CHAPTER 1 11/03/2010

1.1 Write a program that will print your mailing address in the following form :

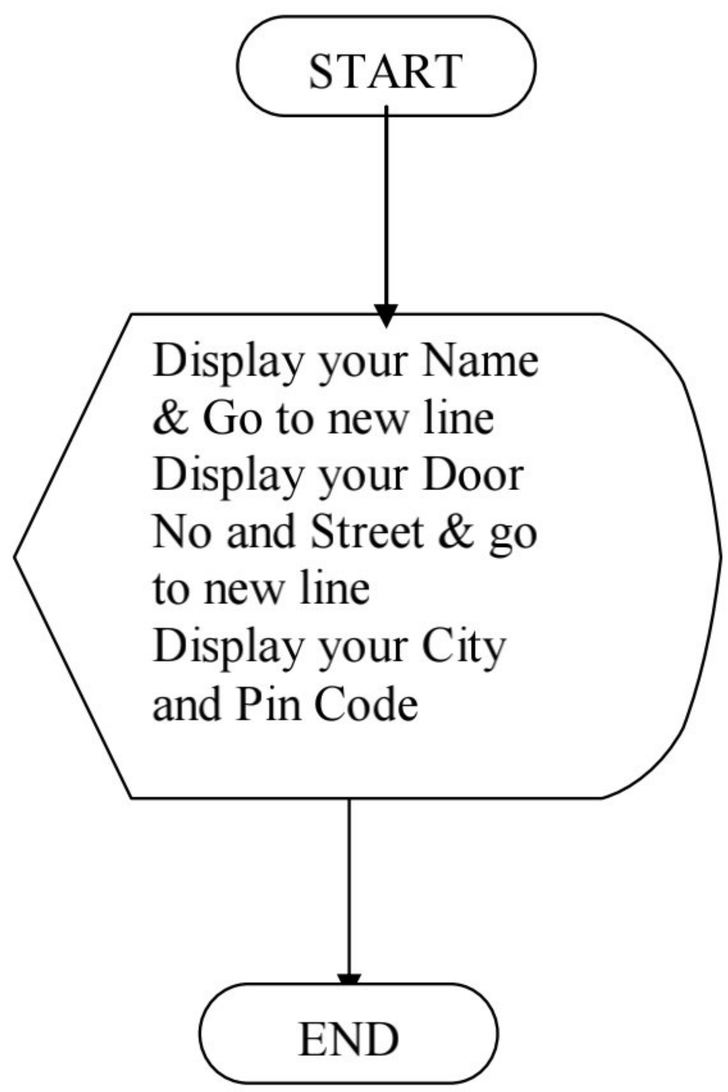
First line : Name
Second line : Door No, Street
Third line : City, Pin code

Algorithm: -

Algorithm to print your mailing address.

Step 1 : Display your Name and Go to new line.
Step 2 : Display your Door No and Street and Go to new line.
Step 3 : Display your City and Pin Code.

Flowchart:-



Program: -

```
// Write a program that will print your mailing
//address in the following form:
//First line        : Name
//Second line       : Door No, Strret
//Third line        : City, Pin Code
//Date : 11/03/2010
```

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

void main()
{
    clrscr();
    printf("Name :-- Ritesh Kumar Jain\n");
    printf("Door No :-- 57 , Street :-- Parkho Ki Gali\n");
    printf("City :-- Nimbahera , Pin Code :-- 312601");
    getch();
}
```

Output:--

```
Name :-- Ritesh Kumar Jain              |
Door No:-- 57, Street:- Parkho Ki Gali
City:-- Nimbahera, Pin Code:-- 312601
```

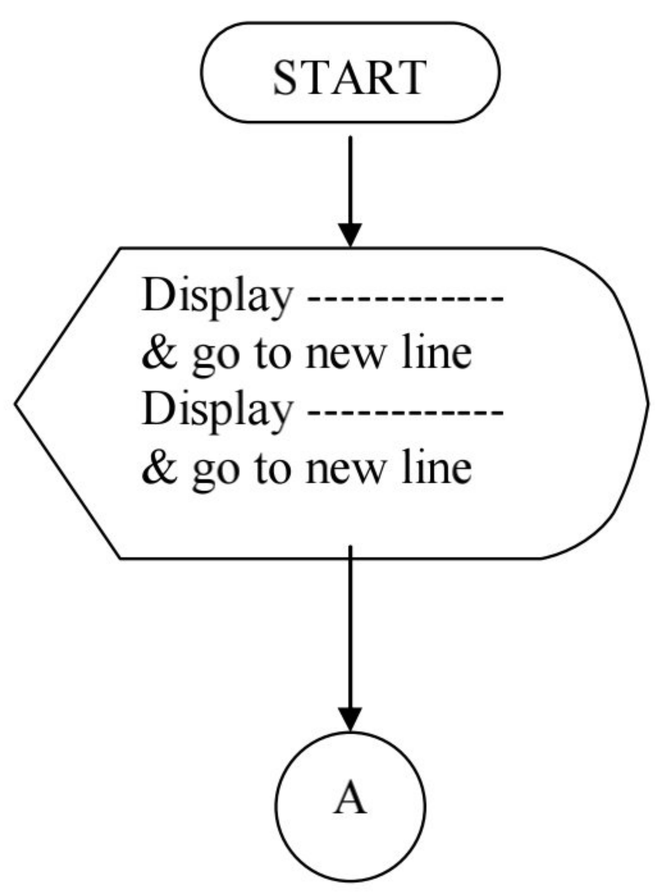
1.2 Modify the above program to provide border lines to the address.

Algorithm: -

Algorithm to provide border lines to address.

Step 1 : Display ---------- line and Go to new line.
Step 2 : Display ---------- line and Go to new line.
Step 3 : Display ||, your Name, || and Go to new line.
Step 4 : Display ||, your Door No and Street, || and Go to new line.
Step 5 : Display ||, your City, Pin Code, || and Go to new line.
Step 6 : Display ---------- line and Go to new line.
Step 7 : Display ---------- line.

Flowchart :-



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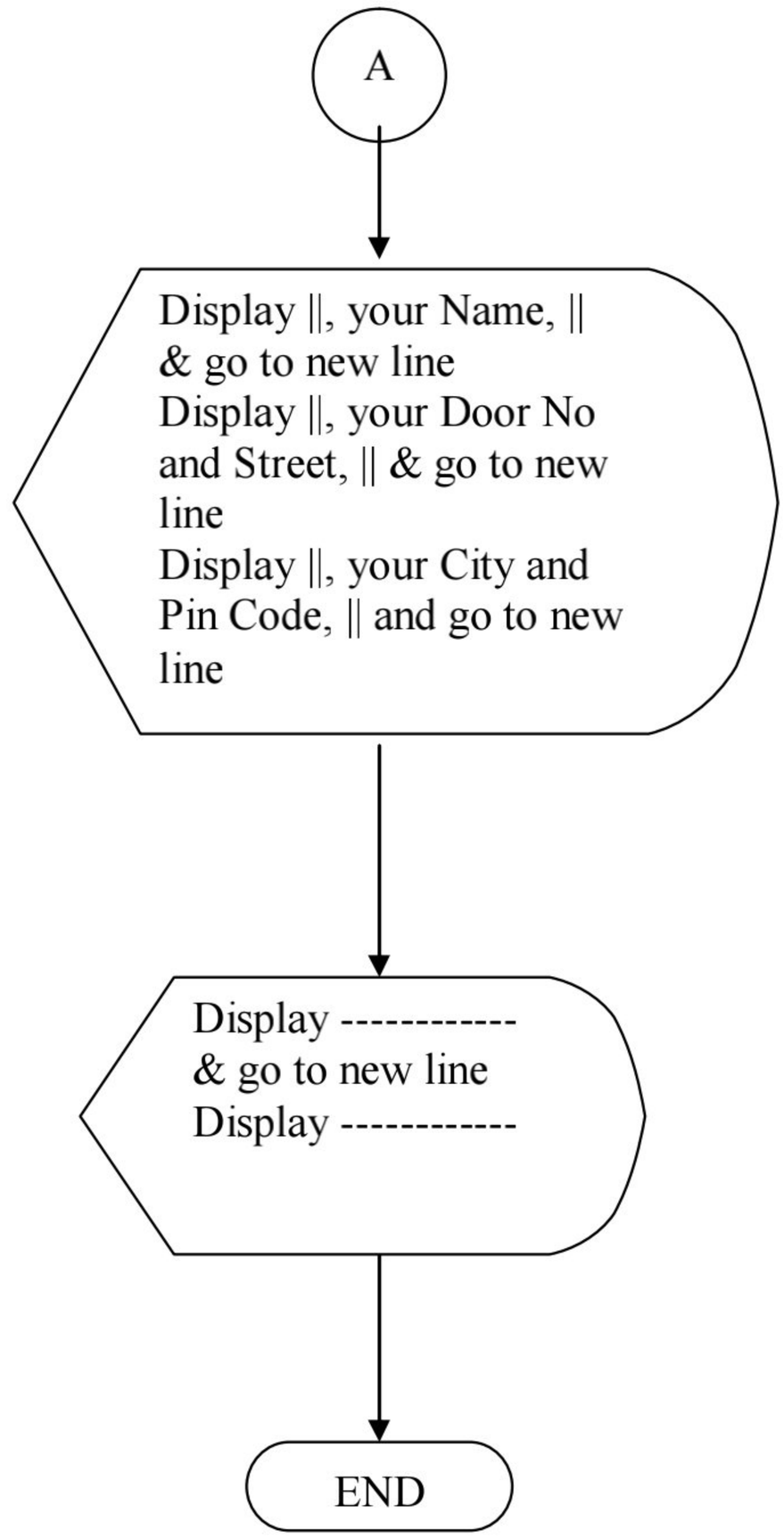


Program:-

```
// Write a program that will print your mailing
//address in the following form:
//----------------------------------------
//----------------------------------------
//|| First line      : Name                 ||
//|| Second line     : Door No, Strret||
//|| Third line      : City, Pin Code   ||
//----------------------------------------
//----------------------------------------
//Date : 11/03/2010

#include<stdio.h>
#include<conio.h>
void main()
{
        clrscr();
```

```
        printf(" ---------------------------------------------\n");
        printf(" ---------------------------------------------\n");
        printf("|| Name :-- Ritesh Kumar Jain                ||\n");
        printf("|| Door No :-- 57 , Street :-- Parkho Ki Gali ||\n");
        printf("|| City :-- Nimbahera , Pin Code :-- 312601   ||\n");
        printf(" ---------------------------------------------\n");
        printf(" ---------------------------------------------\n");
        getch();
}
```

Output:-

```
---------------------------------------------
---------------------------------------------
|| Name :-- Ritesh Kumar Jain                ||
||   Door No:-- 57, Street:- Parkho Ki Gali||
||City:-- Nimbahera, Pin Code:-- 312601 ||
---------------------------------------------
---------------------------------------------
```

1.3 Write a program using one print statement to print the pattern of asterisks as shown below :

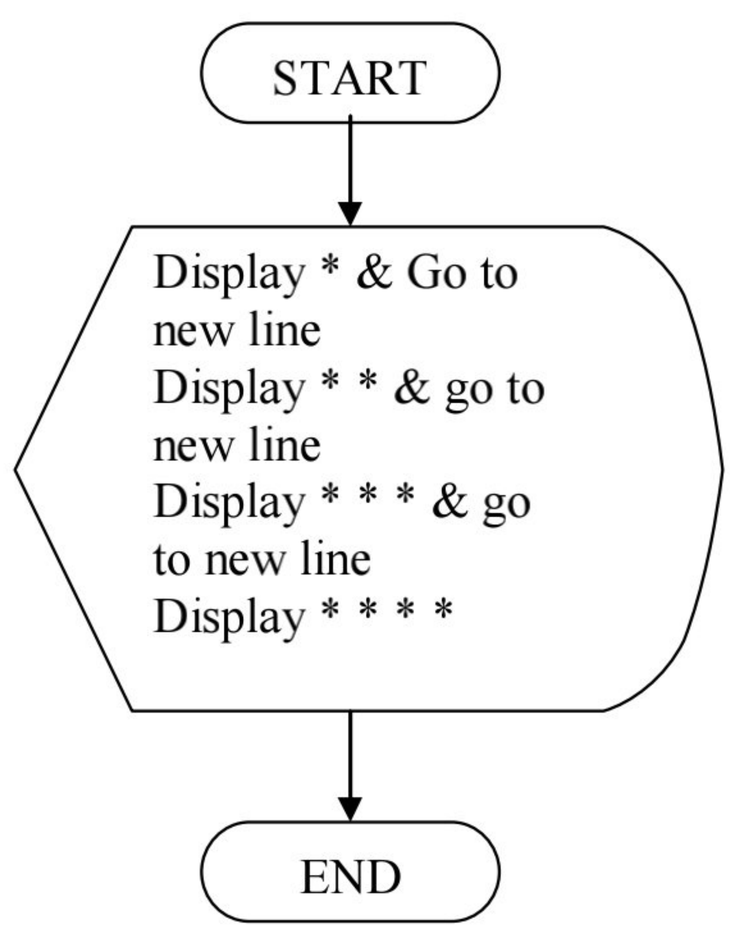
```
*
*     *
*     *     *
*     *     *     *
```

Algorithm: -

Algorithm to print the pattern of pattern of asterisks.

Step 1: Display * and go to new line
Step 2: Display * * and go to new line.
Step 3: Display * * * and go to new line.
Step 4: Display * * * *

Flowchart:-



Program :-

```
//Write a program using one print statement to
//print the pattern of asterisks as shown below :


//*
//*   *
//*   *     *
//*   *     *     *

#include<stdio.h>
#include<conio.h>
void main()
{
      clrscr();
      printf("* \n* * \n* * * \n* * * *");
      getch();
}
```

Output: -

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

1.4 Write a program that will print the following figure using suitable charactes.

```
------------                                  --------------
|           |                                 |            |
|           |     >>------------------→       |            |
------------                                  ---------------
```

<u>Algorithm:--</u>

Algorithm to print the figure using suitable characters.

Step 1: Display ---------- and spaces
Step 2: Display ---------- and Go to new line
Step 3: Display | | and spaces
Step 4: Display | | and go to new line
Step 5: Display | |
Step 6: Display >>----------→
Step 7: Display | | and go to new line
Step 8: Display ---------- and spaces
Step 9: Display ----------

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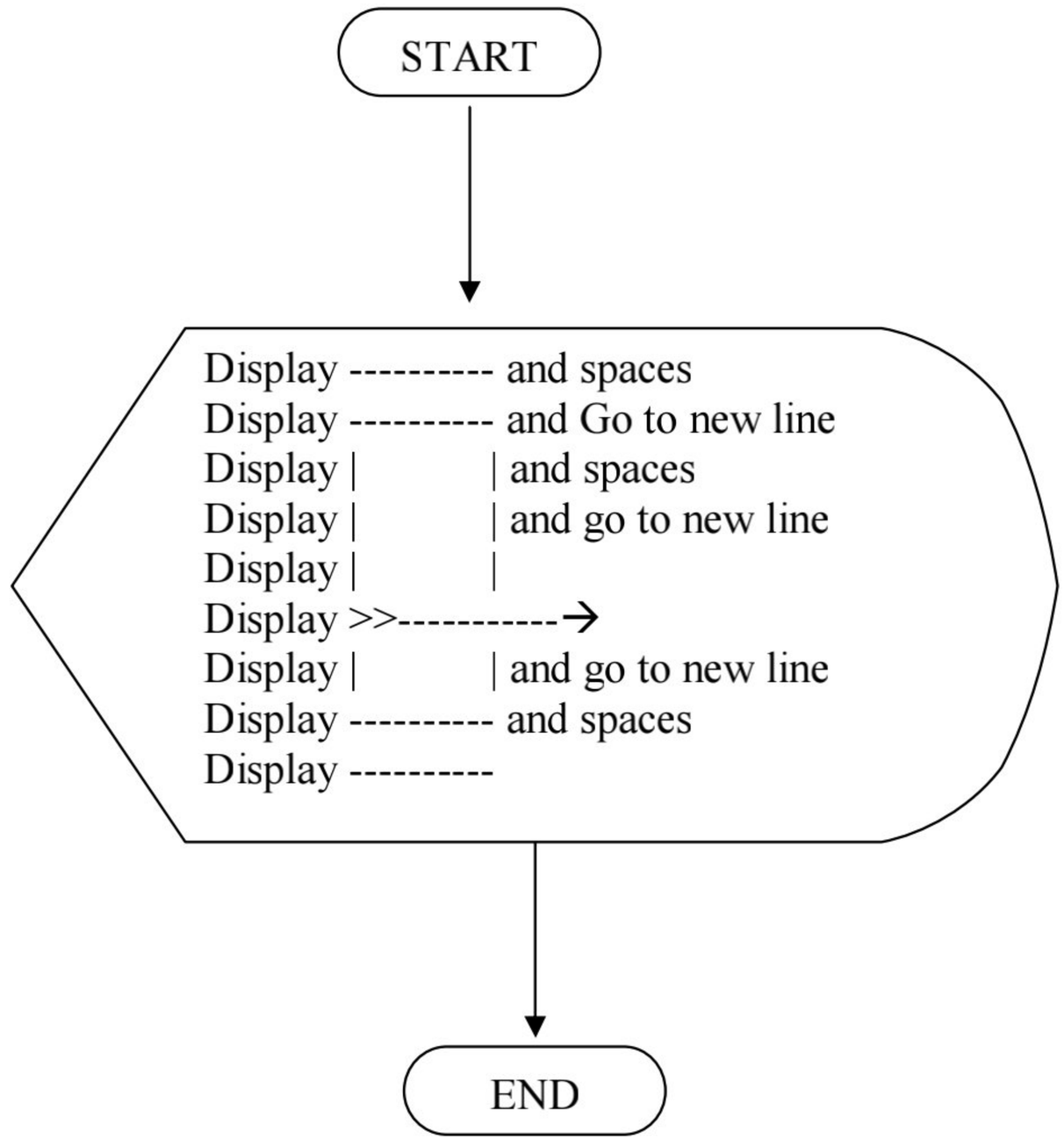
Flowchart:-



Program:--

//Write a program that will print the following figure using suitable charactes.

```
//   -------------                          --------------
//   |           |                          |            |
//   |           |     >>------------------>  |            |
//   -------------                          --------------
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
        clrscr();
        printf("-------------");
        printf("                ")
        printf("-------------\n);
        printf("|          |");
        printf("                ")
        printf("|          |\n");
        printf("|          |");
        printf(">>---------->");
        printf("|          |\n");
```

```
        printf("-------------");
        printf("              ")
        printf("-------------");
        getch();
}
```

Output :--

```
---------------                          ---------------
|             |                          |             |
|             |   >>------------------>  |             |
---------------                          ---------------
```

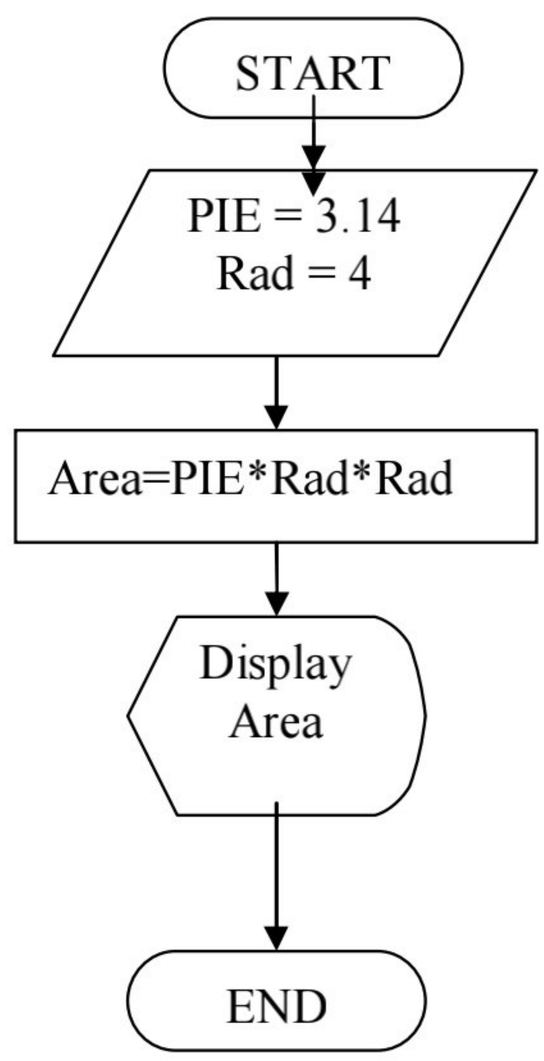
1.5 Given the radius of a circle, write a program to compute and display its area. Use a symbolic constant to define the π value and assume a suitable value for radius.

Algorithm:--

Algorithm to compute the area of circle.

Step 1: Store 3.14 to varable **PIE.**
Step 2: Store 4 to variable Rad.
Step 3: Compute the area of circle and assign it to variable Area.
Area = PIE * Rad * Rad
Step 4: Display the variable.

Flowchart:--



Program :--

//Given the radius of a circle, write a program to compute

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//and display its area. Use a symbolic constant to define the
//PIE value and assume a suitable value for radius.

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

#Define PIE 3.14

void main()
{
        clrscr();

        float Rad,Area;
        Rad=4;
        Area=PIE*Rad*Rad;
        printf("Area of a circle is--> %f",Area);
        getch();
}
```

Output:--

Area of a circle is 50.240002

1.6 Write a program to output the following multiplication table.

5 * 1 =5
5 * 2 =10
5 * 3 =15
. .
. .
. .
5 * 10 =50

Algorithm:--

Algorithm to print multiplication table.

Step 1: Display 5 * 1 = 5 and go to new line
Step 2: Display 5 * 2 = 10 and go to new line
Step 3: Display 5 * 3 = 15 and go to new line
Step 4: Display 5 * 4 = 20 and go to new line
Step 5: Display 5 * 5 = 25 and go to new line
Step 6: Display 5 * 6 = 30 and go to new line
Step 7: Display 5 * 7 = 35 and go to new line
Step 8: Display 5 * 8 = 40 and go to new line
Step 9: Display 5 * 9 = 45 and go to new line
Step 10: Display 5 * 10 = 50 and go to new line

Flowchart:--

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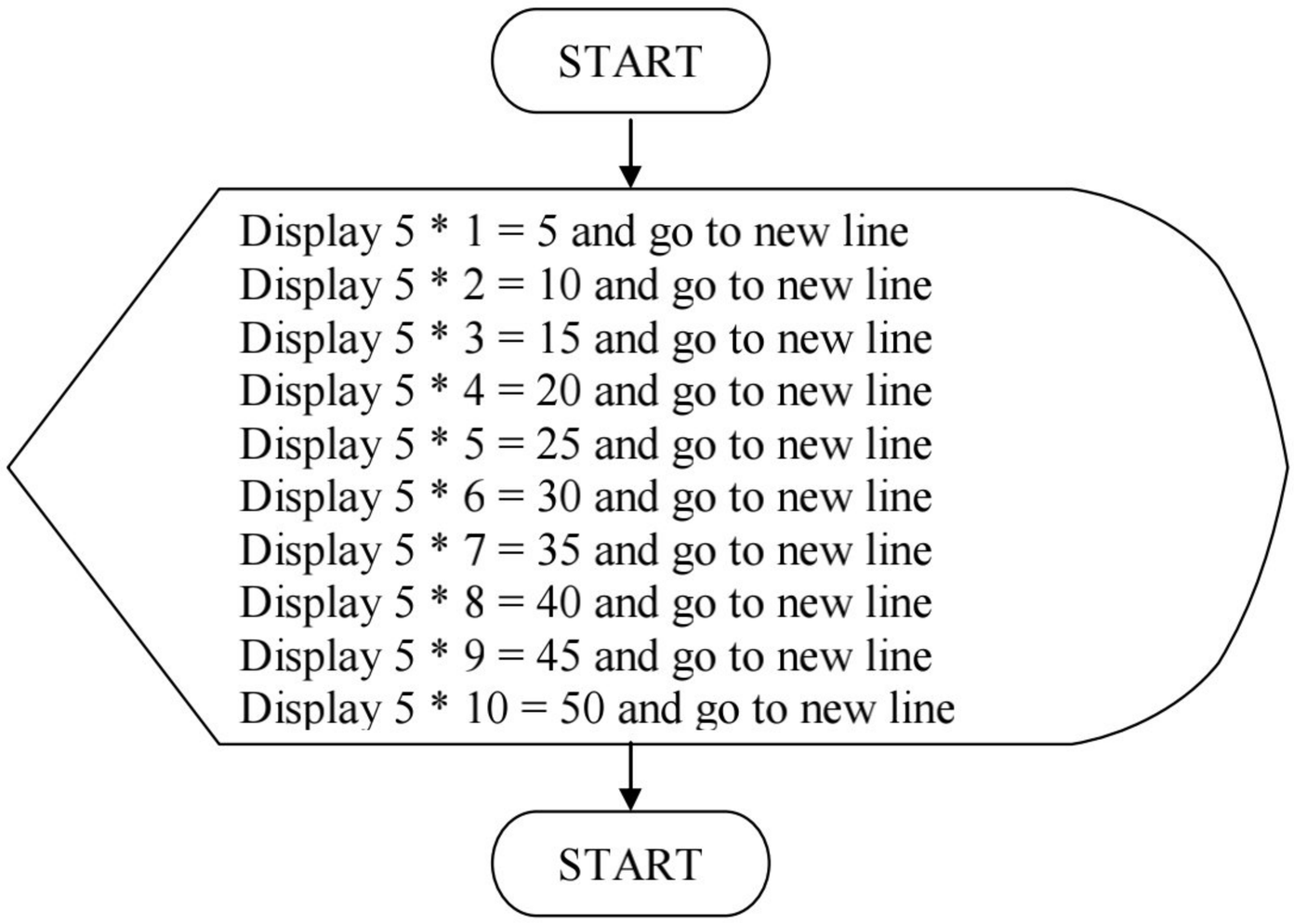

Program:--

```
//Write a program to output the following multiplication table.

//        5 * 1 =5
//        5 * 2 =10
//        5 * 3 =15
//        .   .
//        .   .
//        .   .
//    5 * 10 =50


#include<stdio.h>
#include<conio.h>

void main()
{
        clrscr();

        printf("5 * 1   = 5\n");
        printf("5 * 2   = 10\n");
        printf("5 * 3   = 15\n");
        printf("5 * 4   = 20\n");
        printf("5 * 5   = 25\n");
        printf("5 * 6   = 30\n");
        printf("5 * 7   = 35\n");
        printf("5 * 8   = 40\n");
        printf("5 * 9   = 45\n");
        printf("5 * 10  = 50\n");

        getch();
}
```

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Output:--

5 * 1 =5
5 * 2 =10
5 * 3 =15
5 * 3 =20
5 * 3 =25
5 * 3 =30
5 * 3 =35
5 * 3 =40
5 * 3 =45
5 * 3 =50

1.7 Given two integers 20 and 10, write a program that uses a function add() to add these two numbers and sub() to find the difference of these two numbers and then display the sum and difference in the following form:

20 + 10 = 30
20 – 10 = 10

Algorithm:--

Step 1: Display First Number 20.
Step 2: Display Second Number 10.
Step 3: Call function add(20,10) to add these two numbers and store result in variable Sum.
Step 4: Call function sub(20,10) to Subtract these two numbers and store result in variable Diff.
Step 5: Display 20 + 10 =
Step 6: Display Sum and go to new line.
Step 7: Display 20 – 10 =
Step 6: Display Diff.

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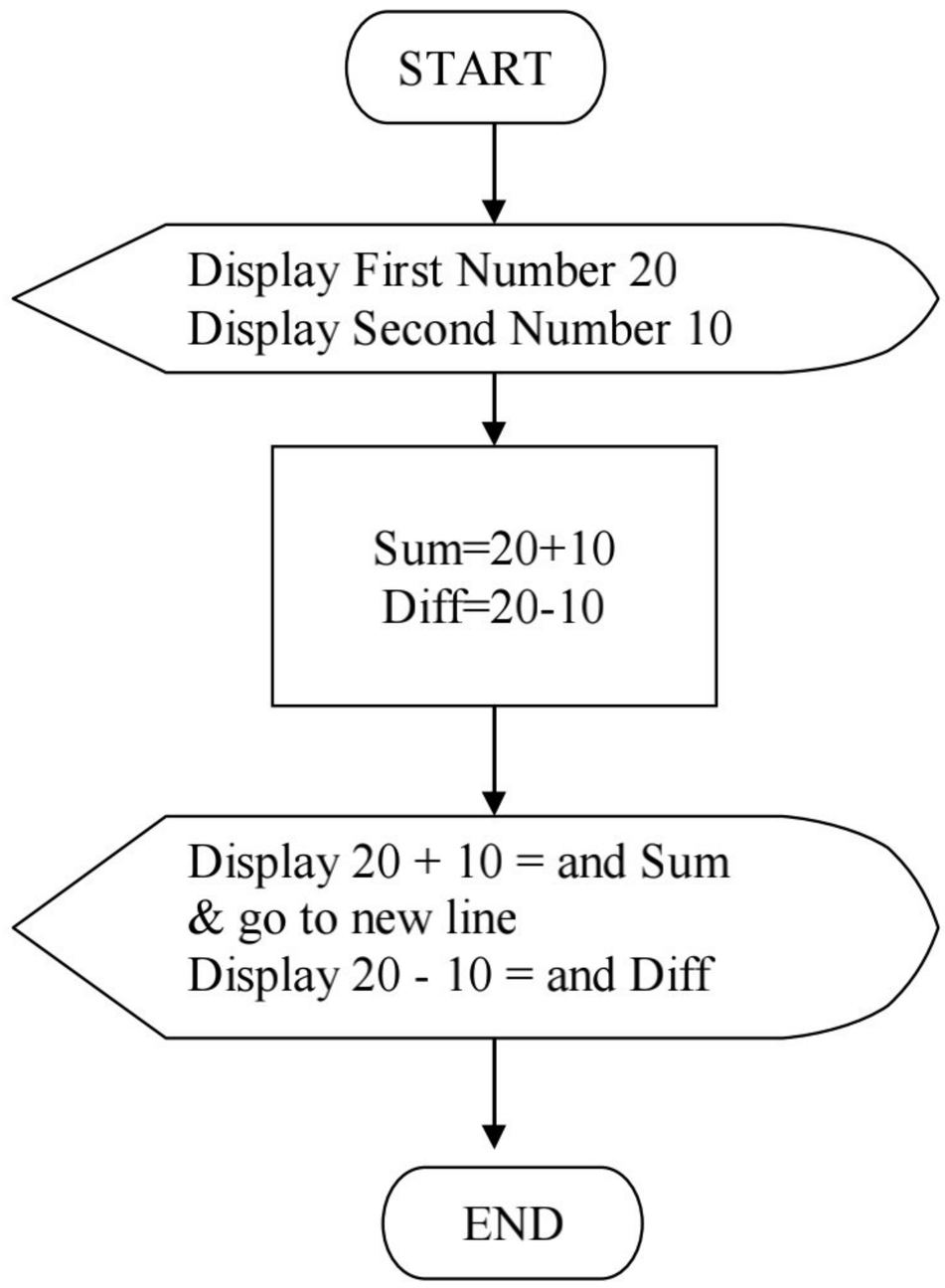
Flowchart:--



Program:--

```
//Given two integers 20 and 10, write a program that
//uses a function add() to add these two numbers and
//sub() to find the difference of these two numbers
//and then display the sum and difference in the following form:

//20 + 10 = 30
//20 - 10 = 10


#include<stdio.h>
#include<conio.h>

void main()
{
        clrscr();

        int Sum,Diff;
        printf("First Number 20\n");
        printf("Second Number 10\n");

        Sum=20+10;
        Diff=20-10;

        printf("20 + 10 = %d\n", Sum);
```

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```
        printf("20 - 10 = %d", Diff);

        getch();
}
```

Output:--

20 + 10 = 30
20 – 10 = 10

1.8 Given the values of three variables a, b and c, write a program to compute and display the values of x, where

X= a / (b - c)

Execute your program for the following values:

(a) a=250, b==85,c=25
(b) a=300, b=70, c=70

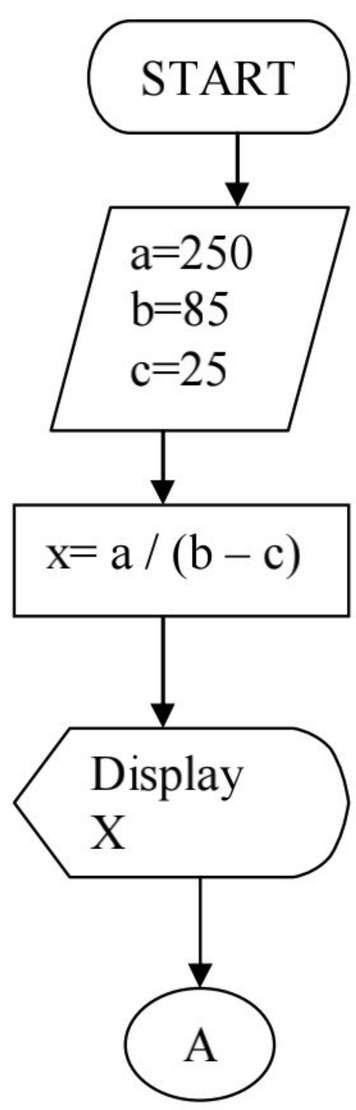
Comment on the output in each case.

Algorithm:--

Algorithm to compute the value of x.

Step 1: Store 250, 85 and 25 to variables a, b and c respectively.
Step 2: Compute a / (b – c) and store the result in variable x.
Step 3: Display x
Step 4: Store 300, 70 and 70 to variables a, b and c respectively.
Step 5: Compute a / (b – c) and store the result in variable x.
Step 6: Display x

Flowchart:--



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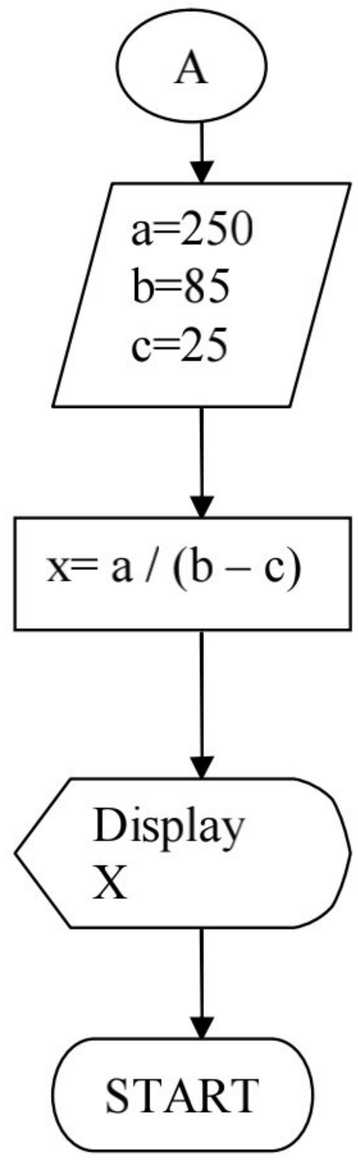

Program:--

//Given the values of three variables a, b and c,
//write a program to compute and display the values of x, where

//X= a / (b - c)

//Execute your program for the following values:

//(a) a=250, b==85,c=25
//(b) a=300, b=70, c=70

//Comment on the output in each case.

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

void main()
{
    clrscr();

    int a,b,c;
    float x;
    a=250;
    b=85;
    c=25;
    x=a/(b-c);

    printf("x = %f\n",x);
```

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```
    a=300;
    b=70;
    c=70;
    x=a/(b-c);

    printf("x = %f\n",x);

    getch();
}
```

Output:--

x=4.000000
Divide error

1.9 Relationship between Celsius and Fahrenheit is governed by the formula

F = (9C/5)+32

Write a program to convert the temperature
(a) from Celsius to Fahrenheit and
(b) from Fahrenheit to Celsius.

Algorithm:--

Algorithm to convert from Celsius to Fahrenheit and from Fahrenheit to Celsius.

Step 1: Store 0 to F & C.
Step 2: Store 200 to C.
Step 3: Compute ((9*c)/5)+32 and store the result in F.
Step 4: Display F.
Step 5: Store 300 to F.
Step 6: Compute ((F-32)*5)/9 and store the result in C.
Step 7: Display C.

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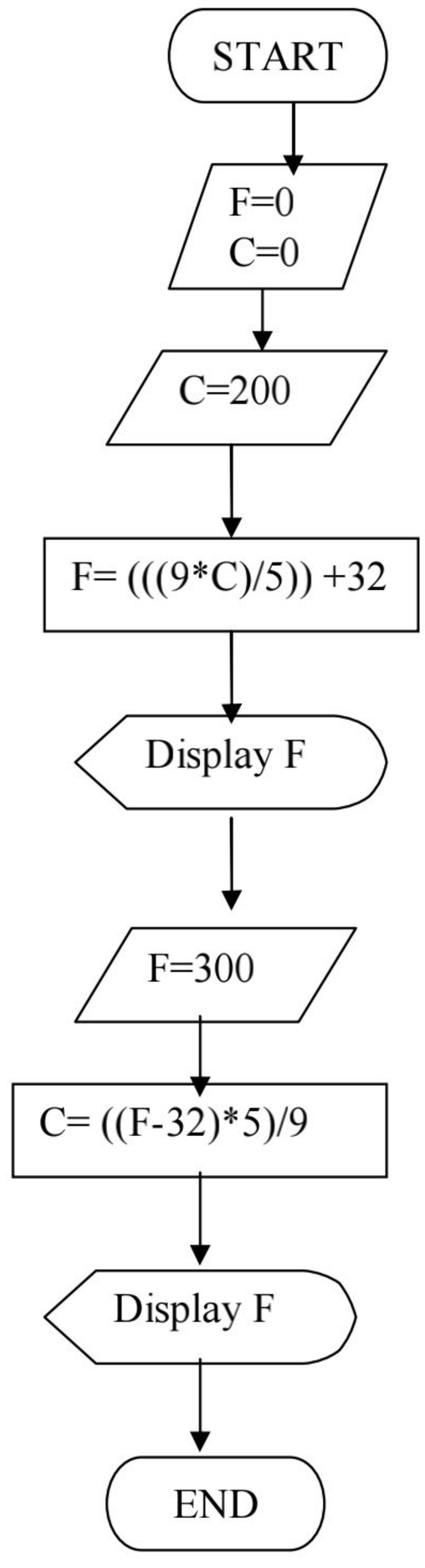
Flowchart:--



Program:--

```
//Relationship between Celsius and Fahrenheit is governed by the formula

//F = (9C/5)+32
//Write a program to convert the temperature
//(a)        from Celsius to Fahrenheit and
//(b)        from Fahrenheit to Celsius.



#include<stdio.h>
#include<conio.h>

void main()
{
```

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```
    float F,C;
    clrscr();

    C=200;
    F=(((9*C)/5)+32);

    printf("Celsius = %f to Fahrenheit = %f\n",C,F);

    F=300;
    C=((F-32)*5)/9;

    printf("Fahrenheit = %f to Celsius = %f\n",F,C);

    getch();
}
```

Output:--

Celsius =200.000000 to Fahrenheit = 392.000000
Fahrenheit = 300.000000 to Celsius = 148.888885

1.10 Area of a triangle is given by the formula

A=sqrt(S(S-a)(S-b)(S-c))

Where a, b and c are sides of the triangle and 2S=a+b+c. Write a program to compute the area of the triangle given the values of a, b and c.

Algorithm:--

Algorithm to compute the area of a triangle.

Step 1: Store 0 to a, b ,c and S.
Step 2: Store 20, 30 and 40 to a, b and c respectively.
Step 3: Compute (a+b+c)/2 and store the result in S.
Step 4: Compute sqrt(S*(S-a)*(S-b)*(S-c)) and store the result in Area.
Step 5: Display Area.

