Algorithms and Flowcharts Section 5

Created by: Rehab Mohamed

Task 1

Find Even numbers between 1 to 50

Algorithm

Step-1   Start

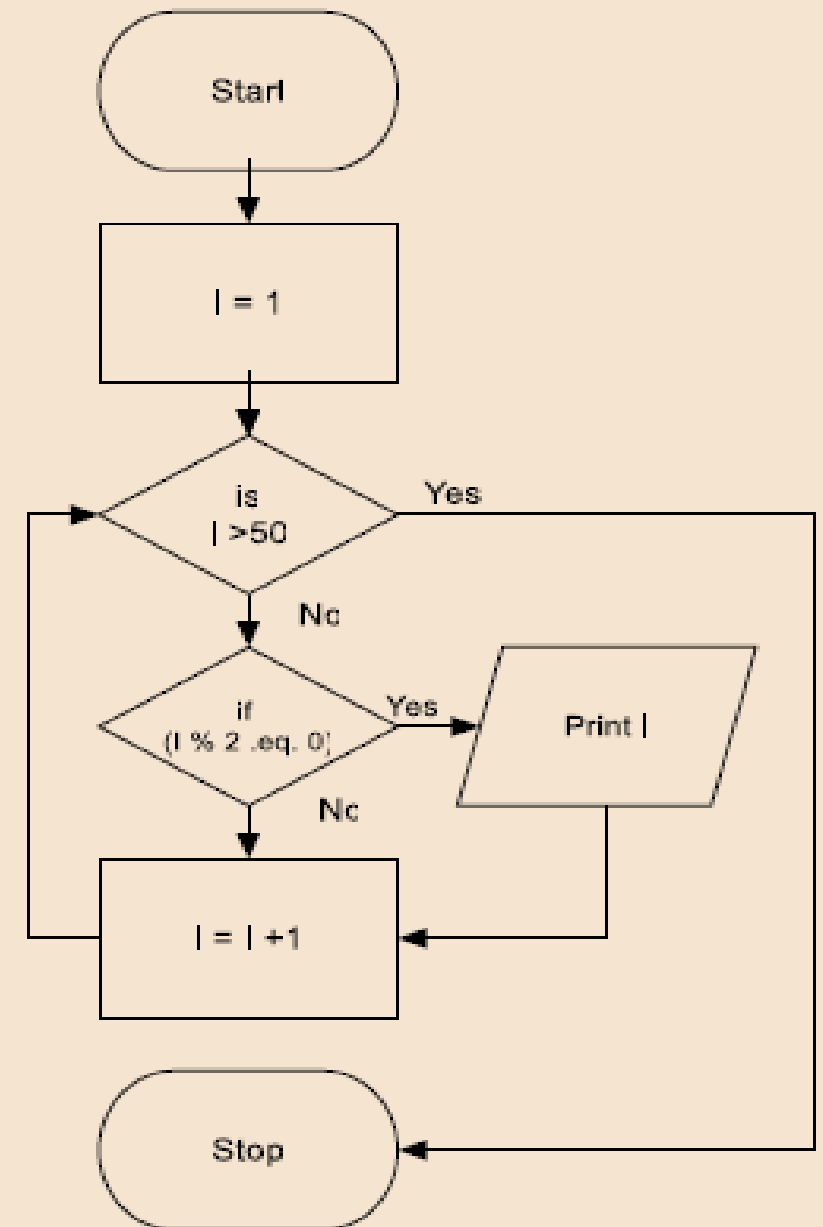Step-2   I = 1

Step-3   IF (I >50) THEN

      GO TO Step-7

    ENDIF

Step-4   IF ((I % 2) =0) THEN

    Display I

   ENDIF

Step-5   I = I + 1

Step-6   GO TO Step--3

Step-7   Stop

Task 2

حساب المعدل التراكمي GPA للطالب يتم بالتالي:

إذا كان التقدير (grade = A) زاد GPA بمقدار 0.9

إذا كان التقدير (grade = B) زاد GPA بمقدار 0.7

إذا كان التقدير (grade = C) زاد GPA بمقدار 0.5

إذا كان التقدير (grade = F) زاد GPA بمقدار 0.0

أوجد المخطط الانسيابي (flowchart) بالإضافة إلى كود الشفرة (Pseudo code) لخوارزم يقوم بحساب المعدل التراكمي GPA للطالب في مادة معينه. إذا تم إدخال تقدير (GPA) خاطئ فان الخوارزم ينتهي مع طباعة رسالة "You typed wrong grade" . الخوارزم يطبع قيمه كل من grade and GPA . يمكن اعتبار وجود قيمه أوليه (GPA = 2.5)

