

# Logic Building

## 31-Jan 2022 to 05 Feb 2022

### Day-2

Trainers:

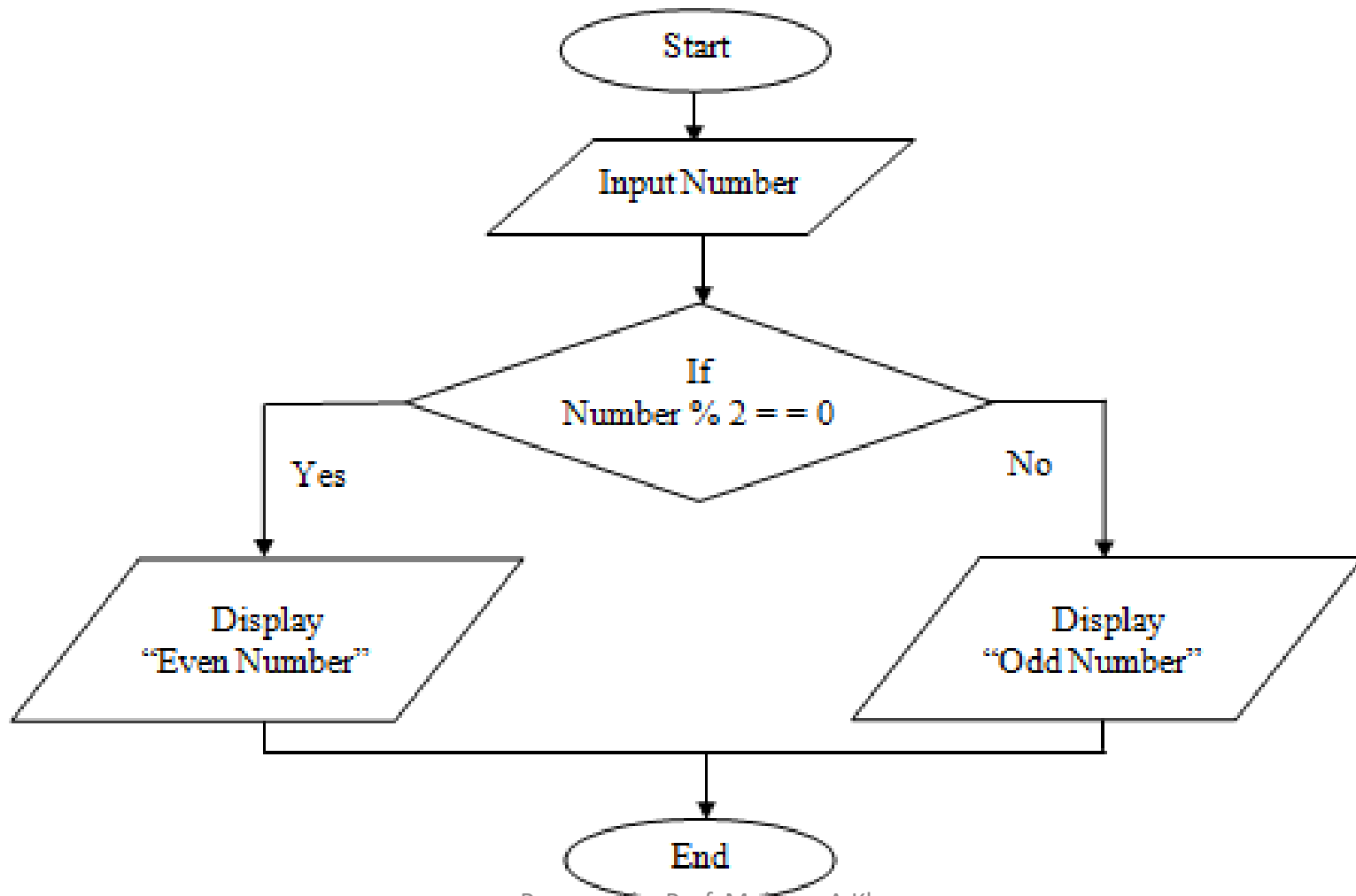
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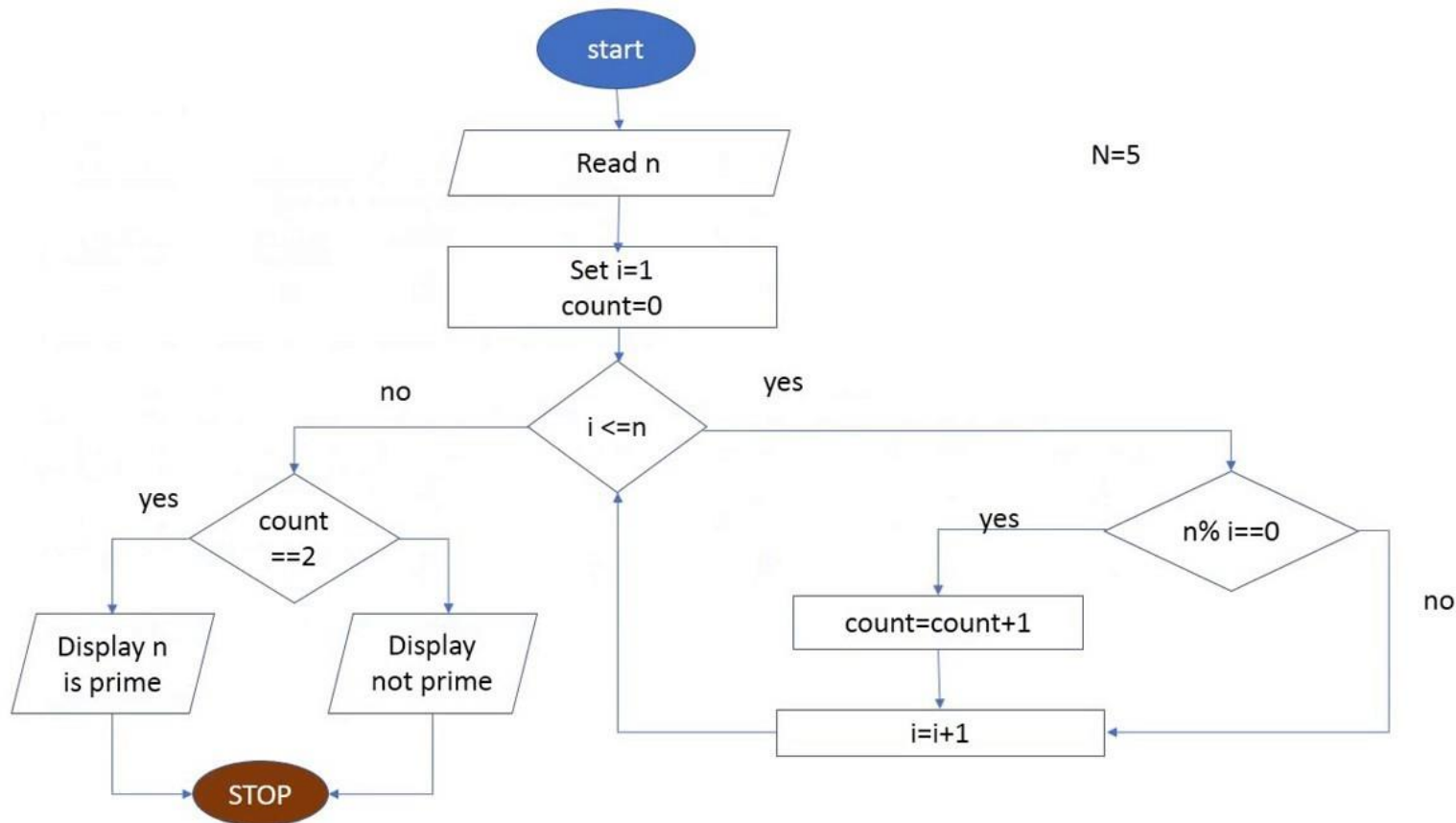
# Contents