Flowchart:--

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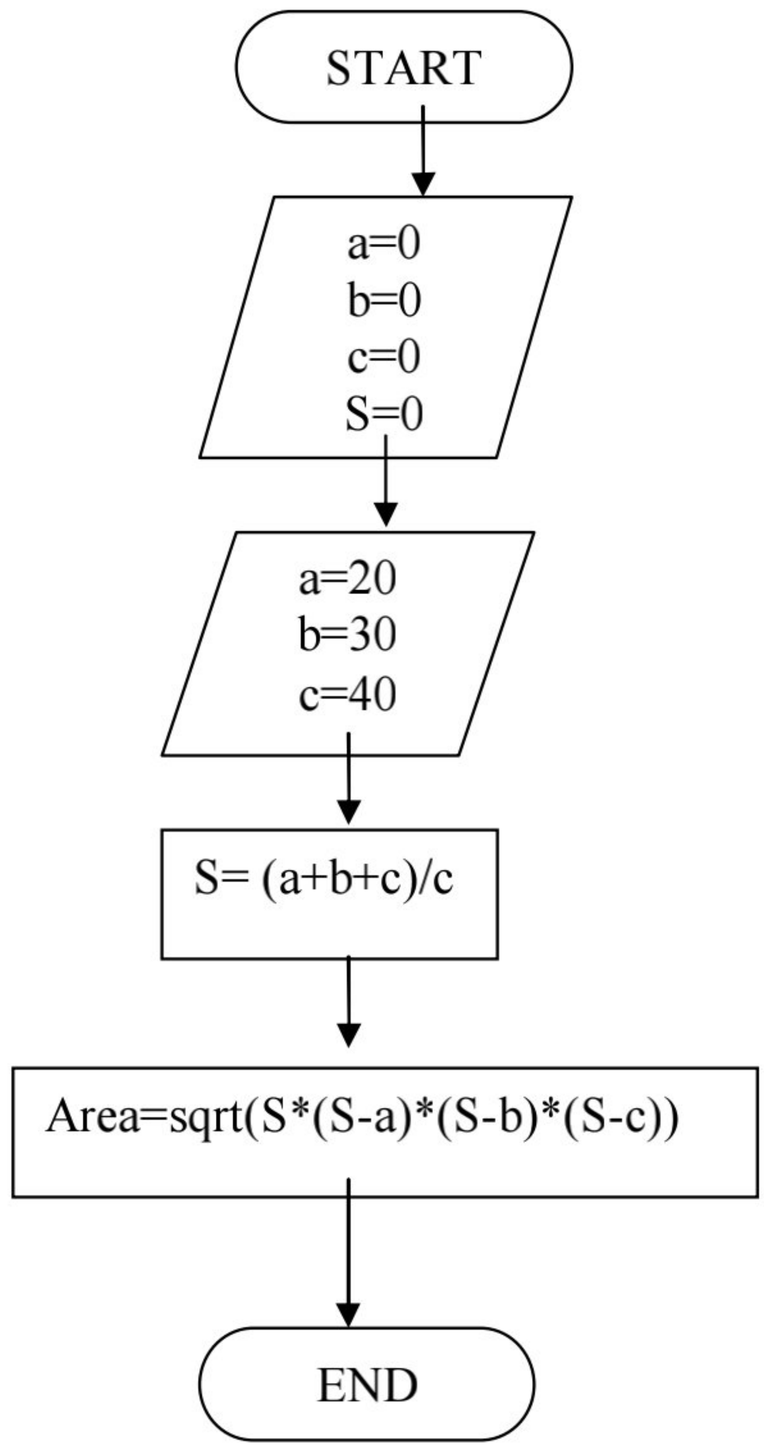

Program:--

```
//Area of a triangle is given by the formula

//A=sqrt(S(S-a)(S-b)(S-c))
//Where a, b and c are sides of the triangle and 2S=a+b+c.
//Write a program to compute the area of the triangle
//given the values of a, b and c.

#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{

    int a,b,c;
    float S,Area;
    a=b=c=S=0;

    clrscr();

    a=20;
```

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```
    b=30;
    c=40;

    S=(a+b+c)/2;

    Area=sqrt(S*(S-a)*(S-b)*(S-c));

    printf("Area of a triangle is= %f",Area);

    getch();
}
```

Output:--

Area of a triangle is= 290.473755

1.11 Distance between two points (x1,y1) and (x2,y2) is governed by the formula

$$D^2 = (x_2-x_1)^2+(y_2-y_1)^2$$

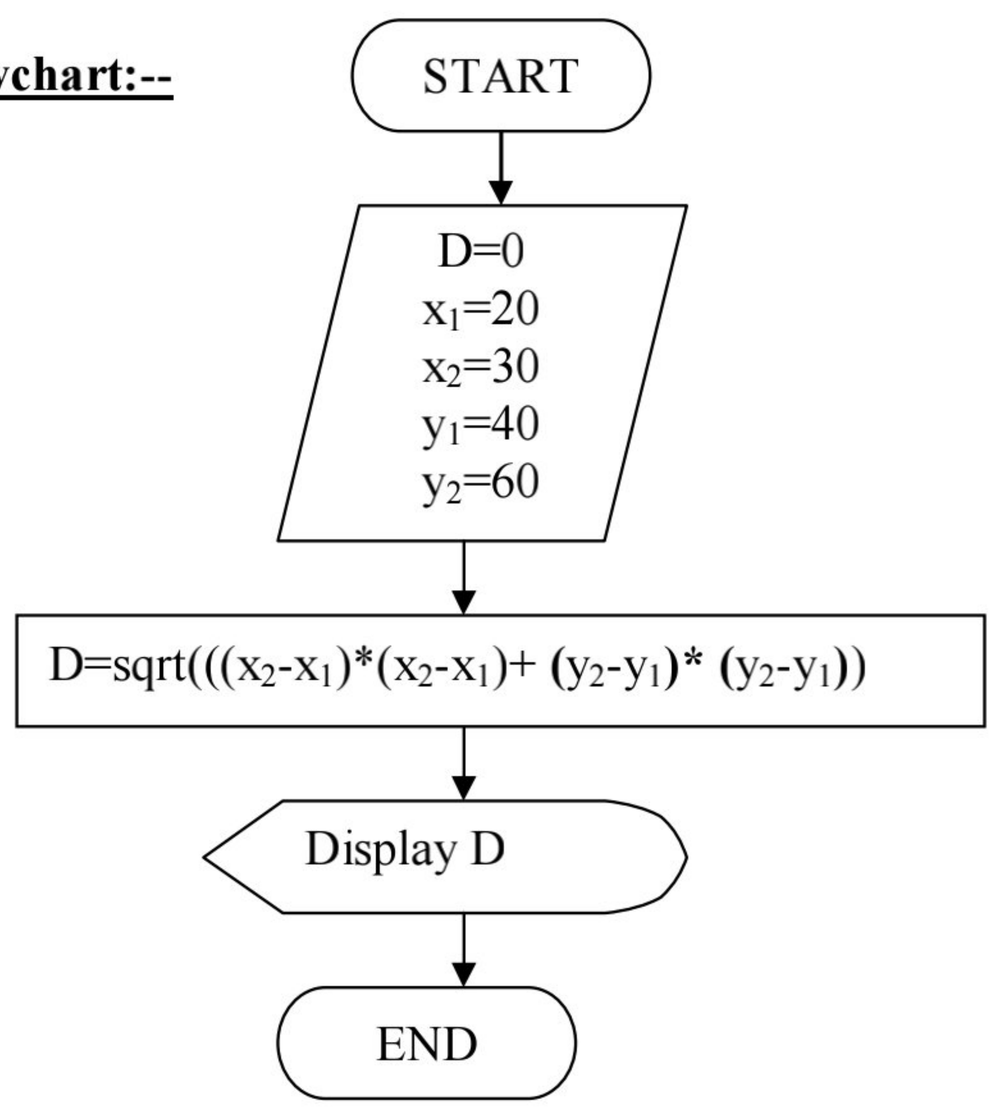
Write a program to compute D given the coordinates of the points.

Algorithm:--

Algorithm to compute the distance between to points.

Step 1: Store 0 to D.
Step 2: Store 20,30,40 and 50 in x_1,x_2,$y_1$and y_2 respectively.
Step 3: Compute sqrt((x_2-x_1)*(x_2-x_1)+ (y_2-y_1)* (y_2-y_1)) and store the result in D.
Step 4: Display D.

Flowchart:--



Program:--

//Distance between two points (x1,y1) and (x2,y2) is governed by the formula

//D2 = (x2-x1)2+(y2-y1)2

//Write a program to compute D given the coordinates of the points.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{

    int x1,x2,y1,y2;
    float D;
    D=0;
    x1=20;
    x2=30;
    y1=40;
    y2=50;

    clrscr();

    D=sqrt((x2-x1)*(x2-x1)+ (y2-y1)* (y2-y1));

    printf("Distance between to points is= %f",D);

    getch();
}
```

Output:--

Distance between twoo points is = 14.142136

1.12 A point on the circumference of a circle whose center is (0, 0) is (4, 5). Write a program to compute perimeter and area of the circle.

Algorithm:--

Algorithm to compute perimeter and area of the circle.

Step 1: Store the coordinate of origin O1 and O2 to 0, 0 respectively.
Step 2: Store the coordinate of point x1 and y1 to 4, 5 respectively.
Step 3: Compute sqrt((x1-O1)*(x1-O1)+ (y1-O2)* (y1-O2)) and store the result in Rad.
Step 4: Compute 2*PIE*Rad and store the result in Circum.
Step 5: Compute PIE*Rad*Rad and store the result in Area.
Step 6: Display Circum & Area.

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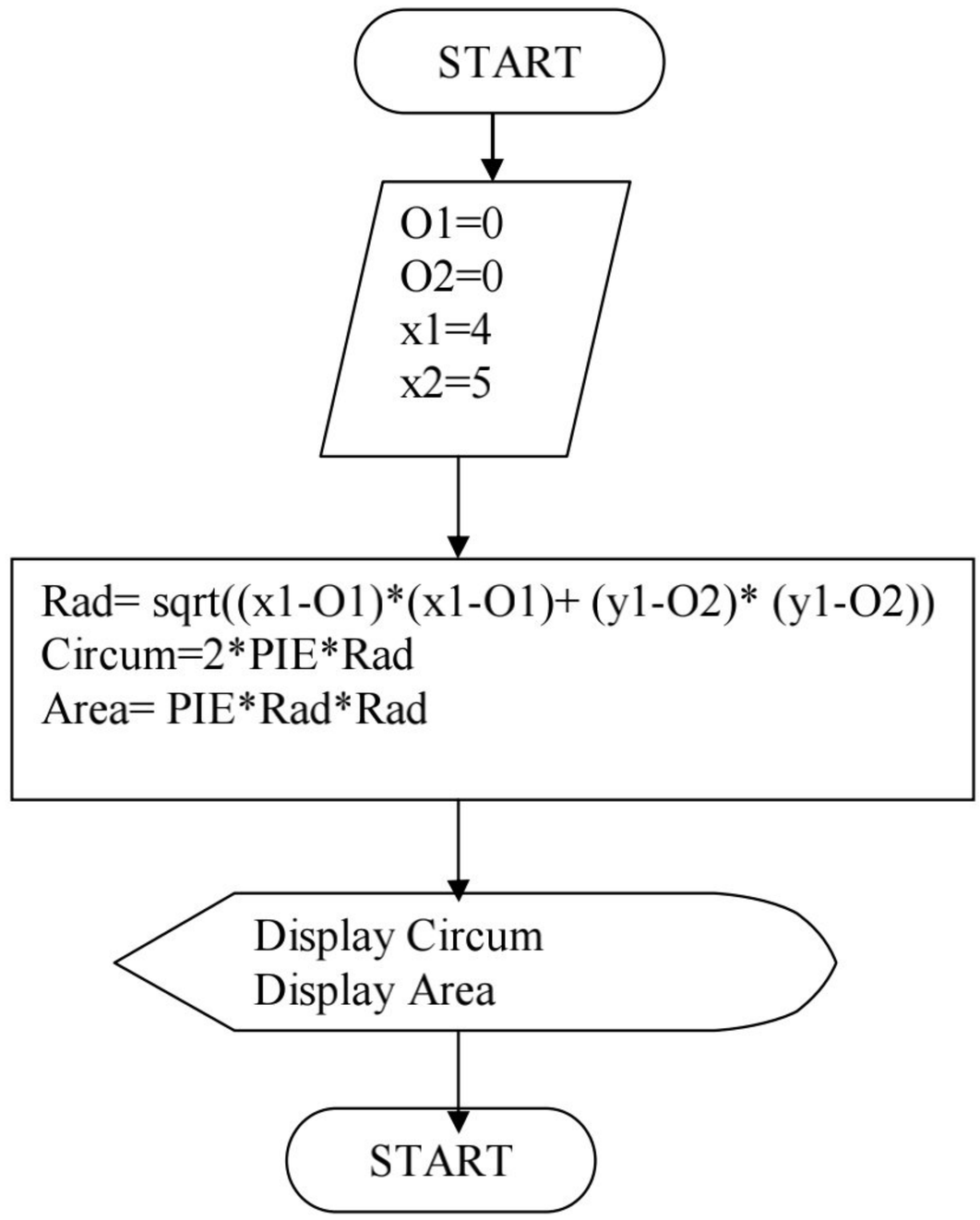
Flowchart:--



Program:--

//A point on the circumference of a circle whose center is (0, 0) is (4, 5). Write
//a program to compute perimeter and area of the circle.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

#define PIE 3.14

void main()
{

    int O1,O2,x1,y2;
    float Rad,Circum,Area;

    clrscr();

    Rad=sqrt((x1-O1)*(x1-O1)+ (y1-O2)* (y1-O2)));
    Circum=2*PIE*Rad;
    Area=PIE*Rad*Rad;

    printf("Circumference is= %f \n Area is= %f",Circum,Area);

    getch();
}
```

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Output:--

Circumference is= 40.211620
Area is= 128.740005

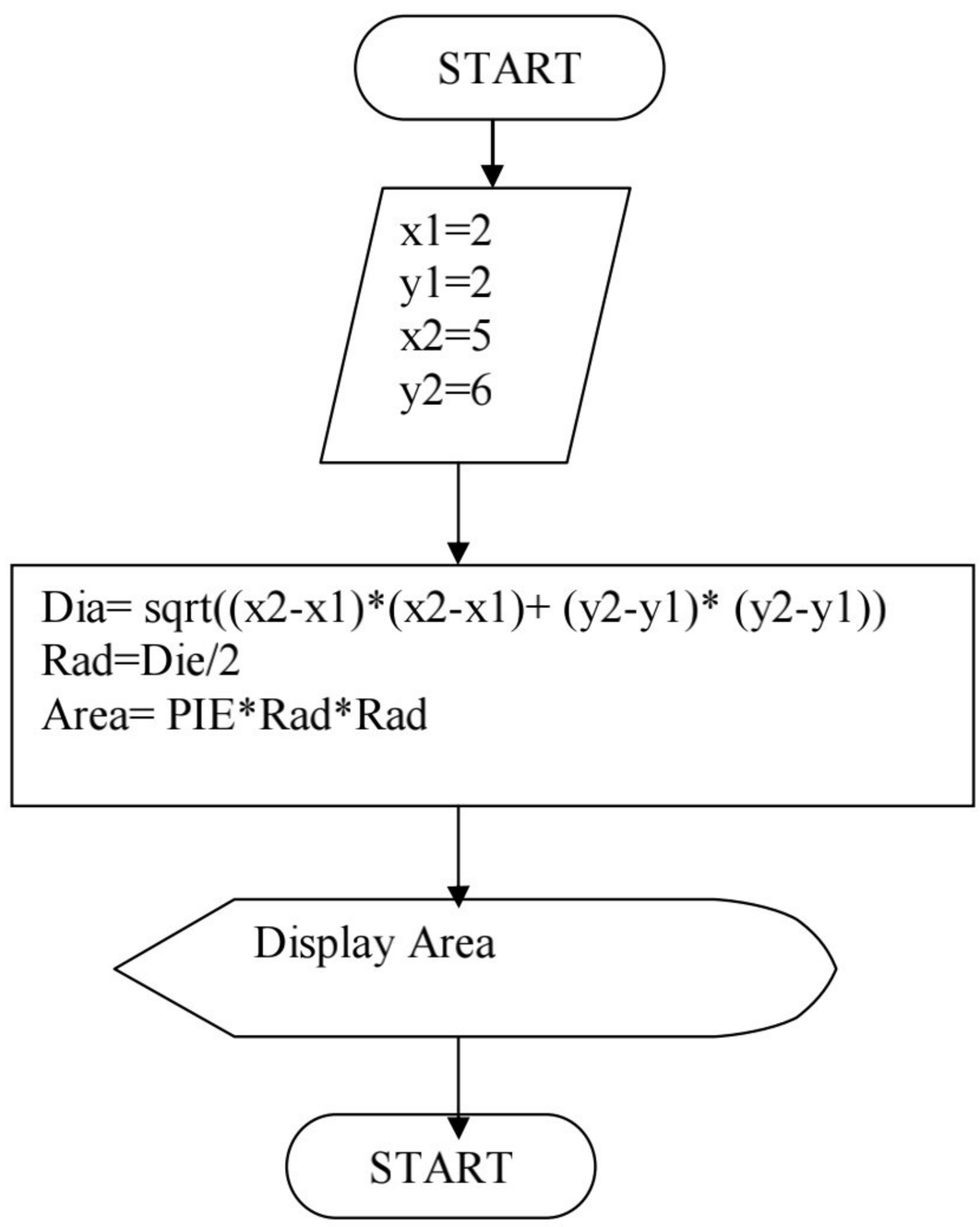
1.13 The line joining the points (2,2) and (5,6) which lie on the circumference of a circle is the diameter of the circle. Write a program to compute the area of the circle.

Algorithm:--

Algorithm to compute the area of the circle.

Step 1: Store 2, 2, 5 and 6 in x1, y1, x2 and y2 respectively.
Step 2: Compute sqrt((x2-x1)*(x2-x1)+ (y2-y1)* (y2-y1)) and store the result in Dia.
Step 3: Compute Dia/2 and store the result in Rad.
Step 4: Compute PIE*Rad*Rad and store the result in Area.
Step 5: Display Area.

Flowchart:--



Program:--

```
//The line joining the points (2,2) and (5,6) which lie
//on the circumference of a circle is the diameter of the circle.
//Write a program to compute the area of the circle.
```

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```
#include<stdio.h>
#include<conio.h>
#include<math.h>

#define PIE 3.14

void main()
{

        int x1,y1,x2,y2;
        float Die,Rad,Area;

        clrscr();

        x1=2;
        y1=2;
        x2=5;
        y2=6;

        Die=sqrt((x2-x1)*(x2-x1)+ (y2-y1)* (y2-y1));
        Rad=Die/2;
        Area=PIE*Rad*Rad;

        printf("Area is= %f",Area);

        getch();
}
```

Output:--

Area is = 19.625000

1.14 Write a program to display the equation of a line in the form

ax+by=c

for a=5, b=8 and c=18.

Algorithm:--

Algorithm to display the equation.

Step 1: Store 5, 8 and 18 to a, b and c respectively.
Step 2: Display ax+by=c

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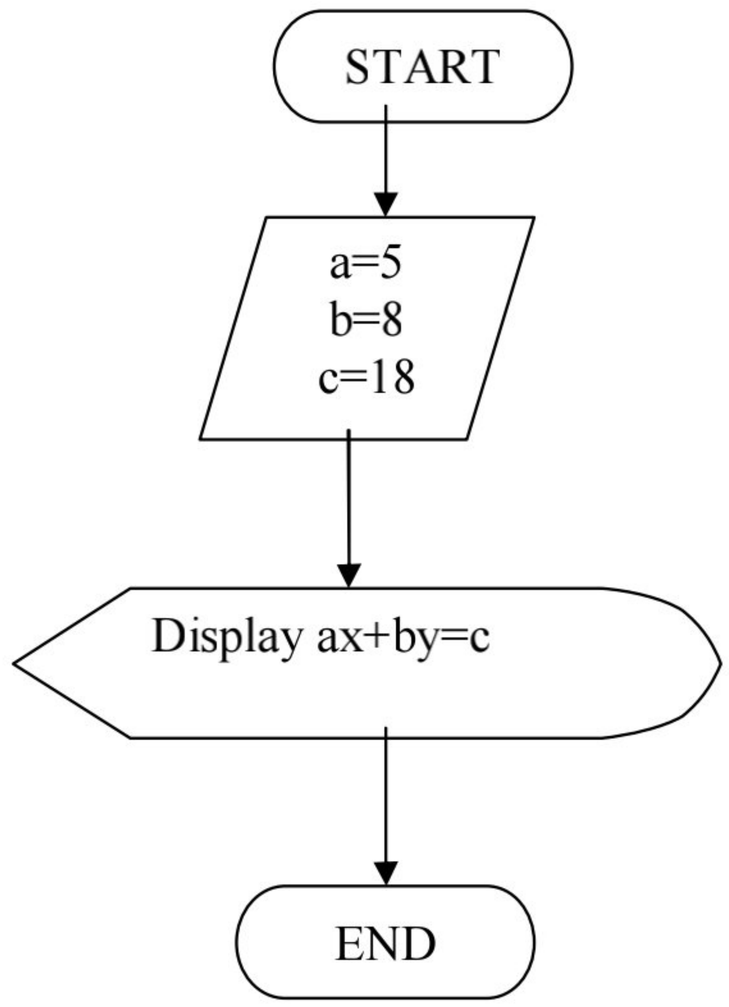
Flowchart:--



Program:--

```
//Write a program to display the equation of a line in the form

//ax+by=c

//for a=5, b=8 and c=18.


#include<stdio.h>
#include<conio.h>
#include<math.h>


void main()
{

   int a,b,c;

   clrscr();

   a=5;
   b=8;
   c=18;

   printf(" %d x + %d y = %d",a,b,c);

   getch();
}
```

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Output:--

5 x + 8 y = 18

1.15 Write a program to display the following simple arithmetic calculator

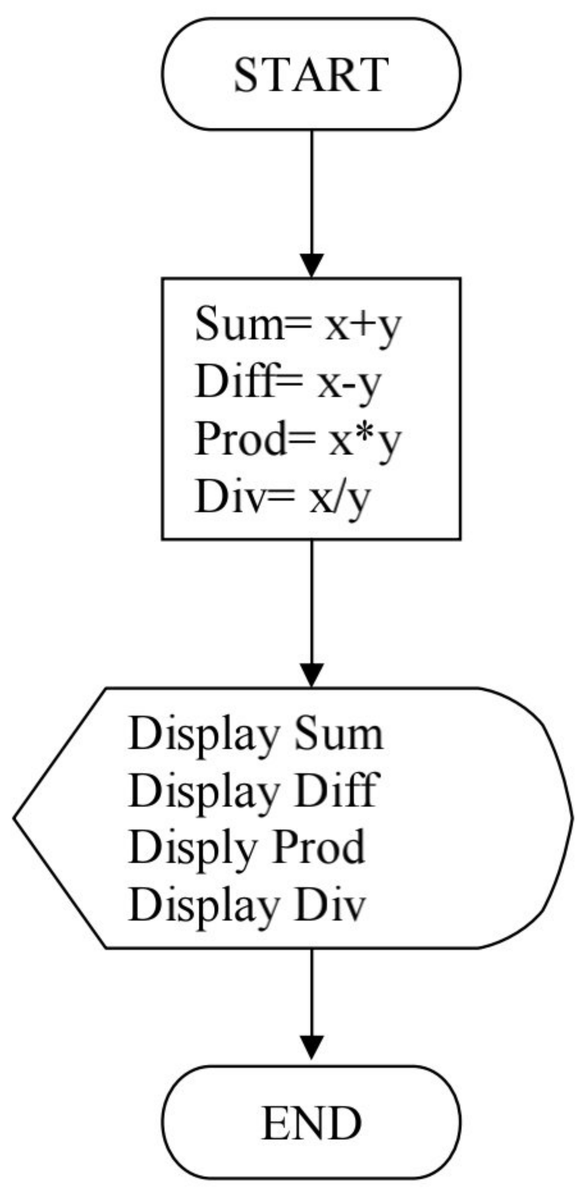
x=	**y=**
Sum=	**Difference=**
Product=	**Division=**

Algorithm:--

Algorithm to display simple arithmetic calculator.

Step 1: Store 6, 5 to x, y respectively.
Step 2: compute x+y and store the result in Sum.
Step 3: compute x-y and store the result in Diff.
Step 4: compute x*y and store the result in Prod.
Step 5: compute x/y and store the result in Div.
Step 6: Display Sum, Diff, Prod and Div.

Flowchart:--



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Program:--

```
//Write a program to display the following simple arithmetic calculator

//x=                    y=
//Sum=                  Difference=
//Product=              Division=



#include<stdio.h>
#include<conio.h>
#include<math.h>


void main()
{
    int x,y;

    float Sum,Diff,Prod,Div;

    clrscr();

    x=6;
    y=5;

    Sum=x+y;
    Diff=x-y;
    Prod=x*y;
    Div=x/y;

    printf("x= %d              y= %d\n",x,y);
    printf("Sum= %f              Difference= %f\n",Sum,Diff);
    printf("Product= %f              Dividion= %f",Prod,Div);

    getch();
}
```

Output:--

```
x= 5                    y= 6
Sum= 11.000000          Difference= 1.000000
Product= 30.000000      Division= 1.000000
```

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2.1 Write a program to determine and print the sum of following harmonic series for given value of n:

1+1/2+1/3+…….+1/n.

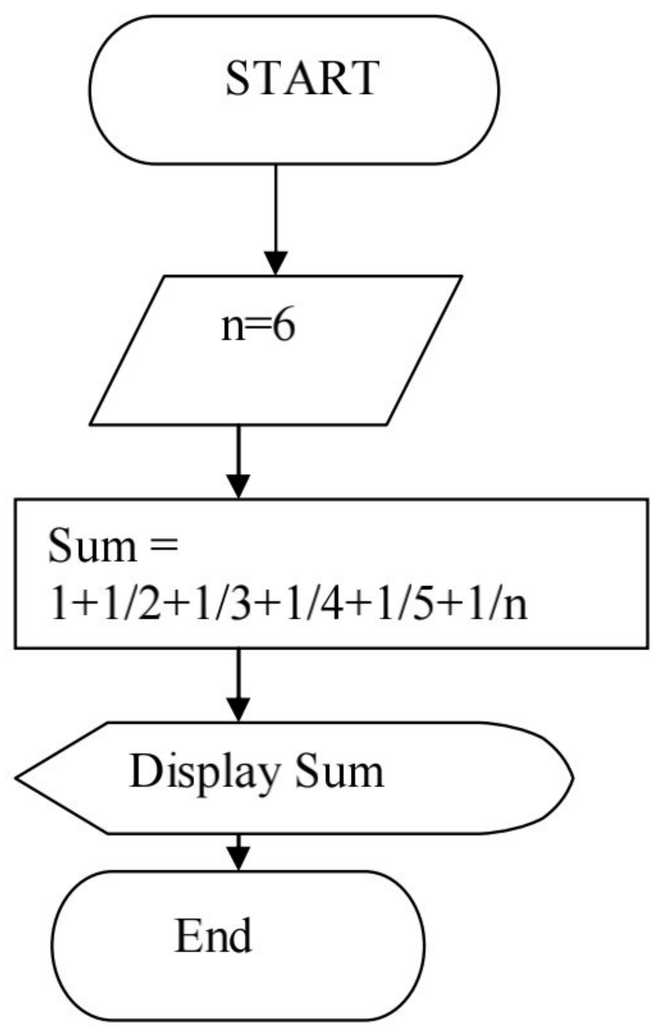
The value of n should be given interactively through the terminal.

Algorithm:--

Algorithm to display the sum of harmonic series.

Step 1. Store value 6 to n..
Step 2. compute 1+1/2+1/3+1/4+1/5+1/n and store the result in Sum.
Step 3 Display Sum.

Flowchart:--



Program:--

```
// Write a program to determine and print the sum of
//following harmonic series for given value of n:
//1+1/2+1/3+……+1/n.
//The value of n should be given interactively through the terminal.


// Date: 12/03/2010


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

```
void main()
{

int n;
float sum;

clrscr();

n=6;

sum=1+1/2+1/3+1/4+1/5+1/n;

printf("Sum is %f",sum);

getch();
}
```

Output:--

Sum is 1.000000

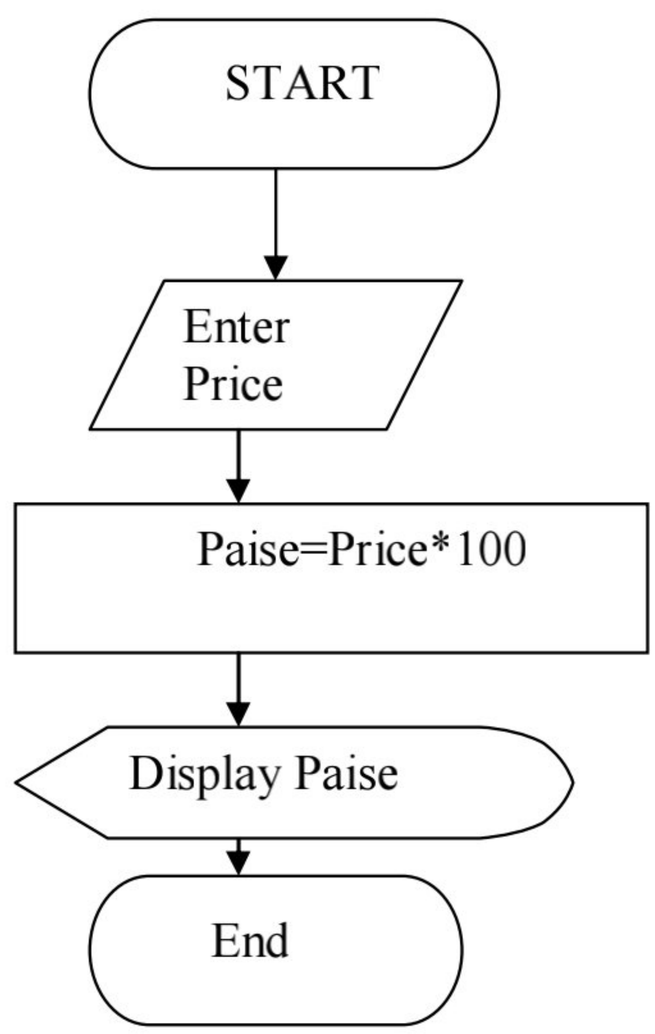
2.2 Write a program to read the price of an item in decimal form and print it in paise (like 2563).

Algorithm:--

Algorithm to display price of item in paise form.

Step 1: Enter a value in Price.
Step 2: Compute Price*100 and store the result in Paise.
Step 3: Display Paise.

Flowchart:--



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Program:--

```
//Write a program to read the price of an item in decimal
//form and print it in paise   (like 2563).

//Date: 12/03/2010


#include<stdio.h>
#include<conio.h>


void main()
{

        float Price;
        int Paise;

        clrscr();

        printf("Enter the price of Item in decimal\n");
        scanf("%f",&Price);

        Paise=Price*100;

        printf("Price in Paise is %d ",Paise);

        getch();
}
```

Output:--

```
Enter the price of Item in decimal 27.68
Price in Paise is 2768
```

2.3 Write a program that prints the even no. from 1 to 10.

Algorithm:--

Algorithm to ptints even no. from 1 to 10.

Step 1: Store 2 to i.
Step 2: Display i.
Step 3: Compute i=i+2 & Display i
Step 4: Compute i=i+2 & Display i.
Step 4: Compute i=i+2 & Display i
Step 5: Compute i=i+2 & Display i
Step 4: End

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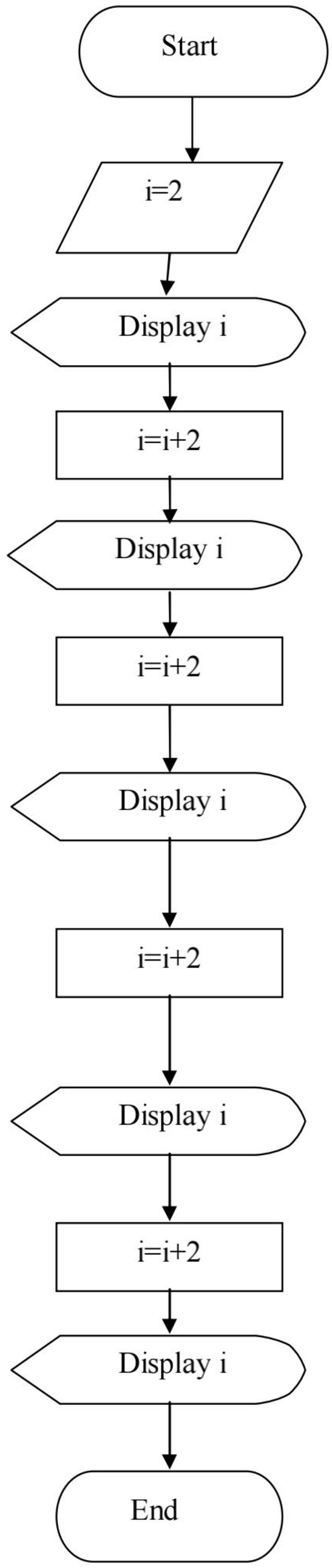
Flowchart:--



Program:--

//Write a program that prints the even no. from 1 to 100.

//Date: 12/03/2010

```
#include<stdio.h>
```

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```
#include<conio.h>

void main()
{

        int i=2;

        clrscr();

        printf("Even Numbers from 1 t0 10 are :--\n");
        printf("%d  ",i);
        i=i+2;
        printf("%d  ",i);
        i=i+2;
        printf("%d  ",i);
        i=i+2;
        printf("%d  ",i);
        i=i+2;
        printf("%d  ",i);

        getch();
}
```

Output:--

Even Numbers from 1 t0 10 are :--

2 4 6 8 10

2.4 Write a program that requests two float type numbers from the user and then divides the first number by the second and display the result along with the numbers.

Algorithm:--

Algorithm to display the division of two numbers.

Step1: Enter the first number and store in x
Step2: Enter the second number and store in y
Step3: Compute x/y and store in Div.
Step4: Display x, y and Div.

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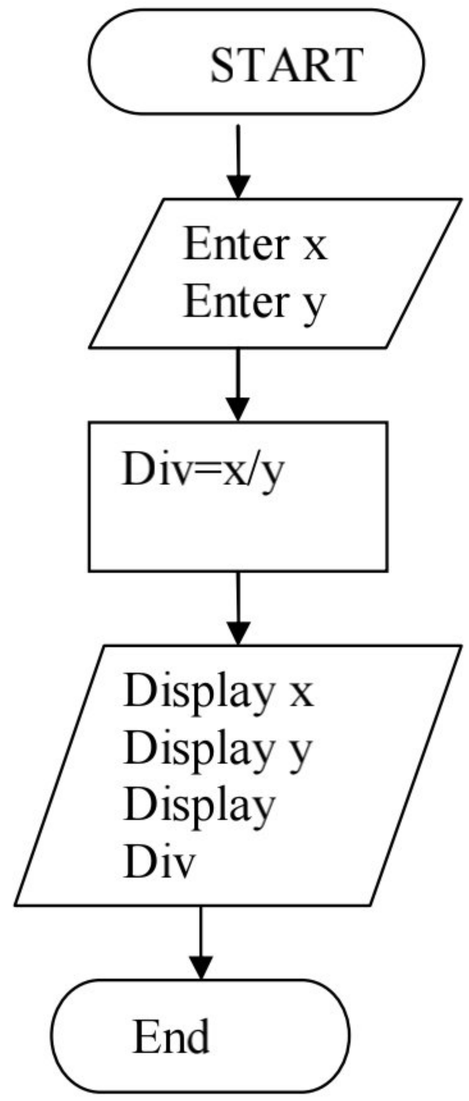
Flowchart:--



Program:--

```
//Write a program that requests two float type numbers
//from the user and then divides the first number by the
//second and display the result along with the numbers.

//Date: 12/03/2010


#include<stdio.h>
#include<conio.h>

void main()
{
        float x,y,Div;

        clrscr();

        printf("Enter Two Values:--\n");
        scanf("%f %f",&x,&y);

        Div=x/y;

        printf("x= %f y= %f Div= %f",x,y,Div);
        getch();
}
```

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Output:--

Enter Two Values:--
4 2
x= 4.000000 y= 2.000000 Div= 2.000000

2.5 The price of one kg of rice is Rs. 16.75 and one kg of sugar is Rs.15. Write a program to get these values from the user and display the prices as follows:

***** LIST OF ITEMS*****

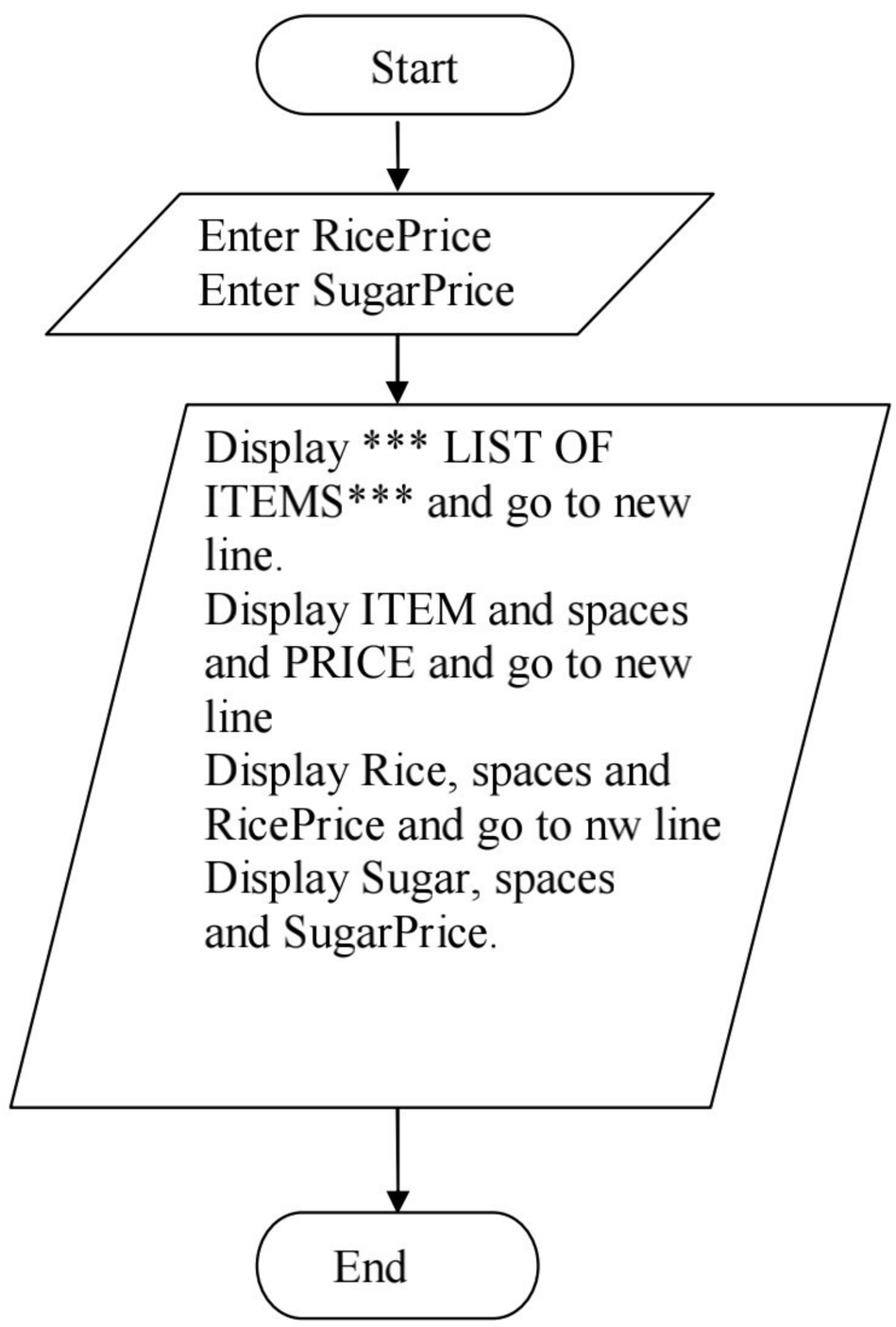
Item	**Price**
Rice	**Rs. 16.75**
Sugar	**Rs. 15.00**

Algorithm:--

Algorithm to Display List of Items.

Step1: Enter the price of rice in RicePrice.
Step2: Enter the price of sugar in SugarPrice.
Step3: Display *** LIST OF ITEMS*** and go to new line.
Step4: Display ITEM and spaces and PRICE and go to new line
Step5: Display Rice, spaces and RicePrice and go to nw line.
Step6: Display Sugar, spaces and SugarPrice.

Flow Chart



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Program:--

```
// The price of one kg of rice is Rs. 16.75 and one kg of sugar is Rs.15
// Write a program to get these values from the user and display the
// prices as follows:
// *** LIST OF ITEMS***
// Item       Price
// Rice       Rs. 16.75
// Sugar      Rs. 15.00

// Date: 12/03/2010


#include<stdio.h>
#include<conio.h>

void main()
{
  float RicePrice,SugarPrice;

  clrscr();

  printf("Enter the price of Rice:\n");
  scanf("%f",&RicePrice);
  printf("Enter the price of Sugar:\n");
  scanf("%f",&SugarPrice);

  printf("***LIST OF ITEMS***\n");

  printf("Item      Price\n");
  printf("Item      Rs. %f\n",RicePrice);
  printf("Rice      Rs. %f\n",SugarPrice);

  getch();
}
```

Output:--

```
Enter the price of Rice: 16.75
Enter the price of Sugar: 15

*** LIST OF ITEMS***
Item       Price
Rice       Rs. 16.7500
Sugar      Rs. 15.0000
```

2.7 Write a program to do the following:

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a) **Declare x and y as integer variables and z as a short integer variable.**
b) **Assign two 6 digit numbers to x and y.**
c) **Assign the sum of x and y to z.**
d) **Output the value of x, y and z.**

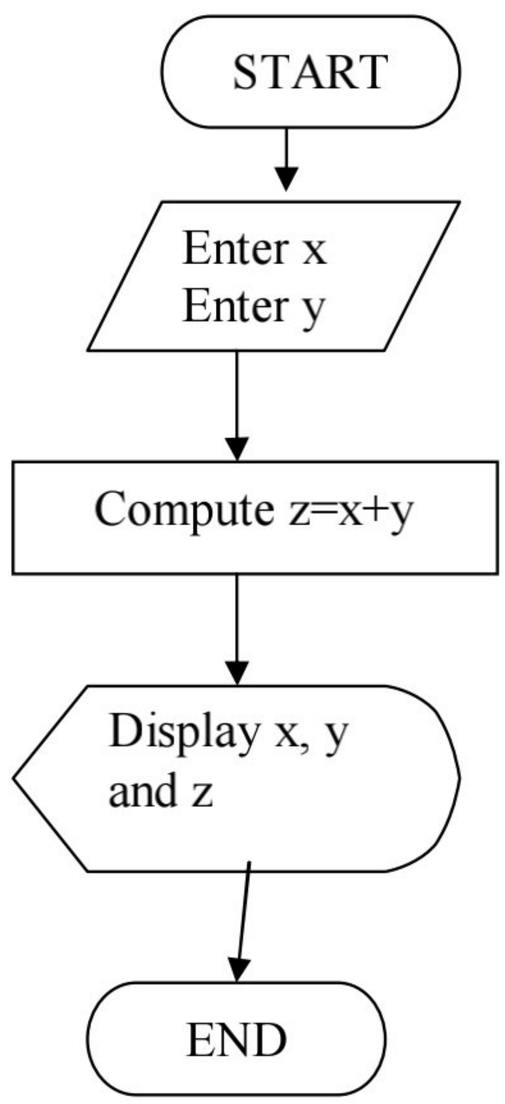
Comment on the output.

Algorithm:--

Algorithm to print the sum of to values.

Step 1: Enter the two integer values to variables x and y.
Step 2: Compute the sum or x and y
Step 3: Store the result of Step 3 to short integer z.
Step 4: Display x, y and z.

Flowchart:--



Program:-

// Write a program to do the following:

//a) Declare x and y as integer variables and z as a short integer variable.
//b) Assign two 6 digit numbers to x and y.
//c) Assign the sum of x and y to z.
//d) Output the value of x, y and z.

//Comment on the output.

//Date : 12/03/2010

CamScanner

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

void main()
{

   int x,y;
   short int z;

   clrscr();

   printf("Enter Two Values\n");
   scanf("%d %d",&x,&y);

   z=x+y;

   printf("Values Are:--\n");
   printf("x= %d , y= %d , z=%d",x,y,z);

   getch();
}
```

Ouput:--

```
Enter Two Values
123456
234567
Values Are:--
x= -7616      y= -27577    z= 30343
```

2.8 Write a program to read two floating point numbers using a scanf statement, assign their sum to an integer variable and then output the values of all the three variables.

Algorithm:--

Algorithm to display the sum of two floating point numbers.

Step 1: Enter the two floating point numbers to x and y.
Step 2: Compute the sum of x and y.
Step 3: Store the result of Step 2 to integer variable z.
Step 4: Display the values of x, y and z.

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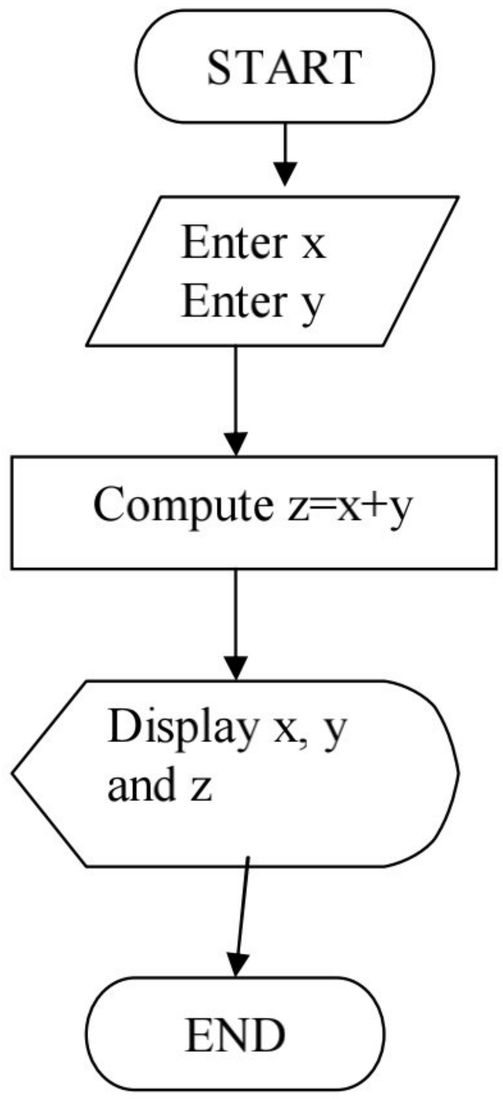
Flowchart:--



Program:--

```
// Write a program to read two floating point numbers
//using a scanf statement, assign their sum to an integer
//variable and then output the values of all the three variables.