Pseudo code

```
Variable GPA=2.5 : real
Variable grade: character
Begin
Read (grade)
Switch (grade)
        case: 'A'

                GPA = GPA + 0.9

        Break
        case: 'B'
                GPA = GPA + 0.7

        Break
case: 'C'

                GPA = GPA + 0.5

        Break
        case: 'F'

                GPA = GPA + 0.0

        Break
        Default
                Write ("You Typed Wrong Grade ")
                Exit
Switch-end
Write (grade, GPA)
End
```
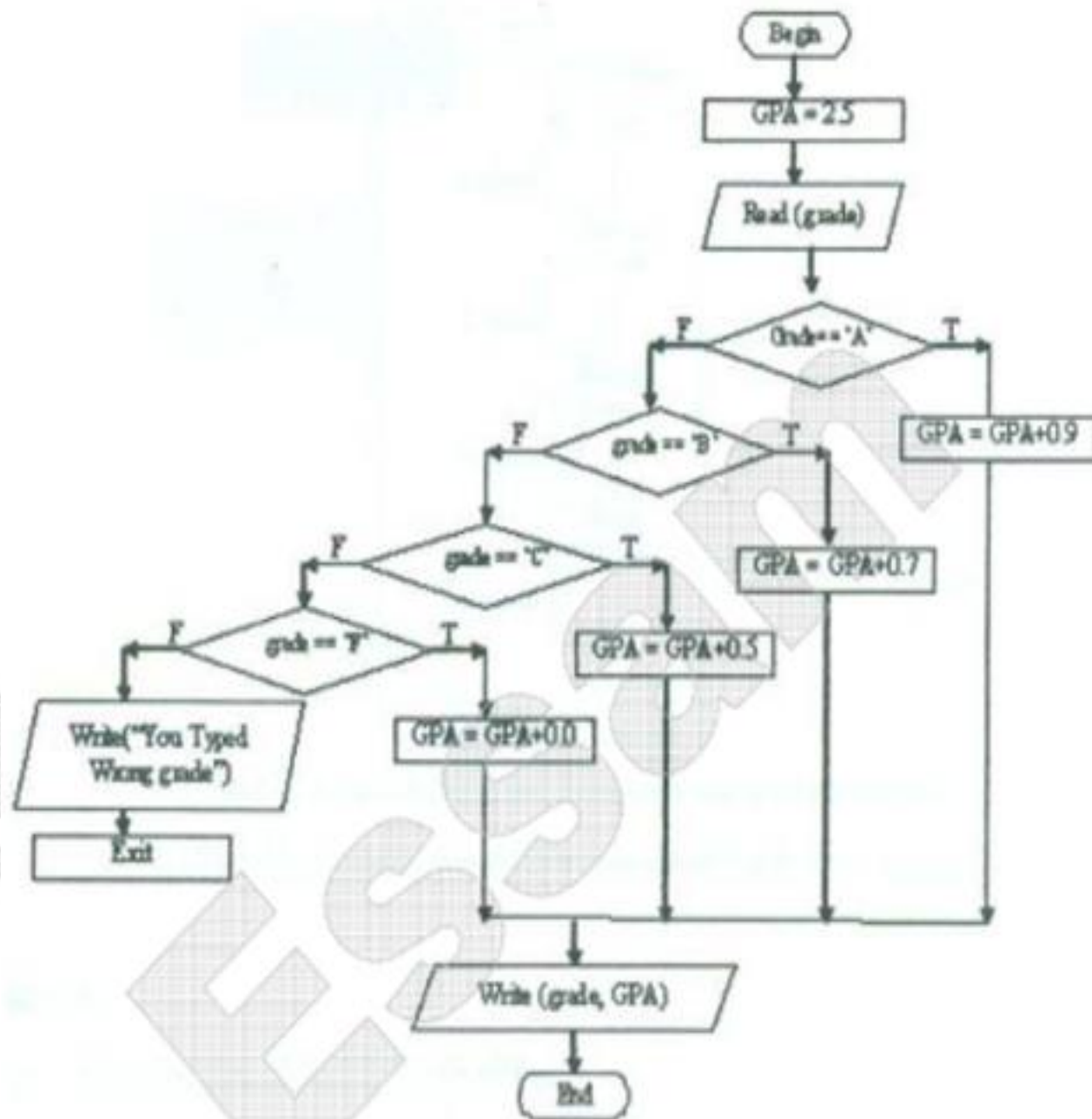
باستخدام While structure أوجد Pseudo code لخوارزم يقوم بطباعة الأعداد من 1 إلى 100

```
Variable Num=1 : integer
Begin
While (Num <=100)
        Write (Num)
        Num = Num + 1
While-end
End
```