- Logic for checking even or odd.
- Logic for checking prime numbers
- Logic for checking perfect numbers
- Logic for Fibonacci series
- Logic for finding factorial of a given number
- Logic for swapping of two integers
- Logic for asterisks graph
- Logic for checking divisibility(2,3,4,5,6,7)

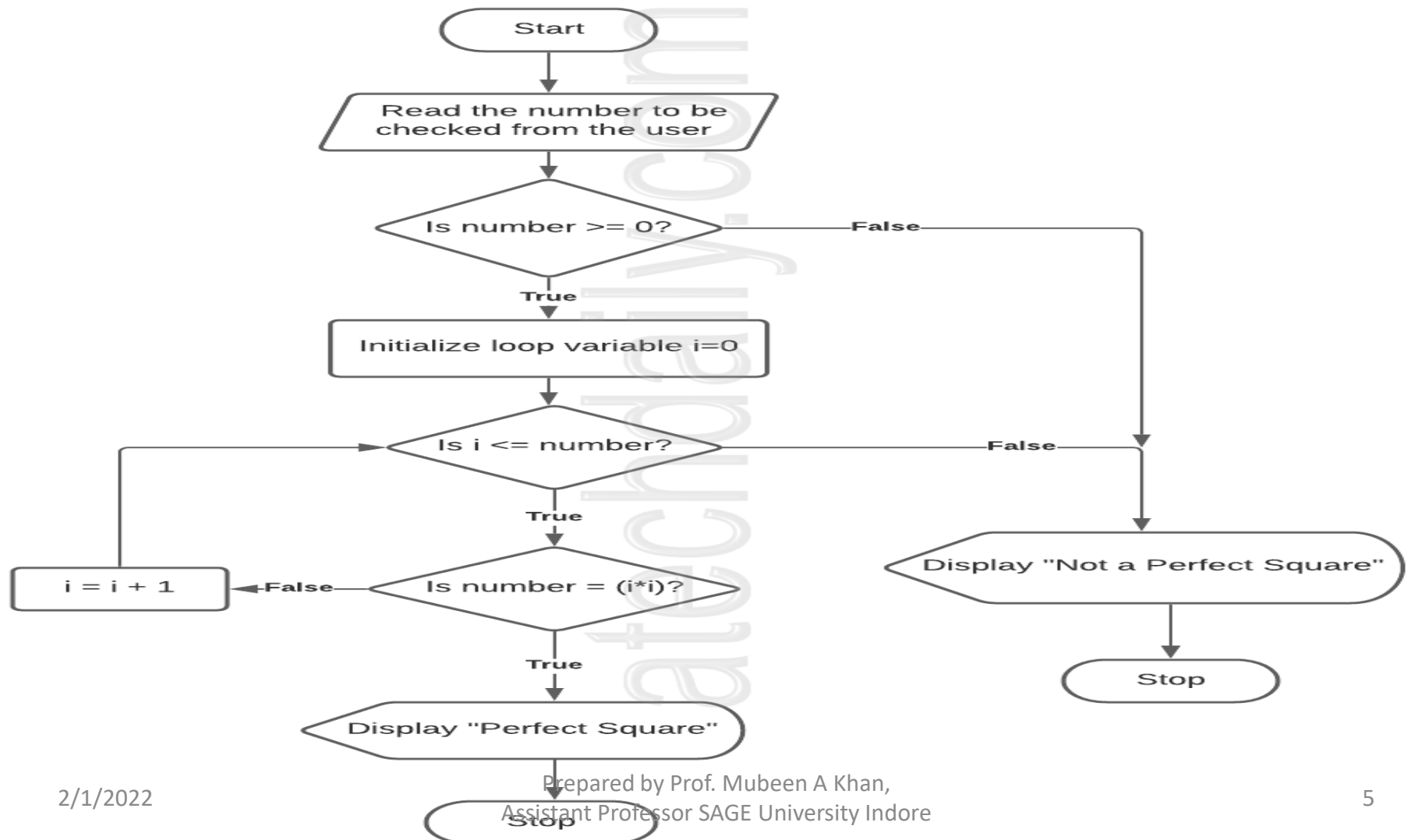
# Logic for even or odd



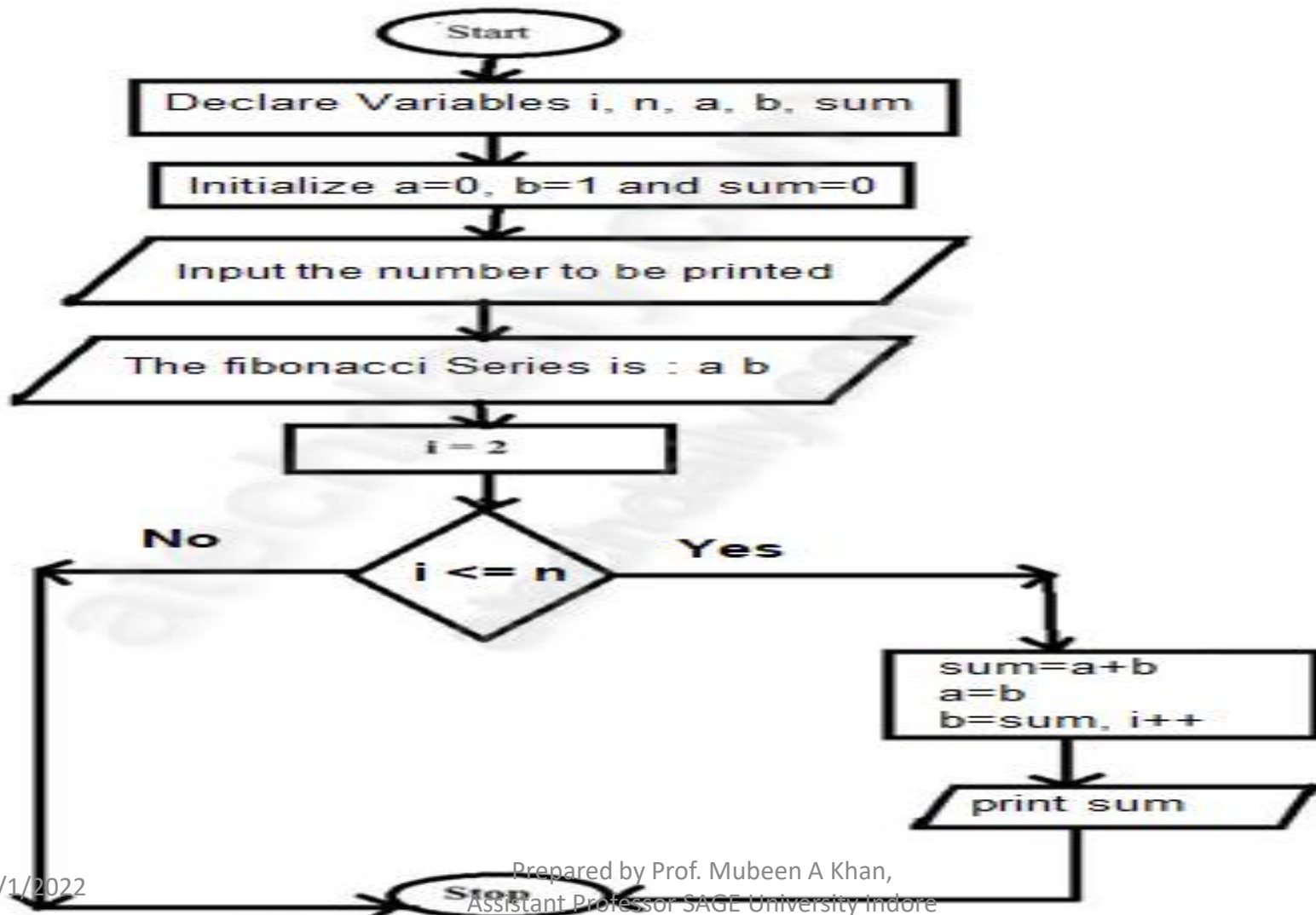
# Logic for checking prime numbers



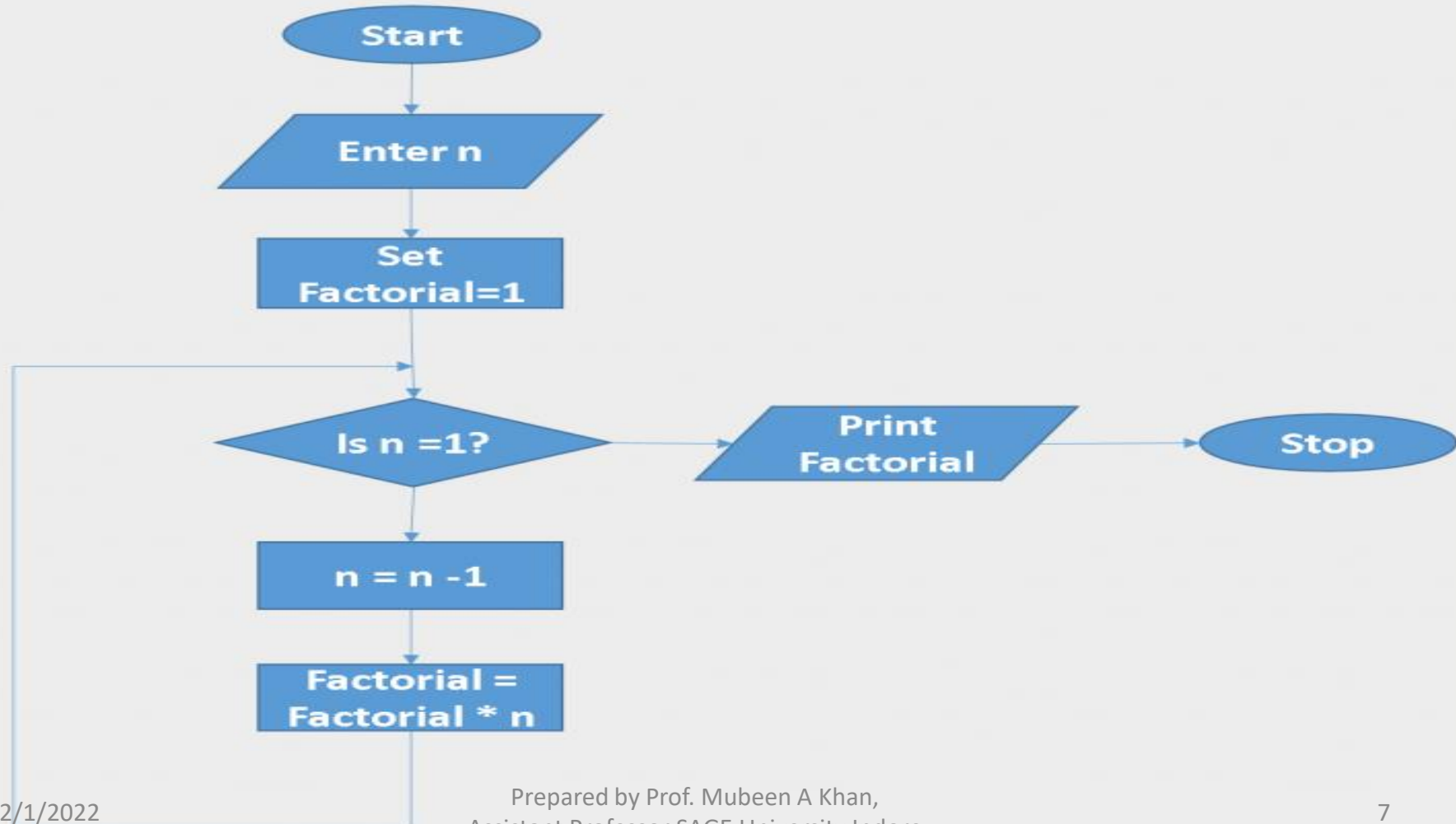
# Logic for checking perfect numbers



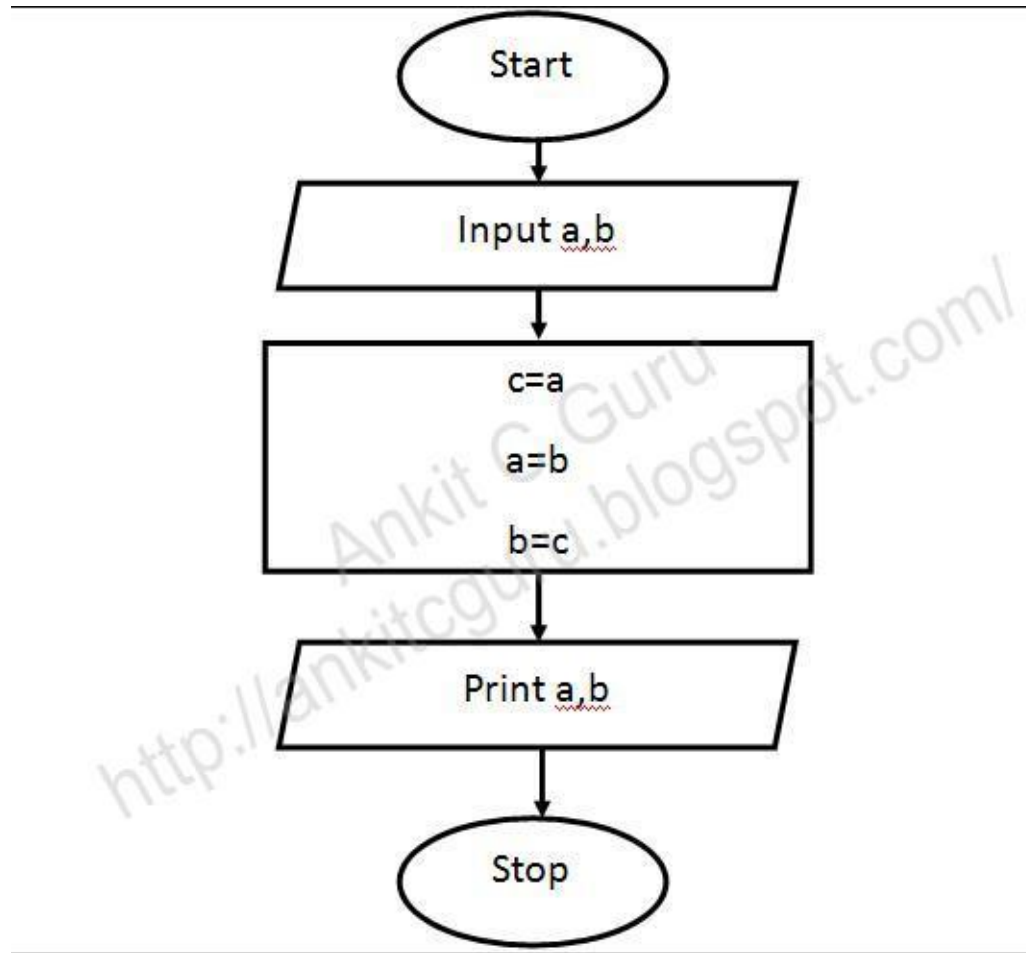