//Date : 12/03/2010


#include<stdio.h>
#include<conio.h>

void main()
{

   float x,y;
   int z;

   clrscr();

   printf("Enter Two Values\n");
   scanf("%f %f",&x,&y);

   z=x+y;

   printf("Values Are:--\n");
   printf("x= %f , y= %f , z=%d",x,y,z);

   getch();
}
```

Output:--

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Enter Two Values
12.35
14.67
Values Are:--
x= 12.350000 y= 14.670000 z= 27

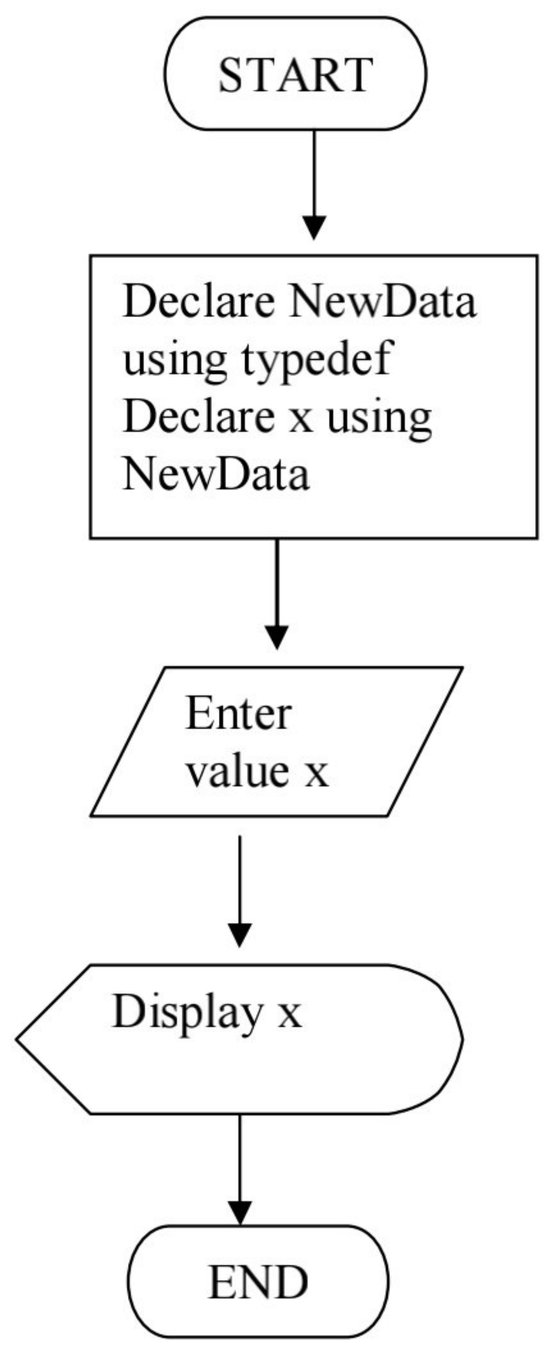
2.9 Write a program to illustrate the use of typedef declaration in a program.

Algorithm:--

Algorithm to illustrate the use of typedef declaration.

Step 1: Declare a user define datatype NewData using typedef.
Step 2: Declare a variable x using NewData.
Step 3: Enter value to x.
Step 4: Display the value of x.

Flowchart:--



Program:--

```
// Write a program to illustrate the use of typedef declaration in a program.

//Date : 12/03/2010

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

```
void main()
{

   typedef int NewData;

   NewData x;

   clrscr();

   printf("Enter Value\n");
   scanf("%d",&x);

   printf("Value is:--\n");
   printf("x= %d",x);

   getch();
}
```

Output:--

Enter value
2
Value is:--
X=2

2.10 Write a program to illustrate the use of symbolic constants in a real life application.

Algorithm:--

Algorithm to illustrate the use of symbolic constants.

Step 1: Declare symbolic constants PIE to value 3.14.
Step 2: Compute PIE*Rad*Rad
Step 3: Store the result of Step 2 to Area.
Step 4: Display Area.

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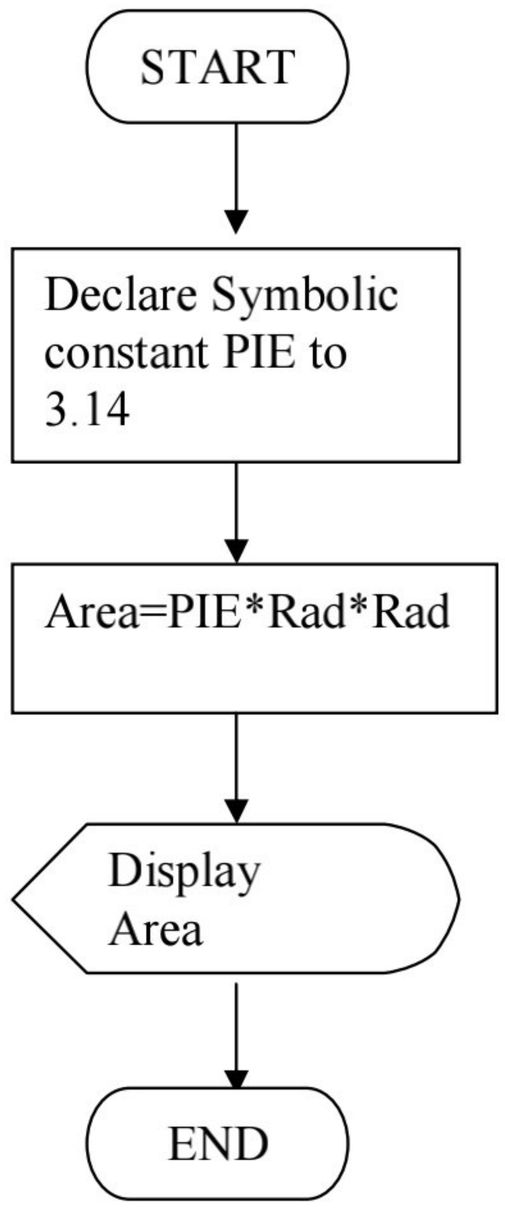
Flowchart:--



Program:--

```
// Write a program to illustrate the use of symbolic constants in a real
//life application.
//Date : 12/03/2010


#include<stdio.h>
#include<conio.h>

#define PIE 3.14

void main()
{

   float Area;
   int Rad;

   clrscr();

   printf("Enter Radius\n");
   scanf("%d",&x);

   Area=PIE*Rad*Rad;

   printf("Area of Circle is:--\n");
   printf("%f",Area);
```

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```
  getch();
}
```

Output:--

```
Enter Radius
3
Area of Circle is:--
28.260000
```

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CHAPTER 3

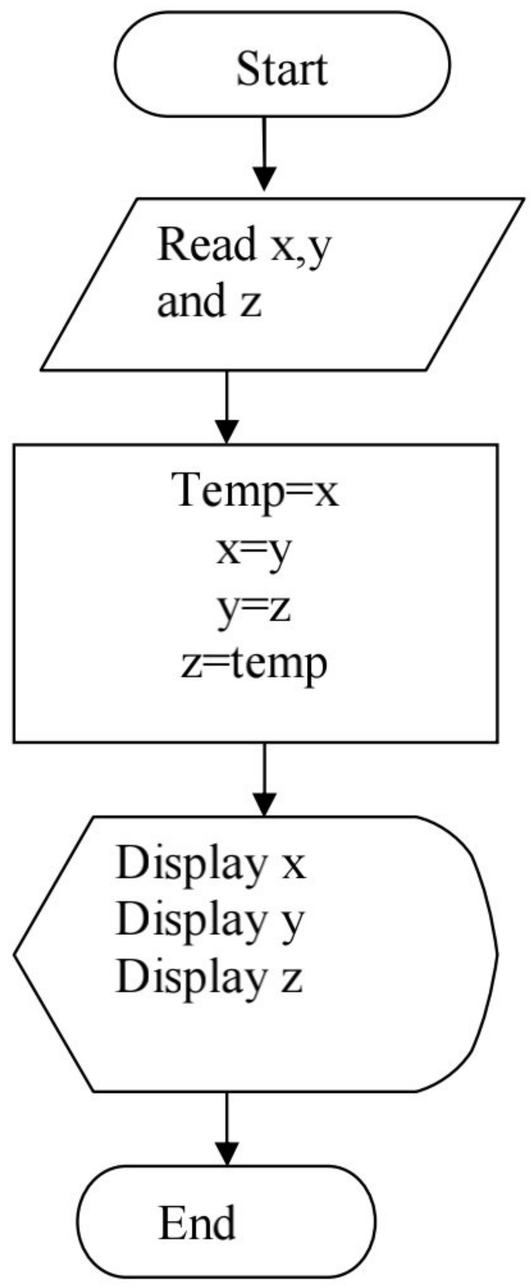
12/03/2010

3.1 Given the values of the variables x, y and z, write a program to rotate their values such that x has the value of y, y has the value of z and z has the value of x.

Algorithm:--

Step 1: Read x, y and z.
Step 2: Compute Temp=x.
Step 3: Compute x=y.
Step 4: Compute y=z.
Step 5: Compute z=Temp.
Step 6: Display x, y and z.

Flow Chart:--



Program

```
// Given the values of the variables x, y and Z, write a program to rotate  their values such
//that x has the value of y, y has the value of z and  z has the value of x

//Date : 12/03.2010

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

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```
void main()
{
 int x,y,z,Temp;

          clrscr();

printf("Enter Three Values\n");
scanf("%d%d%d",&x,&y,&z);

 Temp=x;
 x=y;
 y=z;
 z=Temp;

printf(" x= %d \n y= %d \n z= %d",x,y,z);

getch();
}
```

Output

Enter Values of x, y and z
1 2 3

x=2
y=3
z=1

2.2 Write a program that reads a floating-point number and then displays the right –most digit of the integral part of the number.

Algorithm:--

Step 1: Read x where x is float type.
Step 2: Compute y=x where y is integer type.
Step 3: compute y %10 and store the result in z.
Step 4: Display z.

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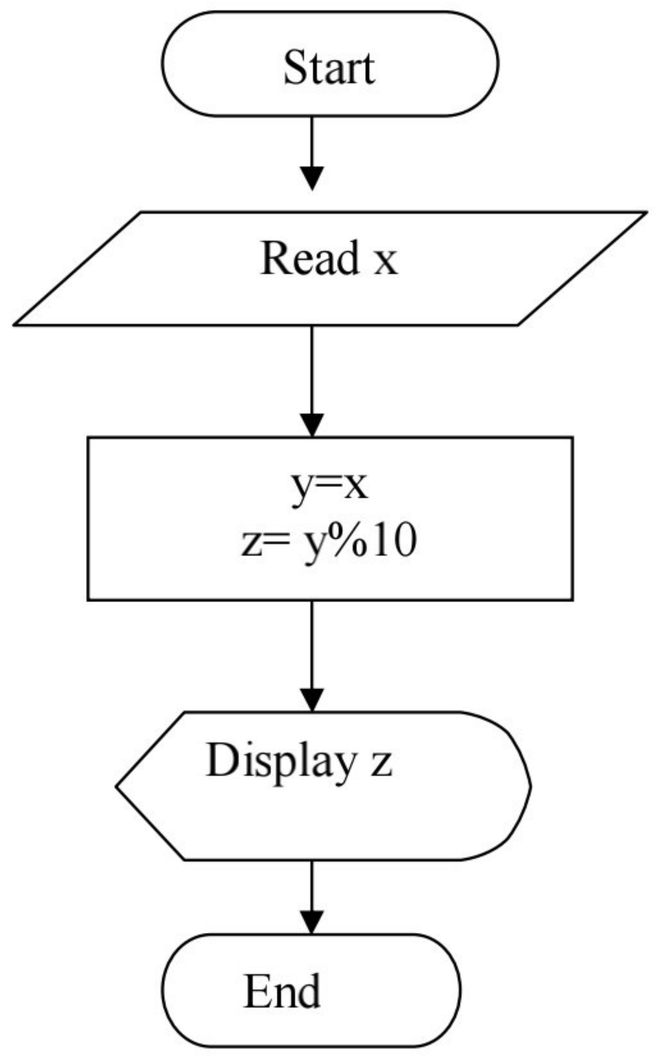
Flow Chart:--



Program

```
// Write a program that reads a floating-point number and then displays the right –most
//digit of the integral part of the number.

// Date 12/03/2010

#include<stdio.h>
#include<conio.h>

void main()
{
        float x;
        int y,z;

        clrscr();

        printf("Enter floating point number : x= ");
        scanf("%f",&x);

         y=x;
        z=y%10;

        printf(" \nThe Right-most digit of the integral part of the number %f is %d",x,z);
        getch();
}
```

Output

```
Enter floating point number : x= 172.34
The Right-most digit of the integral part of the number 172.34 is 3.
```

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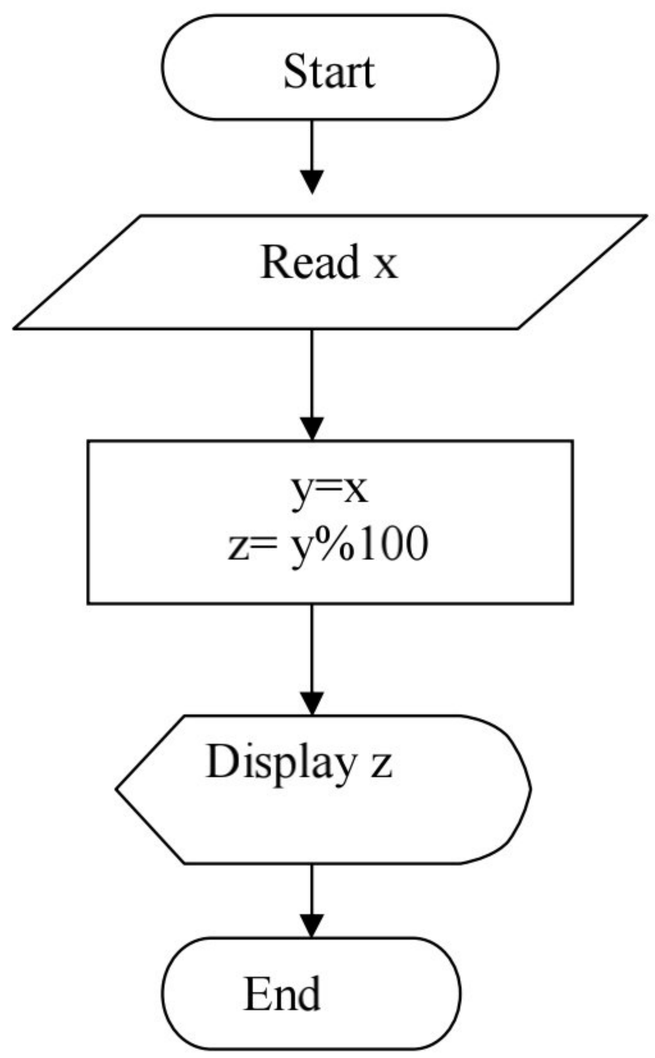
3.3 Write a program that reads a floating-point number and then displays the two right –most digit of the integral part of the number.

Algorithm:--

Step 1: Read x where x is float type.
Step 2: Compute y=x where y is integer type.
Step 3: compute y %100 and store the result in z.
Step 4: Display z.

Flow Chart:--



Program

```
// Write a program that reads a floating-point number and then displays the two right –
//most digit of the integral part of the number.

// Date 12/03/2010

#include<stdio.h>
#include<conio.h>

void main()
{
        float x;
        int y,z;

        clrscr();

        printf("Enter floating point number : x= ");
        scanf("%f",&x);

         y=x;
        z=y%100;
```

```
        printf(" \nThe two Right-most digit of the integral part of the number %f is
%d",x,z);
        getch();
}
```

Output

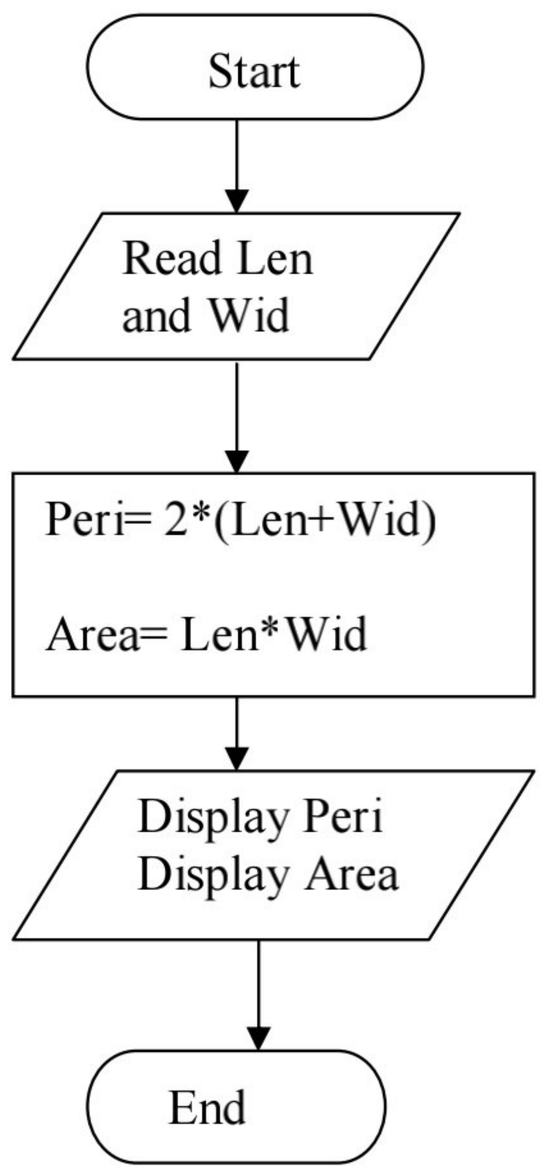
Enter floating point number : x= 172.34
The two Right-most digit of the integral part of the number 172.34 is 72

3.4 Write a program that will obtain the length and width of a rectangle from the user and compute its area and perimeter.

Algorithm--

Step 1: Read Len and Wid.
Step 2: Compute 2*(Len+Wid) and store the result in Peri.
Step 3: Compute Len*Wid and store the result in Area.
Step 4. Display Peri,Area.

Flow Chart--



Program

```
//Write a program that will obtain the length and width of a rectangle from the user and
//compute its area and perimeter.

// Date: 12/03/2010

#include<stdio.h>
```

```
#include<conio.h>

void main()
{

        int Len,Wid,Area,Peri;

         clrscr();

        printf("Enter the  length of the rectangle :\n");
        scanf("%d",&Len);

        printf("Enter width of the rectangle :\n");
        scanf("%d",&Wid);

         Peri= 2*(Len+Wid);

        Area= Len*Wid;

        printf("The perimeter of the rectangle is =%d \n",Peri);
        printf("The area of the rectangle is =%d \n",Area);

        getch();
}
```

Output

```
Enter the  length of the rectangle :20
Enter width of the rectangle : 40

The perimeter of the rectangle =120
The area of the rectangle =800
```

3.5 Given an integer number, write a program that displays the number as follows:

First line: all digits
Second line: all except first digit
Third line: all except first two digits
……
Last line : The last digit.

Algorithm

Step 1: Read x (Only 4 Digit number).
Step 2: Compute x%1000 and store the result in a.
Step 2: Compute a%100 and store the result in b.
Step 2: Compute b%10 and store the result in c.
Step5. Display x and go to new line.
Step6. Display a and go to new line.
Step7. Display b and go to new line.

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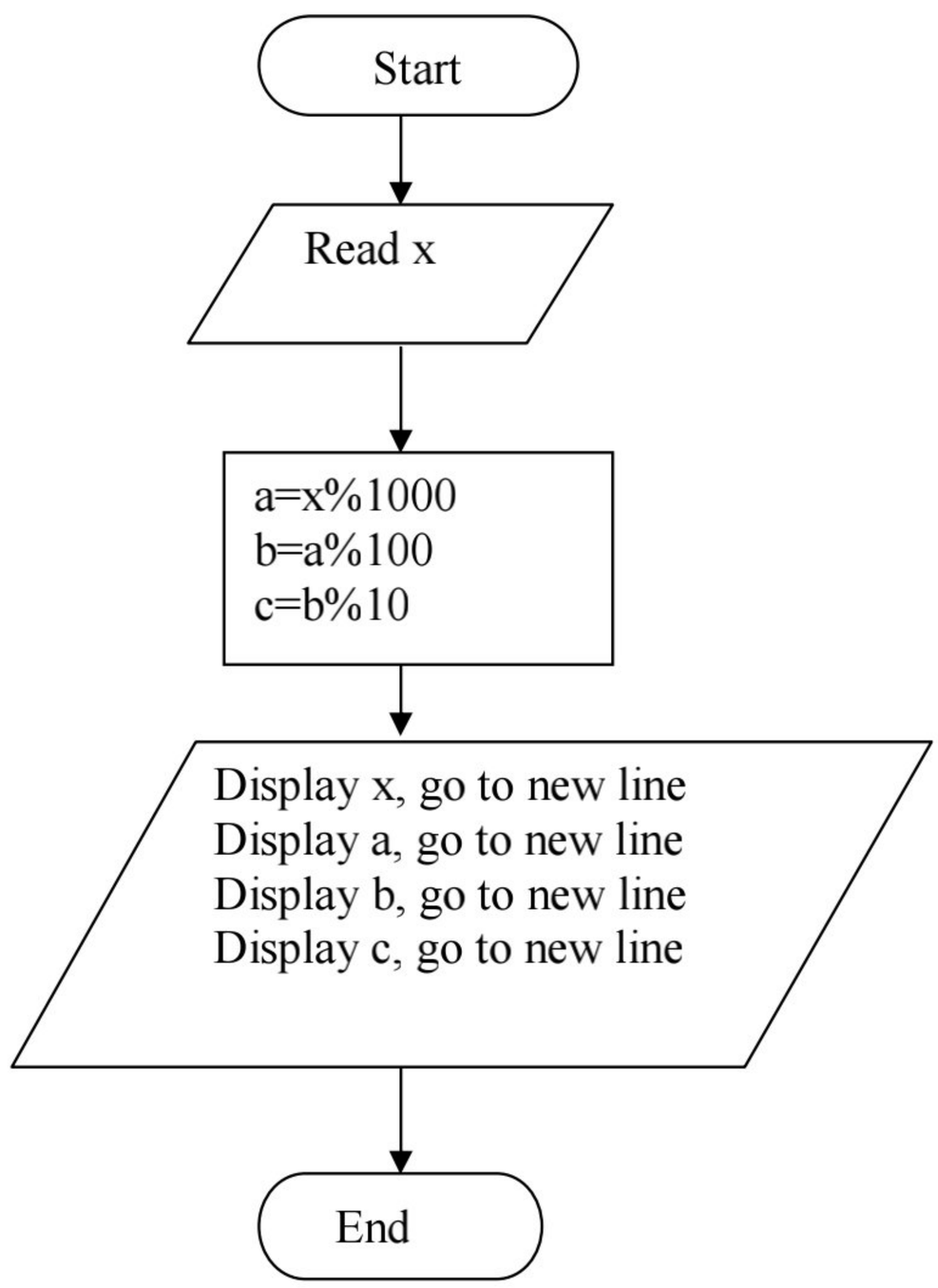
Step8. Display c.

Flow Chart



Program

//Given an integer number, write a program that displays the number as follows:

//First line: all digits
//Second line: all except first digit
//Third line: all except first two digits
//....
//Last line : The last digit.

// Date: 12/03/2010

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

void main()
{

        int x,a,b,c;

        clrscr();
```

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```
        printf("Enter a four digit number: ");
         scanf("%d",&x);

         a=x%1000;
         b=a%100;
         c=b%10;

         printf("%d\n",x);
         printf("%d\n",a);
         printf("%d\n",b);
         printf("%d\n",c);

         getch();
}
```

Output

```
Enter a four digit number: 1234

1234
234
23
2
```

3.6 The straight line method of computing the yearly depreciation of the value of an item is given by:

$$\textbf{Depreciation} = \frac{\textbf{Purchase price- Salvage Value}}{\textbf{Years of Service}}$$

Write a Program to determine the salvage value of an item when the purchase price, years of service and the annual depreciation are given.

Algorithm:--

Step 1: Read Dep,Year_Ser, Pur_Price.
Step 2: Compute Pur_Price-(Dep*Year_Ser) and store in variable Sal_Price.
Step4. Display Sal_Price.

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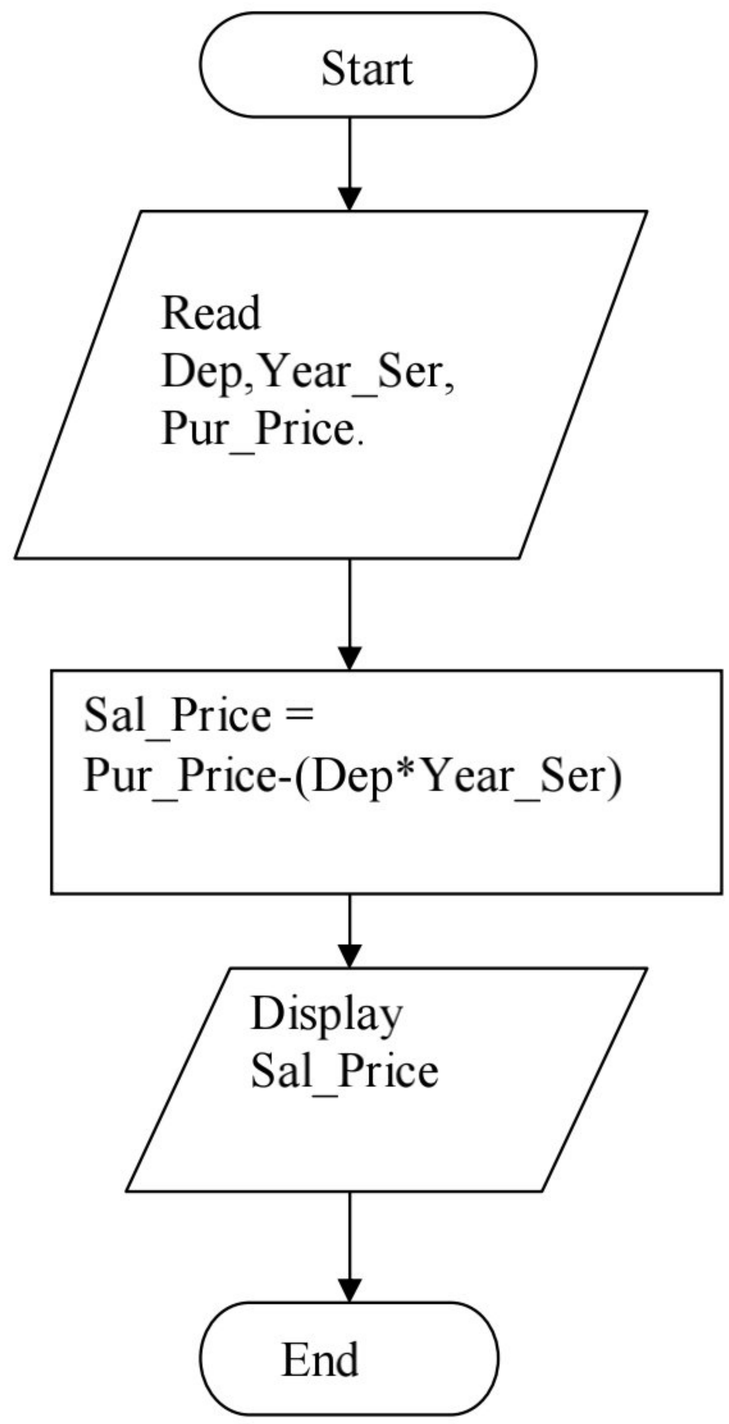
Flow Chart:--



Program

```
//The straight line method of computing the yearly depreciation of the value of an item is
//given by:
 // Depreciation = (Purchase price- Salvage Value)/Years of Service

//Write a Program to determine the salvage value of an item when the purchase price,
//years of service and the annual depreciation are given.*/


// Date 12/03/2010

#include<stdio.h>
#include<conio.h>

void main()
 {

          float Dep,Year_Ser,Pur_Price,Sal_Price;

         clrscr();

         printf("Enter Deperaciation, Year of Service, Purchase price\n");
         scanf("%f%f%f",&Dep,&Year_Ser,&Pur_Price);
```

CamScanner

```
        Sal_Price = Pur_Price-(Dep*Year_Ser);

          printf("The salvage value of an item = %f ",Sal_Price);
  getch();
 }
```

Output:--

Enter Deperaciation, Year of Service, Purchase price
23
2
342
The salvage value of an item = 296.000000

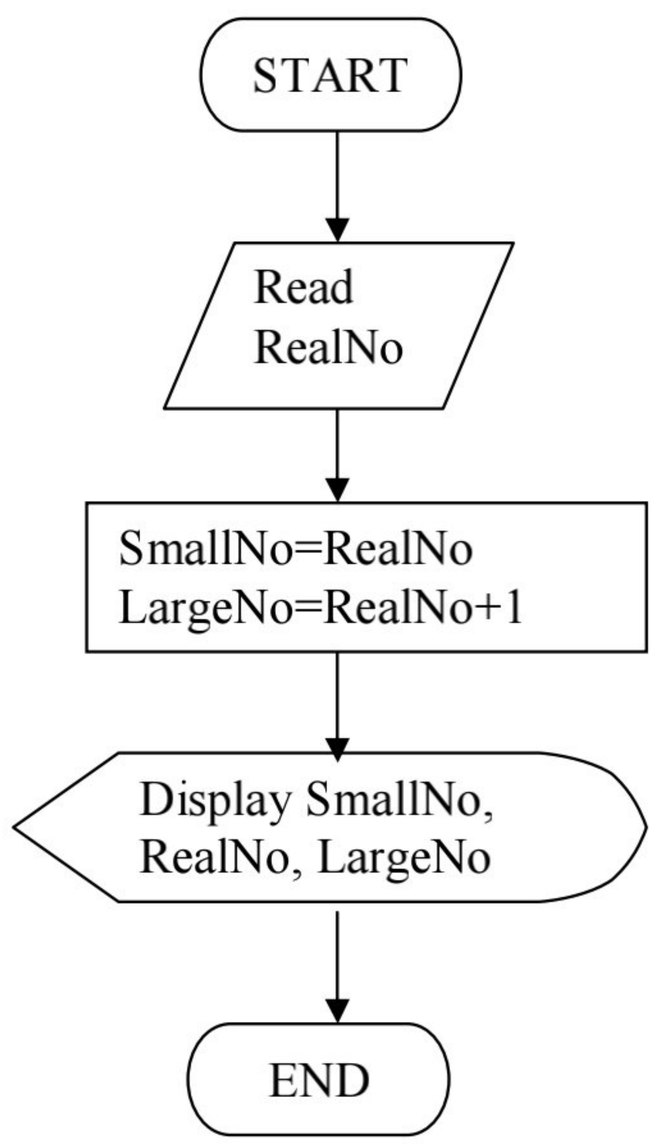
3.7 Write a program that will read a real no. from the keyboard and print the output in one line:

Smallest integer not less than the number **the given no.** **largest integer not greater than the no.**

Algorithm:--

Step 1: Input float value to RealNo
Step 2: Compute SmallNo=RealNo where SmallNo is integer type.
Step 3: Compute LargeNo=RealNo+1 where LargeNo is integer type.
Step 4: Display SmallNo, RealNo, LargeNo.

Flowchart:--



CamScanner

Program:

```
//Write a program that will read a real no. from the keyboard and print the
//output in one line:

//Smallest integer not                the given no.                largest integer not
//less than the number                                             greater  than the no.

//Date: 12/03/2010


#include<stdio.h>
#include<conio.h>


void main()
{

        int SmallNo,LargeNo;
        float RealNo;

        clrscr();

        printf("Enter the real no.");
        scanf("%f",& RealNo);

        SmallNo=RealNo;
        LargeNo=RealNo;

        printf("Smallest integer not     ");
        printf("The given no.          ");
        printf("Largest integer not \n");

        printf("less than the number     ");
        printf("                    greater  than the no.\n");

        printf("%d                  ", SmallNo);
        printf("%f                  ", RealNo);
        printf("%d   ", LargeNo);

        getch();
}
```

<u>Output:--</u>

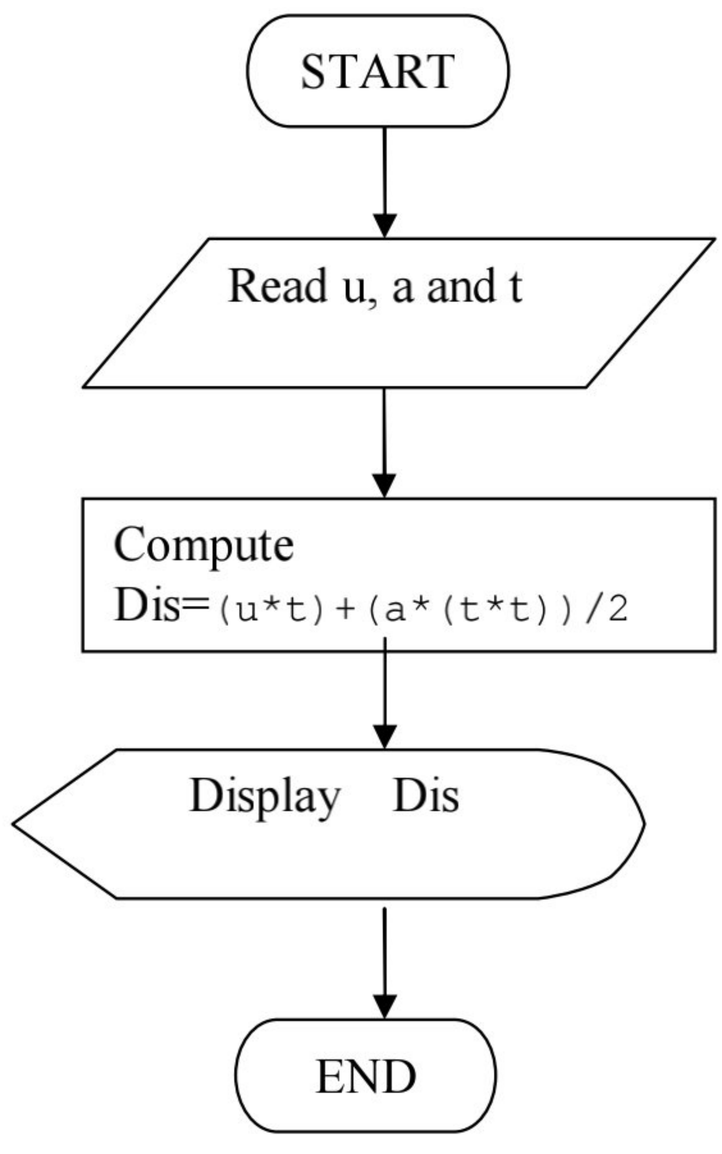
```
Enter a Real no.
25.32

Smallest integer not          the given no.                Largest integer not
less than the number                                       greater  than the no.

        25                        25.32                          25
```

3.8 The total distance traveled by a vehicle, a is the acceleration. Write a program to calculate the distance travelled by at regular intervals of time ,given the values of u and a.the program should be flexible to the user select his own time interval and repeat the calculation for diff values of u,a.

Algorithm:--

Step 1: Read u,a,t.
Step 2: Compute `(u*t)+(a*(t*t))/2` and store the result in Dis.
Step 3: Display Dis.

Flowchart:--



Program:--

```
//The total distance traveled by a vehicle, a is the acceleration. Write a program to
//calculate the distance travelled by  at regular intervals of time ,given the values
//of u and a.the program should be flexible to the user select his own time interval
//and repeat the calculation for diff values of u,a.


//Date: 12/03/2010


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

CamScanner

```
void main()
{

int u,t,a;
float Dis;

clrscr();

printf("Enter the value of u,a and t\n");
scanf("%d %d %d",&u,&a,&t);

Dis=(u*t)+(a*(t*t))/2;

printf("The distance is :  %f \n",Dis);

getch();
}
```

Output:--

```
Enter the value of u,a and t
2 3 4
The distance is :  36.000000
```

3.9 In inventory management, the economy order quantity for a single item is given by

EOQ = sqrt((2*dr*sc)/hc)

and the optimal time between orders

TBO= sqrt((2*sc)/(dr*hc))

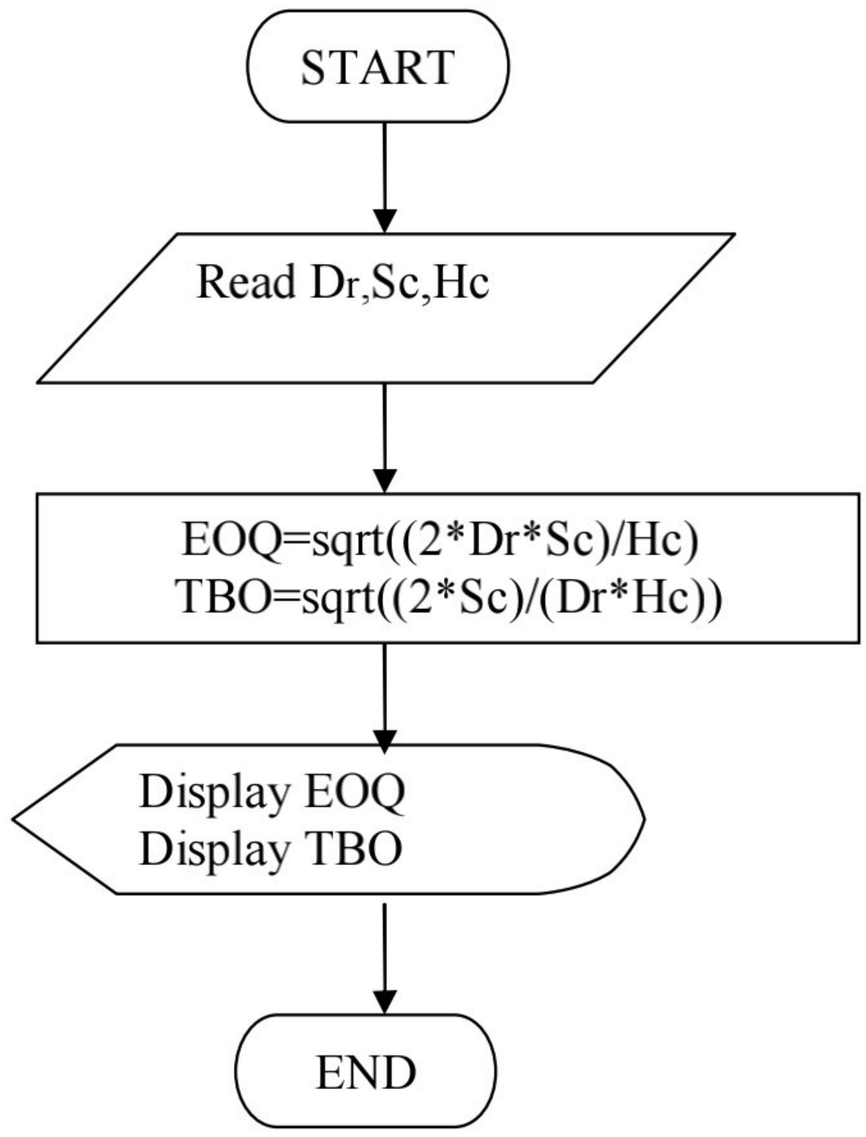
Write a program to compute EOQ and TBO ,given demand rate ,setup costs,and the holding cost.

Algorithm:--

Step 1: Read Dr,Sc,Hc.
Step 2: Compute sqrt((2*Dr*Sc)/Hc)and store the result in EOQ
Step 3: Compute sqrt((2*Sc)/(Dr*Hc)) and store the result in TBO
Step 4: Display EOQ, TBO

CamScanner

Flowchart:--



Program:--

```
//In inventory management, the economy order quantity for a single item is given
//by

//EOQ = sqrt((2*dr*sc)/hc)

//     and the optimal time between orders

//TBO= sqrt((2*sc)/(dr*hc))

//     Write a program to compute EOQ and TBO ,given demand rate ,setup costs,and
//     the holding cost.



//Date: 12/03/2010


#include<stdio.h>
#include<conio.h>
#include<math.h>


void main()
```

```
{
        float Dr,Sc,Hc;
        float TBO,EOQ;

        clrscr();

        printf("Enter Demand Rate \n");
        scanf("%f\n",&Dr);

        printf("Enter Setup Cost \n");
        scanf("%f\n",&Sc);

        printf("Enter Holding Cost \n");
        scanf("%f\n",&Hc);

        EOQ=sqrt((2*Dr*Sc)/Hc);
        TBO=sqrt((2*Sc)/(Dr*Hc));

        printf("The Economic Order Quantity is :  %f\n",EOQ);
        printf("The time Between Order is  :  %f",TBO);

        getch();
}
```

Output:--

Enter Demand Rate 23
Enter Setup Cost 24
Enter Holding Cost 45
The Economic Oder Quantity is: 1.384437
The time Between Order is: 0.060193

3.10 For a certain electrical circuit with an inductance L and resistance R,the damped natural frequency is given by frequency is

Frequency= sqrt((1/LC)-(R*R)/(4*C*C))

It is desired to study the variation of this frequency with c,write a program to calculate the frequency for diff values of c starting from .01 to.10(interval is .01).

Algorithm:--

Step 1: Read L,R,C.
Step 2:Compute (1/(L*C)) andc store the result in Temp1.
Step 3:Compute ((R*R)/(4*C*C)) and store the result in Temp2.
Step 4:Compute sqrt(Temp1-Temp2) and store the result in Freq.
Step 5: Display Freq.