Algorithm & Flowchart to find Odd numbers between 1 to 100

ALGORITHM :

Step 1: Start

Step 2: Declare variable N as integer type

Step 3: Set N = 1

Step 4: while (N <= 100)

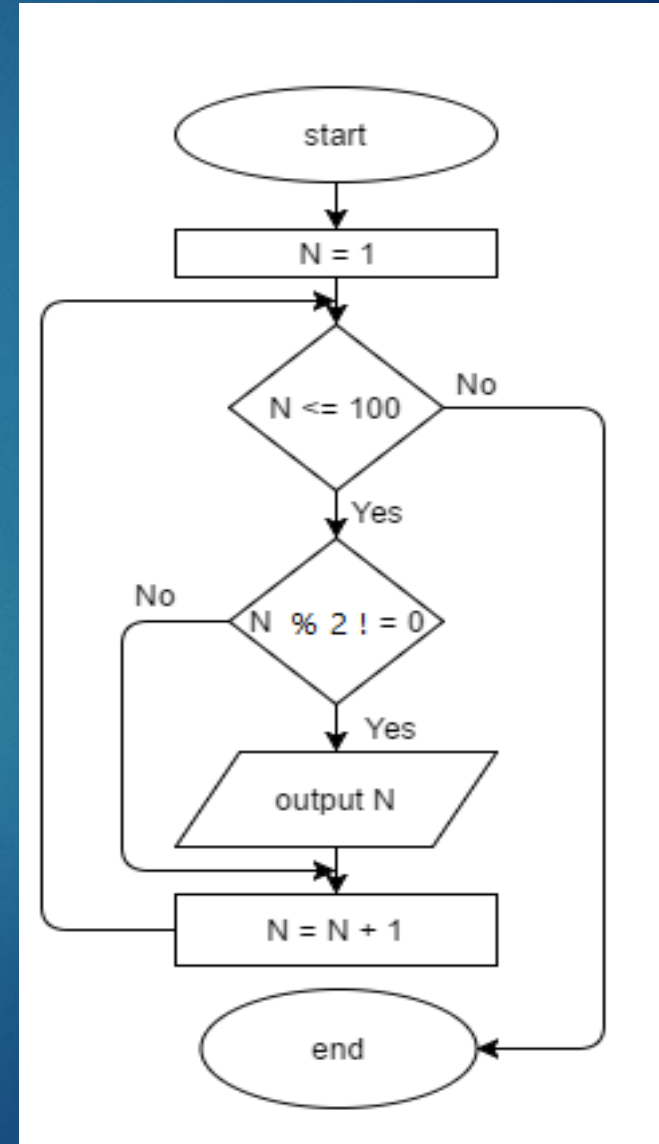**Step 5:   if (N % 2 != 0) then**

Step 6:   print N

Step 7:   End if

Step 8:   N = N + 1

Step 9: End while

Step 10: Stop

Algorithm & Flowchart to find sum of series 1+2+3+…..+N

Algorithm

Step-1 Start