# Fibonacci series



# Factorial of a given number

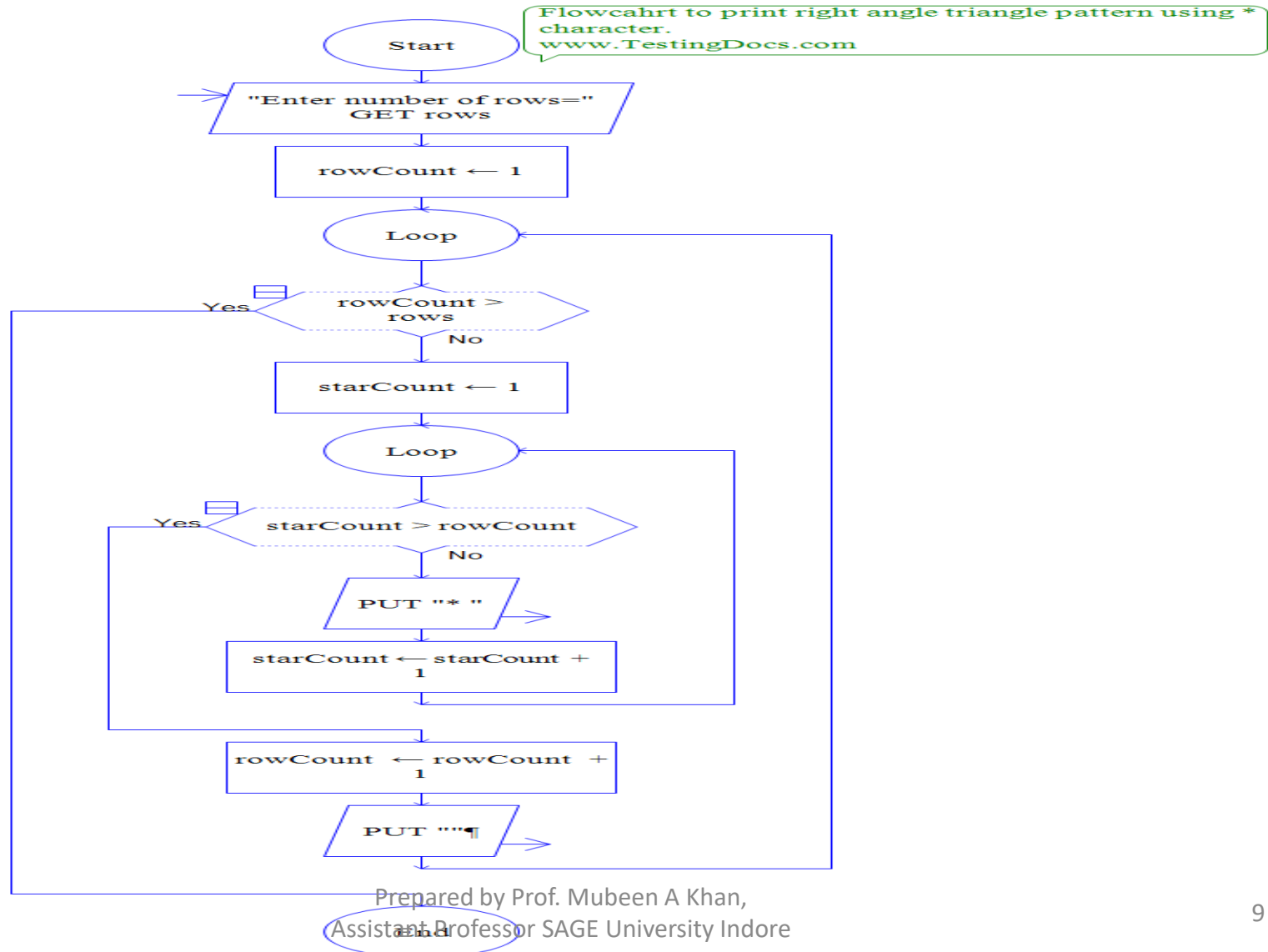


# Swapping of two integers

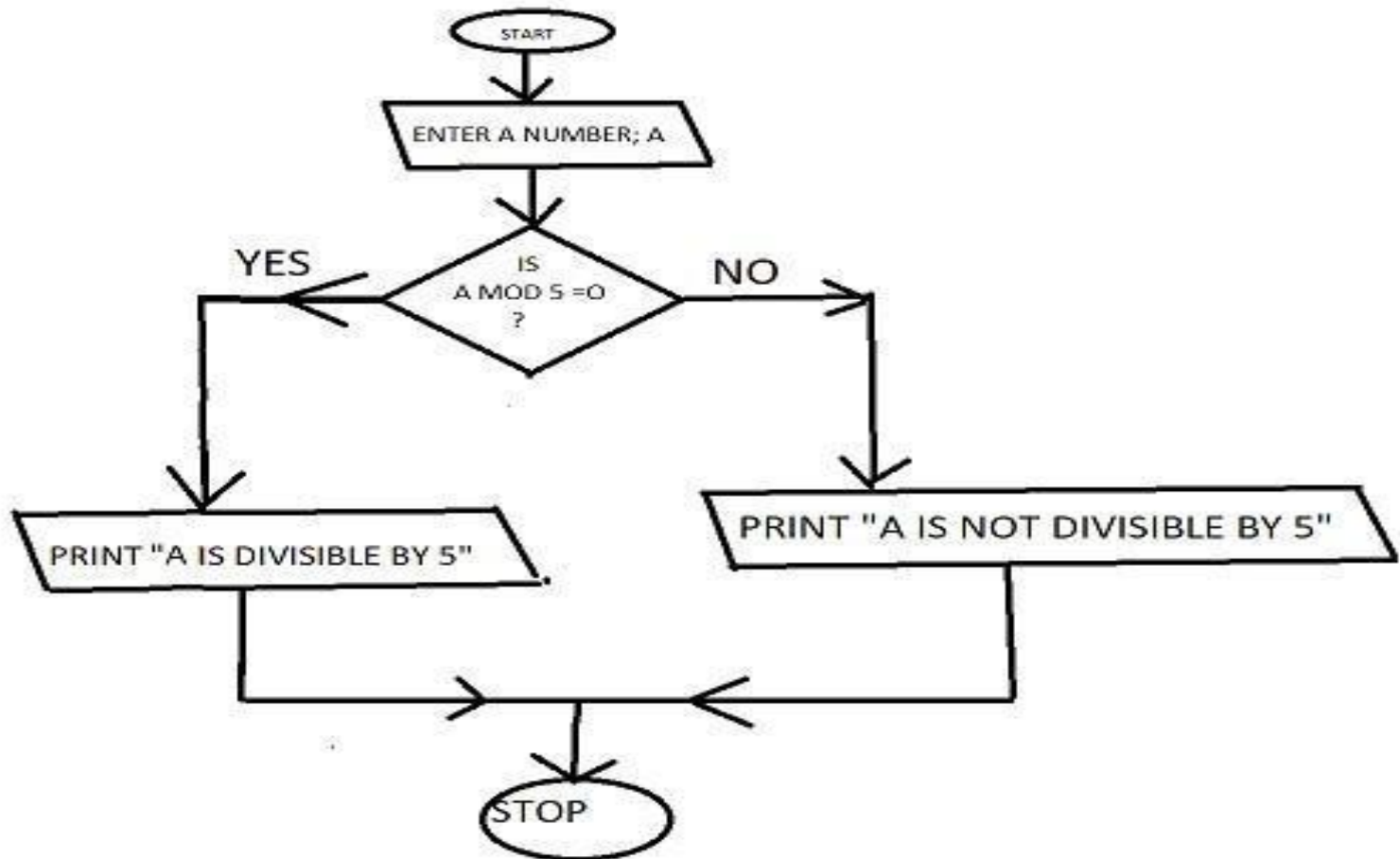




# Logic for asterisks graph



# Logic for divisibility



- THANK YOU

# Exercise to make flow charts

- LCM
- HCF
- OHMs Law
- Newton's 3 laws of motion
- Pythagoras theorem
- Taylors series, Maclaurian Series, Lagranges Series, Logarithms
- Differentiation and Integration of  $F(x)=x^4$
- Mean Mode Median
- Max, Min
- Trigonometry
- Coordinate system and polar system conversions
- Power functions
  - Cube
  - Square

# Day-2 Lab contents

- Algorithm for checking even or odd.
- Algorithm for checking prime numbers
- Algorithm for checking perfect numbers
- Algorithm for Fibonacci series
- Algorithm finding factorial of a given number
- Algorithm for swapping of two integers
- Algorithm for asterisks graph
- Algorithm for checking divisibility(2,3,4,5,6,7)