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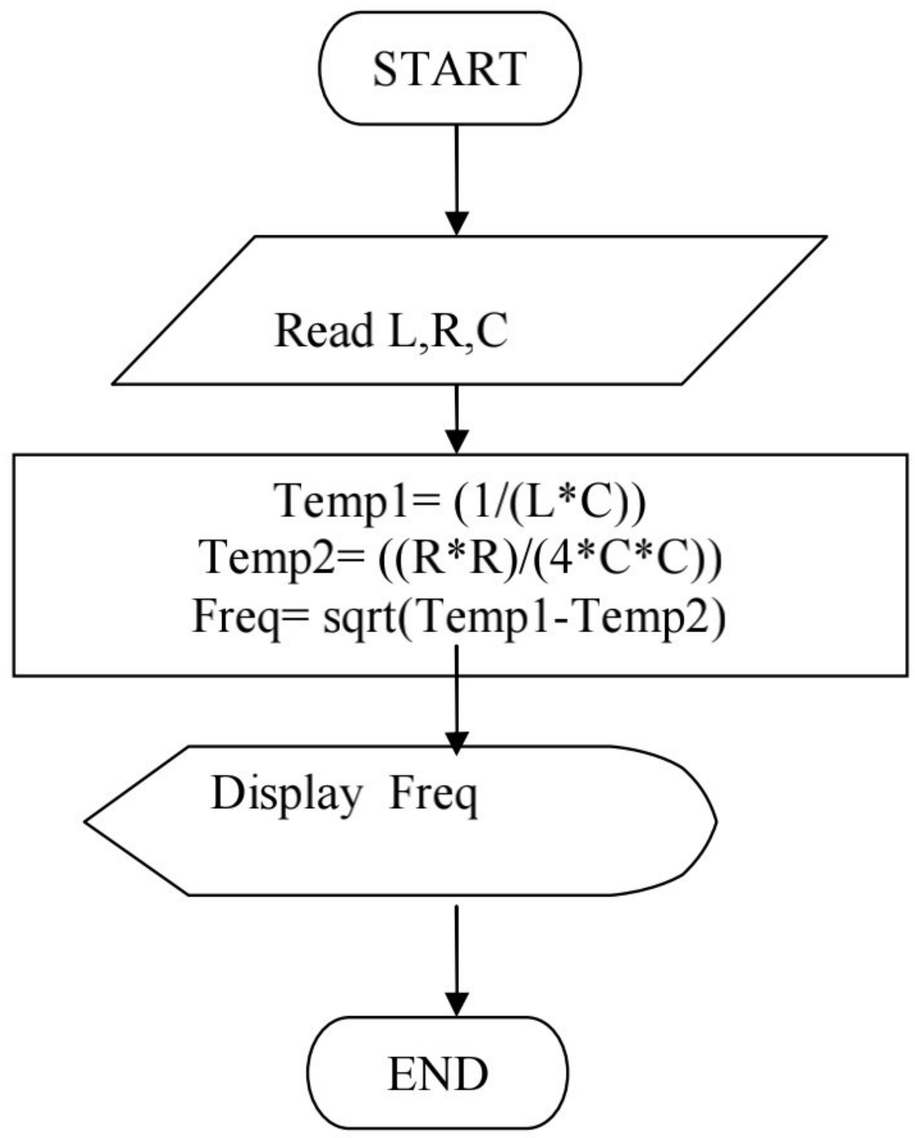
Flowchart:--



Program:

```
//For a certain electrical circuit with an inductance L and resistance R,the
//      damped natural frequency is given by frequency is

//Frequency= sqrt((1/LC)-(R*R)/(4*C*C))

//      It is desired to study the variation of this frequency with c,write a program to
//      calculate the frequency for diff values of c starting from .01 to.10(interval is
//      .01).


//Date: 12/03/2010


#include<stdio.h>
#include<conio.h>
#include<math.h>


void main()
{

        double L,R,C;
        double Freq,Temp1,Temp2;
```

CamScanner

```
        clrscr();

        printf("Enter Inductance, Resistance, Capacitannce \n");
        scanf("%lf %lf %lf",&L,&R,&C);

        Temp1= (1/(L*C))
        Temp2= ((R*R)/(4*C*C))
        Freq= sqrt(Temp1-Temp2)


        printf("The Frequency is  :  %lf\n",Freq);

        getch();
}
```

Output:--

```
Enter Inductance, Resistance, Capacitannce
2 3 4
The Frequency is  :
```

3.11 Write a program to read a four digit integer and print the sum of its digits.
Hint: Use / and % operators.

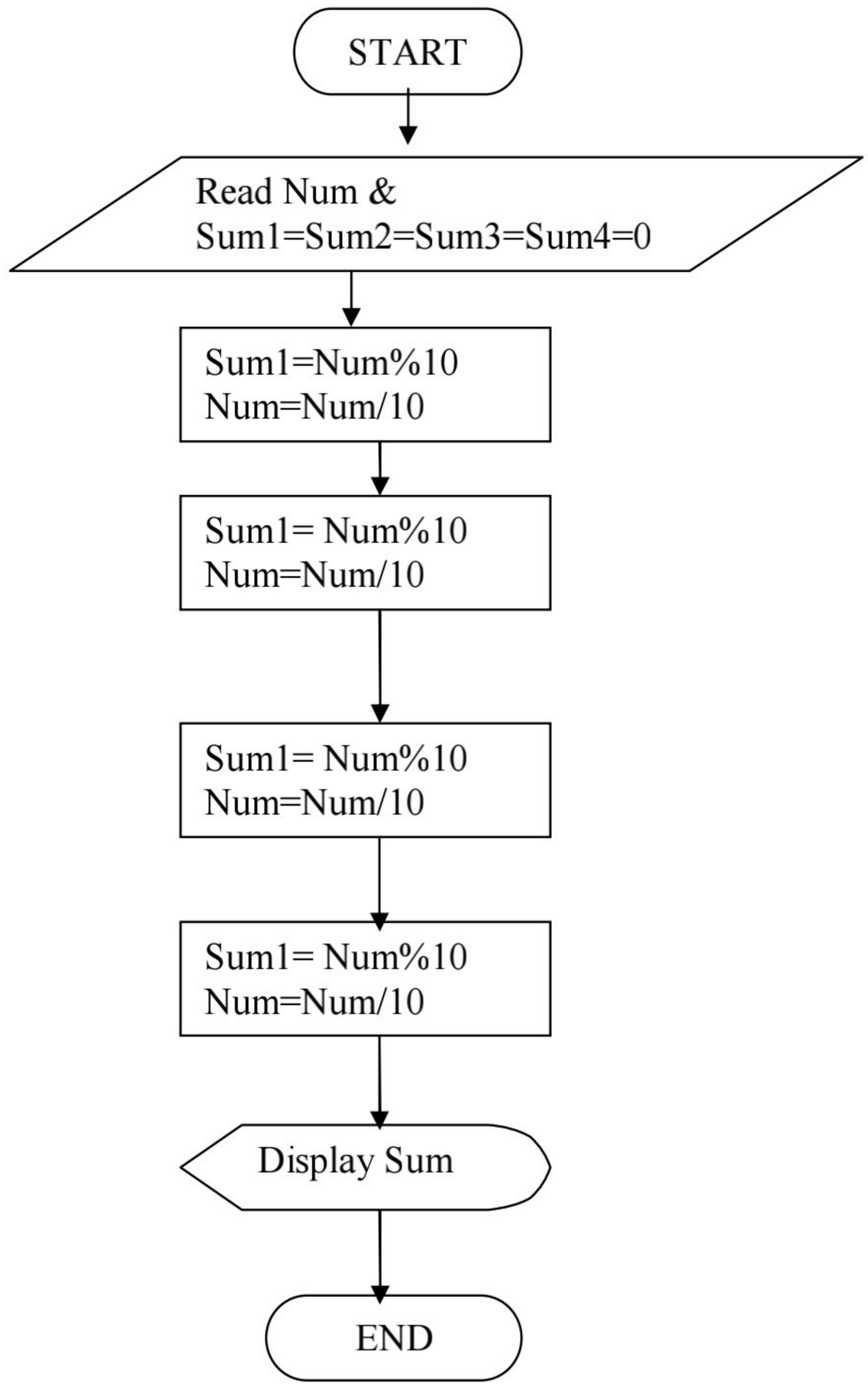
Algorithm:--

Algorithm to find the sum of digits of a number.

Step 1: Read Num.
Step 2: Store 0 to Sum,Sum1,Sum2,Sum3,Sum4.
Step 3: Compute Num %10 & store the result in Sum1.
Step 5: Compute Num/10 & store the result in Num.
Step 3: Compute Num %10 & store the result in Sum2.
Step 5: Compute Num /10 & store the result in Num.
Step 3: Compute Num %10 & store the result in Sum3.
Step 5: Compute Num /10 & store the result in Num.
Step 3: Compute Num %10 & store the result in Sum4.
Step 6: Compute Sum1+Sum2+Sum3+Sum4 & store the result in Sum.
Step 7: Display Sum.

CamScanner

Flowchart:--



Program:--

```
//Write a program to read a four digit integer and print the sum of its digits.
//        Hint: Use / and % operators.


//Date: 12/03/2010


#include<stdio.h>
#include<conio.h>

void main()
{

   int Num,Sum,Sum1,Sum2,Sum3,Sum4;

   Sum1=Sum2=Sum3=Sum4=0;
```

CamScanner

```
Sum=0;

clrscr();

printf("Enter a Four Digits Number\n",&Num);
scanf("%d",&Num);

Sum1=Num%10;
Num=Num/10;

Sum2=Num%10;
Num=Num/10;

Sum3=Num%10;
Num=Num/10;

Sum4=Num%10;
Num=Num/10;

  Sum=Sum1+Sum2+Sum3+Sum4;

  printf("\nSum of Digits are :-- %d\n",Sum);

  getch();
}
```

Output:--

```
Enter a Four Digits Number
1234
Sum of Digits are :-- 10
```

3.12 Write a program to print the size of various data types in C.

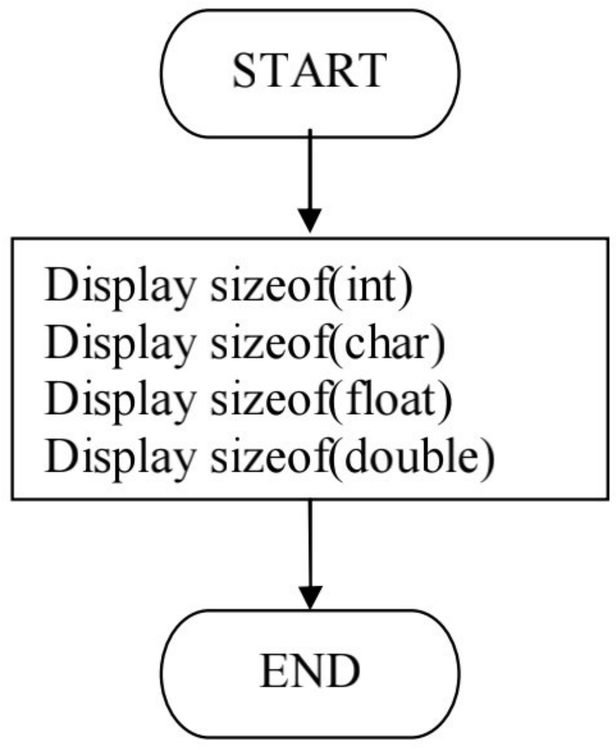
Algorithm:--

Algorithm to print the size of various data types in C.

Step 1: Display the size of integer datatype using sizeof(int) function.
Step 2: Display the size of character datatype using sizeof(char) function.
Step 3: Display the size of float datatype using sizeof(float) function.
Step 4: Display the size of double datatype using sizeof(double) function.

CS CamScanner

Flowchart:--



Program:--

//Write a program to print the size of various data types in C.

//Date: 12/03/2010

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

void main()
{

   clrscr();

   printf("Size of Integer Data Type :-- %d \n",sizeof(int));
   printf("Size of Character Data Type :-- %d \n",sizeof(char));
   printf("Size of Float Data Type :-- %d \n",sizeof(float));
   printf("Size of Double Data Type :-- %d \n",sizeof(double));

   getch();
}
```

Output:--

```
Size of Integer Data Type :-- 2
Size of Character Data Type :-- 1
Size of Float Data Type :-- 4
Size of Double Data Type :-- 8
```

CamScanner

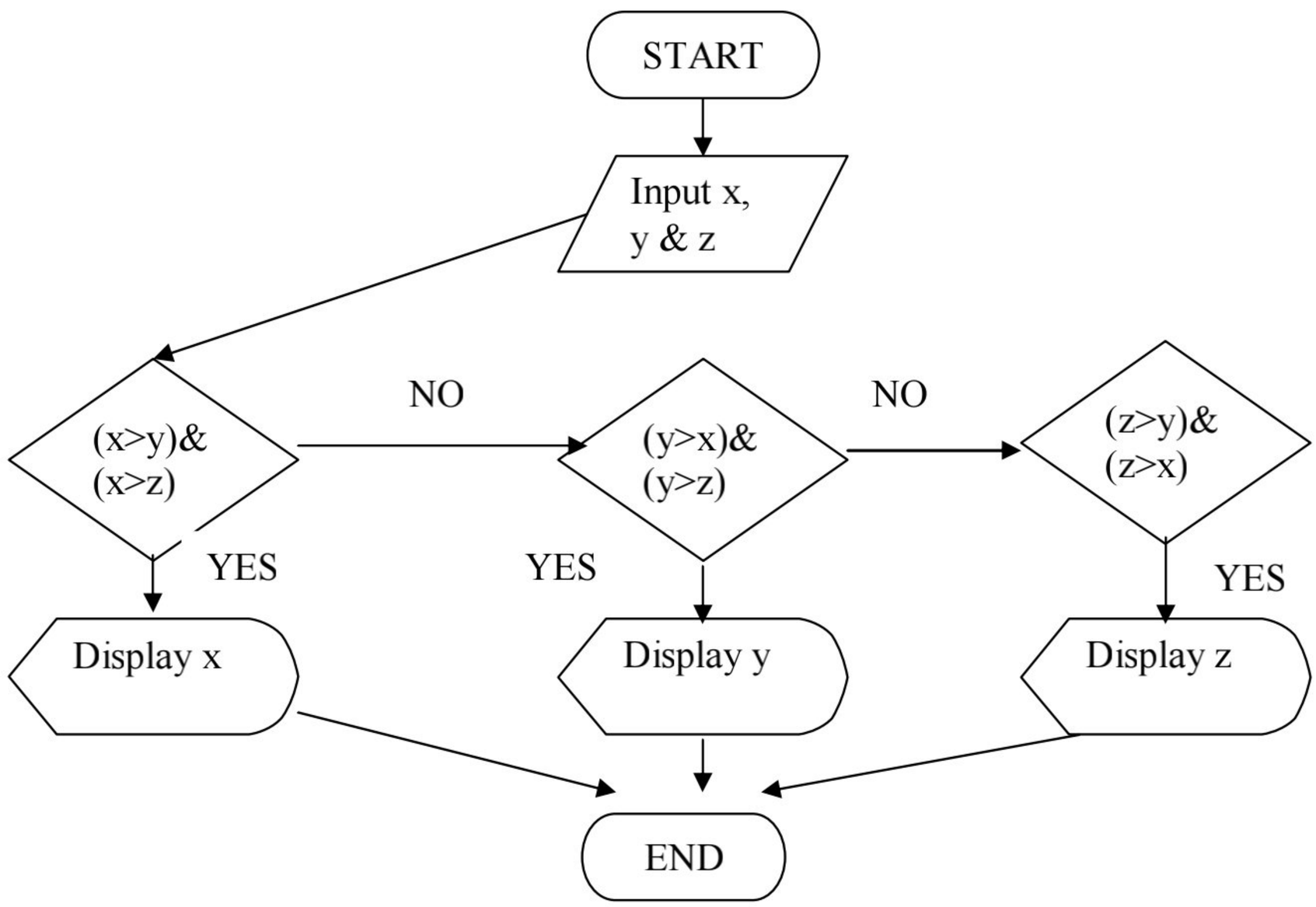
3.13 Given three values, write a program to read three values from keyboard and print out the largest of them without using if statement.

Algorithm:--

Algorithm to find largest between three values.

Step 1: Input three values from keyboard & store in x, y and z.
Step 2: Check ((x>y)&(y>z)) then largest is x otherwise go to Step 3.
Step 3: Check ((y>x)&(x>z)) then largest is y otherwise go to Step 4.
Step 4: Check ((z>y)&(y>x)) then largest is z.
Step 5: End.

Flowchart:--



Program:--

```
//Given three values, write a program to read three values
//from keyboard and print out the  largest of them without using if statement.


//Date: 12/03/2010


#include<stdio.h>
#include<conio.h>

void main()
```

```
{

   int x,y,z;

   clrscr();

   printf("Enter Three Numbers:--\n");
   scanf("%d %d %d",&x,&y,&z);

   ((x>y)&&(x>z))?printf("Largest is x :-- %d",x):((y>x)&&(y>z))?printf("Largest is y :--
%d",y):printf("Largest is z :-- %d",z);

   getch();
}
```

Output:--

```
Enter Three Numbers:--
3 4 5
Largest is z :-- 5
```

3.14 Write a program to read two integer values m and n and to decide and print whether m is multiple of n.

Algorithm:--

Algorithm to find whether m is multiple of n.

Step 1: Input two values.
Step 2: Store these values in m & n.
Step 3: Compute m%n and store the result in x.
Step 4: Check x==0
Step 5: If Step 4 is true then m is multiple of n.
Step 6: If Step 4 is false then m is not multiple of n.

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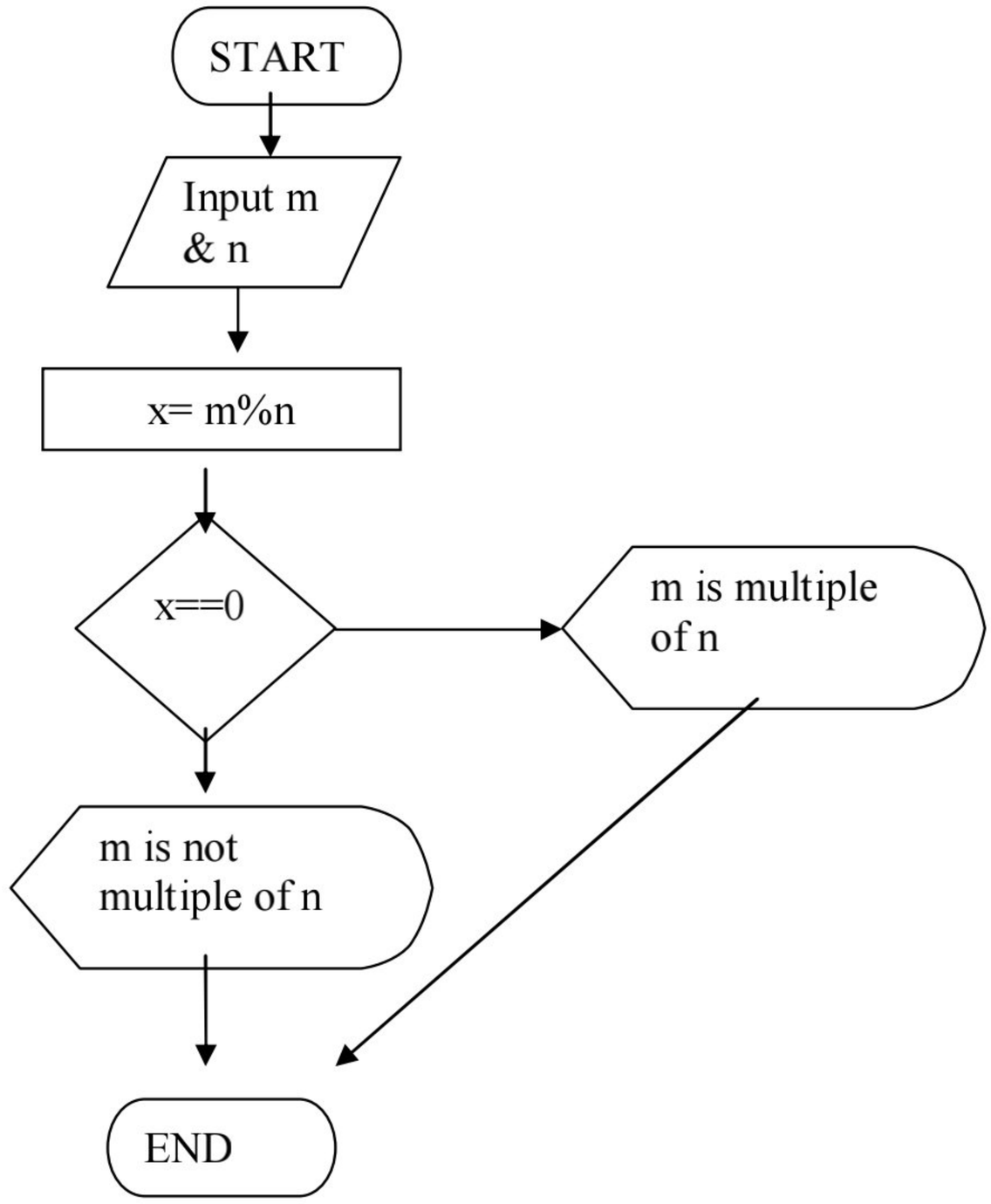
Flowchart:--



Program:--

```
//Write a program to read two integer values m and n and
//to decide and print whether m is multiple of n.


//Date: 12/03/2010


#include<stdio.h>
#include<conio.h>

void main()
{

   int m,n,x;

   clrscr();

   printf("Enter Two Numbers:--\n");
   scanf("%d %d",&m,&n);

   x=m%n;

   (x==0)?printf("m is multiple of n\n"):printf("m is not multiple of n\n");
```

CamScanner

```
  getch();
}
```

Output:--

```
Enter Two Numbers:--
6
3
m is multiple of n
```

3.15 Write a program to read three values using scanf statement and print the following results:

a) Sum of the values
b) Average of the three values
c) Largest of three values
d) Smallest of three values

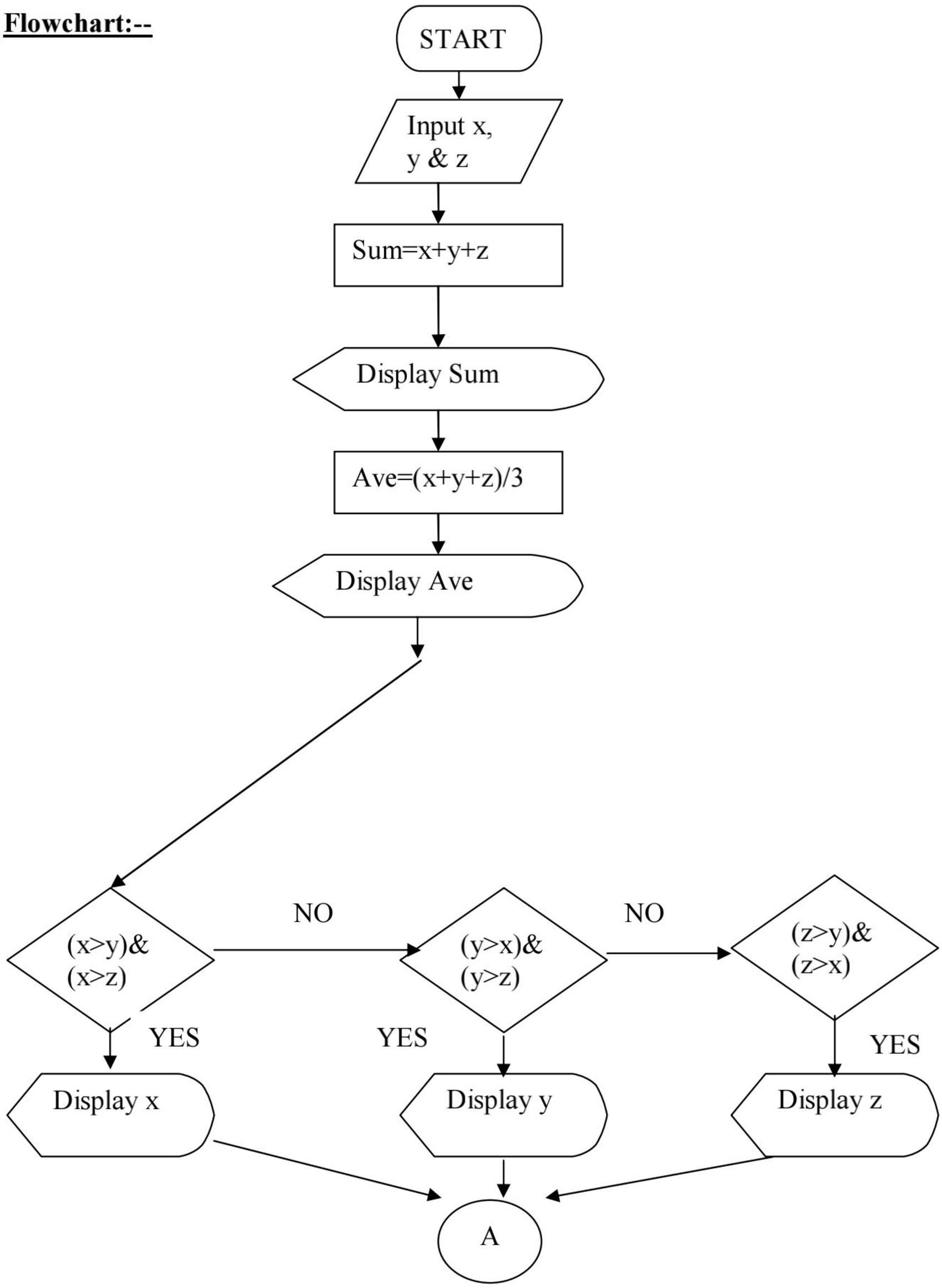
Algorithm:--

Algorithm to find various results.

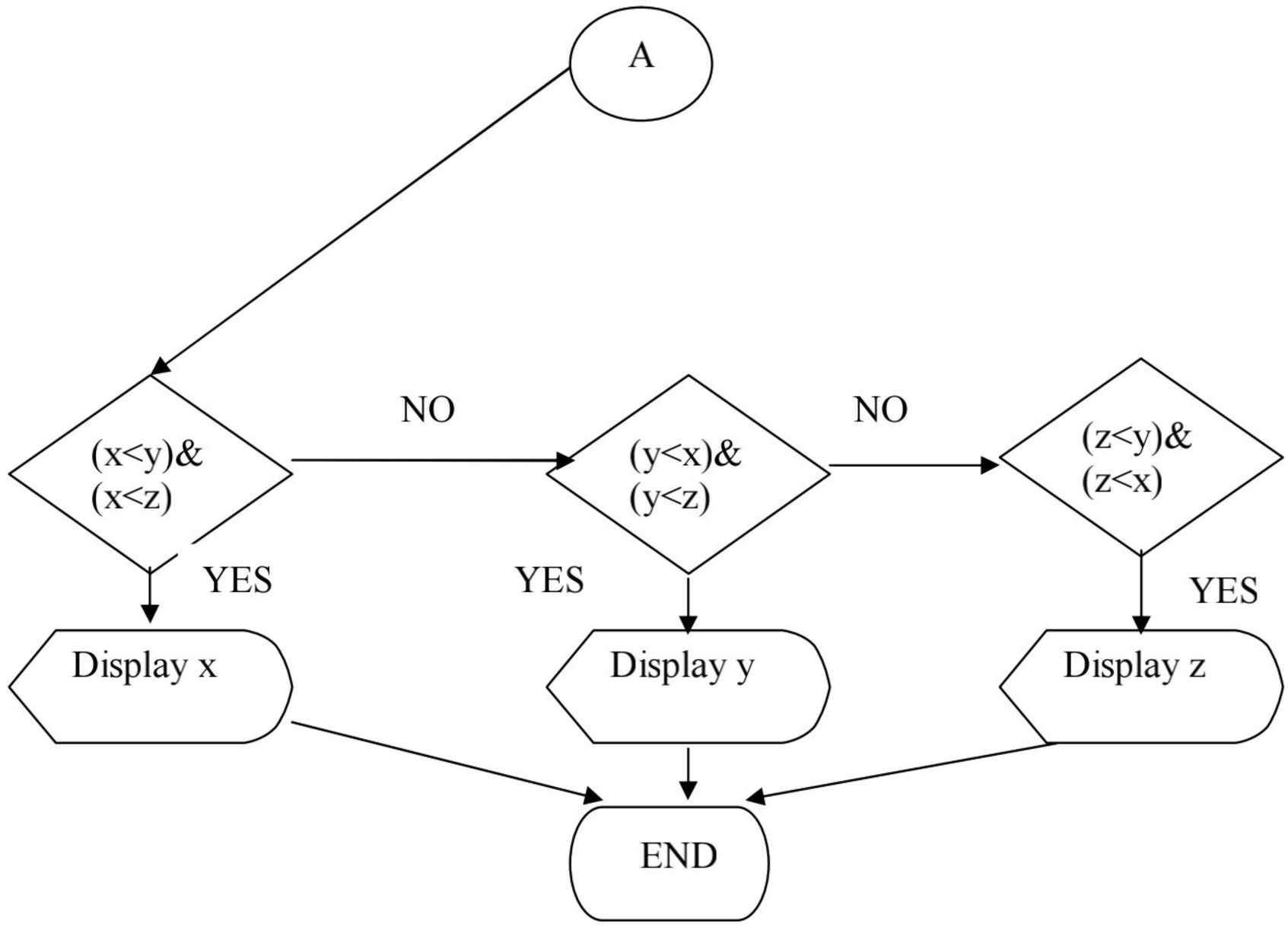
Step 1: Input three values.
Step 2: Store these values in x, y and z.
Step 3: Compute x+y+z and store the result in Sum.
Step 4: Display Sum.
Step 5: Compute (x+y+z)/3 and store the result in Ave.
Step 6: Display Ave.
Step 7: Check ((x>y)&(x>z)) then largest is x otherwise go to Step 3.
Step 8: Check ((y>x)&(y>z)) then largest is y otherwise go to Step 4.
Step 9: Check ((z>y)&(z>x)) then largest is z.
Step 10: Check ((x<y)&(x<z)) then smallest is x otherwise go to Step 3.
Step 11: Check ((y<x)&(y<z)) then smallest is y otherwise go to Step 4.
Step 12: Check ((z<y)&(z<x)) then smallest is z.

CamScanner

Flowchart:--



CamScanner



Program:--

```
//Write a program to read three values using scanf statement and print the following
//      results:
//                  a)      Sum of the values
//                  b)      Average of the three values
//                  c)      Largest of three values
//                  d)      Smallest of three values


//Date: 12/03/2010

#include<stdio.h>
#include<conio.h>

void main()
{

   int x,y,z,Sum;
   float Ave;

   clrscr();

   printf("Enter Three Numbers:--\n");
   scanf("%d %d %d",&x,&y,&z);
```

```
  Sum=x+y+z;
  printf("Sum= %d\n",Sum);

  Ave=(x+y+z)/3;
  printf("Average= %d\n",Ave);

  ((x>y)&&(x>z))?printf("Largest is x :-- %d\n",x):((y>x)&&(y>z))?printf("Largest is y :--
%d\n",y):printf("Largest is z :-- %d\n",z);


  ((x<y)&&(x<z))?printf("Smallest is x :-- %d\n",x):((y<x)&&(y<z))?printf("Smallest is y :--
%d\n",y):printf("Smallest is z :-- %d\n",z);



  getch();
}
```

Output:--

```
Enter Three Numbers:--
  2 3 4
  Sum= 9
  Average= 3
  Largest is z :-- 4
  Smallest is x :-- 2
```

3.16 The cost of one type of mobile service is Rs. 250 plus Rs. 1.25 for each call made over and above 100 calls. Write a program to read customer codes and calls made and print the bill for each customer.

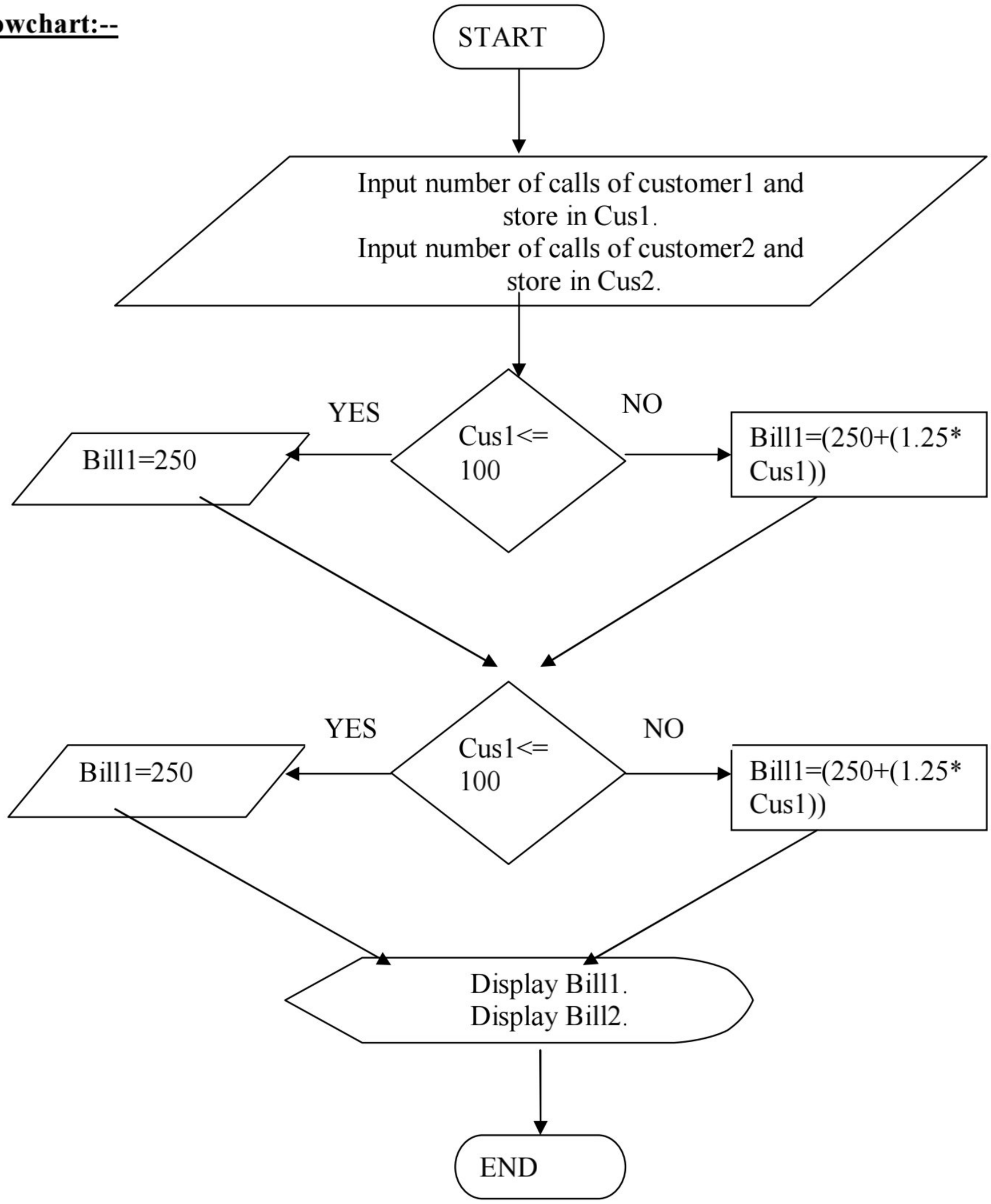
Algorithm:--

Algorithm to print the mobile bill of each customer.

Step 1: Input number of calls of customer1 and store in Cus1.
Step 2: Input number of calls of customer2 and store in Cus2.
Step 3: Check Cus1<=100 then store Bill1=250 otherwise compute (250+(1.25*Cus1)) & store in Bill11.
Step 4: Check Cus2<=100 then store Bill2=250 otherwise compute (250+(1.25*Cus2)) & store in Bill12.
Step 5: Display Bill1.
Step 6: Display Bill2.

CamScanner

Flowchart:--



Program:--

//The cost of one type of mobile service is Rs. 250 plus Rs. 1.25
//for each call made over and above 100 calls. Write a program to
//read customer codes and calls made and print the bill for each customer.

//Date: 12/03/2010

CamScanner

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

void main()
{

   float Cus1,Cus2,Bill1,Bill2;

   clrscr();

   printf("Enter Numbers of Call of Customer 1:--\n");
   scanf("%f",&Cus1);

   printf("Enter Numbers of Call of Customer 2:--\n");
   scanf("%f",&Cus2);

   Cus1<=100?Bill1=250:Bill1=(250+Cus1*1.25);
   Cus2<=100?Bill2=250:Bill2=(250+Cus1*1.25);

   printf("Mobile Bill of Customer 1:-- %f\n",Bill1);
   printf("Mobile Bill of Customer 2:-- %f",Bill2);

   getch();
}
```

Output:--

```
Enter Numbers of Call of Customer 1:--
100
Enter Numbers of Call of Customer 2:--
Mobile Bill of Customer 1:--
250.000000
Mobile Bill of Customer 2:--
375.000000
```

CS CamScanner

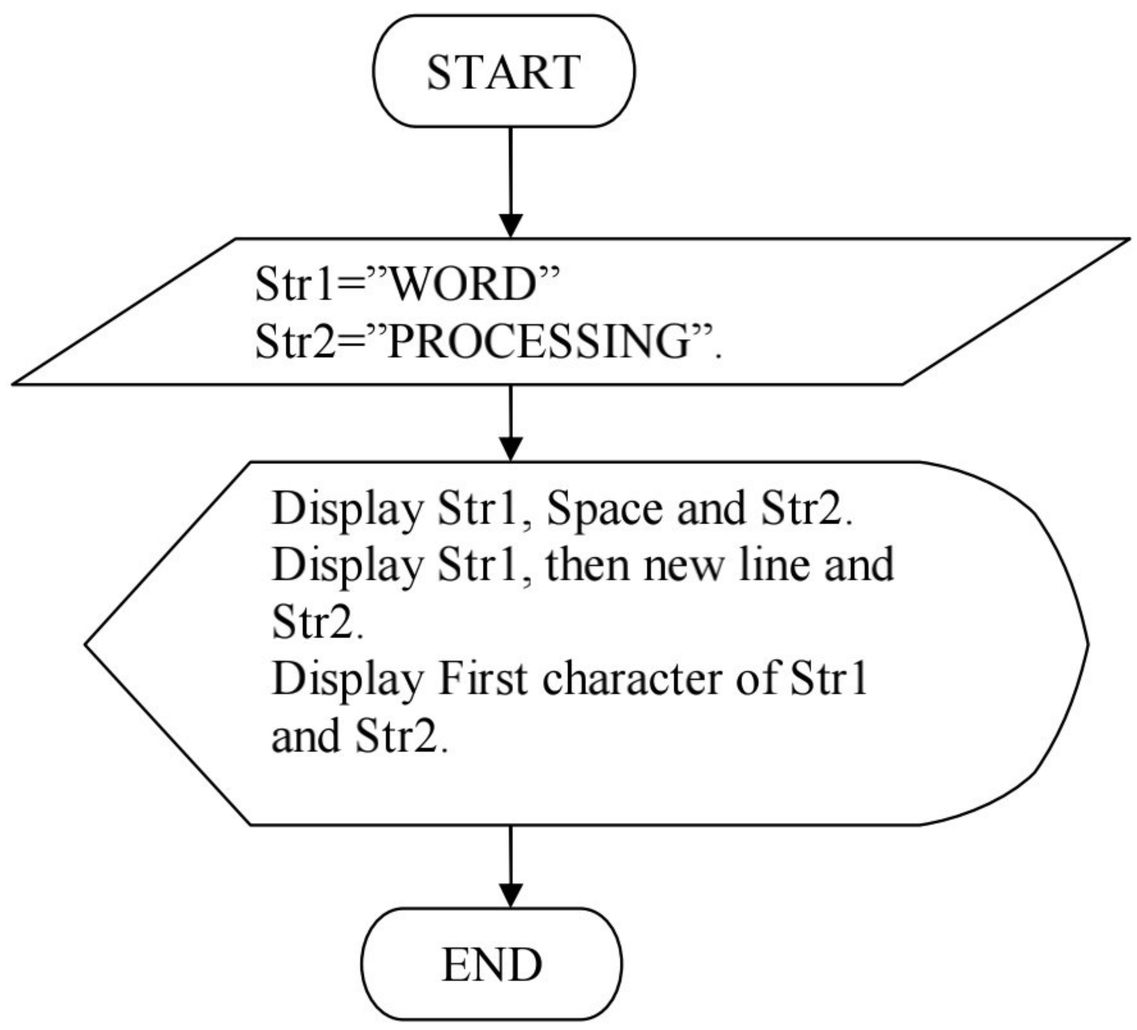
4.1 Given the string "WORDPROCESSING", write a program to read the string from the terminal and display the same in the following formats:

a. WORD PROCESSING.
b. WORD
PROCESSING
c. W.P.

Algorithm:--

Step 1. Store Str1="WORD" and Str2="PROCESSING".
Step 2. Display Str1, Space and Str2.
Step 3. Display Str1, then new line and Str2..
Step 4. Display First character of Str1 and Str2.

Flowchart:--



Program:--

```
//Given the string"WORDPROCESSING", write a program to read the string from //the
terminal and display the same in the following formats:
//WORD PROCESSING.
//WORD
//PROCESSING
//W.P.

//Date: 13/03/2010


#include<stdio.h>
#include<conio.h>
#include<math.h>
```

CS CamScanner

```
void main()

{

  char Str1[10]="WORD";
  char Str2[10]="PROCESSING";

  clrscr();

  printf("%s ",Str1);
  printf(" %s\n",Str2);

  printf("%s\n",Str1);
  printf("%s\n",Str2);

  printf("%.1s.",Str1);
  printf("%.1s.",Str2);

  getch();
}
```

Output:--

```
WORD PROCESSING
WORD
PROCESSING
W.P.
```

4.2 write a program to read values of x,y and print as

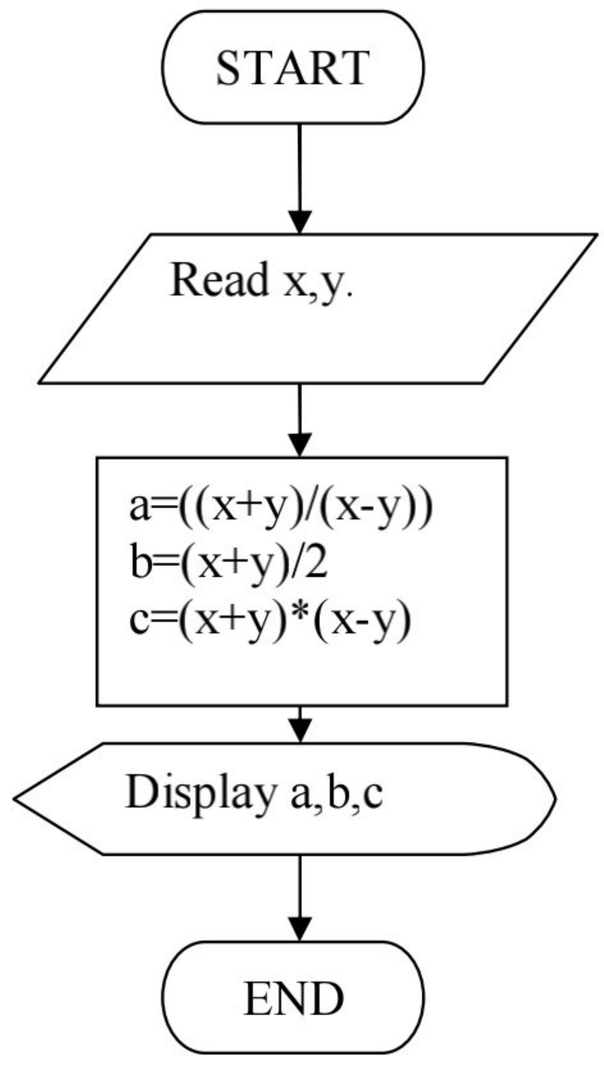
x+y/x-y **x+y/2** **(x+y)(x-y)**

Algorithm:--

Step 1: Read x,y.
Step 2: Compute a=((x+y)/(x-y))
Step 3: Compute b=(x+y)/2
Step 4: Compute c=(x+y)*(x-y)
Step 5: Display a,b,c.