Step-2 Input Value of N

Step-3 Initialize SUM = 0 , i = 1

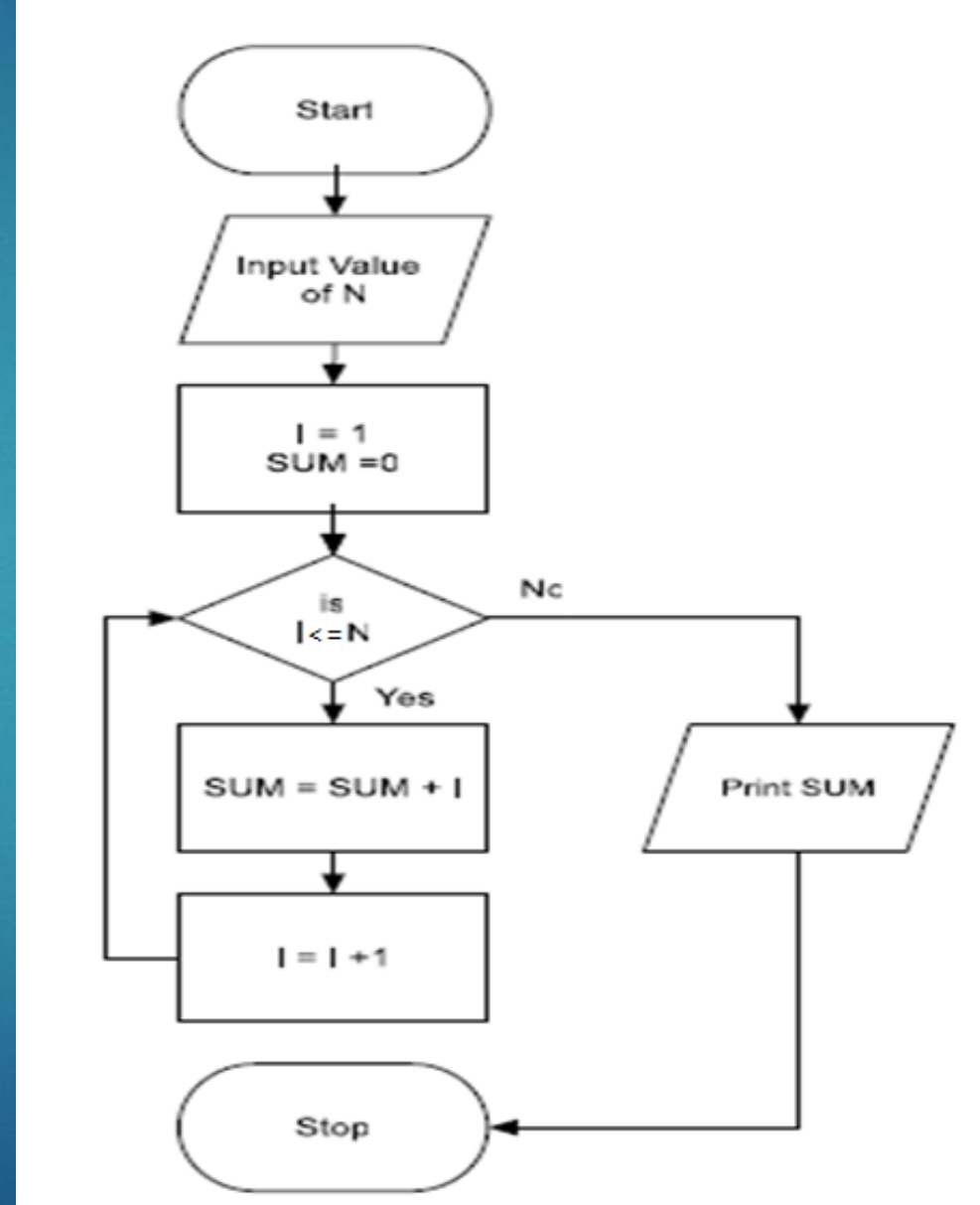**Step-4** while (i <= N)

Step-5   SUM = SUM + i

Step-6   i = i + 1

Step-7 End while

Step-8 Display value of SUM

Step-9 Stop

Algorithm & Flowchart to find Factorial of number n (n!=1x2x3x...n)

Algorithm (Using While loop)

Step-1 Start

Step-2 Read number N
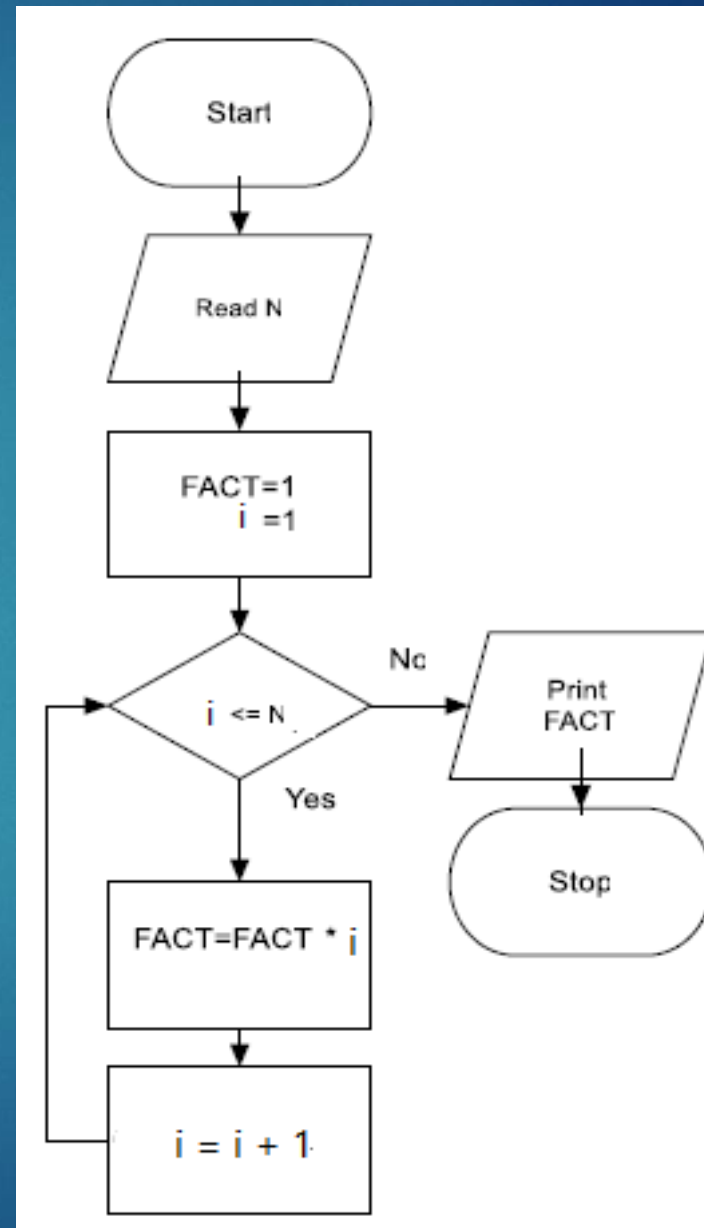
Step-3 FACT = 1 , i =1