# Algorithm for checking even or odd.

```
•step 1 : start
•step 2 : input number
•step 3 : rem=number mod
2
•step 4 : if rem=0 then
    print "number even"
    else
        print "number
odd"
    endif
•step 5 : stop
```

# Algorithm for checking prime numbers

- Step 1: Start
- Step 2: Declare variables  $n, i, \text{flag}$ .
- Step 3: Initialize variables  $\text{flag} \leftarrow 1$   $i \leftarrow 2$
- Step 4: Read  $n$  from user.
- Step 5: Repeat the steps until  $i < (n/2)$  5.1 If remainder of  $n \div i$  equals 0  $\text{flag} \leftarrow 0$  Go to step 6 5.2  $i \leftarrow i + 1$
- Step 6: If  $\text{flag} = 0$  Display  $n$  is not prime else Display  $n$  is prime
- Step 7: Stop

# Algorithm for checking perfect numbers

## Perfect number

Divisor of 28 : 1, 2, 4, 7, 14, 28

Sum : 1 + 2 + 4 + 7 + 14 = 28

Sum = Original number

28 is a perfect number

Perfect numbers between 1 to 1000 are :

6

28

496



# Algorithm for checking perfect numbers

```
# include <stdio.h>
int main()
{
    int i, Number, Sum = 0 ;
    printf("\n Please Enter any number \n") ;
    scanf("%d", &Number) ;
    for(i = 1 ; i < Number ; i++)
    {
        if(Number % i == 0)
            Sum = Sum + i ;
    }
    if (Sum == Number)
        printf("\n %d is a Perfect Number", Number) ;
    else
        printf("\n %d is not the Perfect Number", Number)
```

# Algorithm for Fibonacci series

## Finding the Fibonacci series

Algorithm

Step1: Start

Step2: Read the value of  $n$  and set  $f=0, f1=-1, f2=1$

Step3: While ( $f < n$ ) do

$f = f1 + f2$

$f1 = f2$

$f2 = f$

Print  $f$

else Goto step5

Step4: Goto step 3

Step5: Stop

# Algorithm for factorial of a given number

Step-1 Start

Step-2 Read number N

Step-3 FACT=1 CTRL=1

Step-4 WHILE (CTRL <= N)

DO

FACT=FACT\*I

CTRL=CTRL+1

DONE

Step-5 Display FACT

Step-6 Stop

# swapping of two integers

**Algorithm :** Interchanging / swapping two values

**Step 1:** Input 1<sup>st</sup> number A

**Step 2:** Input 2<sup>nd</sup> number B

**Step 3:** Set Temp = A

**Step 4:** Set A=B

**Step 5:** Set B=Temp

**Step 6:** Print A, B

**Step 7:** End

# Algorithm for asterisks graph

1. Initialize for  $i = 1$
2. where  $i \leq \text{Rows}$
3. Increment  $i$
4. Initialize for  $j = 1$
5. Where  $j \leq i$
6. increment  $j$
7. print the values of "\*" "
8. `printf("\n");`
9. `exit`

# Algorithm for checking divisibility by 2

- Enter number, N
- If( $N \% 2 == 0$ )
- If (yes)
- Print “Number is divisible by 2”
- Else
- Print “Number is not divisible by 2”
- exit

# Algorithm for checking divisibility by 3

- Enter any number ABCD
- $P = A + B + C + D$
- If  $(P \% 3 == 0)$
- Print “Number is divisible by 3”
- Else
- Print “Number is not divisible by 3”

# Algorithm for checking divisibility by 4

- Enter any number ABCD
- $P = CD$
- If  $(P \% 4 == 0)$
- Print “Number is divisible by 4”
- Else
- Print “Number is not divisible by 4”



# Algorithm for checking divisibility by 5

- Enter number, N
- If( $N \% 5 == 0$ )
- If (yes)
- Print “Number is divisible by 5”
- Else
- Print “Number is not divisible by 5”
- exit

# Algorithm for checking divisibility by 6

- Enter number N
- If( $N \% 2 == 0 \ \&\& \ N \% 3 == 0$ )
- If (yes)
- Print “Number is divisible by 6”
- Else
- Print “Number is not divisible by 6”
- exit

# Algorithm for checking divisibility by 7

- **Steps to Check for the Divisibility of 7**
- Drop the last digit of the number then double the digit that we dropped.
- Subtract it from the new number formed by removing the last digit of the original number.
- Repeat the process until the number is reduced to two digits.
- If the two-digit number is divisible by 7, then the original number is divisible by 7. Otherwise, it is not.
  - Eg: the last digit of 679 is 9
  - double it  $2(9)=18$
  - The remaining number is  $67-18=49$  (divisible by 7)
  - Therefore 679 is divisible by 7

- THANK YOU

# Assignment-2

- Write a program to check whether the given number is even or odd
- Write a program for checking prime numbers
- Write a program to check a perfect numbers
- Write a program for Fibonacci series
- Write a program for finding factorial of a given number
- Write a program for swapping of two integers
- Write a program for asterisks graph
- Write a program to check divisibility(2,3,4,5,6,7)
- Write a program to check leap year and printing leap year
- Write a program to check cricket team averages.
- Write a program to show average numbers of even numbers up to given range