CS CamScanner

Flowchart:--



Program:--

//write a program to read values of x,y and print as

//x+y/x-y x+y/2 (x+y)(x-y)

//Date: 13/03/2010

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
  float x,y,a,b,c;

  clrscr();

  printf(" Enter x\n");
  scanf("%f",&a);

  printf("Enter y\n");
  scanf("%f",&y);

  a=((x+y)/(x-y));
  b=(x+y)/2;
  c=(x+y)*(x-y);
```

CamScanner

```
  printf("%f          %f          %f",a,b,c);

  getch();
}
```

Output:--

```
 Enter x 5
 Enter y 3
4.000000        4.000000                16.000000
```

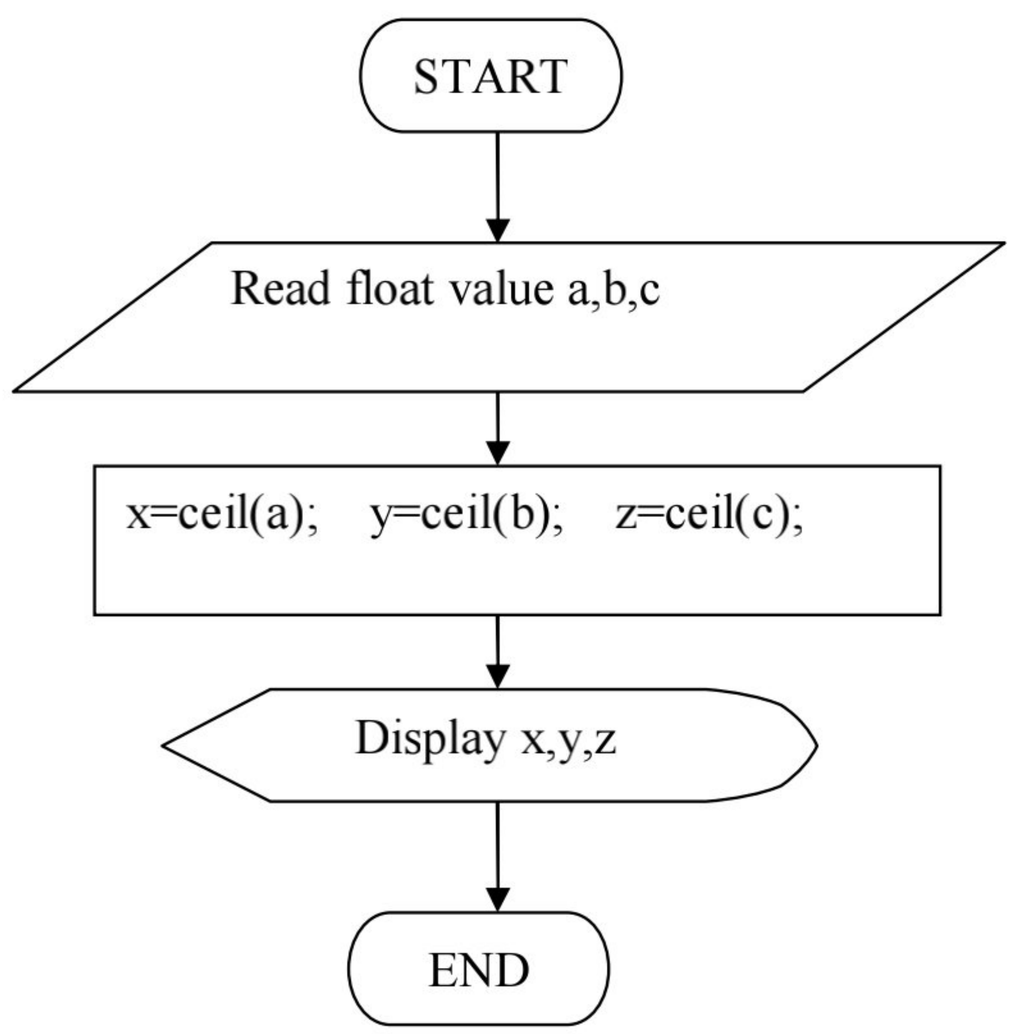
4.3 Write a program to read the following numbers, round them off to the nearest integer and print out the result as:

35.7 50.21 -23.73 -46.45

Algorithm:--

Step 1: Read float value a,b,c.
Step 2: Compute x=ceil(a), y=ceil(b), z=ceil(c).
Step 3: Display x,y,z.

Flowchart:--



CamScanner

Program :--

```
//Write a program to read the following numbers, round them off to the nearest
//integer and  print out the result as:
//35.7        50.21        -23.73          -46.45

//Date: 13/03/2010

#include<stdio.h>
#include<conio.h>
#include<math.h>


void main()

{

  int x,y,z;
  float a,b,c;

  clrscr();

  printf(" Enter three value a, b, c:--\n");
  scanf("  %f %f %f",&a,&b,&c);

  x=ceil(a);
  y=ceil(b);
  z=ceil(c);

  printf("Values Are:-\n")  ;

  printf("%d       ",x);
  printf("%d       ",y);
  printf("%d",z);

  getch();
  }

}
```

Output :

```
Enter three value a, b, c:--

76.34        24.56       12.90

Values Are:-
76             25           13
```

CamScanner

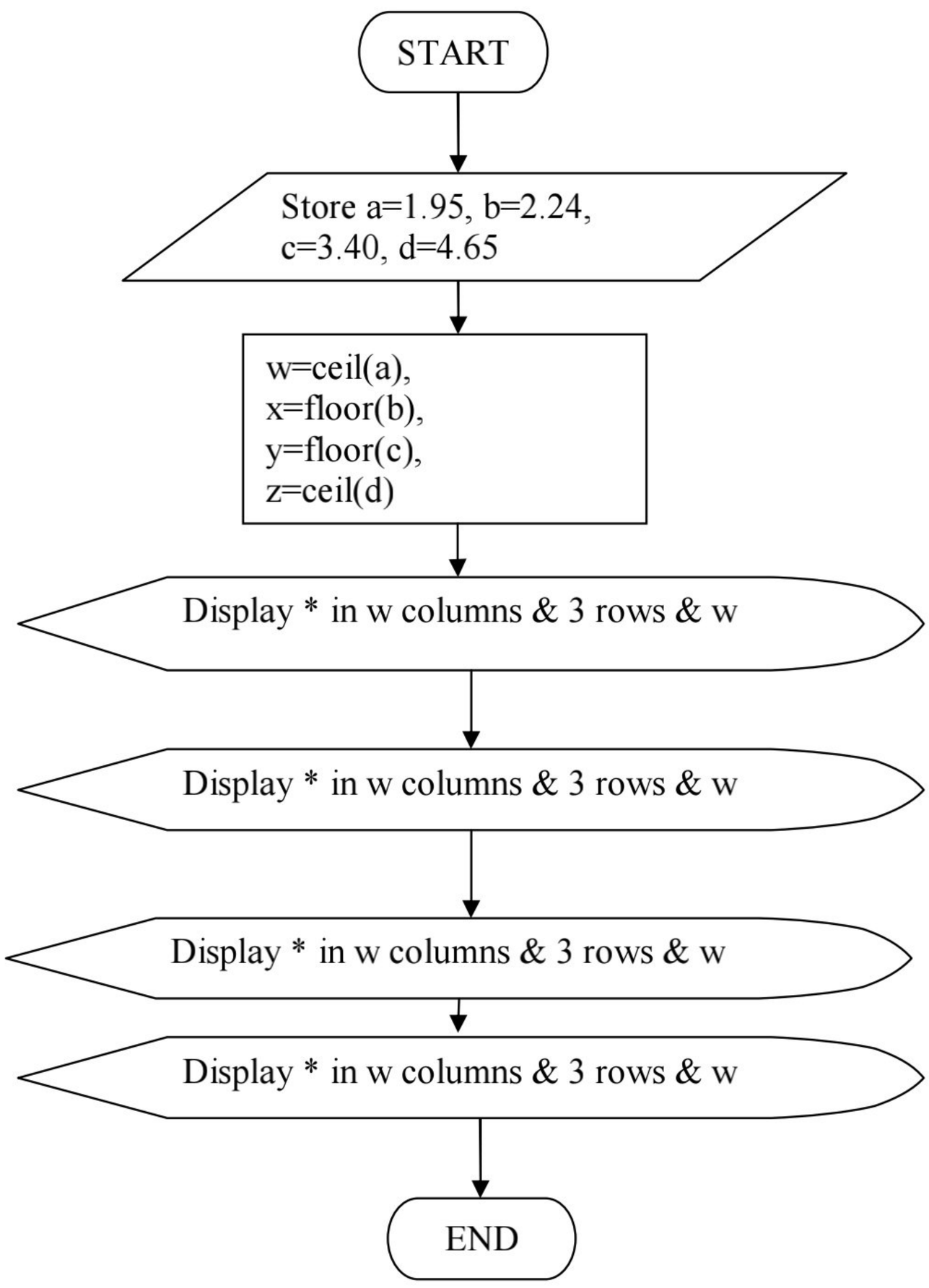
4.4 Write a program that reads 4 floating point values in the range of 0.0 to 20.0,and prints a horizontal bar chart to represent these values using the character * as the fill char.forr the purpose of chart,the values may be rounded off to the nearest integer.for ex.

```
*   *   *   *
*   *   *   *   4.36
*   *   *   *
```

Algorithm:--

Step 1: Store a=1.95, b=2.24, c=3.40, d=4.65
Step 2: Compute w=ceil(a), x=floor(b), y=floor(c), z=ceil(d).
Step 3: Display * in w columns & 3 rows & w.
Step 4: Display * in x columns & 3 rows & x.
Step 5: Display * in y columns & 3 rows & y.
Step 6: Display * in z columns & 3 rows & z.

Flowchart:--



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Program :

```
//Write a program that reads 4 floating point values in the range of 0.0 to
//      20.0,and prints a horizontal bar chart to represent these values using the
//      character * as the fill char.forr the purpose of chart,the values may be rounded
//      off to the nearest integer.for ex.

//*    *    *    *
//*    *    *    *    4.36
//*    *    *    *

//Date: 13/03/2010

#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{

   int w,x,y,z;
   float a,b,c,d;

   clrscr();

   a=1.95;
   b=2.24;
   c=3.40;
   d=4.65;

   w=ceil(a);
   x=floor(b);
   y=floor(c);
   z=ceil(d);

   printf("\n\n*\n*(%f)\n*",a);
   printf("\n\n* *\n* *(%f)\n* *",b);
   printf("\n\n* * *\n* * *(%f)\n* * *",c);
   printf("\n\n* * * *\n* * * *(%f)\n* * * *",d);

   getch();
}
```

<u>Output:--</u>

```
*
* 1.950000
*

* *
* * 2.240000
* *
```

```
* * *
* * * 3.400000
* * *

* * * *
* * * * 4.650000
* * * *
```

4.5 write a program to demo the process of multiplication. The program should ask the user to enter two digit integers and print the product to integers as shown below

```
                    45
                 *  37
              ------------------
7x45 is            315
3x45 is           135
              -----------------
Add them          1665
```

<u>Algorithm:--</u>

Step 1: Read a,b;
Step 2: Compute x=b%10, y=b/10.
Step 3: Compute t=x*a, q=y*a and w=t+(q*10).
Step 4: Display a, Newline, '*' and b.
Step 5: Display ---------- & go to newline.
Step 6: Display x, '*', a, "is" and t & go to new line.
Step 7: Display y, '*', a, "is" and q & go to new line.
Step 8: Display ---------- & go to newline.
Step 9: Display "Add Them" and w.

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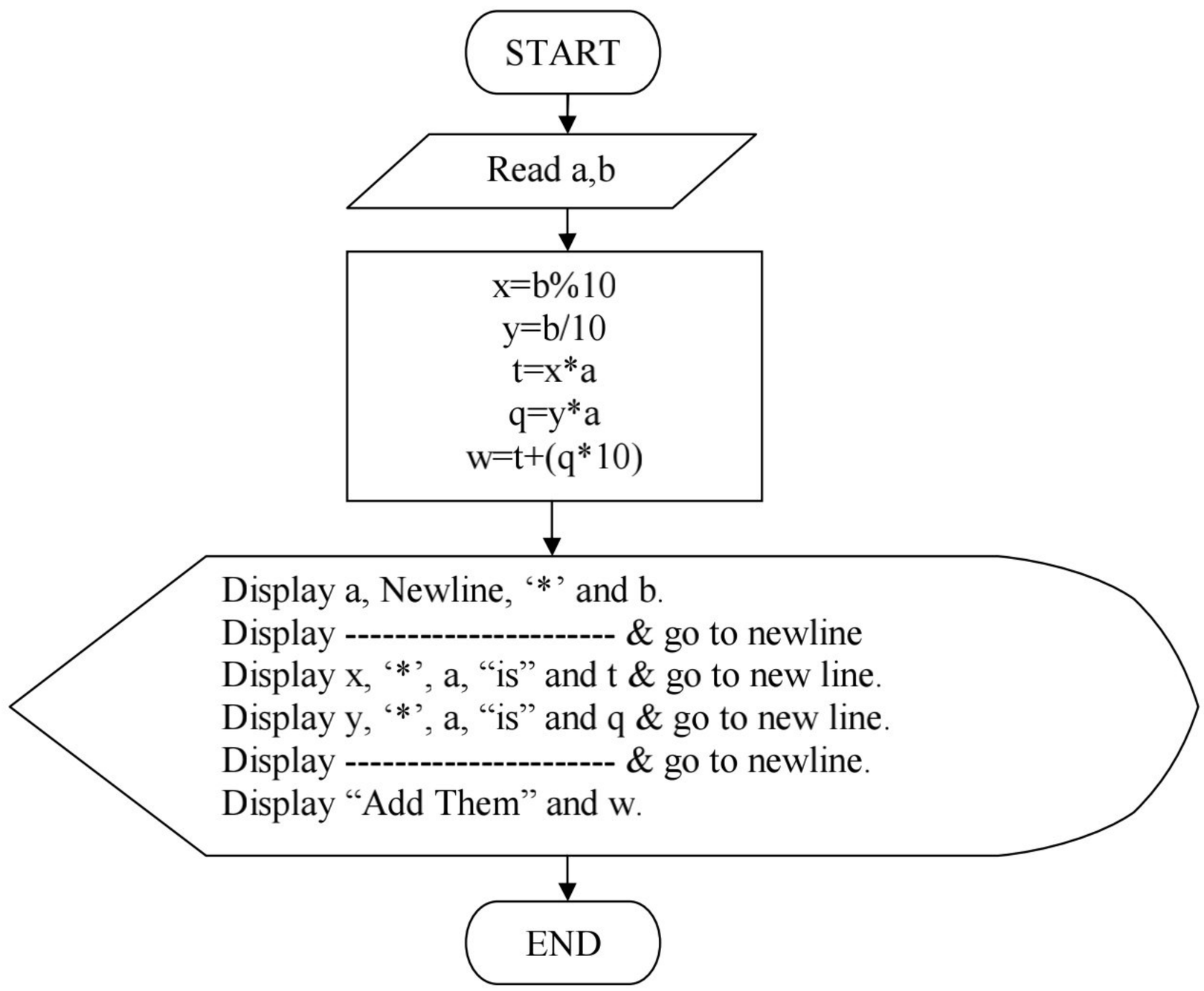
Flowchart:--



Program:--

```
//write a program to demo the process of multiplication. The program should ask
//      the user to enter two digit integers and print the product to integers as shown
//      below

//                                  45
//                              *   37
//                          --------------------
//   7x45 is                          315
//   3x45 is                         135
//                          --------------------
//Add them                            1665


//Date: 13/03/2010


#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
```

```
int a,b,x,y,t,q,w;

clrscr();

printf("Enter value of a");
scanf("%d",&a);

printf("Enter value of b");
scanf("%d",&b);

x=b%10;
y=b/10;
t=x*a;
q=y*a;
w=t+(q*10);

printf("\n                    %d",a);
printf("\n        *            %d\n",b);
printf("                     -----\n");

printf("%d x %d is",x,a);
printf("              %d\n",t);
printf("%d x %d is",y,a);

printf("              %d\n",q);
printf("                    ----------\n");

printf("ADD THEM              %d\n",w);
printf("                    ----------");

getch();
}
```

Output :

```
Enter value of a 56
Enter value of b 65

                 56
        *        65
               ---------------
5 x 56 is        280
6 x 56 is       336
               ----------------
ADD THEM        3640
               ----------------
```

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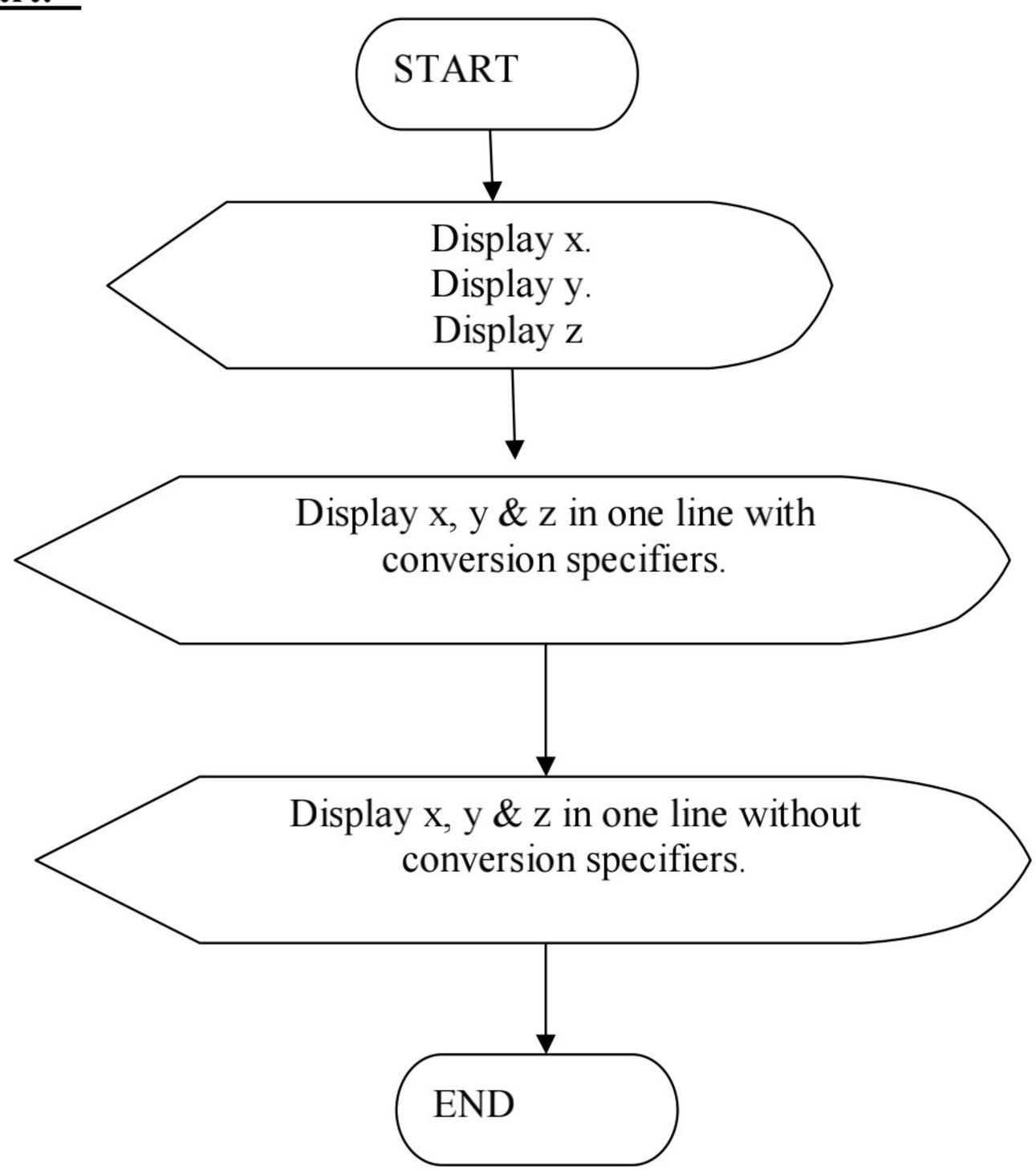
4.6 Write a program to read three integers form the keyboard using one scanf statement and output them on one line using:

a) **Three printf statements.**
b) **Only one printf with conversion specifiers, and**
c) **Only one printf without conversion specifiers.**

Algorithm:--

Step 1: Read x, y and z.
Step 2: Display x.
Step 3: Display y.
Step 4: Display z.
Step 5: Display x, y & z in one line with conversion specifiers.
Step 6: Display x, y & z in one line without conversion specifiers.

Flowchart:--



Program:--

```
//Write a program to read three integers form the keyboard using one scanf statement and
//      output them on one line using:

//a)        Three printf statements.
//b)        Only one printf with conversion specifiers, and
//c)        Only one printf without conversion specifiers.
```

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```
//Date : 13/03/2010

#include<conio.h>
#include<stdio.h>

void main()
{
   int x,y,z;

   clrscr();

   printf("Enter Three Values\n");
   scanf("%d%d%d",&x,&y,&z);

   printf(" x= %d",x);
   printf(" y= %d",y);
   printf(" z= %d",z);

   printf(" x= %d y= %d z= %d\n",x,y,z);

   printf(" x= %d y= %d z= %d\n",x,y,z);

getch();
}
```

Output:--

```
Enter Three Values
2 3 4
x=2 y=3 z=4
x=2 y=3 z=4
x=2 y=3 z=4
```

4.7 Write a program that prints the value 10.45678 in exponential format with the following specification:

a) correct to two decimal places;
b) correct to four decimal places; and
c) correct to eight decimal places.

Algorithm:--

Step 1: Store 10.45678 in Num.
Step 2: Display Num in exponential format (correct to two decimal places).
Step 3: Display Num in exponential format (correct to four decimal places).
Step 4: Display Num in exponential format (correct to eight decimal places).

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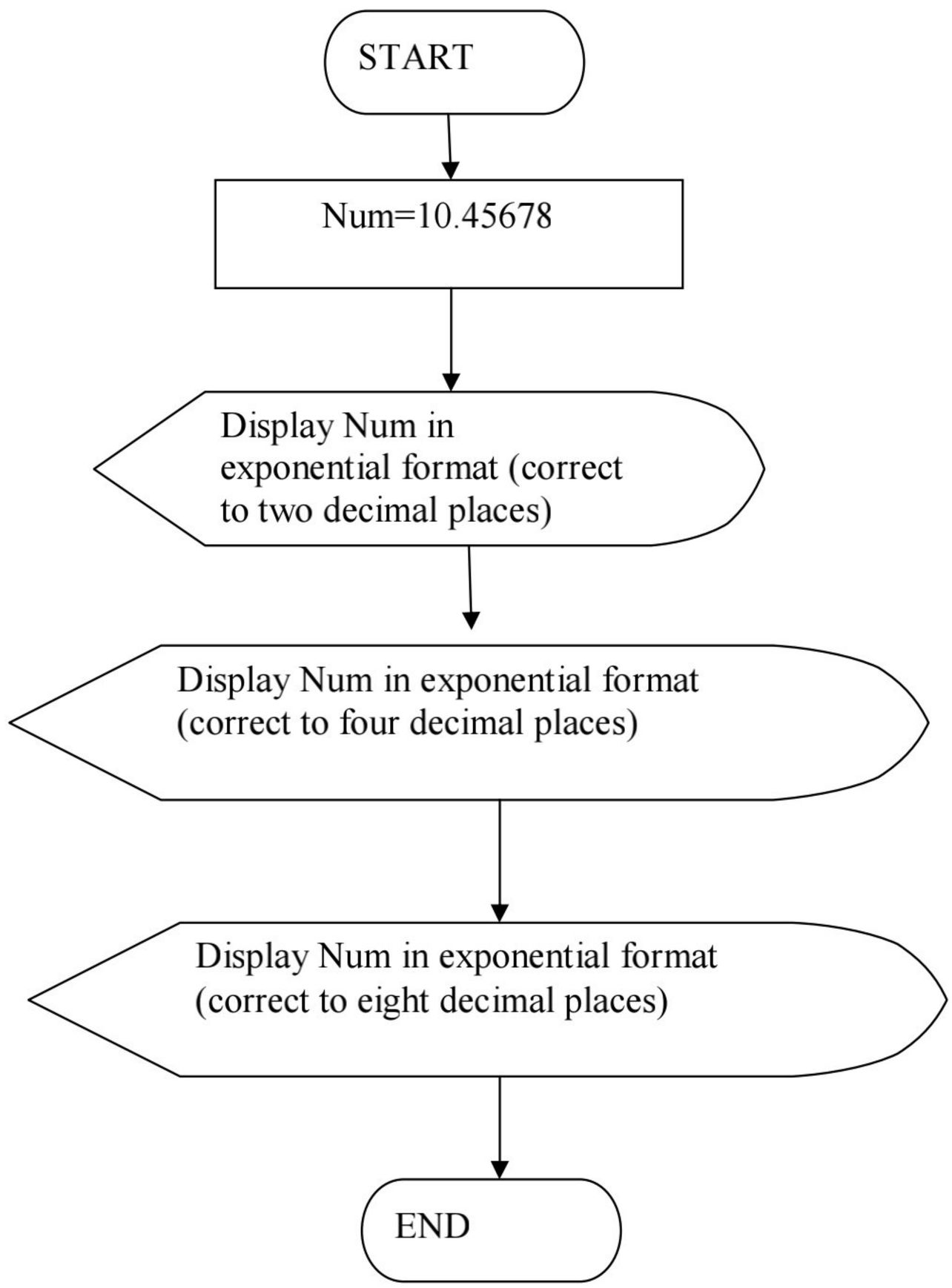
Flowchart:--



Program:--

```
/Write a program that prints the value 10.45678 in exponential format with the following
 //    specification:
 //                    a) correct to two decimal places;
 //                    b) correct to four decimal places; and
 //                    c) correct to eight decimal places.

//Date : 13/03/2010

#include<conio.h>
#include<stdio.h>

void main()
{
  float Num=10.45678;
```

```
clrscr();

  printf("exponential format with correct to two decimal places:-- %.2e\n",Num);
  printf("exponential format with correct to four decimal places:-- %.4e\n",Num);
  printf("exponential format with correct to eight decimal places:-- %.8e\n",Num);

  getch();
}
```

Output:--

```
exponential format with correct to two decimal places:-- 1.05e+01
exponential format with correct to four decimal places:-- 1.0457e+01
exponential format with correct to eight decimal places:-- 1.0456780e+01
```

4.8 Write a program to print the value 345.6789 in fixed-point format with the following specification:

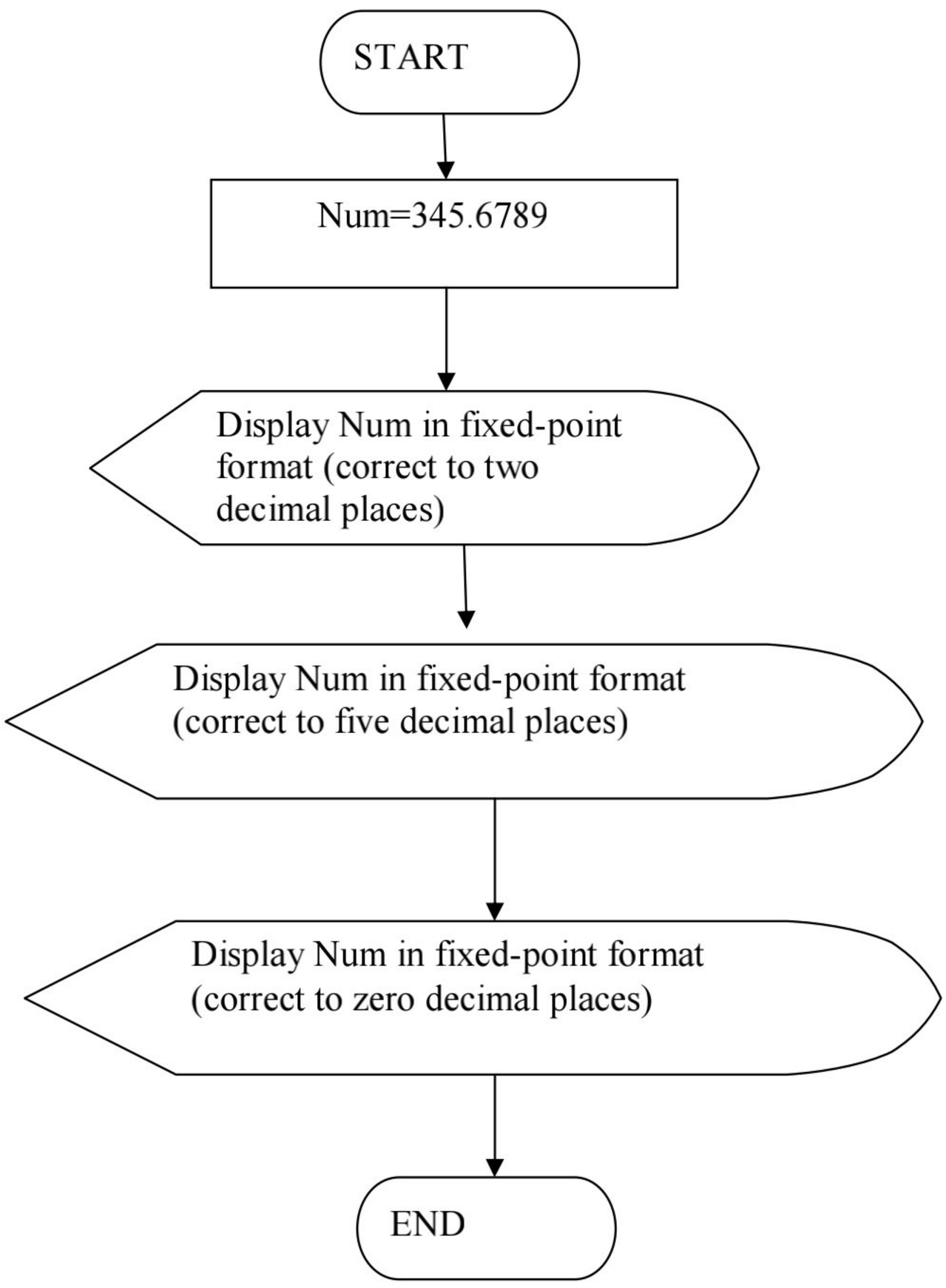
a) Correct to two decimal places;
b) Correct to five decimal places; and
c) Correct to zero decimal places.

Algorithm:--

Step 1: Store 345.6789 in Num.
Step 2: Display Num in fixed-point format (correct to two decimal places).
Step 3: Display Num in fixed-point format (correct to five decimal places).
Step 4: Display Num in fixed-point format (correct to zero decimal places).

CamScanner

Flowchart:--



Program:--

```
//Write a program to print the value 345.6789 in fixed-point format with the following
//      specification:

//a)        Correct to two decimal places;
//b)        Correct to five decimal places; and
//c)        Correct to zero decimal places.

//Date : 13/03/2010

#include<conio.h>
#include<stdio.h>

void main()
{
  float Num=345.6789;

  clrscr();
```

```
printf("fixed-point format (correct to two decimal places):-- %.2f\n",Num);
  printf("fixed-point format (correct to five decimal places):-- %.5f\n",Num);
  printf("fixed-point format (correct to zero decimal places):-- %f\n",Num);

  getch();
}
```

Output:--

```
fixed-point format (correct to two decimal places):-- 345.68
fixed-point format (correct to five decimal places):-- 345.67889
fixed-point format (correct to zero decimal places):--345.678894
```

4.9 Write a program to read the name ANIL KUMAR GUPTA in three parts using the scanf statement and to display the same in the following format using the printf statement.

a) ANIL K. GUPTA
b) A.K. GUPTA
c) GUPTA A.K.

Algorithm:--

Step 1: Store ANIL in Str1.
Step 2: Store KUMAR in Str2.
Step 3: Store GUPTA in Str3.
Step 4: Display Str1,first character of Str2 & Dot(.) and Str3.
Step 5: Display First character of Str1,Dot(.),first character of Str2 and Str3.
Step 6: Display Str3,First character of Str1,Dot(.),first character of Str2 and Dot(.).

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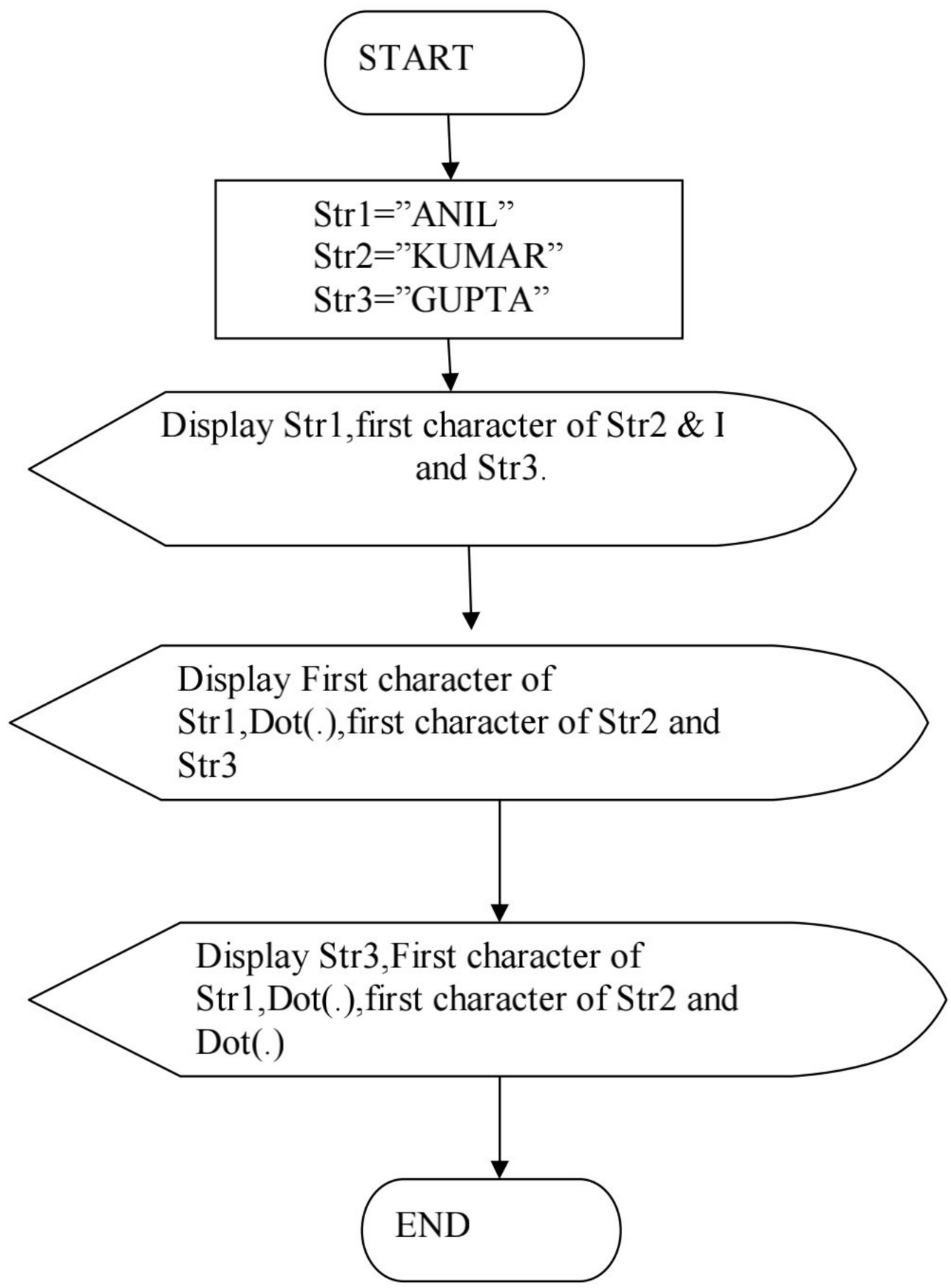
Flowchart:--



Program:--

```
//Write a program to read the name ANIL KUMAR GUPTA in three parts using the scanf
//      statement and to display the same in the following format using the printf statement.


//a)        ANIL K. GUPTA
//b)        A.K. GUPTA
//c)        GUPTA A.K.



//Date : 13/03/2010

#include<conio.h>
#include<stdio.h>

void main()
```

```
{
  char Str1[10]="ANIL";
  char Str2[10]="KUMAR";
  char Str3[10]="GUPTA";


  clrscr();

  printf("%s %.1s. %s\n",Str1,Str2,Str3);
  printf("%.1s. %.1s. %s\n",Str1,Str2,Str3);
  printf("%s %.1s.%.1s.\n",Str3,Str1,Str2);

  getch();
}
```

Output:--

ANIL K. GUPTA
A.K. GUPTA
GUPTA A.K.

4.10 Write a program to read and display the following table of data.

Name	**Code**	**Price**
Fan	**67831**	**1234.50**
Motor	**450**	**5786.70**

The name and code must be left-justified and price must be right-justified.

Algorithm:--

Step 1: Read Name1, Code1 and Price1.
Step 2: Read Name2, Code2 and Price2.
Step 3: Display Name1 and Code1 left-justified and Price1 right-justified.
Step 4: Go to new line
Step 5: Display Name2 and Code2 left-justified and Price2 right-justified.

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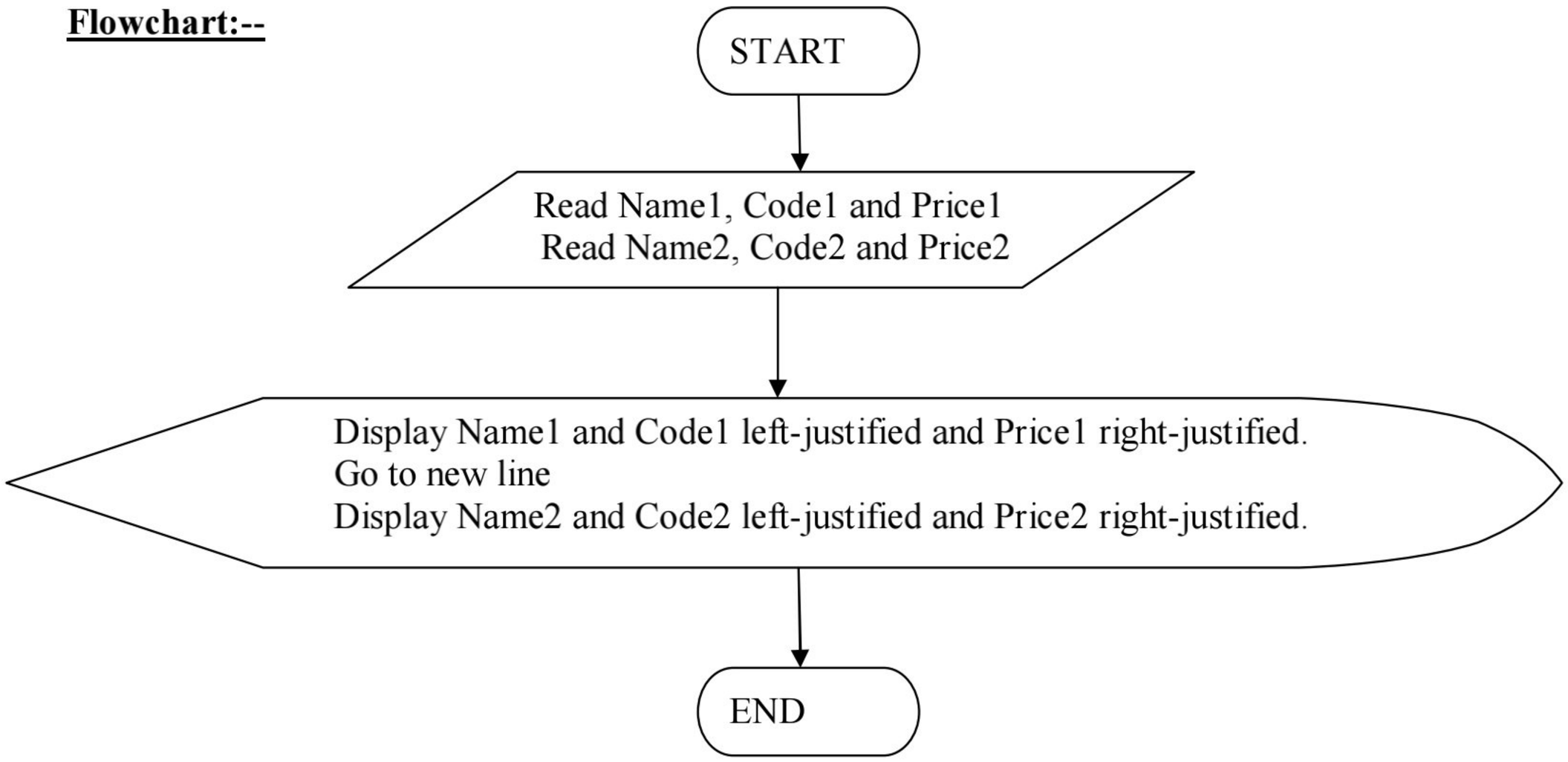
Flowchart:--



Program:--

//Write a program to read and display the following table of data.

//Name	Code	Price
//Fan	67831	1234.50
//Motor	450	5786.70

//The name and code must be left-justified and price must be right-justified.

//Date : 13/03/2010

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

void main()
{
  char Name1[10],Name2[10];
  int Code1,Code2;
  float Price1,Price2;


  clrscr();

  printf("Enter Name, Code and Price\n");
  scanf("%s%d%f",&Name1,&Code1,&Price1);

  printf("Enter Name, Code and Price\n");
  scanf("%s%d%f",&Name2,&Code2,&Price2);
```

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```
  printf("Name      Code      Price\n");
  printf("%-7s       %-8d       %8.2f\n",Name1,Code1,Price1);
  printf("%-7s       %-8d       %8.2f\n",Name2,Code2,Price2);

  getch();
}
```

Output:--

```
Enter Name, Code and Price
Fan
67831
1234.50

Enter Name, Code and Price
Motor
450
5786.70

Name                    Code                    Price
Fan                     67831                   1234.50
Motor                   450                     5786.70
```

CS CamScanner

5.1 Write a program to determine whether a given number is "odd" or "even" and print the message

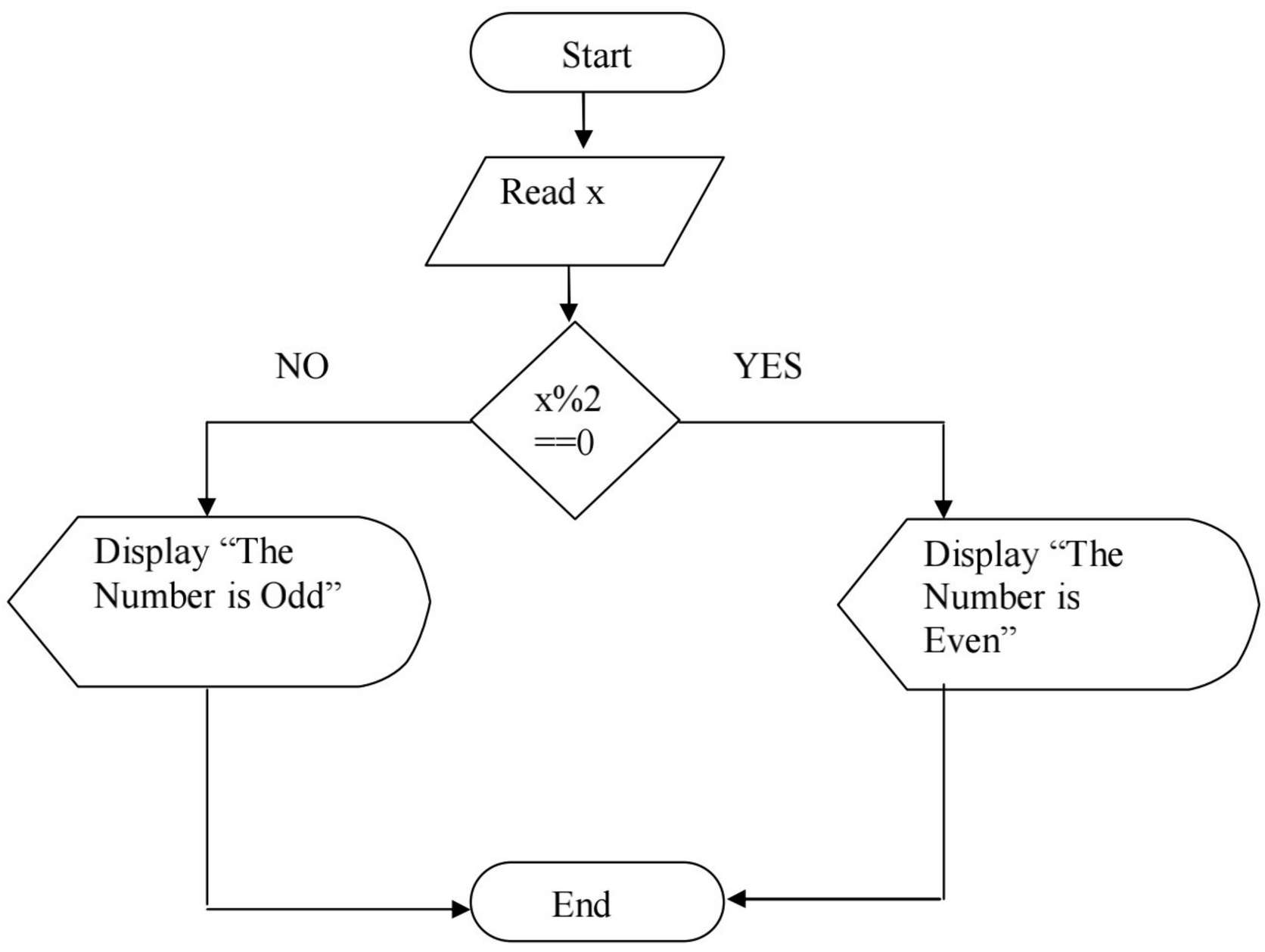
NUMBER IS EVEN
OR
NUMBER IS ODD
(a) Without using the else option.
(b) With else option.

Algorithm:--

Without using the else option
Step 1: Read x.
Step 2: Check x%2==0.
Step 3: If true then go to step 4 and otherwise go to step 5.
Step 4: Display "The number is even" and exit.
Step 5: Display "The number is odd".

With else option
Step 1: Read x.
Step 2: Check x%2==0.
Step 3: If true then go to step 4 and otherwise go to step 5.
Step 4: Display "The number is even".
Step 5: Display "The number is odd".

Flowchart:--



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Program:--

Without using the else option

//Write a program to determine whether a given number is “odd” or “even” and print the message

//NUMBER IS EVEN
//Or
//NUMBER IS ODD
//(a) Without using the else option.
//(b) With else option.

// Date : 13/03/2010

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
 int x;

 clrscr();

 printf("Enter an integer number: ");
 scanf("%d",&x);

 if(x%2==0)
 {
  printf("The number entered is even");
  getch();
  exit(0);
 }

  printf("The number entered is odd");
  getch();
}
```

Output:--

Enter an integer number: 5
The number entered is odd

With else option
//Write a program to determine whether a given number is “odd” or “even” and print the message

//NUMBER IS EVEN
//Or
//NUMBER IS ODD

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//(a) Without using the else option.
//(b) With else option.

// Date: March 13,2010

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

void main()
{
  int x;

  clrscr();

  printf("Enter an integer number: ");
  scanf("%d",&x);

  if(x%2==0)
    printf("The number entered is even");
  else
    printf("The number entered is odd");

  getch();

}
```

Output:--

Enter an integer number: 5
The number entered is odd

5.2 Write a program to find the number of and sum of all integers greater than 100 and less than 200 that are divisible by 7.

Algorithm:--

Step 1: Store 100 to Num & 0 to Sum.
Step 2: if Num%7=0 then go to Step 3
Step 3: Compute Count=Count+1 & Sum=Sum+Num & Num=Num+1.
Step 4: if Num<=200 then go to Step 2 otherwise go to Step 5.
Step 5: Display Count & Sum.