Step-4 WHILE (i <= N)

FACT = FACT * i

i = i + 1

End While

Step-5 Display FACT

Step-6 Stop

Algorithm & Flowchart to find Factorial of number n (n!=1x2x3x…n)

Pseudo code

Variable C, F=1, N: integer
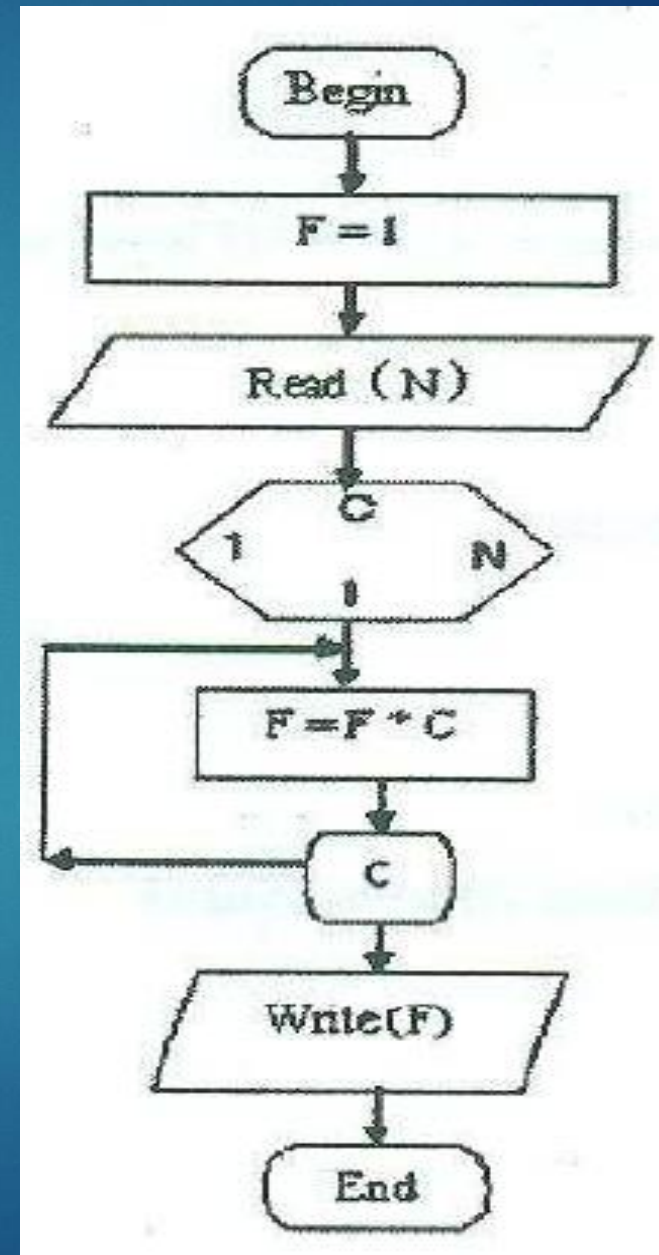
Begin

Read (N)

Loop :(C = 1 to N)

    F = F * C

Loop-end: C

Write (F)

End

Example

Write an algorithm and draw a Flowchart to read in two numbers, x and n, and then compute the sum of this geometric progression:

$$1+x+x^2+x^3+\ldots\ldots\ldots+x^n$$

For example: if n is 3 and x is 5, then the program computes 1+5+25+125.