# END OF DAY 2

- Thank You

# Even odd program, Prime number Program



- `#include <stdio.h>`
- `int main()`
- `{`
- `int num;`
- `printf("Enter an integer: ");`
- `scanf("%d", &num);`
- `if(num % 2 == 0)`
- `printf("%d is even.", num);`
- `else printf("%d is odd.", num);`
- `return 0;`
- `}`

```
#include <stdio.h>

int main()
{ int n, i, flag = 0;
  printf("Enter a positive integer: ");
  scanf("%d", &n);
  for (i = 2; i <= n / 2; ++i)
  { if (n % i == 0)
    { flag = 1;
      break;
    } }
  if (n == 1)
  {
    printf("1 is neither prime nor composite.");
  }
  else
  {
    if (flag == 0)
      printf("%d is a prime number.", n);
    else
      printf("%d is not a prime number.", n);
  } return 0;
}
```

# Program for perfect square/Fabonacci series

```
# include <iostream.h>
# include <conio.h>
void main()
{
    int num,s,i;
    clrscr();
    cout << "Enter any number : ";
    cin >> num;
    i=1;s=0;
    while(i<num)
    {
        if(num%i==0)
        {
            s=s+i;
            i++;
        }
    }
    if(s==num)
        cout << num << " is a perfect number";
    else
        cout << num << " is not a perfect number";
    getch();
}
```

```
# include <iostream.h>
# include <conio.h>
void main()
{
    int a,b,c,value;
    clrscr();
    cout << "Enter any value : ";
    cin >> value;
    a=0;b=1;c=0;
    cout << a << "\t" << b;
    c=a+b;
    while(c<=value)
    {
        cout << "\t" << c;
        a=b;
        b=c;
        c=a+b;
    }
    getch();
}
```

REDMI NOTE 5 PRO



# Factorial and swapping

```
# include <iostream.h>
# include <conio.h>

void main()
{
    int i,num,f;
    clrscr();
    cout << "Enter any number : ";
    cin >> num;
    f=1;
    for (i=num;i>0;i--)
        f=f*i;
    cout << "factorial of "<<num<<" : "<<f;
    getch();
}
```

```
# include <iostream.h>
# include <conio.h>
void main()
{
    int i,j;
    clrscr();
    cout << "enter any two values : ";
    cin >> i >> j;
    cout << "entered values : ";
    cout << i << " " << j;
    i=i+j;
    j=i-j;
    i=i-j;
    cout << "\nafter swapping : ";
    cout << i << " " << j;
    getch();
}
```

# Asterisk Graph/Divisibility Check

```
# include <iostream.h>
# include <conio.h>
void main()
{
    int r,i,j;
    clrscr();
    cout <<"enter no.of rows : ";
    cin >>r;
    for(i=0;i<r;i++)
    {
        cout <<"\n";
        for(j=0;j<=i;j++)
            cout <<"*";
    }
    getch();
}
```

```
#include<stdio.h>
int main()
{
    int num;
    printf("Enter a number: ");
    scanf("%d",&num);
    if(num%3==0)
    {
        printf("%d is divisible by 3",num);
    }
    else
    {
        printf("%d is not divisible by 3",num);
    }
    return 0;
}
```

# Leap Year/Cricket team average

```
# include <iostream.h>
# include <conio.h>
void main()
{
    int y;
    clrscr();
    cout <<"enter any year : ";
    cin >>y;
    if(y%4==0)
        cout <<y<<" is leap year\n";
    else
        cout <<y<<" is not leap year\n";
    for(y=1900;y<2000;y++)
    {
        if(y%4==0)
            cout <<y<<"\t";
    }
    getch();
}
```

```
# include <iostream.h>
# include <conio.h>
void main()
{
    int p,np,ing[10],run[10],avg[10];
    char name[10][10];
    clrscr();
    cout <<"enter no.of players : ";
    cin >>np;
    for(p=0;p<np;p++)
    {
        avg[p]=0;
        cout <<"enter player name : ";
        cin >>name[p];
        cout <<"enter runs scored : ";
        cin >>run[p];
        cout <<"enter no.of innings : ";
        cin >>ing[p];
        avg[p]=run[p]/ing[p];
    }
    for(p=0;p<np;p++)
    {
        cout <<"\nplayer name : "<<name[p];
        cout <<"\nruns scored : "<<run[p];
        cout <<"\nnno.of innings : "<<ing[p];
        cout <<"\naverage runs : "<<avg[p];
    }
    getch();
}
```

# Even numbers up to range/armstrong number

## Program

```
# include <iostream.h>
# include <conio.h>
void main()
{
    int range;
    clrscr();
    cout << "Enter range : ";
    cin >> range;
    int i=1,c=0,s=0;
    while(i<=range)
    {
        if(i%2==0)
        {
            s=s+i;
            c++;
        }
        i++;
    }
    cout << "average of all even numbers upto "<<range<<" : "<<s/c;
    getch();
}
```

```
# include <iostream.h>
# include <conio.h>
void main()
{
    int num,s,r,t;
    clrscr();
    cout << "Enter any number : ";
    cin >> num;
    t=num;
    s=0;
    while(num>0)
    {
        r=num%10;
        s=s+(r*r*r);
        num=num/10;
    }
    if(s==t)
        cout << t << " is an armstrong number";
    else
        cout << t << " is not an armstrong number";
    getch();
}
```

THANK YOU