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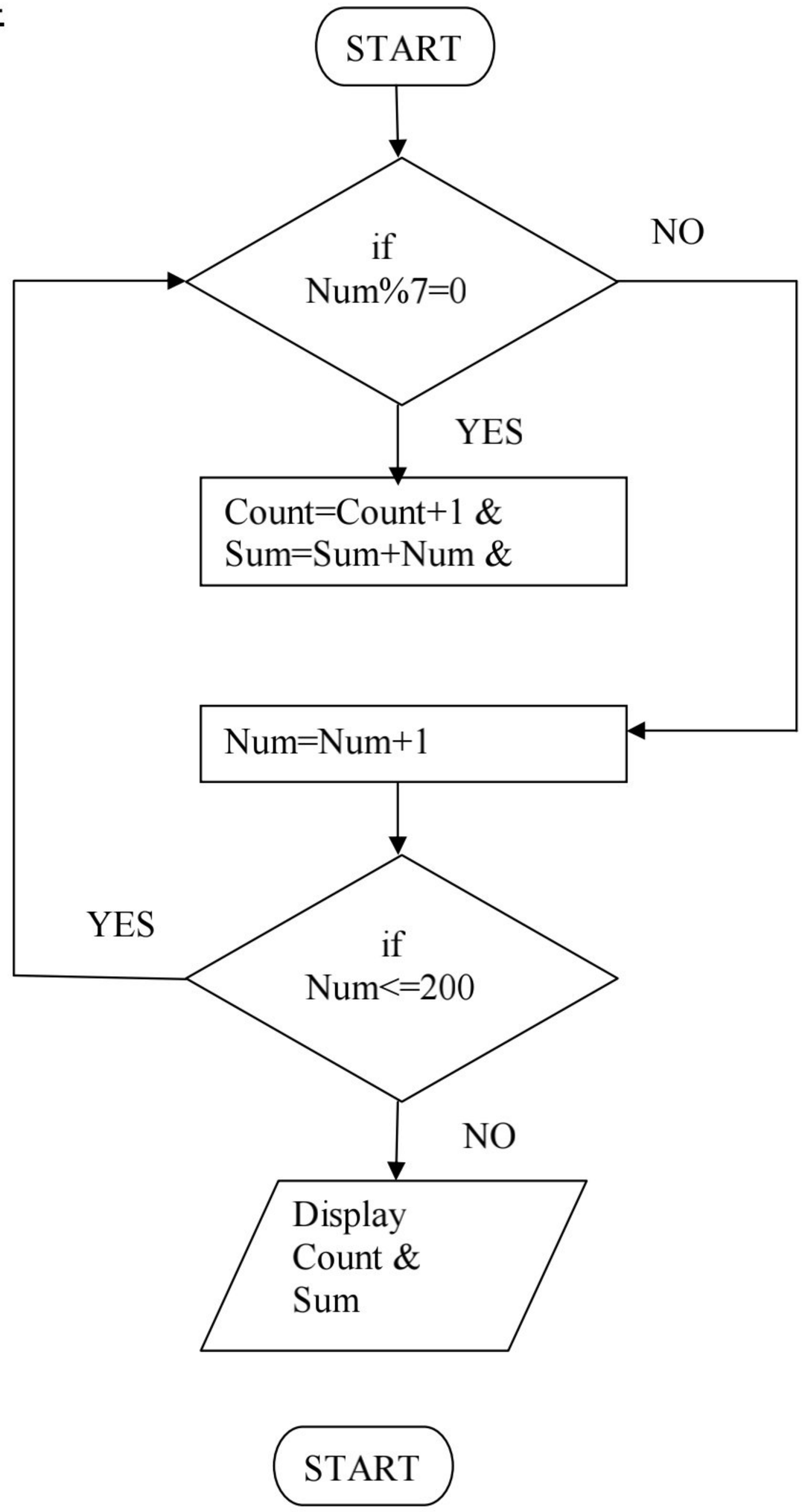
Flowchart:--



Program:--

```
//Write a program to find the number of and sum of all
//integers greater than 100 and less than 200 that are divisible by 7.
// Date : 13/03/2010

#include<stdio.h>
#include<conio.h>
#include<stdlib.h>

void main()
{
        int Num,Sum,Count;

        clrscr();

        Num=100;
```

```
        Sum=Count=0;

        Loop:

        if (Num%i==0)
        {
                Sum=Sum+Num;
                Count=Count+1;
        }

        Num=Num+1;

        if(Num<=100)
                goto Loop;

        printf("Count:-- %d\n",Count);
        printf("Sum:-- %d",Sum);
}
```

Output:--

5.3 A set of two linear equation two unknows x1 and x2 is given below:

ax1 + bx2 = m
cx1 + dx2 = n

The set has a unique solution

x1=(md-bn)/(ad-cb)
x2=(na-mc)/(ad-cb)

Algorithm:--

Step 1: Read a,b,c,d,m and n.
Step 2: Compute a*d-c*b and store the result Dr.
Step 3: Check if Dr! =0.
Step 4: If true then go to Step 5 and otherwise go to step 9.
Step 5: Compute (m*d-b*n)/(a*d-c*b) and store the result x1.
Step 6: Compute (n*a-m*c)/(a*d-c*b) and store the result x2.
Step 7: Display x1.
Step 8: Display x2 and go to step 10.
Step 9: Display “The division is not possible”.
Step 10: Stop.

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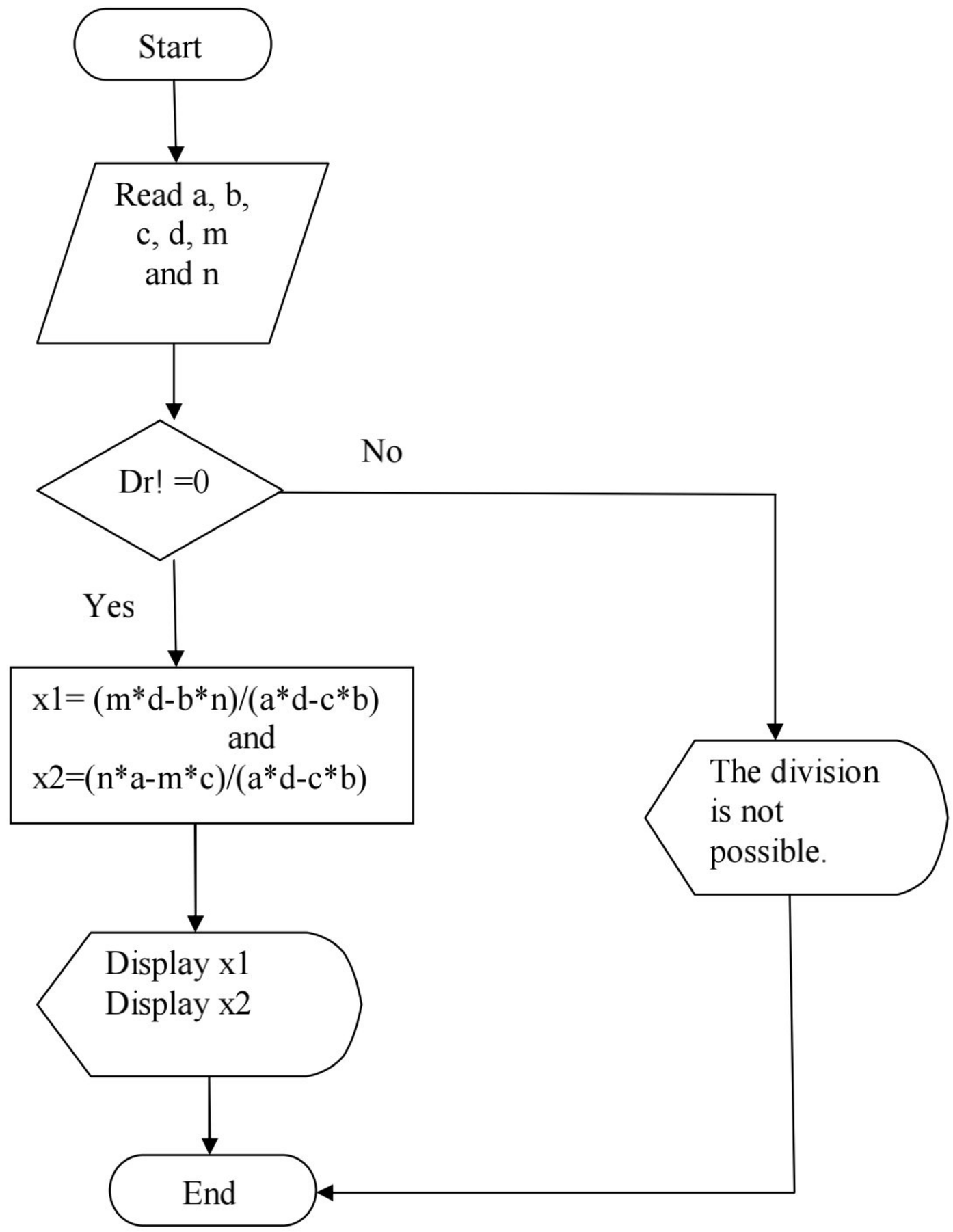
Flowchart:--



Program:--

//A set of two linear equation two unknows x1 and x2 is given below:

```
//                    ax1 + bx2 = m
//                    cx1 + dx2 = n
//     The set has a unique solution

//                      x1=(md-bn)/(ad-cb)
//                      x2=(na-mc)/(ad-cb)


#include<stdio.h>
#include<conio.h>

void main()
{

  int a,b,c,d,m,n,Dr;
```

```
float x1,x2;

clrscr();

printf("Enter the value of a, b, c, d, m, n: ");
scanf("%d%d%d%d%d%d",&a,&b,&c,&d,&m,&n);

Dr=(a*d-c*b);

 if(Dr!=0)
 {
        x1=(m*d-b*n)/dr;
        x2=(n*a-m*c)/dr;
        printf("\n The value of x1= %f \n The value of x2= %f",x1,x2);
 }
 else
        printf("The division is not possible and result is an abrupt value ");

   getch();
 }
```

5.4 Given the list of marks ranging from 0 to 100,write a program to compute and print the number of students:
a) who have obtained more than 80 marks.
b) who have obtained more than 60 marks
c) who have obtained more than 40 marks
d) who have obtained 40 or less marks
e) in the range 81 to 100
f) in the range 61 to 80
g) in the range 41 to 60
h) in the range 0 to 40

The program should use minimum number of if statements.

5.5 Admission to a professional course in subject to the following conditions:
a) Marks in mathematics >=60
b) Marks in Physics >=50
c) Marks in Chemistry >=40
d) Total in all three subjects >=200
or
Total in mathematics and physics>=150.
Given the marks in the three subjects, write a program to process the applications to the eligible candidates.

<u>Algorithm:--</u>

Step 1: Read Maths, Phy and Chem.
Step 2: Compute Maths+Phy+Chem and store the result in Total
Step 3: Compute Maths+Phy and store the result Total_MP
Step 4: Check Maths>=60 && Phy>=50 && Chem>=40 && Total>=200
Step 5: If Step 4 true then go to step 6 otherwise go to step 7.

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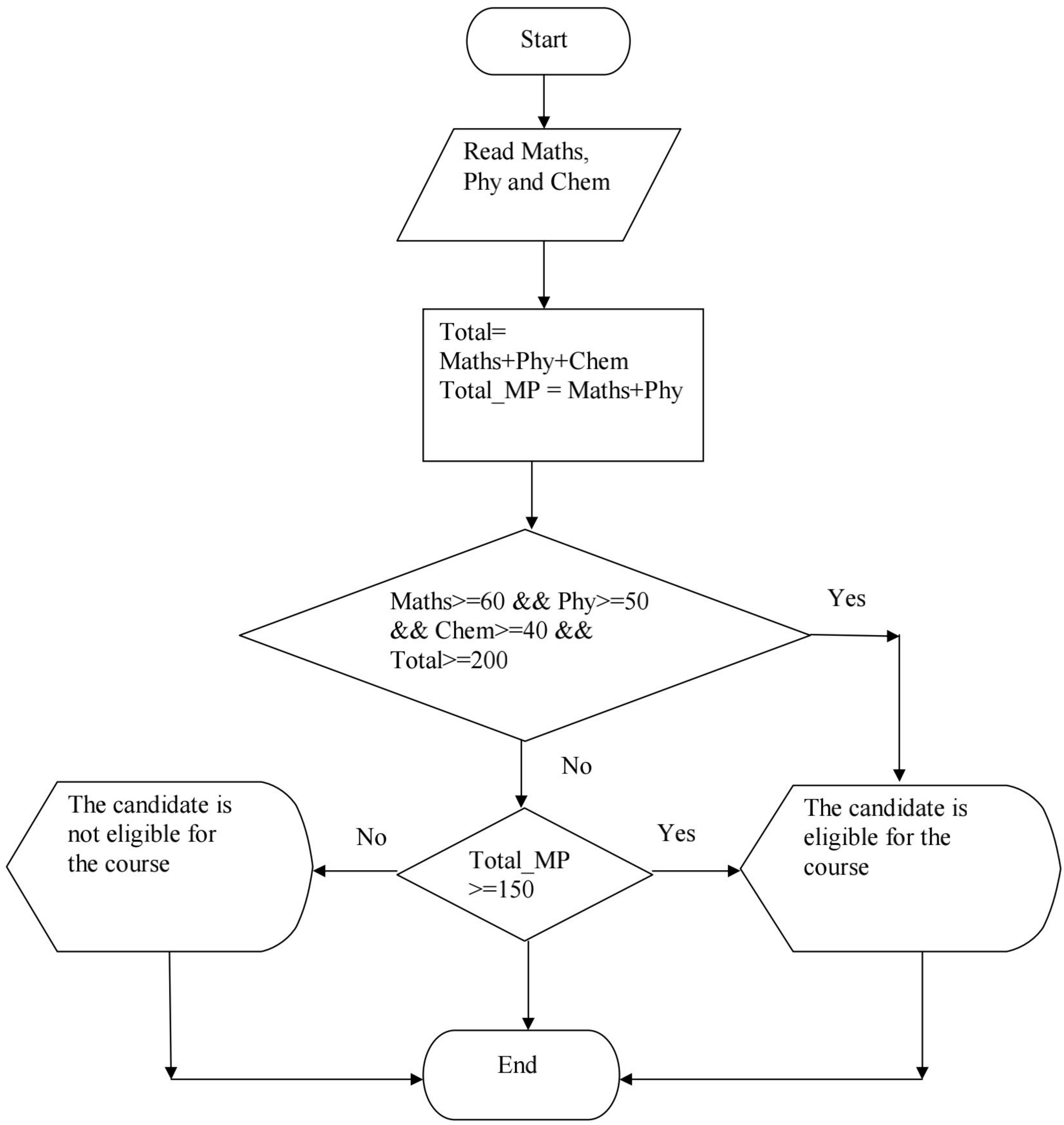
Step 6: Display “The candidate is eligible for the course” and go to step 11.
Step 7: Check Total_MP>=150
Step 8: If Step 7 true then go to step 9 otherwise go to step 10.
Step 9: Display “The candidate is eligible for the course” and go to step11
Step 10: Display “The candidate is not eligible for the course” and go to step 11.
Step 11: Stop.

Flowchart:--



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Program:--

//Admission to a professional course in subject to the following conditions:
//a) Marks in mathematics >=60
//b) Marks in Physics >=50
//c) Marks in Chemistry >=40
//d) Total in all three subjects >=200
//or
//Total in mathematics and physics>=150.
//Given the marks in the three subjects, write a program to process the applications to the eligible candidates.

//Date: 13/03/2010

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

 void main()
 {
  int Maths,Phy,Chem,Total,Total_MP;

  clrscr();

  printf("Enter the marks of maths :");
  scanf("%d",&Maths);

  printf("Enter the marks of phy :");
  scanf("%d",&Phy);

  printf("Enter the marks of chem :");
  scanf("%d",&Chem);

  Total=Maths+Phy+Chem;
  Total_MP=Phy+Maths;

  if (Maths>=60 && Phy>=50 && Chem>=40 && Total>=200)
     printf("The candidate is eligible for the admission");

 else
 {
        if(Total_MP>=150)
                printf("The candidate is eligible for the admission");
        else
        `       printf("The candidate is not eligible for the admission");
 }

getch();

 }
```

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5.6 Write a program to print a two-dimensional Sqaure Root Table as shown below, to provide the square root of any number from 0 to 9.9

Square Root table

Number	0.0	0.1	0.2……0.9
0.0			
1.0			
3.0		x	y
…			
9.0			

<u>Algorithm:--</u>

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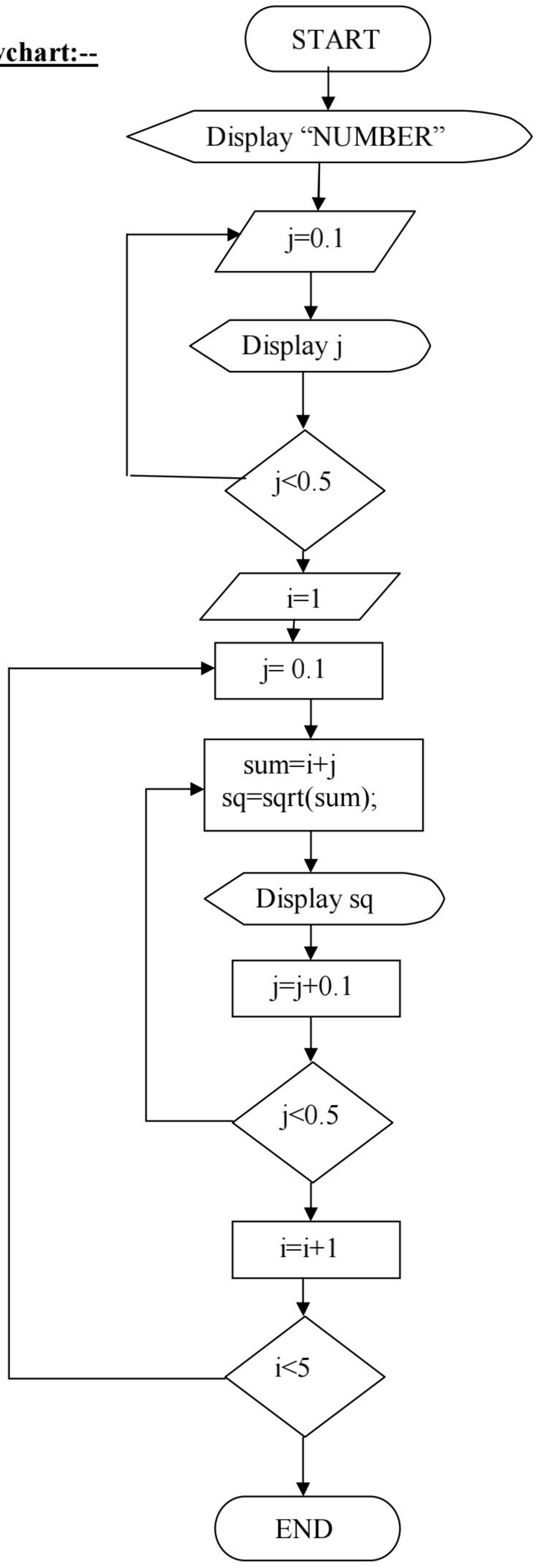
Flowchart:--



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Program:--

```
//Write a program to print a two-dimensional Sqaure Root Table as shown below,
// to provide the square root of any number from 0 to 9.9

//                    Square Root table

//Number      0.0   0.1  0.2……................0.9
//0.0
//1.0
//3.0                    x                        y
//…
//9.0



#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()

{
  float sq,sum,i,j;
  clrscr();

  printf("Number ");

  j=0.1;

  loop3:
        printf("    %f",j);
        j=j+0.1;
        if(j<0.5)
                goto loop3;

  printf("\n");
  i=1;

  loop1:

  printf("%f",i);

  j=0.1;
  loop:

  sum=i+j;

  sq=sqrt(sum);

  printf("    %f",sq);

  j=j+0.1;
```

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```
  if(j<0.5)
        goto loop;

  i=i+1;
  if(i<=4)
  {
        printf("\n");
        goto loop1;
  }
  getch();
}
```

Output:--

5.9 Write a program that will read the value of x and evaluate the following function

Y=
- **1 for x>0**
- **0 for x=0**
- **-1 for x<0**

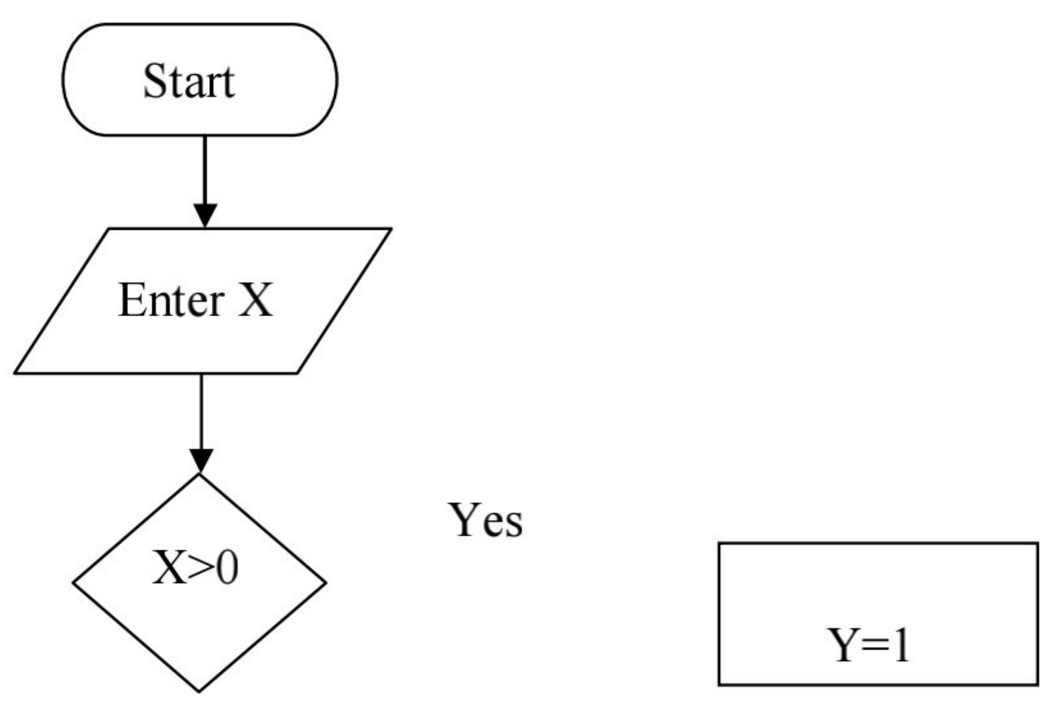
Using

(a) Nested if statements
(b) Else if statements
(c) Conditional operators

Algorithm

Step 1: Read x.
Step 2: Check x>0, if true then go to step 3 otherwise go to step 5.
Step 3: Assign 1 to y, and go to step 4
Step 4: Display y and go to step 10.
Step 5: Check if x==0, if true then go to step 6 otherwise go to step 8.
Step 6: Assign 0 to y and go to step 7.
Step 7: Display y and go to step 10.
Step 8: Assign -1 to y, go to step 9.
Step 9: Display y and go to step 10.
Step 10: End

Flowchart:--



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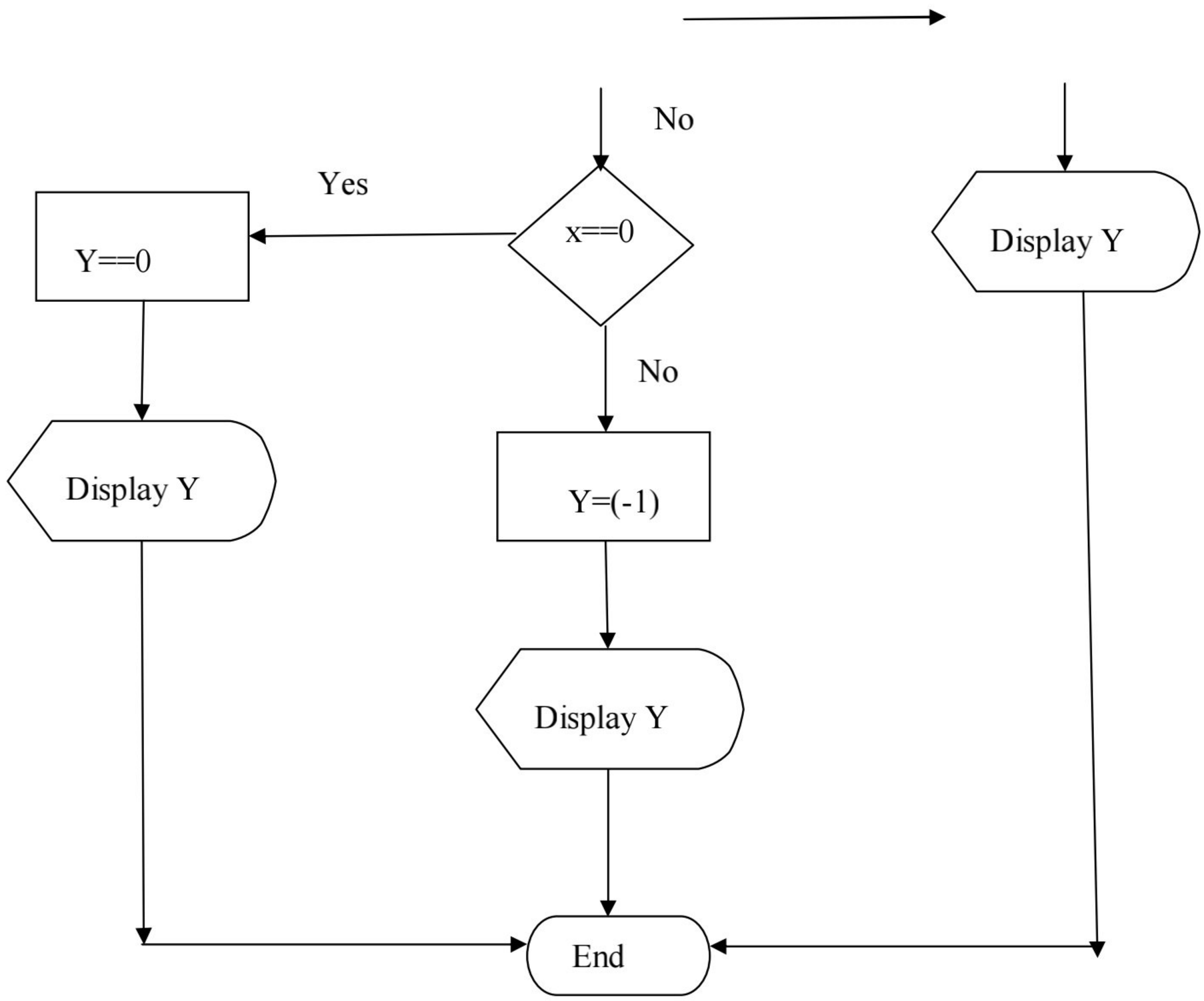

Program:--

Else if statements

```
//Write a program that will read the value of x and evaluate the following function

//Y=     1 for x>0
//       0 for x=0
//      -1 for x<0

//Using
//(a)    Nested if statements
//(b)    Else if statements
//(c)    Conditional operators

//Date: 13/03/2010

 #include<stdio.h>
 #include<conio.h>

 void main()
 {

   int y;
   float x;
```

```
clrscr();

printf("Enter the value of X: ");
scanf("%f",&x);

if(x>0)
{

        y=1;
        printf("The value of y for the given value of x=%f is %d\n",x,y);
}

else if(x==0)
{
                        y=0;
                        printf("The value of y for the given value of x=%f is
%d\n",x,y);
}
else
{
                y=-1;
                printf("The value of y for the given value of x=%f is %d\n",x,y);
}


getch();
}
```

Output:--

Enter the value of X: 3

The value of y for the given value of x=3 is =1

Nested if statements

//Write a program that will read the value of x and evaluate the following function

```
//Y=    1 for x>0
//      0 for x=0
//     -1 for x<0

//Using
//(a)    Nested if statements
//(b)    Else if statements
//(c)    Conditional operators

//Date: 13/03/2010

 #include<stdio.h>
 #include<conio.h>

 void main()
```

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```
{

 int y;
 float x;

 clrscr();

 printf("Enter the value of X: ");
 scanf("%f",&x);

 if(x>0)
 {

        y=1;
        printf("The value of y for the given value of x=%f is %d\n",x,y);
 }

 else
   {
    if(x==0)
    {
                y=0;
                printf("The value of y for the given value of x=%f is %d\n",x,y);
    }
    else
        {
                y=-1;
                printf("The value of y for the given value of x=%f is %d\n",x,y);
        }
    }

  getch();
}
```

Output:--

Enter the value of X: 3

The value of y for the given value of x=3 is =1

Conditional operators

//Write a program that will read the value of x and evaluate the following function

```
//Y=    1 for x>0
//      0 for x=0
//     -1 for x<0

//Using
//(a)   Nested if statements
//(b)   Else if statements
//(c)   Conditional operators
```

CamScanner

// Date 13/03/2010

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

void main()
{

  int y;
  float x;

  clrscr();

  printf("Enter the value of X: ");
  scanf("%f",&x);

  (x>0?(y=1):(x==0)?(y=0):(y=-1));

  printf("The value of y for the given value of x=%f is %d\n",x,y);

  getch();
}
```

Output:--

Enter the value of X: 3

The value of y for the given value of x=3 is =1

5.10 Write a program to compute the real roots of a quadratic equation $ax^2 + bx+c=0$

The roots are given by the equations:

X1=(-b+sqrt(b*b-4*a*c))/(2*a)

X2=(-b-sqrt(b*b-4*a*c))/(2*a)

The program should request for the values of the constants a,b and c and print the values of x1 and x2. Use the following rules:

(a) No solution , if both a nd b are zero
(b) There is only one root,if a=0 (x=-c/b)
(c) There is no real root if b*b-4ac is negative
(d) Otherwise there are real roots.

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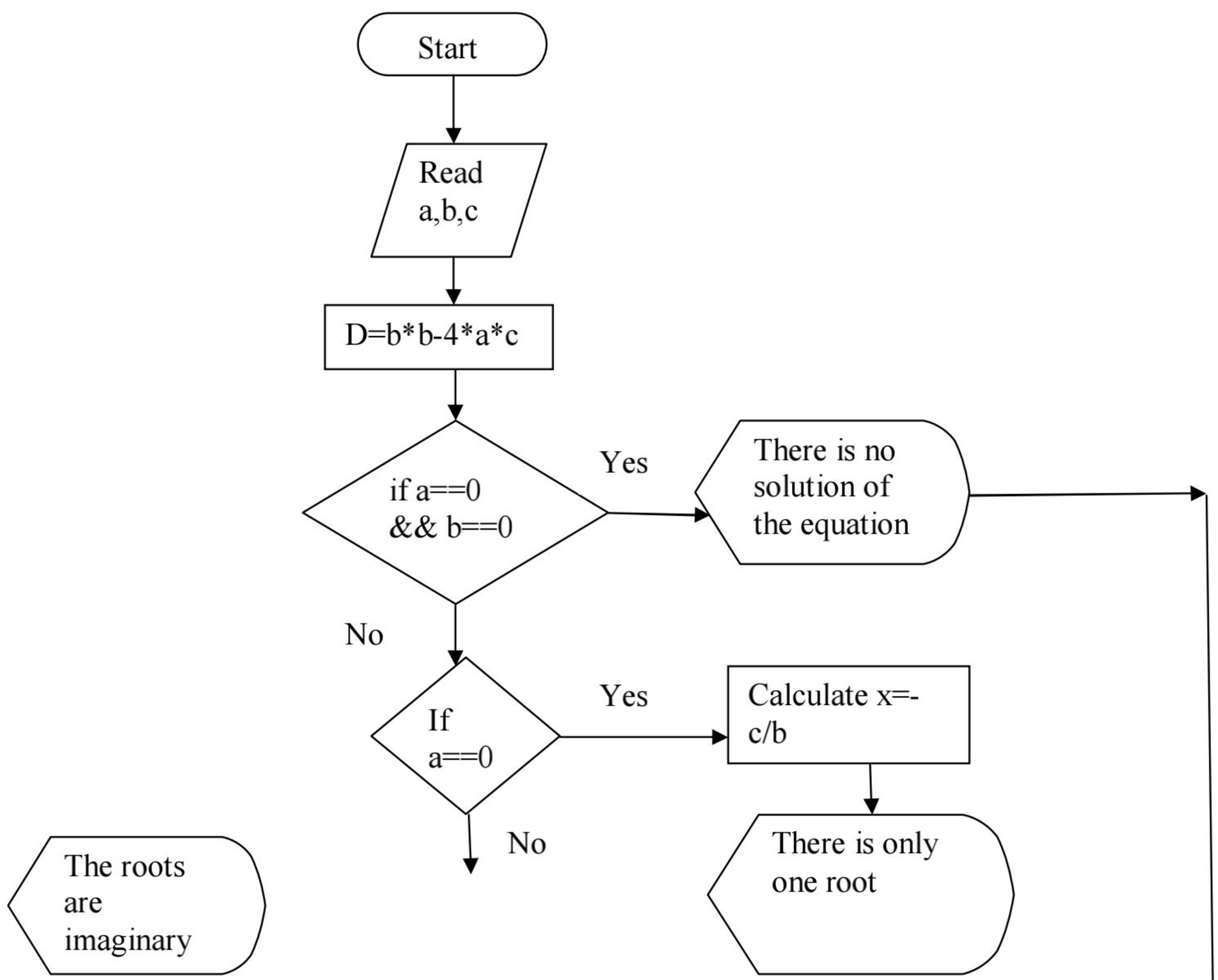
Test your program with appropriate data.

Algorithm:--

Step 1: Read a, b and c
Step 2: Compute b*b-4*a*c and store the result in d.
Step 3: Check if a==0 && b==0, if true then go to step 4 otherwise go to step 5.
Step 4: Display "There is no solution of the quadratic equation" and go to step 13.
Step 5: Check if a==0, if true go to step 6 otherwise go to step 8.
Step 6: Compute x=-c/b and go to step 7.
Step 7: Display "There is only one root" and display x and go to step 13.
Step 8: Check if d<0, if true go to step 9 otherwise go to step 10.
Step 9: Display "Roots are imaginary" and go to step 13.
Step 10: Compute x1= (-b+sqrt(b*b-4*a*c))/(2*a) and go to step11
Step 11: Compute x2= (-b-sqrt(b*b-4*a*c))/(2*a)
Step 12: Display x1 and x2
Step13. Stop

Flowchart:--



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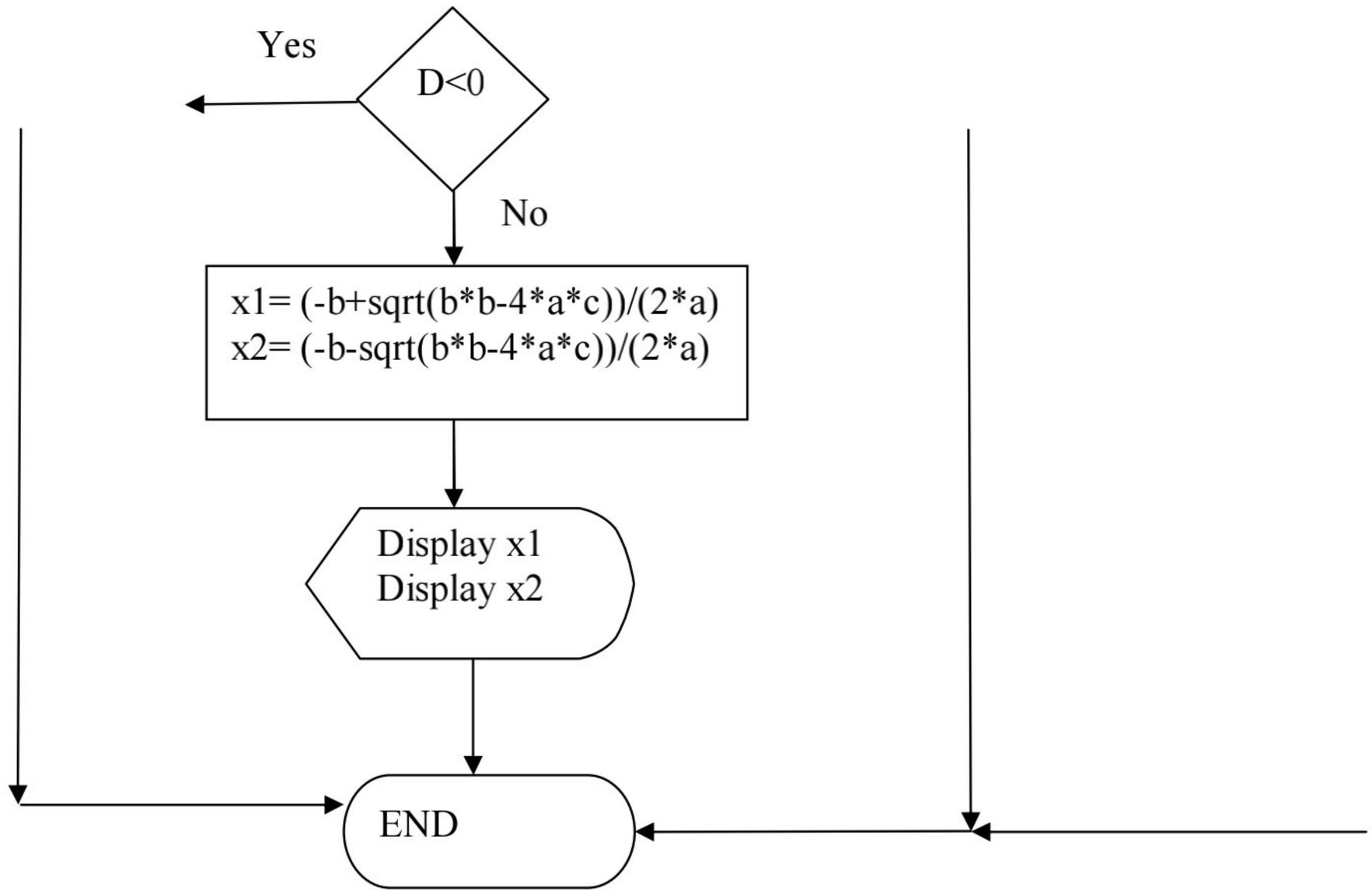

Program:--

// ax2 + bx+c=0

// The roots are given by the equations:

//X1=(-b+sqrt(b*b-4*a*c))/(2*a)

//X2=(-b-sqrt(b*b-4*a*c))/(2*a)

//The program should request for the values of the constants a,b and c and print the values of x1 and x2. Use the following rules:
//(a) No solution , if both a nd b are zero
//(b) There is only one root,if a=0 (x=-c/b)
//(c) There is no real root if b*b-4ac is negative
//(d) Otherwise there are real roots.

//Test your program with appropriate data.

// Date 13 March,2010

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
  float a,b,c,d;
  float x1,x2,x;
```

```
clrscr();

printf(" Enter the value of a: ");
scanf("%f",&a);
printf("\n Enter the value of b: ");
scanf("%f",&b);
printf("\n Enter the value of c: ");
scanf("%f",&c);

d=(b*b)-(4*a*c);

if(a==0 && b==0)
   printf(" There is no solution of the quadratic equation");

else if(a==0)
{
        x=-c/b;
        printf(" There is only one root of the equation, x= %f",x);
   }
   else if(d<0)
   {
        printf("The roots are imaginary and as follows: \n");
   }
   else
   {
        x1= (-b+sqrt(d))/(2*a);
        x2= (-b-sqrt(d))/(2*a);
        printf("The roots are real");
        printf("x1=%f \n x2=%f",x1,x2);
   }

   getch();
}
```

Output:--

Enter the value of a: 1
Enter the value of b: -3
Enter the value of c: 2
The roots are real
x1=2 x2=1

5.11 Write a program to read three integer values from the keyboard and display the output stating that they are the sides of right-angled triangle.

Algorithm:--

Step 1: Read Len, Hei, Hyp.
Step 2: Compute Temp1=Hyp*Hyp , Temp2=Len*Len+Hei*Hei.
Step 3: Check Temp1==Temp2 is true then go to Step 4 otherwise go to Step 5
Step 4: Display “Triangle is Right Angle Triangle”.
Step 5: Display “Triangle is Not a Right Angle Triangle”.

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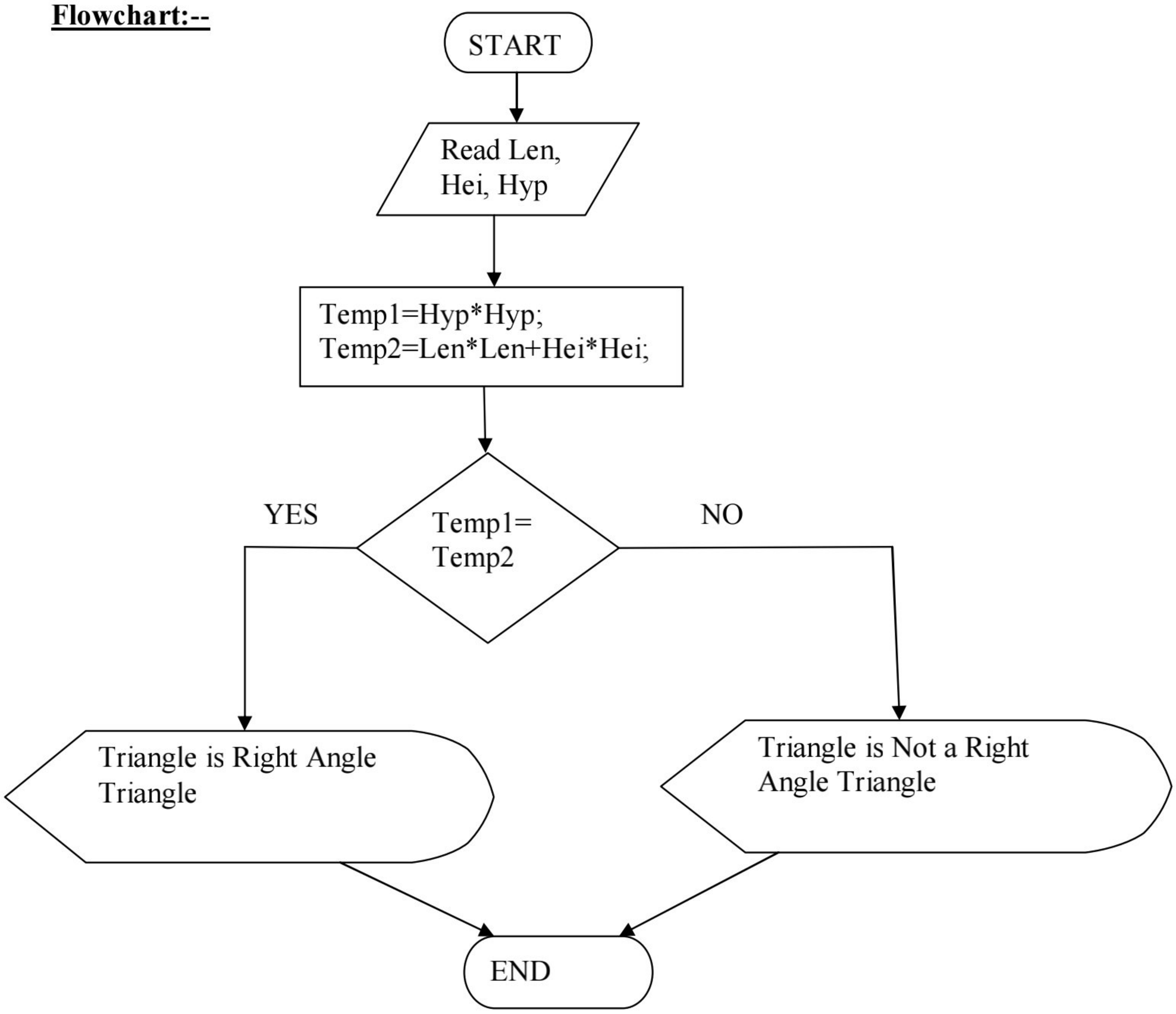
Flowchart:--



Program:--

```
//Write a program to read three integer values from the keyboard and display the
//output stating that they are the sides of right-angled triangle.