Algorithm

Step-1 Start

Step-2 Read numbers N , X

Step-3 SUM = 1 , TERM =1 , i = 1

Step-4 WHILE (i <= N)

         TERM = TERM * x
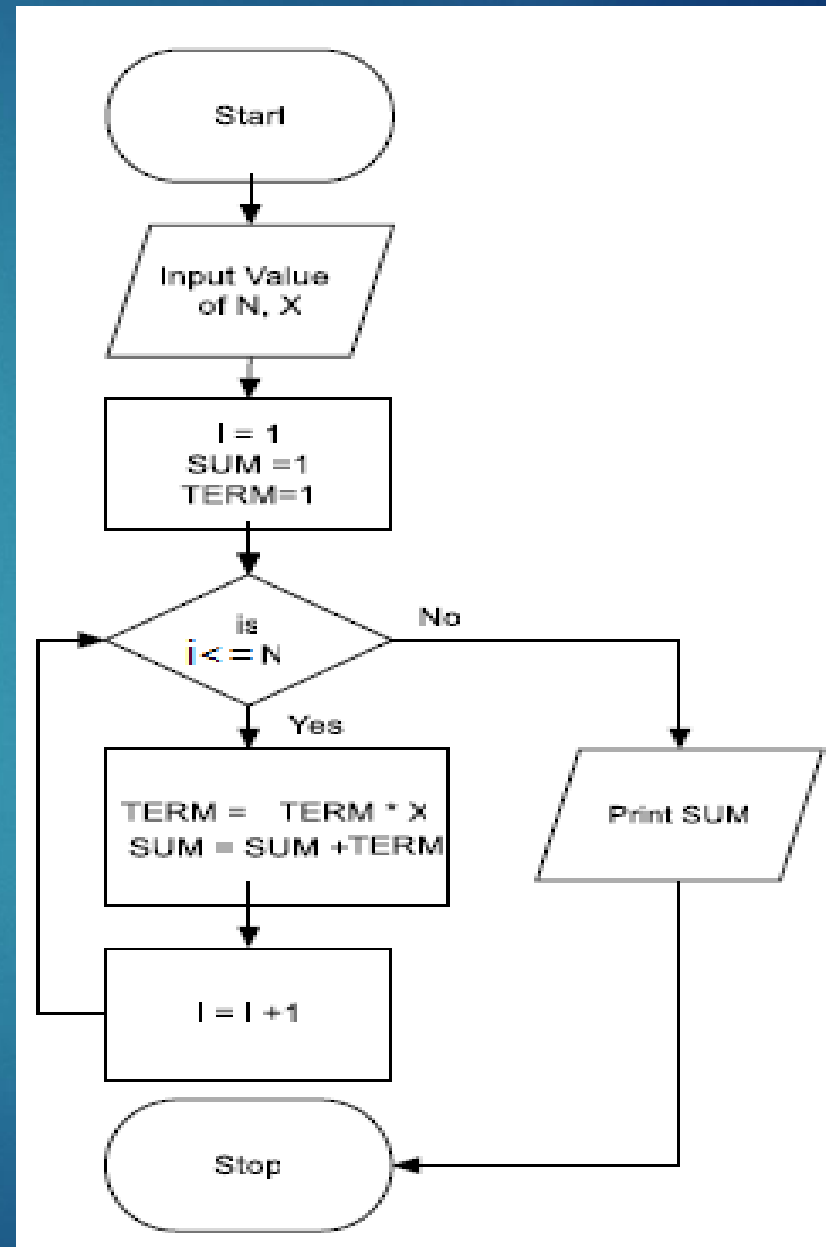
         SUM = SUM + TERM

          i = i + 1

      End While

Step-5 Display SUM

Step-6 Stop

Algorithm & Flowchart to print multiplication Table of a number

Algorithm (Using While loop)

