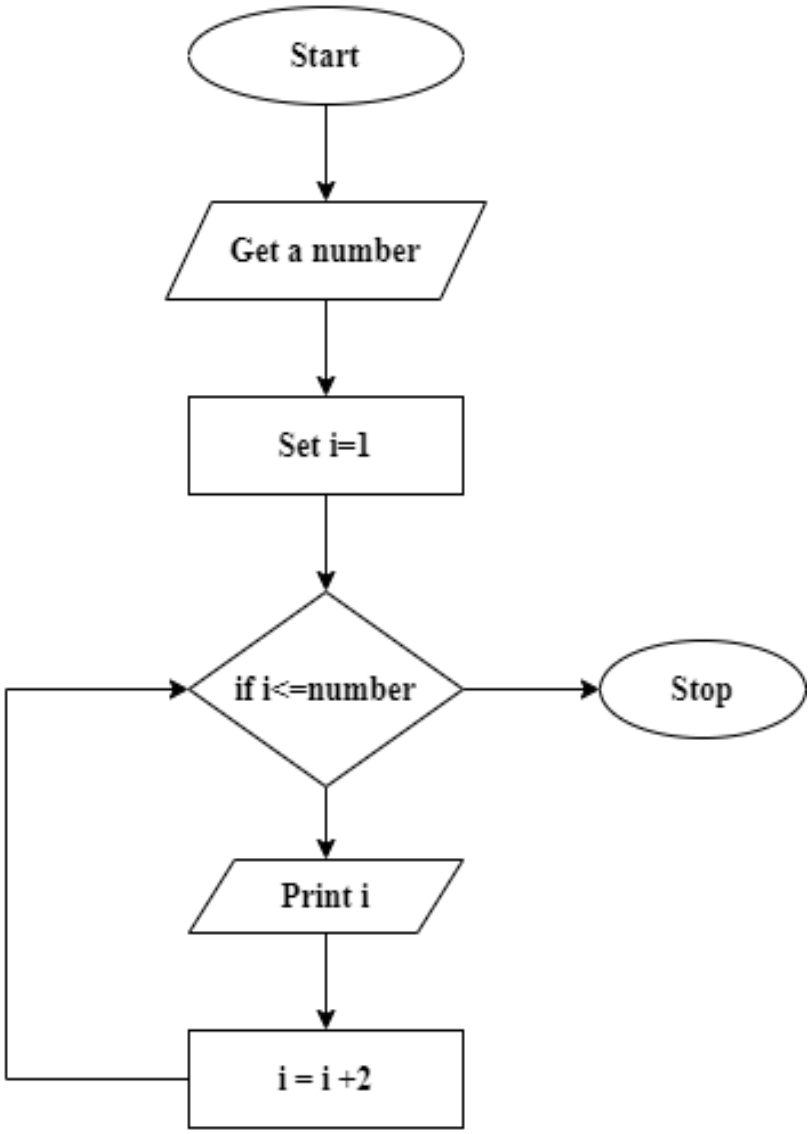
```
E:\cdac\assignments>javac EvenSeries.java
E:\cdac\assignments>java EvenSeries
 Enter Numbers upto which you want to print even no : 15
2  4  6  8  10  12  14
```

Q.20) odd series

Ans: **Algorithm**:-

1. Start
2. Get a number from user upto which they want to print even number
3. Set i=1
4. If i<=number, print i and i=i+2. Else go to step 6
5. Repeat step 4 until i<=number
6. Stop

Flowchart:-



Program :-

```
import java.util.Scanner;
class OddSeries
{
	public static void main(String args[])
	{
		Scanner sc = new Scanner(System.in);
		System.out.print(" Enter Numbers upto which you want to print even no : ");
		int num = sc.nextInt();
		for(int i=1; i<=num; i++ )
		{
			if(i%2 != 0)
			{
				System.out.println(i);
			}
		}
	}
}
```

Output:-

```
E:\cdac\assignments>javac OddSeries.java
E:\cdac\assignments>java OddSeries
 Enter Numbers upto which you want to print even no : 15
s1  3  5  7  9  11  13  15
```