//Date : 13/03/2010

#include<conio.h>
#include<stdio.h>

void main()
{

        float Len,Hei,Hyp;
        float Temp1,Temp2;

        clrscr();

        printf("Enter Length Height and Hypotenes of Triangle--\n");
```

```
        scanf("%f %f %f",&Len,&Hei,&Hyp);

        Temp1=Hyp*Hyp;
        Temp2=Len*Len+Hei*Hei;

        if(Temp1==Temp2)
                printf("Triangle is Right Angle Triangle\n");
        else
                printf("Triangle is Not a Right Angle Triangle\n");

        getch();
}
```

Output:--

Enter Length Height and Hypotenes of Triangle—
2 3 4
Triangle is Not a Right Angle Triangle

5.12 An electricity board charges the following rates for the use of electricity:

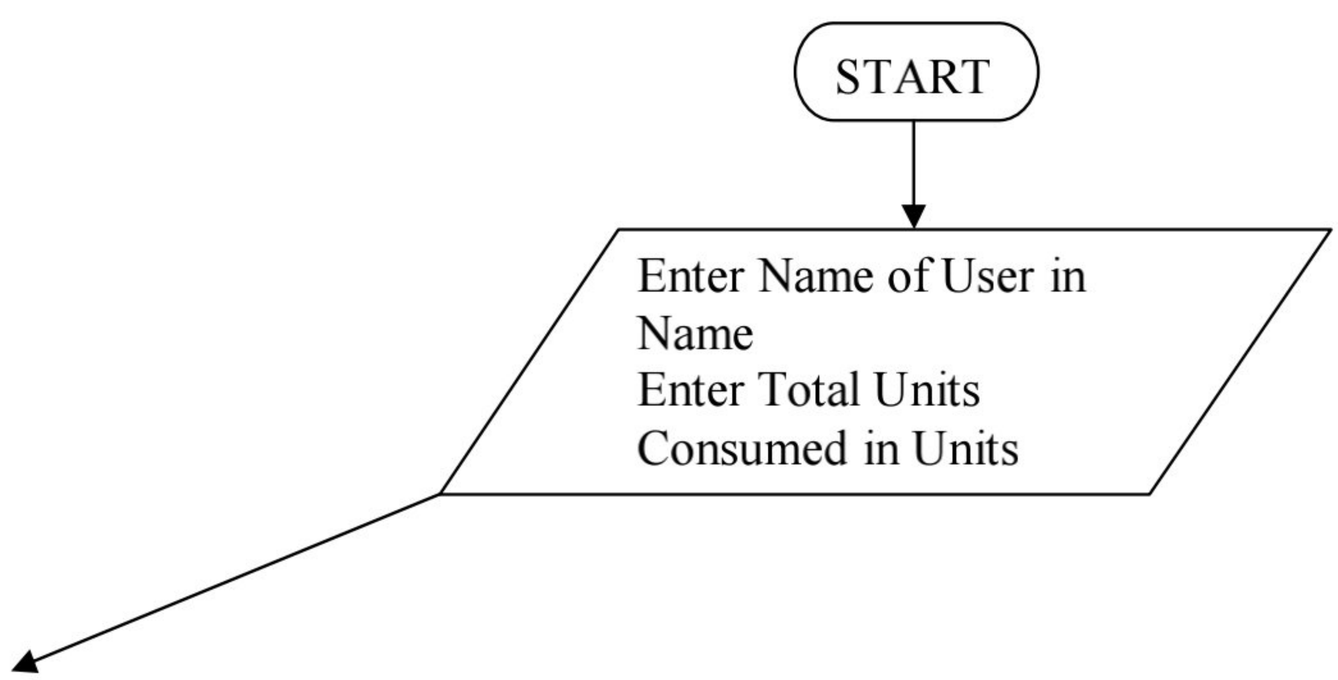
For the first 200 units; 80 P per unit
For the next 100 units; 90 P per unit
Beyond 300 units; Rs. 1 per unit

All users are charged a minimum of Rs. 100 as meter charge. If the total amount is more than Rs. 400, then an additional surcharge of 15% of total amount is charged.
Write a program to read the names of users and number of units consumed and printout the charges with names.

Algorithm:--

Step 1: Read Name & Units.
Step 2: Check Units>=0&&Units<=200 if true the go to Step 3 otherwise go to Step 4
Step 3: Compute Charge=100+(Units*0.80) & go to Step 9
Step 4: Check Units>200&&Units<=300 if true the go to Step 5 otherwise go to Step 6
Step 5: Compute Charge=100+(Units*0.90) & go to Step 9
Step 6: Check Units>300&&Units<=400if true the go to Step 7 otherwise go to Step 8
Step 7: Compute Units>300&&Units<=400 & go to Step 9
Step 8: Compute Charge= (100+units)+(100+Units)*15 & go to Step 9
Step 9: Display Name Units Charge

Flowchart:--



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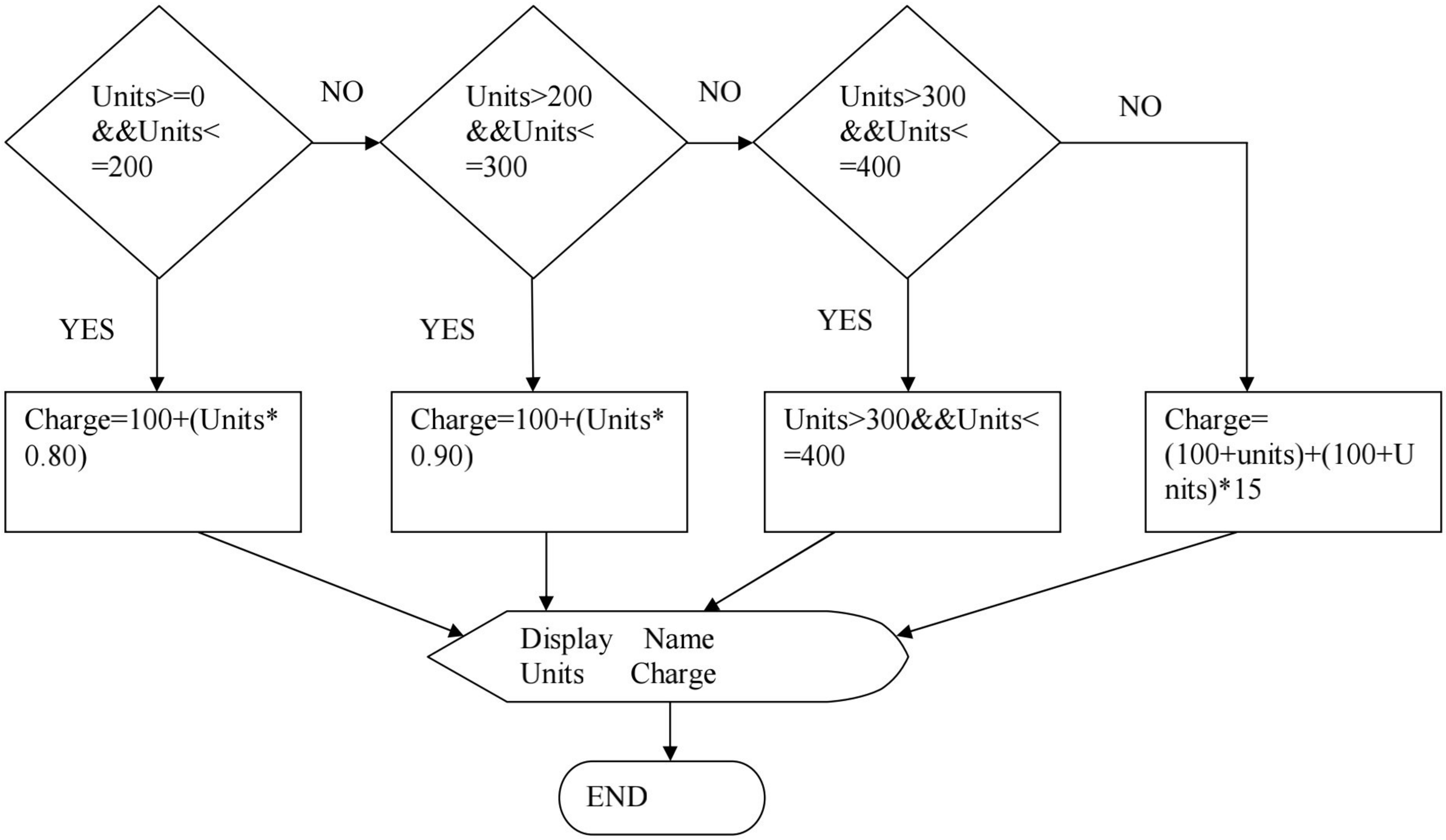


Program:--

```
//An electricity board charges the following rates for the use of electricity:
//        For the first 200 units; 80 P per unit
//        For the next 100 units; 90 P per unit
//        Beyond 300 units; Rs. 1 per unit
//All users are charged a minimum of Rs. 100 as meter charge. If the total amount is more than
Rs. 400,
//then an additional surcharge of 15% of total amount is charged.
//Write a program to read the names of users and number of units consumed and printout the
charges with names.


//Date : 13/03/2010

#include<conio.h>
#include<stdio.h>

void main()
{

        int Units;
        char Name[10];
        float Charge;
```

```
        clrscr();

        printf("Enter Name of User:--\n");
        scanf("%s",&Name);

        printf("Enetr Total Units Consumed\n");
        scanf("%d",&Units);

        if(Units>=0&&Units<=200)
                Charge=100+(Units*0.80);
        else if(Units>200&&Units<=300)
                Charge=100+(Units*0.90);
        else if(Units>300&&Units<=400)
                Charge=100+Units;
        else
                Charge=(100+units)+(100+Units)*15;


        printf("Name            Units        Charge\n");
        printf("%s          %d          %.2f",Name,Units,Charge);

        getch();
}
```

Output:--

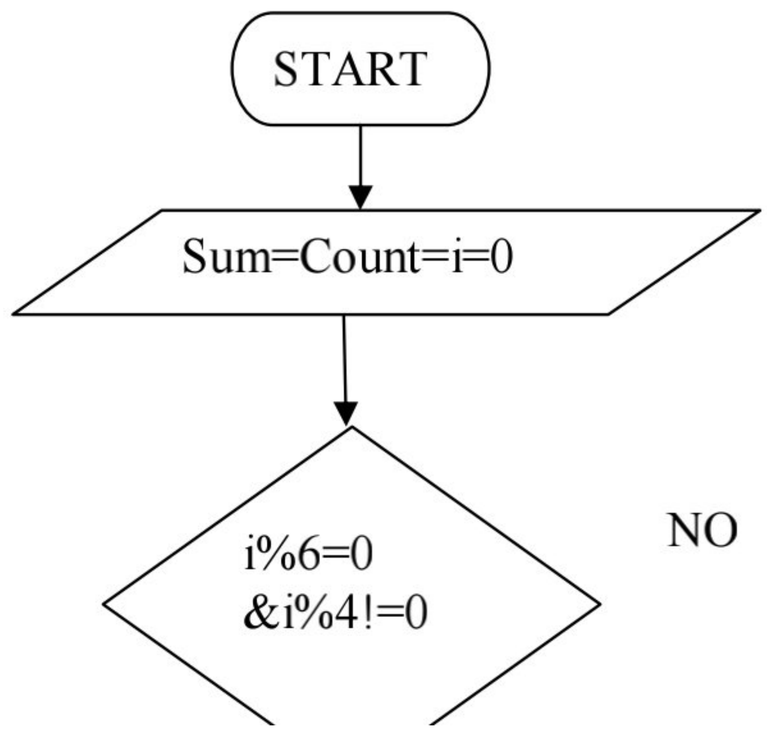
```
Enter Name of User:-- Ritesh
Enetr Total Units Consumed 600
Name        Units       Charge
Ritesh       600        805.00
```

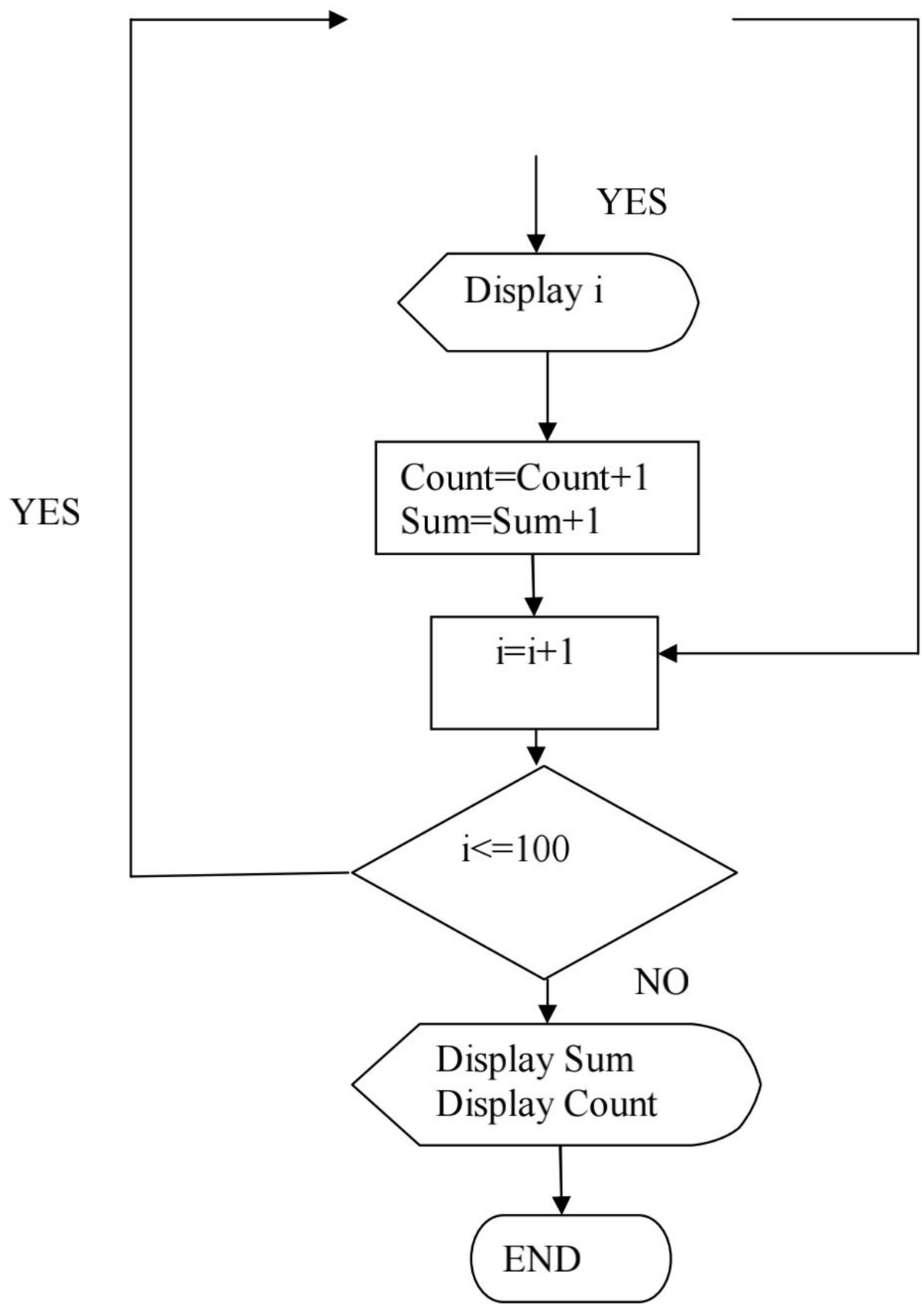
5.13 Write a program to compute and display the sum of all integers that are divisible by 6 but not divisible by 4 and lie between 0 and 100. The program should also count and display the number of such values.

Algorithm:--

Step 1: Store 0 to Sum, Count and i.
Step 2: if i%6==0 & i%4!=0 is true then Continue from Step3 otherwise go to Step 5.
Step 3: Display i
Step 4: Compute Count=Count+1 & Sum=Sum+1.
Step 5: Compute i=i+1
Step 6: if i<=100 then go to Step 2.
Step 7: Display Sum & Count.

Flowchart:--





Program:--

```
//Write a program to compute and display the sum of all integers that are divisible by 6
//      but not divisible by 4 and lie between 0 and 100. The program should also count and
//      display the number of such values.

//Date : 13/03/2010

#include<conio.h>
#include<stdio.h>

void main()
{

   int Sum,i,Count;

   clrscr();

   Sum=Count=0;
   i=0;
```

```
Loop:

if((i%6==0)&&(i%4!=0))
{
                printf("%d \n",i);
                Count=Count+1;
                Sum=Sum+i;
}
i=i+1;

if(i<=100)
        goto Loop;

printf("Sum of Numbers is %d\n",Sum);
printf("Count of Numbers is %d\n",Count);

getch();
}
```

Output:--

6 18 30 42 54 66 78 90
Sum of Numbers is 384
Count of Numbers is 8

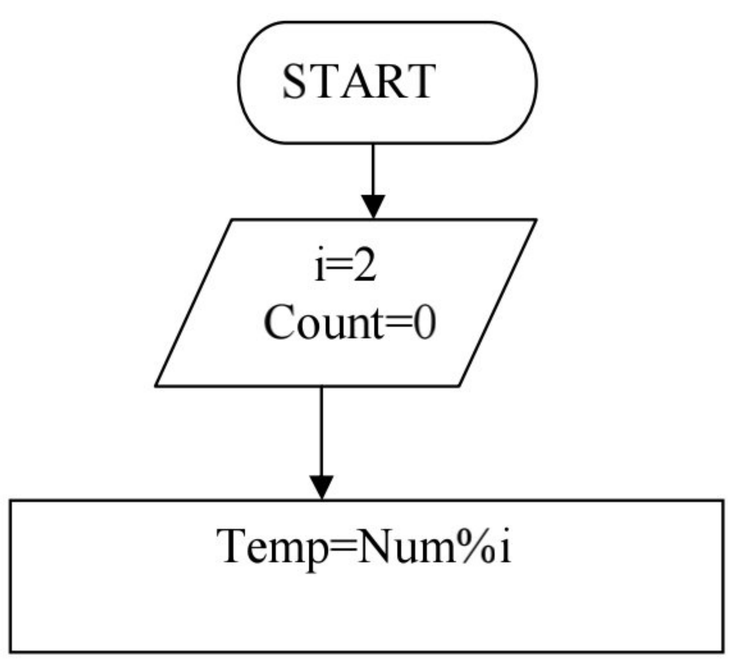
5.14 Write an interactive program that could read a positive integer number and decide whether the number is prime number and display the output accordingly.

Modify the program to count all the prime numbers that lie between 100 and 200.

Algorithm:--

Step 1: Read Num.
Step 2: Store 2 to i & 0 to Count.
Step 3: Compute Num%i & store the result in Temp.
Step 4: if Temp==0 then Count=Count+1
Step 5: if i<=Num then goto step 3
Step 6: if Count==1 then Display Number is Prime
Step 7: Otherwise Display Number is not Prime.

Flowchart:--



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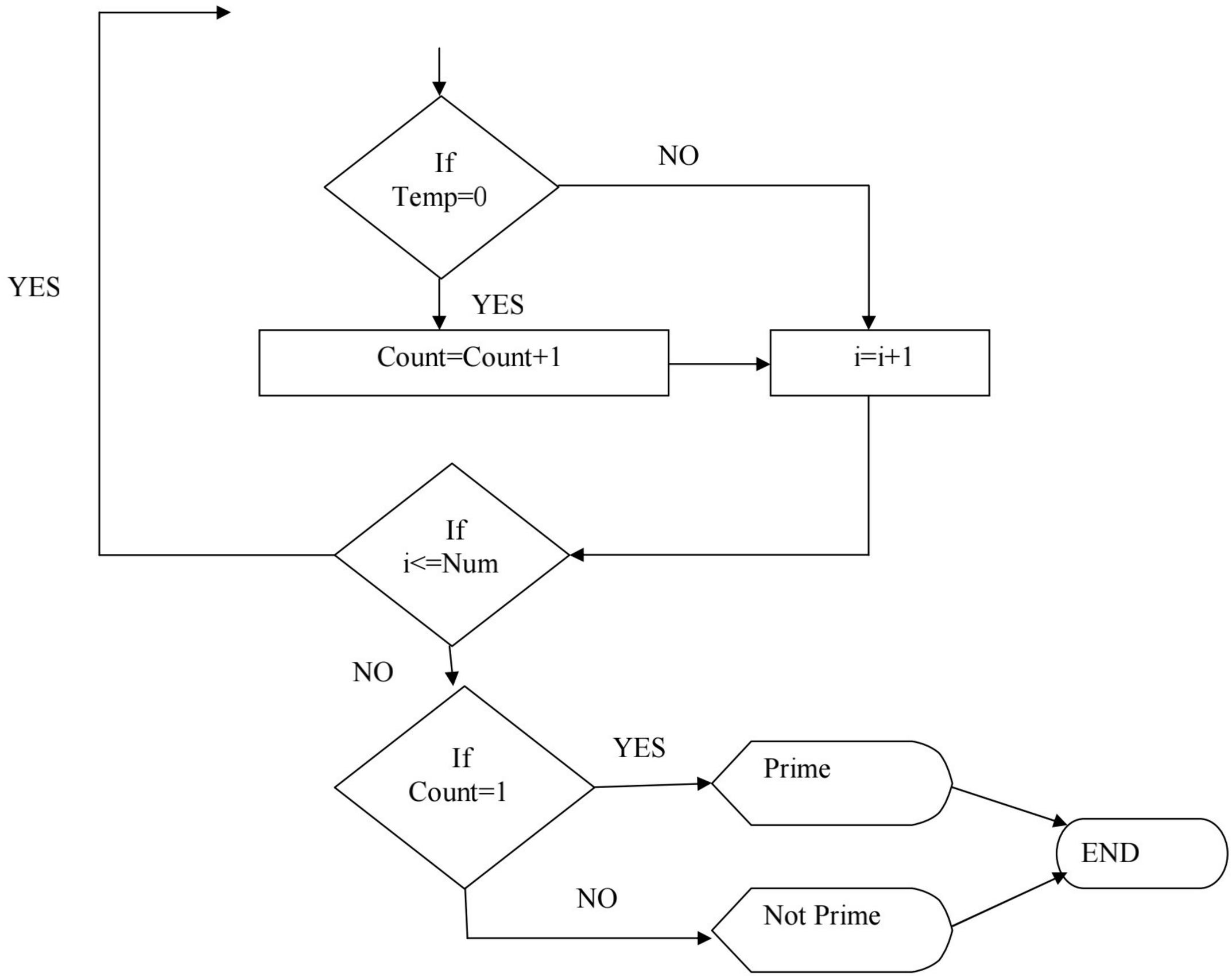

Program:--

//Write an interactive program that could read a positive integer number and decide
//whether the number is prime number and display the output accordingly.

//Date : 13/03/2010

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

void main()
{

   int Num,i,Count,Temp;

   clrscr();

   Count=0;
   i=2;

   printf("Enter A Number :--\n");
```

```
scanf("%d",&Num);

Loop:

Temp=Num%i;

if(Temp==0)
        Cpunt=Count+1;

i=i+1;

if(i<=Num)
        goto Loop;

if(Count==1)
        printf("Number %d is Prime",Num);
else
        printf("Number %d is Not Prime",Num);

  getch();
}
```

Output:--

Enter A Number :--
6
Number 6 is Prime

5.15 Write a program to read a double-type value x that represent angle in radians and a character-type variable T that represents the type of trigonometric function and display the value of

a) Sin(x), if s or S is assigned to T,
b) Cos(x), if c or C is assigned to T, and
c) Tan(x), if t or T is assigned to T.

Using (i) if…….else statement and (ii) switch statement.

Algorithm:--

Step 1: Read x, T.
Step 2: Choice T is s or S then Val=sin(x)
Step 3: Choice T is c or C then Val=cos(x)
Step 4: Choice T is t or T then Val=tan(x)
Step 5: Display Val.

Flowchart:--

Using if……..else

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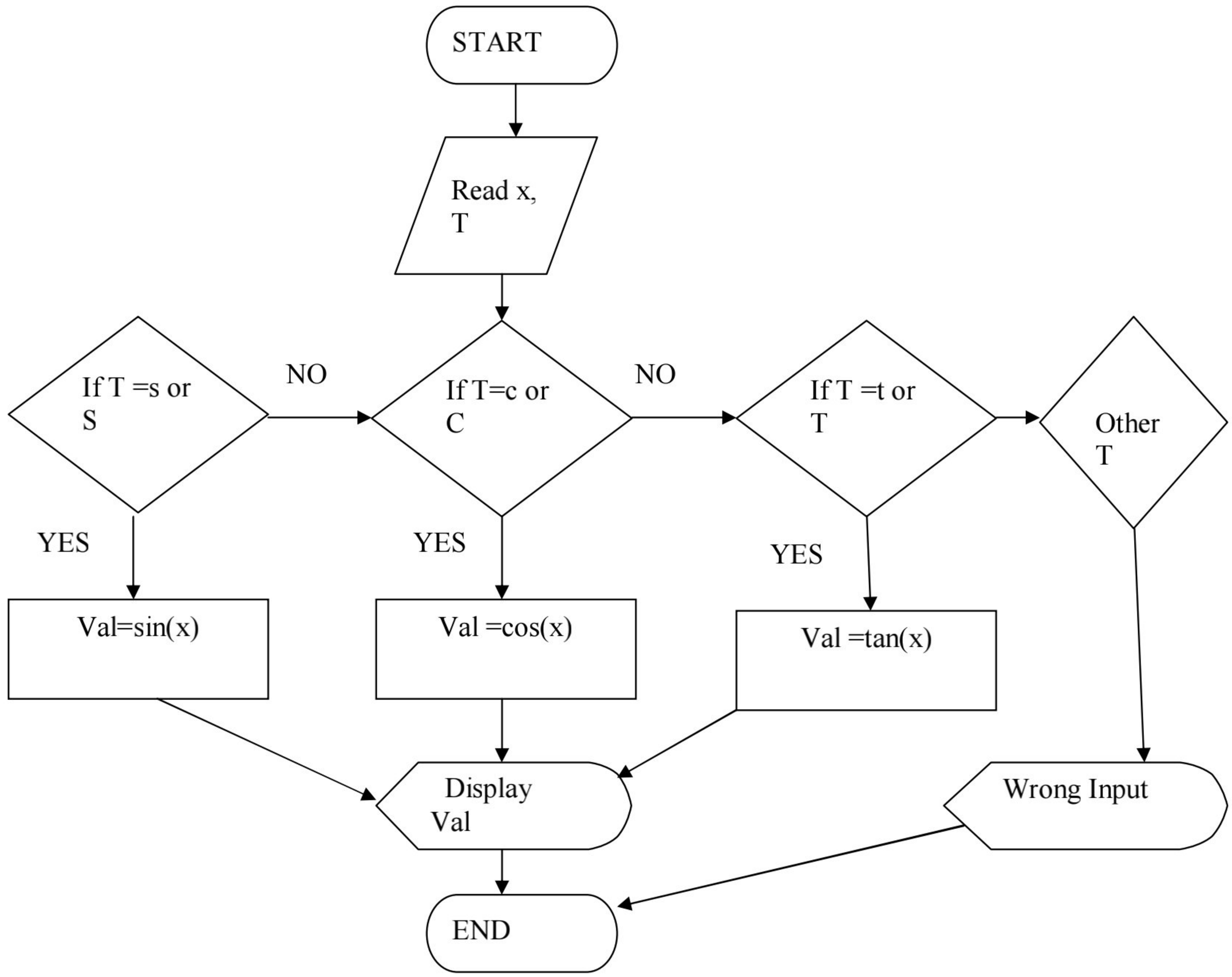
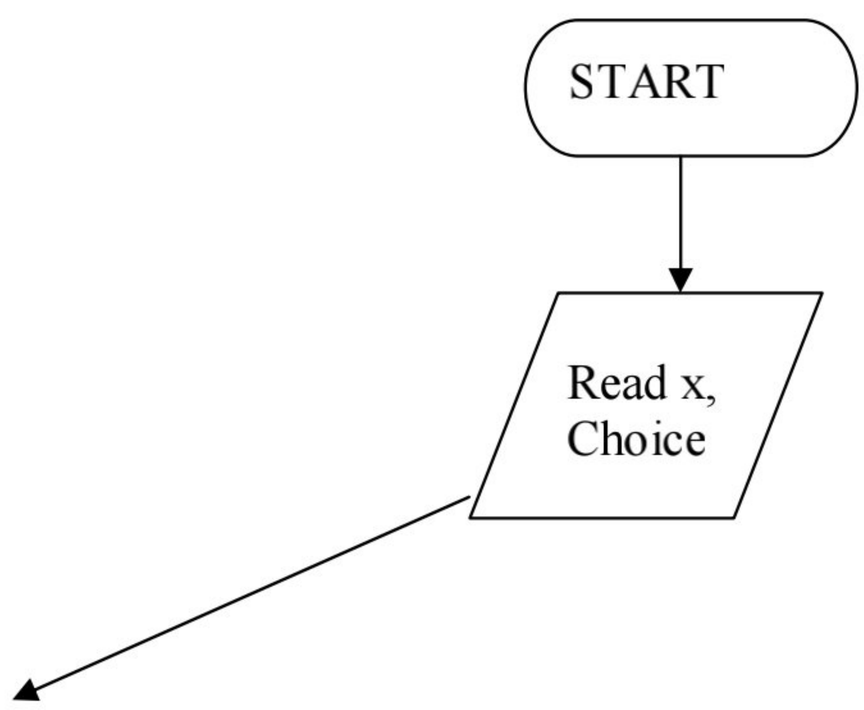


Using switch statement



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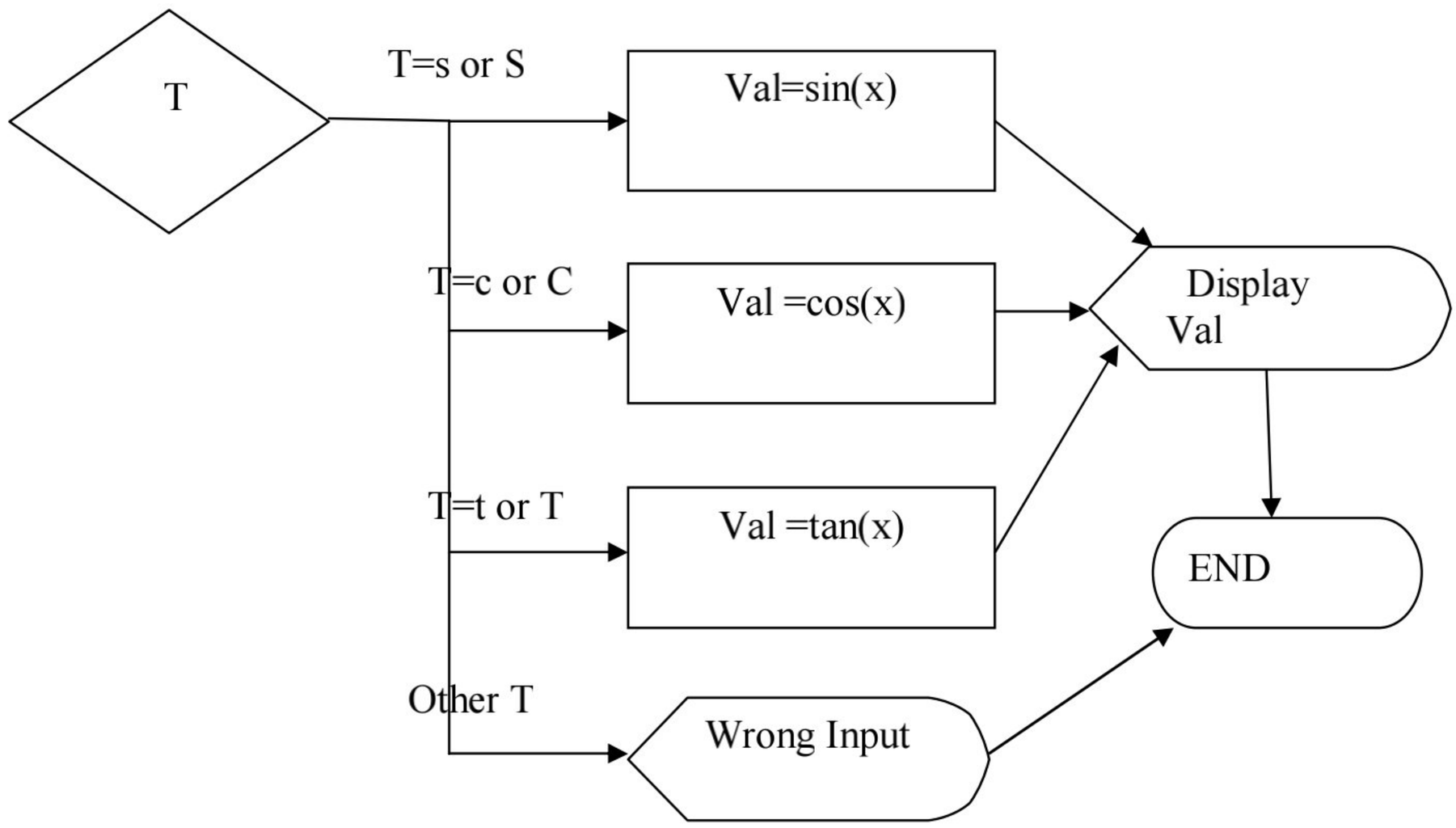

Program:--

Using if……..else

//Write a program to read a double-type value x that represent angle in radians and a
// character-type variable T that represents the type of trigonometric function and display
// the value of

//a) Sin(x), if s or S is assigned to T,
//b) Cos(x), if c or C is assigned to T, and
//c) Tan(x), if t or T is assigned to T.

//Using (i) if……else statement

//Date : 13/03/2010

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

void main()
{
  double x,Val;
  char T;
  Val=0;

  clrscr();

  printf("Enter Angle:--\n");
  scanf("%lf",&x);

  printf("\ns or S for Sin(x)");
```

```
    printf("\nc or C for Cos(x)");
    printf("\nt or T for Tan(x)");
    printf("\nEnter Choice\n");

    T=getch();

    if((T=='s')||(T=='S'))
            Val=sin(x);
    else if((T=='c')||(T=='C'))
            Val=cos(x);
    else if((T=='t')||(T=='T'))
            Val=tan(x);
    else
            printf("\nWrong Input\n");

    printf("Value:---   %lf",Val);

    getch();
}
```

Output:--

```
Enter Angle:--
90
s or S for Sin(x)
c or C for Cos(x)
t or T for Tan(x)

Enter Choice
s

Value:---   1.000000
```

Using Switch Statement

```
//Write a program to read a double-type value x that represent angle in radians and a
//      character-type variable T that represents the type of trigonometric function and display
//      the value of

//a)        Sin(x), if s or S is assigned to T,
//b)        Cos(x), if c or C is assigned to T, and
//c)        Tan(x), if t or T is assigned to T.

//Using (ii) switch statement


//Date : 13/03/2010

#include<conio.h>
#include<stdio.h>

void main()
```

```
{
  double x,Val;
  char T;
  clrscr();
  Val=0;
  printf("Enter Angle:--\n");
  scanf("%lf",&x);

  printf("\ns or S for Sin(x) \ns or S for Cos(x) \ns or S for Tan(x)\nEnter Choice ");
  T=getch();

  switch(T)
  {

        case 's':
        case 'S': Val=sin(x); break;
        case 'c':
        case 'C': Val=cos(x); break;
        case 't':
        case 'T': Val=tan(x); break;

        default:printf("\nWrong Input\n");

  }

  printf("Value:---   %lf\n",Val);

  getch();
}
```

```
Enter Angle:--
90
s or S for Sin(x)
c or C for Cos(x)
t or T for Tan(x)

Enter Choice
s

Value:---   1.000000
```

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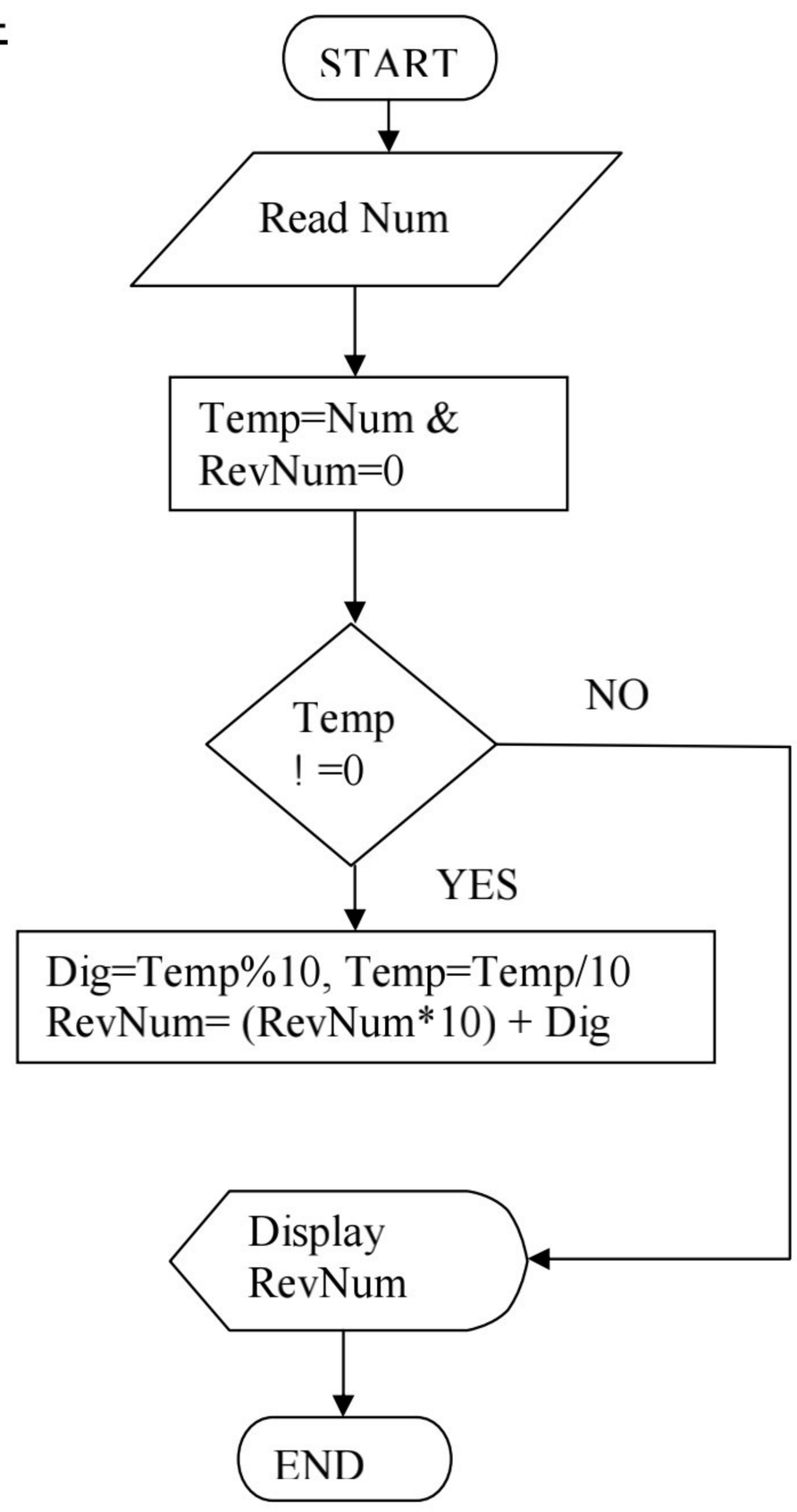
6.1 Given a number, write a program using while loop to reverse the digits of the number.

Algorithm:--

Step 1: Read Num.
Step 2: Store Temp=Num & RevNum=0.
Step 3: Repeat Step 4 to Step 5 while Temp! =0 do otherwise go to Step 6
Step 4: Compute Dig=Temp%10 & Temp=Temp/10.
Step 5: Compute RevNum=(RevNum*10)+Temp.
Step 6: Display RevNum.

Flowchart:--



Program:--

```
//Given a number, write a program using while loop to reverse the digits of the number.
// Date : 15/03/2010

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

```
void main()
{
 long int Num,Temp,RevNum,Dig;

 clrscr();

 printf("Enter any Number:--\n");
 scanf("%ld",&Num);


 Temp=Num;
 RevNum=0;

 while(Temp!=0)
 {
        Dig=Temp%10;
        Temp=Temp/10;
        RevNum=(RevNum*10)+Dig;
 }

 printf("Rverse of Number %ld is %ld\n",Num,RevNum);
 getch();

}
```

Output:--

Enter any Number:--
12345
Rverse of Number 12345 is 54321

5.2 The factorial of an integer m is the product of consecutive integers from 1 to m. That is,
Factorial m = m! = m*(m-1)*……1

Algorithm:--

Step 1: Read m.
Step 2: Store 1 to Fact & n=m.
Step 3: Repeat Step 4 while n > 0 otherwise go to Step 5
Step 4: Compute Fact=Fact*n & n=n-1.
Step 5: Display Fact.