Step-1 Start

Step-2 Input Value of NUM

Step-3 i =1

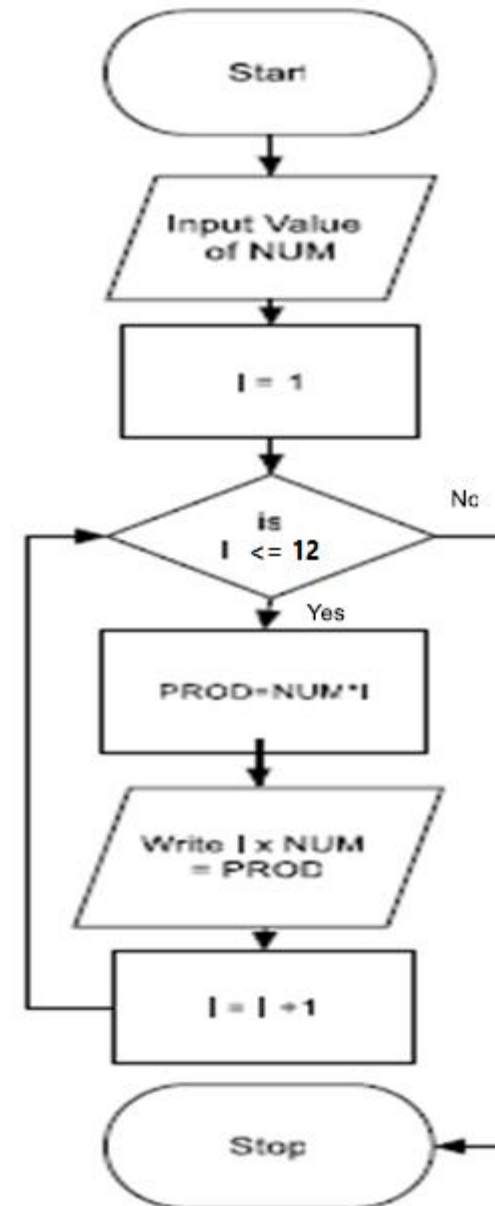**Step-4** While (i <= 12)

      PROD= NUM * i

      Write i "x" NUM "=" PROD

      i = i + 1

    End While

Step-5 Stop

Algorithm & Flowchart to print multiplication Table of a number

Algorithm (Using For loop)

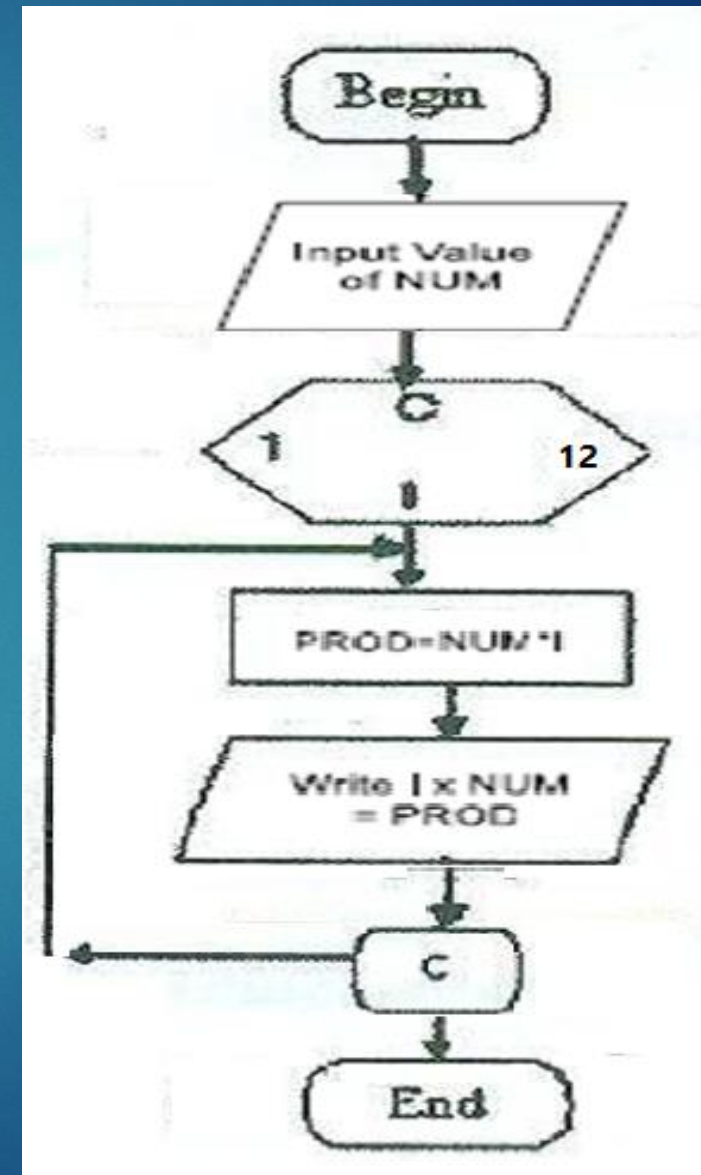**Step-1** Start

Step-2 Input Value of NUM

Step-3 For (i = 1 to 12)

PROD= NUM * i

Write i "x" NUM "=" PROD

End For

Step-4 Stop

Algorithm & Flowchart to print multiplication Table

Pseudo code

Variable C1, C2, Prod : integer

Begin

Loop:(C1=1 to 10)

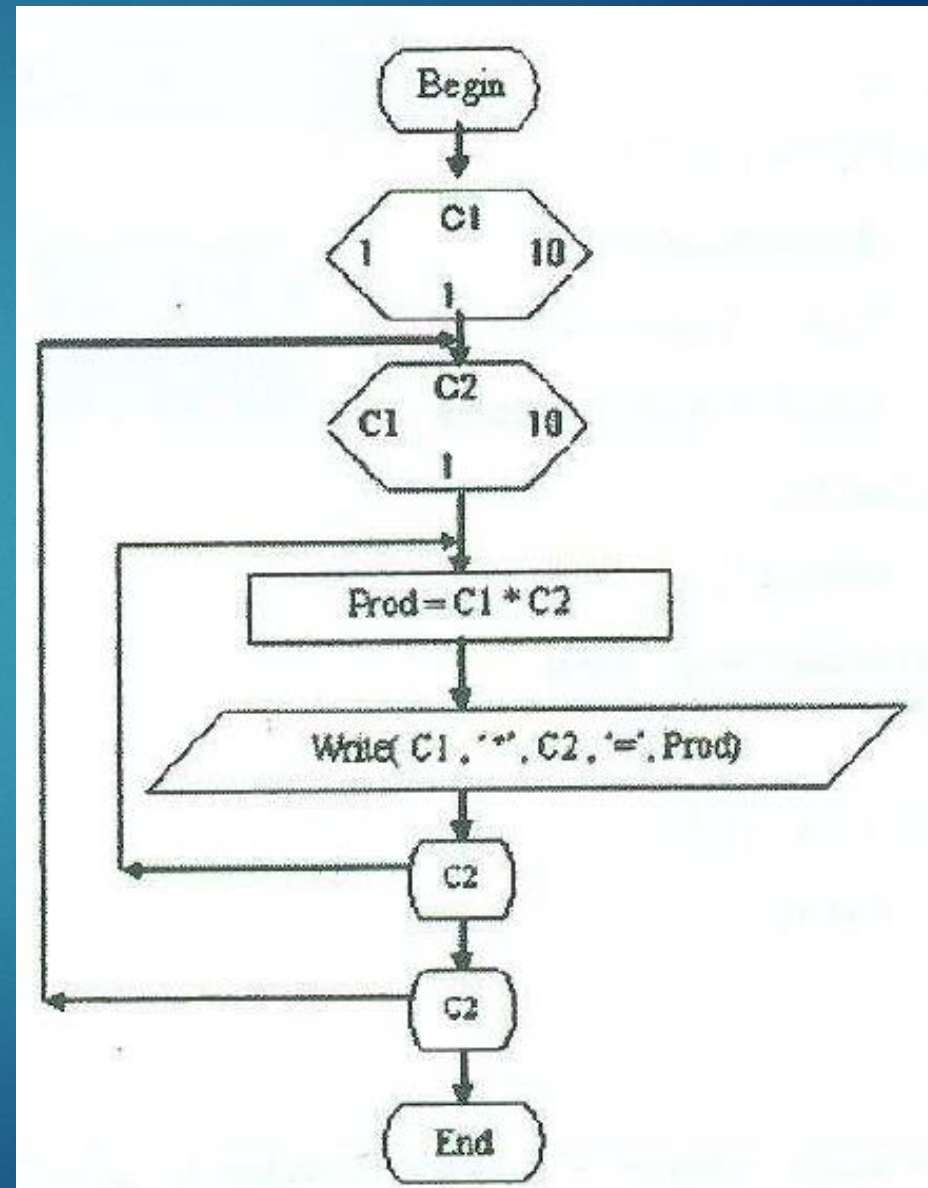   Loop:(C2 = C1 to 10)

        Prod = C1 * C2

        Write (C1 , '*', C2, '=', Prod)

    Loop-end:C2

Loop-end:C1

End

Algorithm & Flowchart to generate Fibonacci series 0,1,1,2,3,5…,n

Algorithm

Step-1 Start

Step-2 Initialize the variables, next, A=0, B=1, Count =2

Step-2 Read number N

Step-3 Print (A, B)

Step-4 While (Count < N)

        next = A + B

        print (next)

        A = B

        B = next

        Count = Count + 1

    End While

Step-5 Stop