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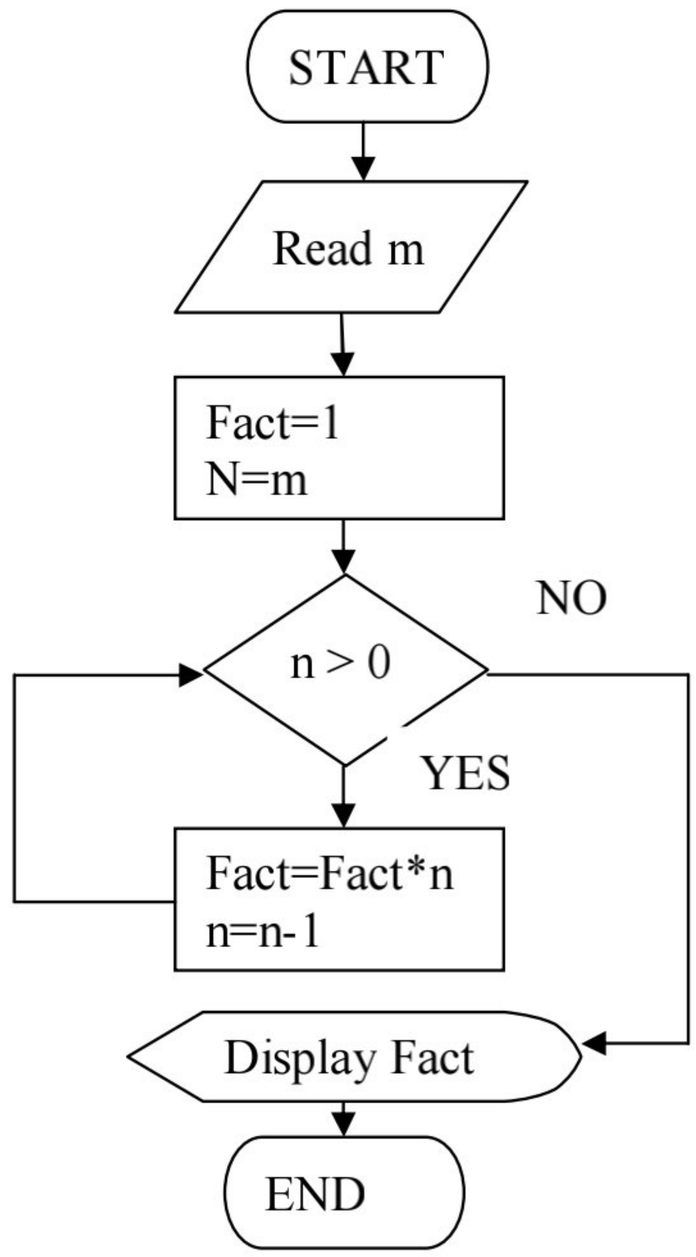
Flowchart:--



Program:--

```
//The factorial of an integer m is the product of consecutive integers from 1 to m. That is,
//                    Factorial m = m! = m*(m-1)*…….. 1

// Date : 15/03/2010

 #include<stdio.h>
 #include<conio.h>


 void main()
 {
 long int m,n,Fact;

 clrscr();

 printf("Enter any Number:--\n");
 scanf("%ld",&m);


 n=m;
 Fact=0;

 while(n>0)
 {
        Fact=Fact*n;
        n=n-1;
```

```
  }

  printf("Factorial of Number %ld is %ld\n",m,Fact);
  getch();

 }
```

Output:--

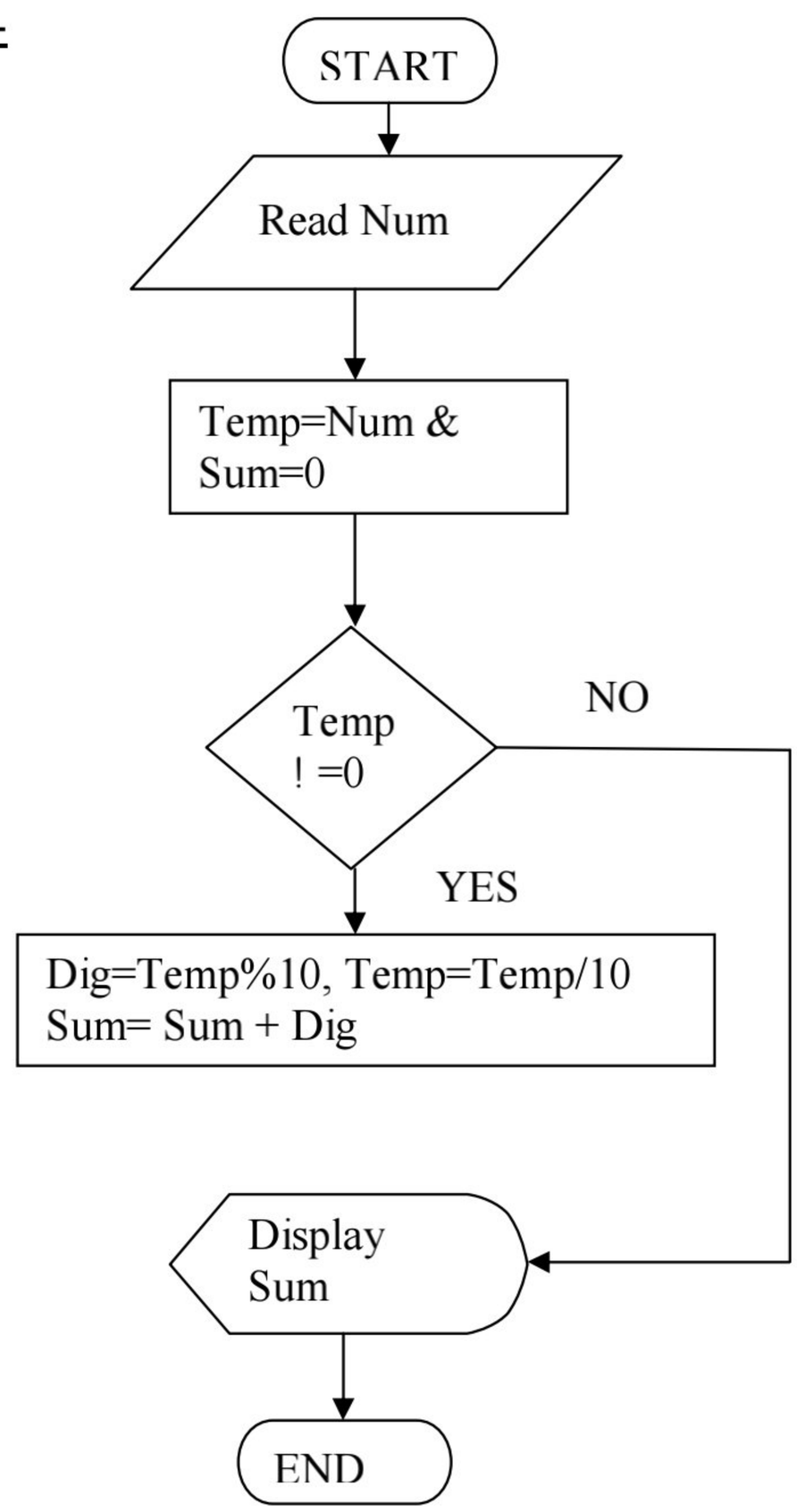
Enter any Number:--
4
Factorial of Number 4 is 24

6.3 Write a program to compute the sum of the digits of a given number.

Algorithm:--

Step 1: Read Num.
Step 2: Store Temp=Num & Sum=0.
Step 3: Repeat Step 4 to Step 5 while Temp! =0 do otherwise go to Step 6
Step 4: Compute Dig=Temp%10 & Temp=Temp/10.
Step 5: Compute Sum=Sum+Temp.
Step 6: Display Sum.

Flowchart:--



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Program:--

```
//Write a program to compute the sum of the digits of a given number.
// Date : 15/03/2010

 #include<stdio.h>
 #include<conio.h>


 void main()
 {
   long int Num,Temp,Sum,Dig;

   clrscr();

   printf("Enter any Number:--\n");
   scanf("%ld",&Num);

   Temp=Num;
   Sum=0;

   while(Temp!=0)
   {
            Dig=Temp%10;
            Temp=Temp/10;
            Sum=Sum+Dig;
   }

   printf("Sum of Number %ld is %ld\n",Num,Sum);
   getch();

 }
```

Output:--

```
Enter any Number:--
12345
Sum of Number 12345 is 15
```

6.4 The numbers in the sequence

1 1 2 3 5 8 13 21 ……..

are called Fibonacci numbers. Write a program using do …….. while loop to calculate and print the first m Fibonacci numbers.

Algorithm:--

Step 1: Read m.
Step 2: Store i=1, Fib1=0 & Fib2=1.
Step 3: Check m>1 then Display Fib2 otherwise go to Step 4
Step 4: Do Step 5 to Step 7
Step 5: Compute Fib=Fib1+Fib2, Fib1=Fib2, Fib2=Fib, i=i+1.

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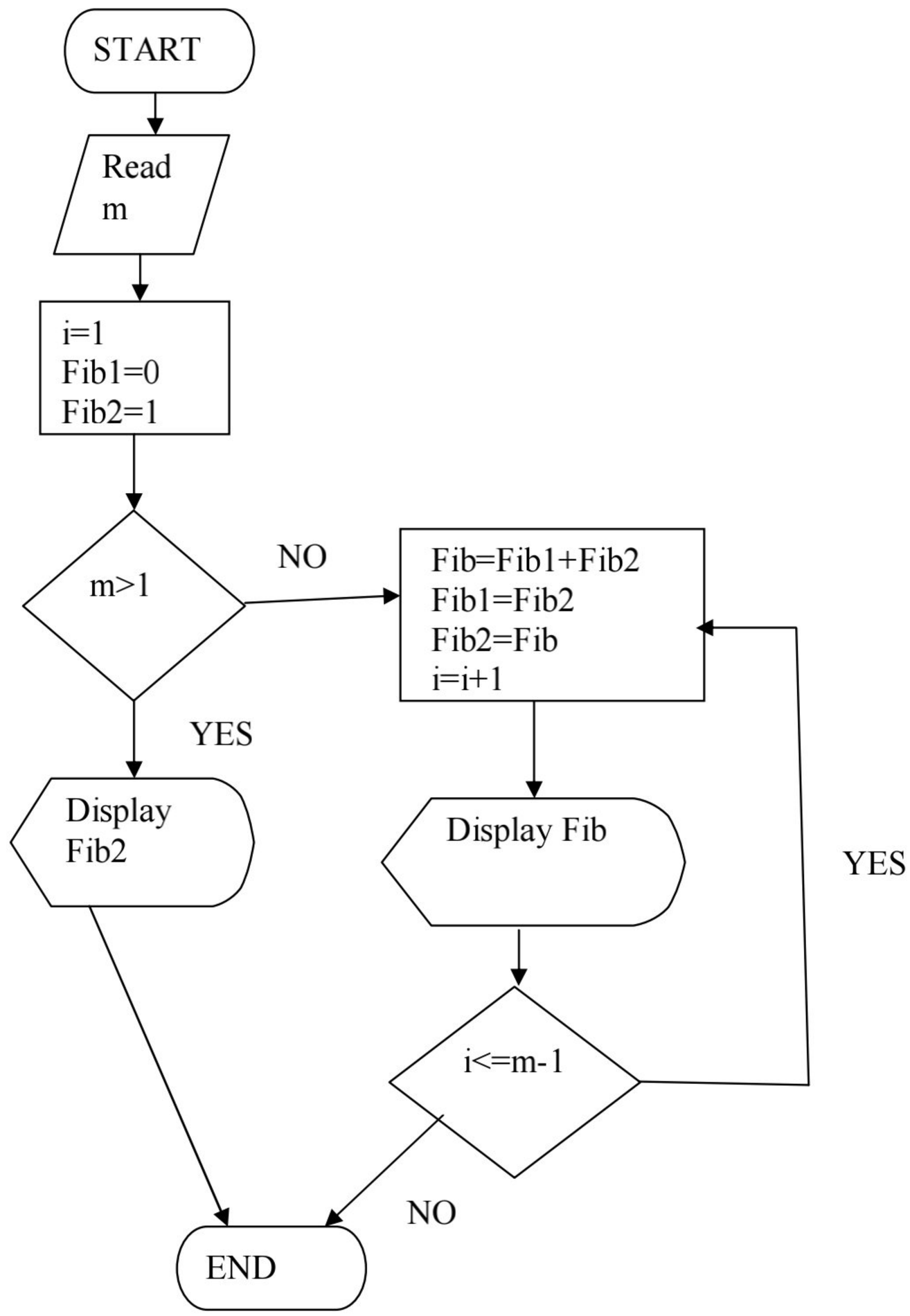
Step 6: Display Fib.
Step 7: Check i<=m-1 if true then go to Step 5 otherwise go to Step 8.
Step 8: End.

Flowchart:--



Program:--

```
//The numbers in the sequence
//                    1 1 2 3 5 8 13 21 ……................
//are called Fibonacci numbers. Write a program using do …….. while loop to
//calculate and print the first m Fibonacci numbers.

// Date : 15/03/2010

 #include<stdio.h>
 #include<conio.h>


 void main()
```

```
{
 int m,i,Fib1,Fib2,Fib;

 clrscr();

 printf("Enter Length of Series:--\n");
 scanf("%d",&m);

 Fib1=0;
 Fib2=i=1;

 printf("Fibonacci Numbers-->\n");

 if(m>1)
 {
        printf("%d ", Fib2);
 }

 do
  {
        Fib=Fib1+Fib2;
        Fib1=Fib2;
        Fib2=Fib;
        i=i+1;
        printf("%d ",Fib);

  }while(i<=m-1);

  getch();

 }
```

Output:--

```
Enter Length of Series:--
5
Fibonacci Numbers-->
1 1 2 3 5
```

6.5 Rewrite the program of the Example using the for statement.

A program to evaluate the equation

$$y = x^n$$

when n is a non-negative integer.

Algorithm:--

Step 1: Read x, n.
Step 2: Store 1.0 to y.
Step 3: For Count=1 to n repeat Step
Step 4: Compute y=y*x & Count=Count+1.
Step 5: Display x, n, y.

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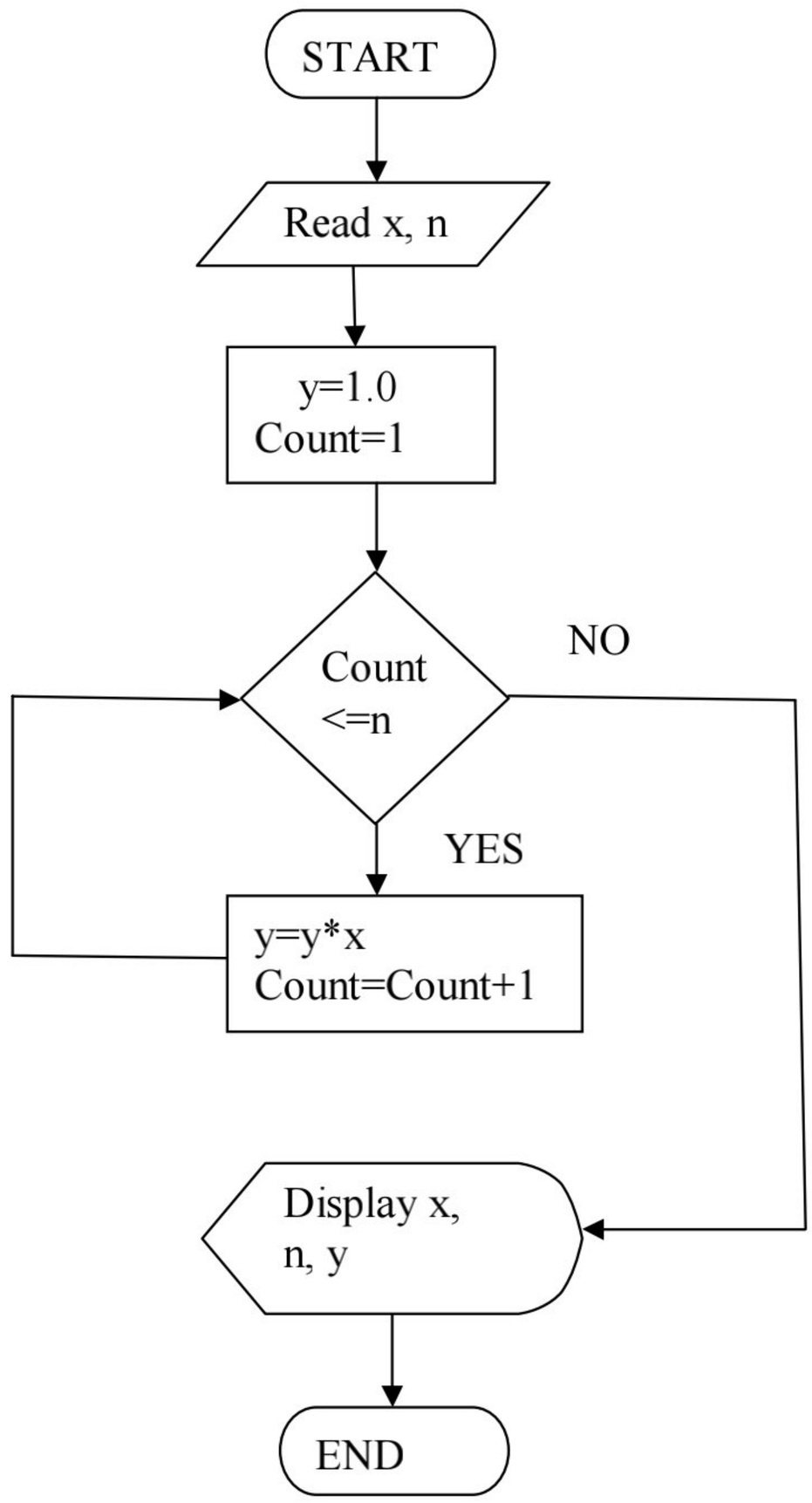
Flowchart:--



Program:--

//Rewrite the program of the Example using the for statement.

// A program to evaluate the equation
// y = xn
// when n is a non-negative integer.

// Date : 15/03/2010

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


void main()
{
  int Count,n;
  float x,y;
```

```
  clrscr();

  printf("Enter The Value of x and n:--\n");
  scanf("%f %n",&x,&n);

  y=1.0;

  for(Count=1;Count<=n;Count++)
  {
          y=y*x;
  }

  printf("\nx = %f; n = %d; x to power n = %f\n",x,n,y);

  getch();

 }
```

Output:--

Enter The Value of x and n:-- 2.5 4
nx = 2.500000; n = 4; x to power n = 39.062500

6.6 Write a program to evaluate the following investment equation

$$V=P\,(1+r)^{n}$$

And print the tables which would give the values of various combination of the following values of P, r and n.

P: 1000, 2000, 3000, ……..10000
r: 0.10, 0.11, 0,12,……...0.20
n: 1,2,3…….10

Algorithm:--

Step 1: Read P.
Step 2: For r=0.1 to 0.15 repeat Step 3 to Step 4
Step 3: For n=1 to 2 repeat Step Step 4
Step 4: Compute $V=P\,(1+r)^{n}$
Step 5: Display r, n, V

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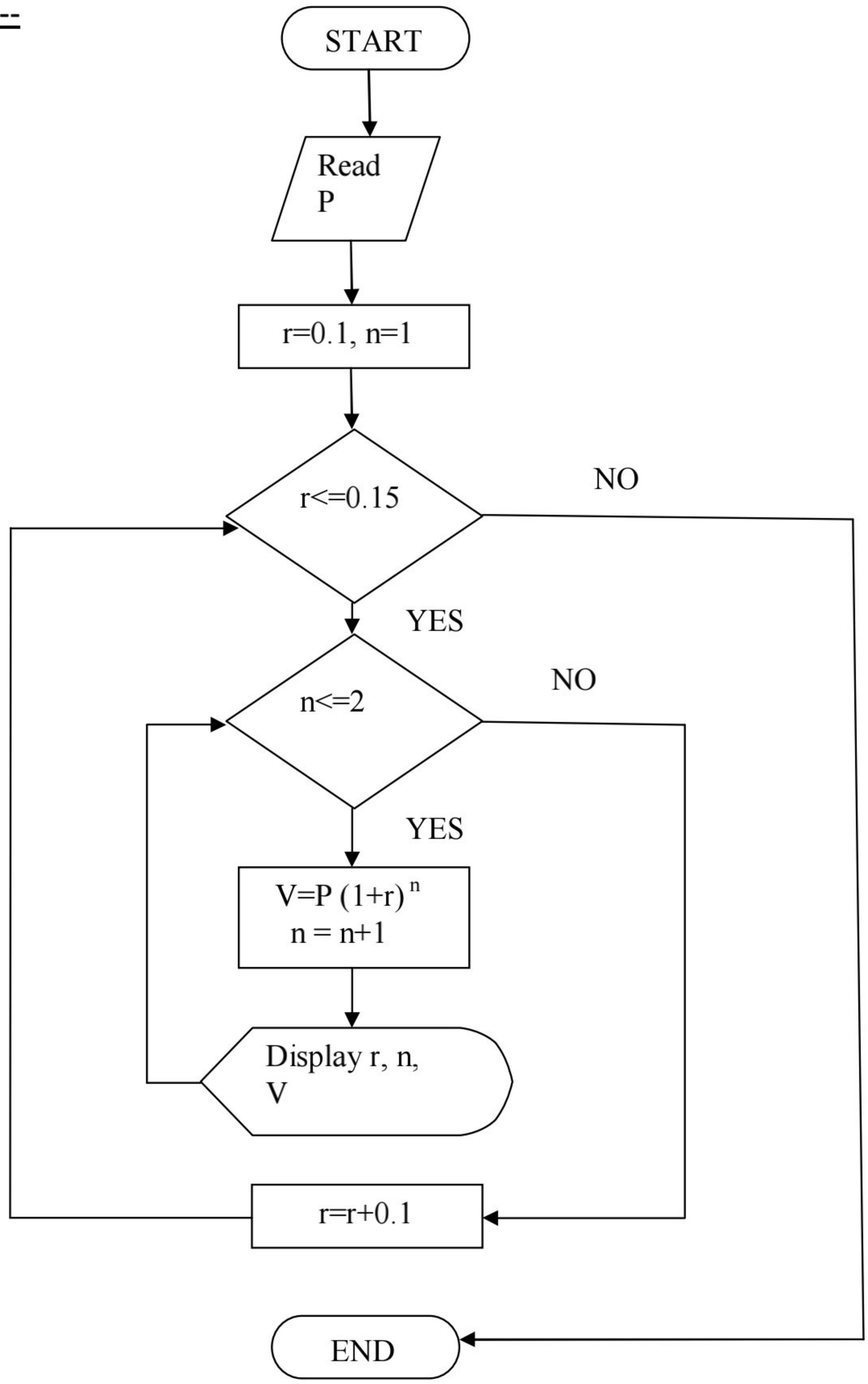
Flowchart:--



Program:--

//Write a program to evaluate the following investment equation

// V=P(1+r)n
//And print the tables which would give the values of various combination of the following values of P, r and n.

// P: 1000, 2000, 3000, ……10000
// r: 0.10, 0.11, 0,12,……..0.20
// n: 1,2,3……10

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```
// Date : 15/03/2010

 #include<stdio.h>
 #include<conio.h>


 void main()
 {
   int P,n;
   float V,r,temp;

   clrscr();

   printf("Enter Principal Amount:--\n");
   scanf("%d",&P);

   printf("For P:-- %d\n",P);

   for(r=0.1;r<=0.15;r+=0.01)
   {
           printf("For Rate %f\n",r);

           printf("n      V");
           for(n=1;n<=5;n++)
           {
                   printf("%d    ",n);

                   temp=pow((1+r),n);
                   V=P*temp;
                   printf("%f",V);
           }
   }

   printf("\nx = %f; n = %d; x to power n = %f\n",x,n,y);

   getch();

 }
```

Output:--

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6.7 Write a program to print the following outputs using for loops

a)
```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

b)
```
*
* *
* * *
* * * *
* * * * *
```

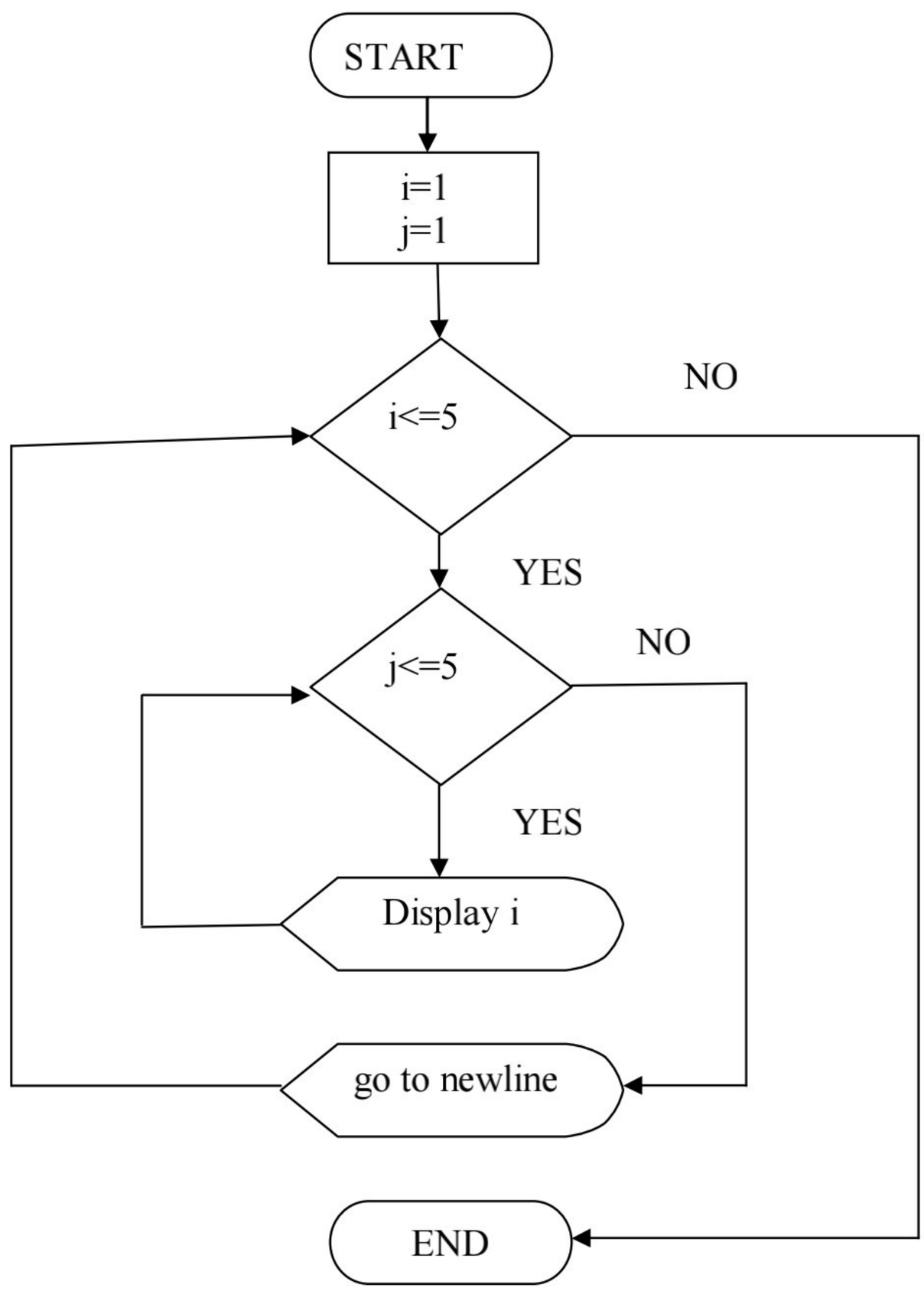
Algorithm:--

a)
Step 1: for i=1 to 5 repeat Step 2 to Step 4
Step 2: for j=1 to 5 repeat Step 3
Step 3: Display i
Step 4: go to newline

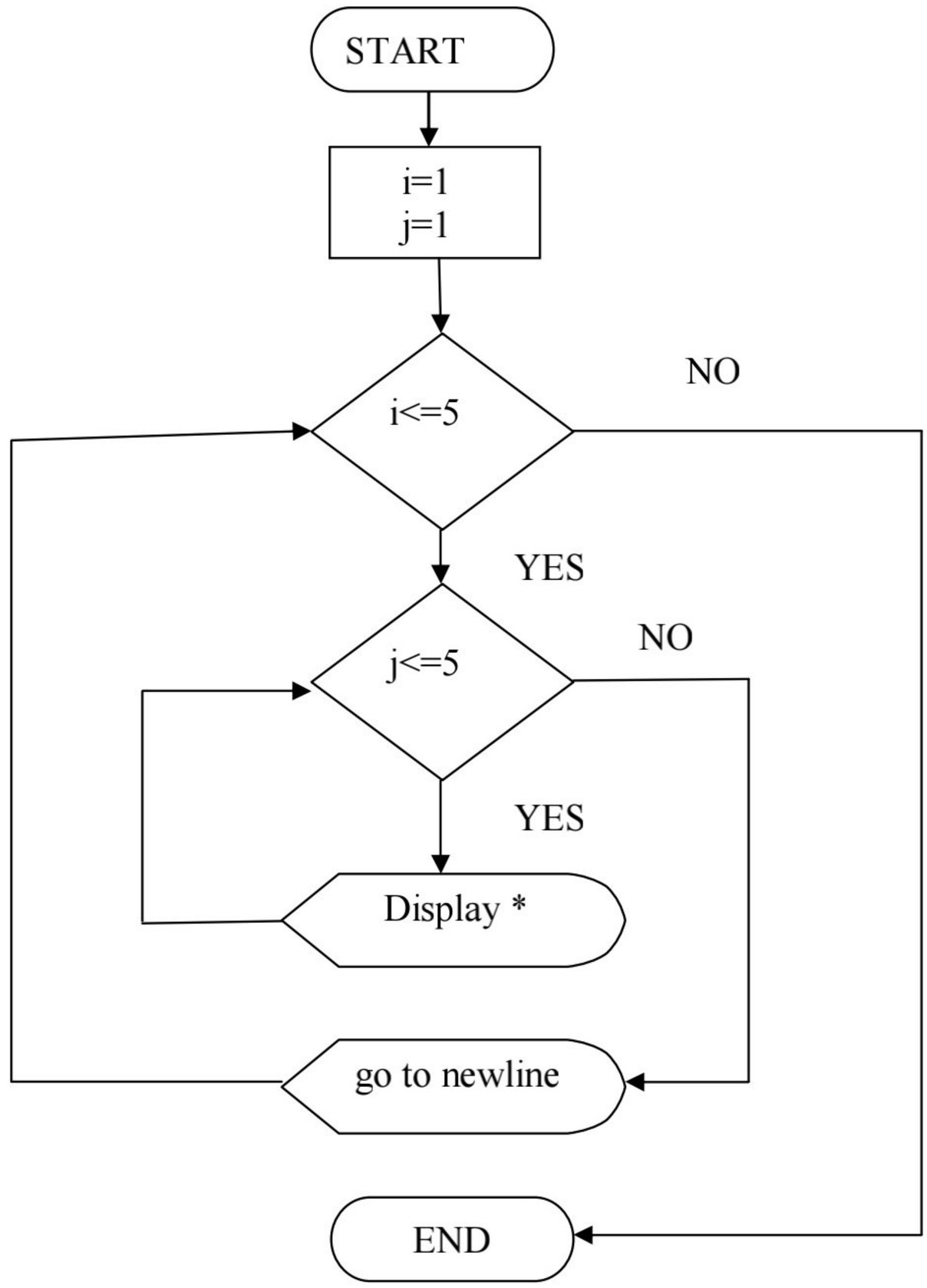
b)
Step 1: for i=1 to 5 repeat Step 2 to Step 4
Step 2: for j=1 to 5 repeat Step 3
Step 3: Display *
Step 4: go to newline

Flowchart:--

a)



b)



<u>Program:-</u>

a)

```
// Write a program to print the following output using for loops :
//1
//2 2
//3 3 3
//4 4 4 4
//5 5 5 5 5

// Date: 15/03/2010

#include<conio.h>
#include<stdio.h>

void main()
{

  int i,j;

  clrscr();
```

```
  for(i=1;i<=5;i++)
   {
     for(j=1;j<=i;j++)
           {
             printf("%d",i);
           }
     printf("\n");
   }
 getch();
}
```

Output:--

```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

b)

```
//Write a program to print the following output using for loops :
//*
//* *
//* * *
//* * * *
//* * * * *

// Date: 15/03/2010

#include<conio.h>
#include<stdio.h>

void main()
{

  int i,j,k;

  clrscr();

  for(i=5;i>=1;i--)
   {
     for(k=5;k>i;k--)
        printf(" ");
          for(j=1;j<=i;j++)
             {
               printf("*");
             }
       printf("\n");
   }
 getch();
}
```

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Output:--

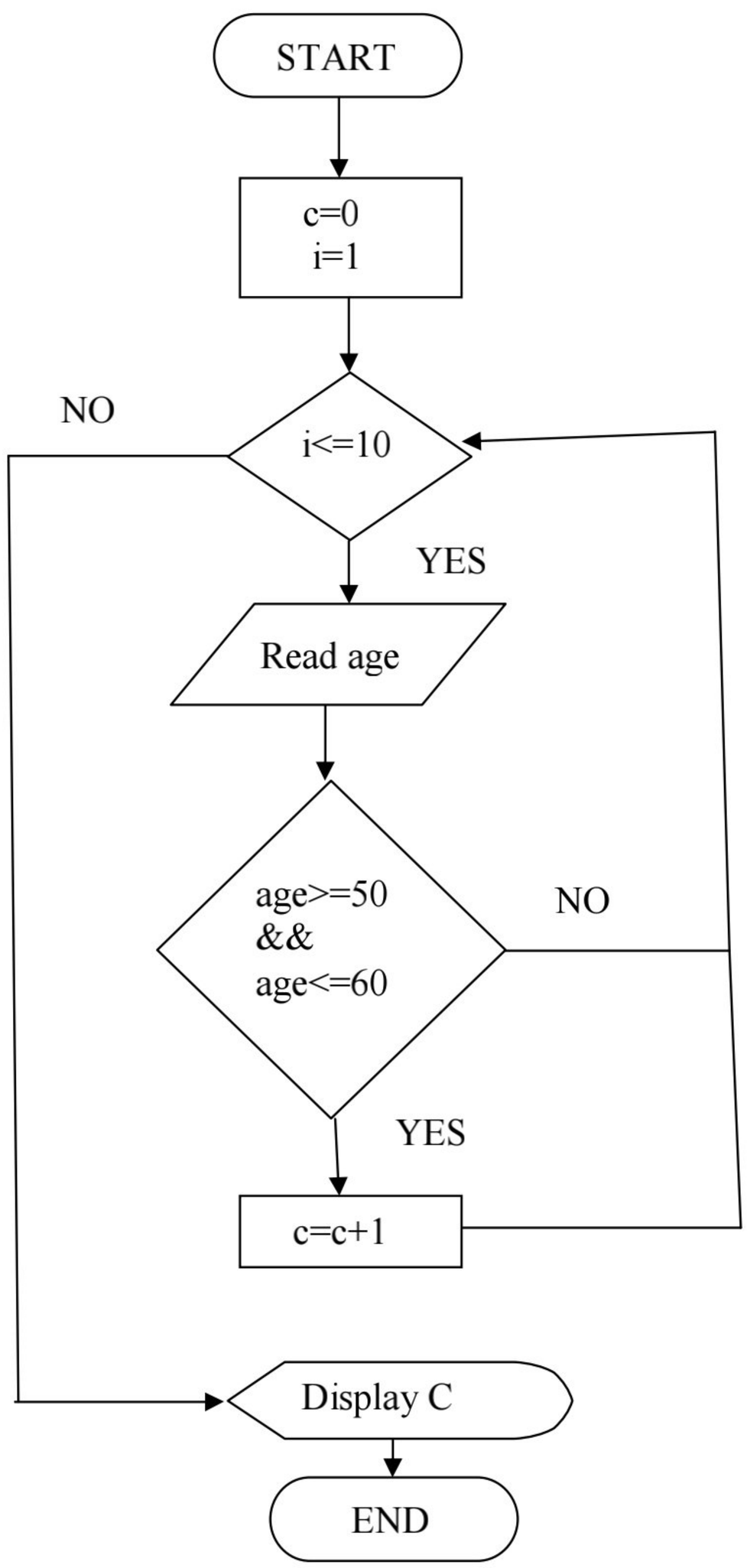
```
*
* *
* * *
* * * *
* * * * *
```

6.8 Write a program to read the age of 100 persons and count the number of persons in the age group 50 to 60.

Algorithm:--

Step 1: for i=1 to 10 repeat Step 2 to Step 4
Step 2: Read age
Step 3: Check age>=50 && age<=60 then go Step 4 otherwise go Step 1
Step 4: Compute c=c+1
Step 5: Display c.

Flowchart:--



Program:--

```
//Write a program to read the age of 10 persons and count the numbers of
//persons in teh group 50 to 60 /

// Date: 15/03/2010

#include<conio.h>
#include<stdio.h>
void main()
{

        int i,age,c=0;

        clrscr();

        for(i=1;i<=10;i++)
        {
                 printf("Enter the age of the person%d:",i);
                scanf("%d",&age);

                if (age>=50 && age<=60)
                        c=c+1;

        }

   printf("The number of persons in the age group 50 to 60 are : %d",c);

   getch();

}
```

Output:--

6.9 Rewrite the program of case study 6.4 using else……if constructs instead of continue Statement.

Program:--

```
//Rewrite the program of case study 6.4 using else…… if constructs instead of continue
//Statement.


// Date: March15,2010

#include<conio.h>
#include<stdio.h>
#include<math.h>

void main()
{

  int i;
  float a,x,y1,y2;
  a=0.4;
```

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```
printf("                    Y----->            \n");
printf("0-------------------------------------\n");
for(x=0;x<5;x=x+0.25)
{
 y1=(int) (50*exp(-a*x)+0.5);
 y2=(int) (50*exp(-a*x*x/2)+0.5);
 if(y1==y2)
 {
   if(x==2.5)
     printf("X   |");
   else
     printf("|");
   for(i=1;i<=y1-1;++i)
     printf(" ");
     printf("#\n");
 }
 else
 {
  if(y1>y2)
  {
   if(x==2.5)
     printf("X  |");
   else
     printf("  |");
   for(i=1;i<y2-1;i++)
     printf(" ");
   printf("*");
   for(i=1;i<=(y1-y2-1);++i)
     printf("-");
   printf("0\n");
   continue;
  }
  else
   {
    if(x==2.5)
      printf("X   |");
    else printf("   |");
    for(i=1;i<=(y1-1);++i)
      printf(" ");
    printf("0");
    for(i=1;i<=(y2-y1-1);++i)
      printf("-");
    printf("*\n");
    }
   }
    printf("   |\n");
  }
}
```

6.10 Write a program to print a table of values of the function

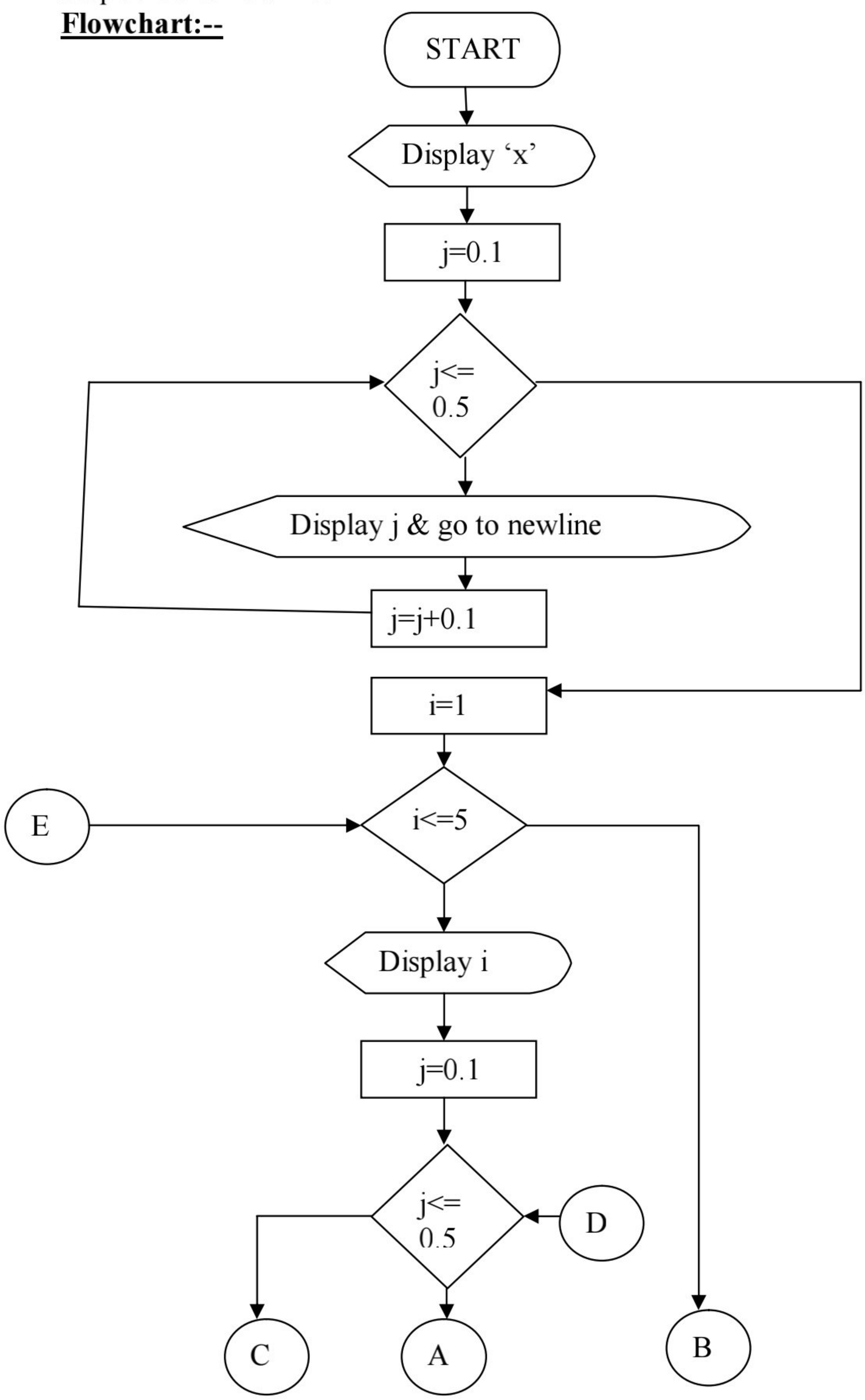
y = exp (-x)

for varying from 0.0 to 10.0 in steps of 10.0.

<u>Algorithm:--</u>

Step 1: Display 'x'.
Step 2: For j=0.1 to 0.5 repeat Step 3
Step 3: Display j & go to newline.
Step 4: For i=1 to 5 repeat Step 5 to Step 9
Step 5: Display i
Step 6: For j=0.1 to 0.5 repeat Step 7 to Step 8
Step 7: Compute sum=i+j, Ex=exp(sum).
Step 8: Display Ex.
Step 9: Go to newline.

<u>Flowchart:--</u>



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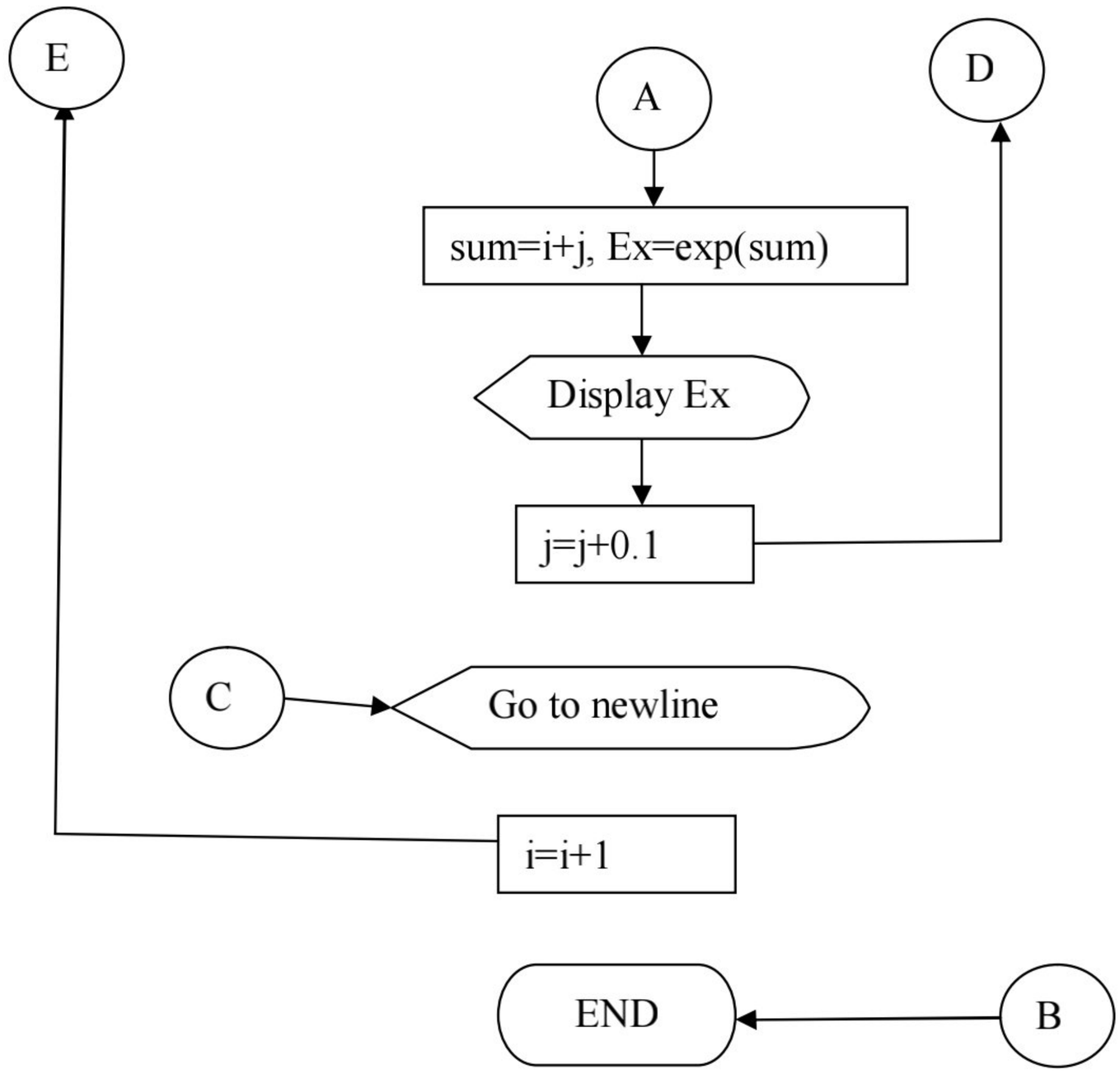


Program:--

```
//Write a program to print a table of values of the function
//                    y = exp (-x)
//                for varying from 0.0 to 10.0 in steps of 10.0.

// Date : 15/03/2010

#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()

{
  float Ex,sum,i,j;

  clrscr();

  printf("X");

  for(j=0.1;j<=0.5;j+=0.1)
  printf("    %f",j);

  printf("\n");


  for(i=1;i<=5;i++)
  {
```

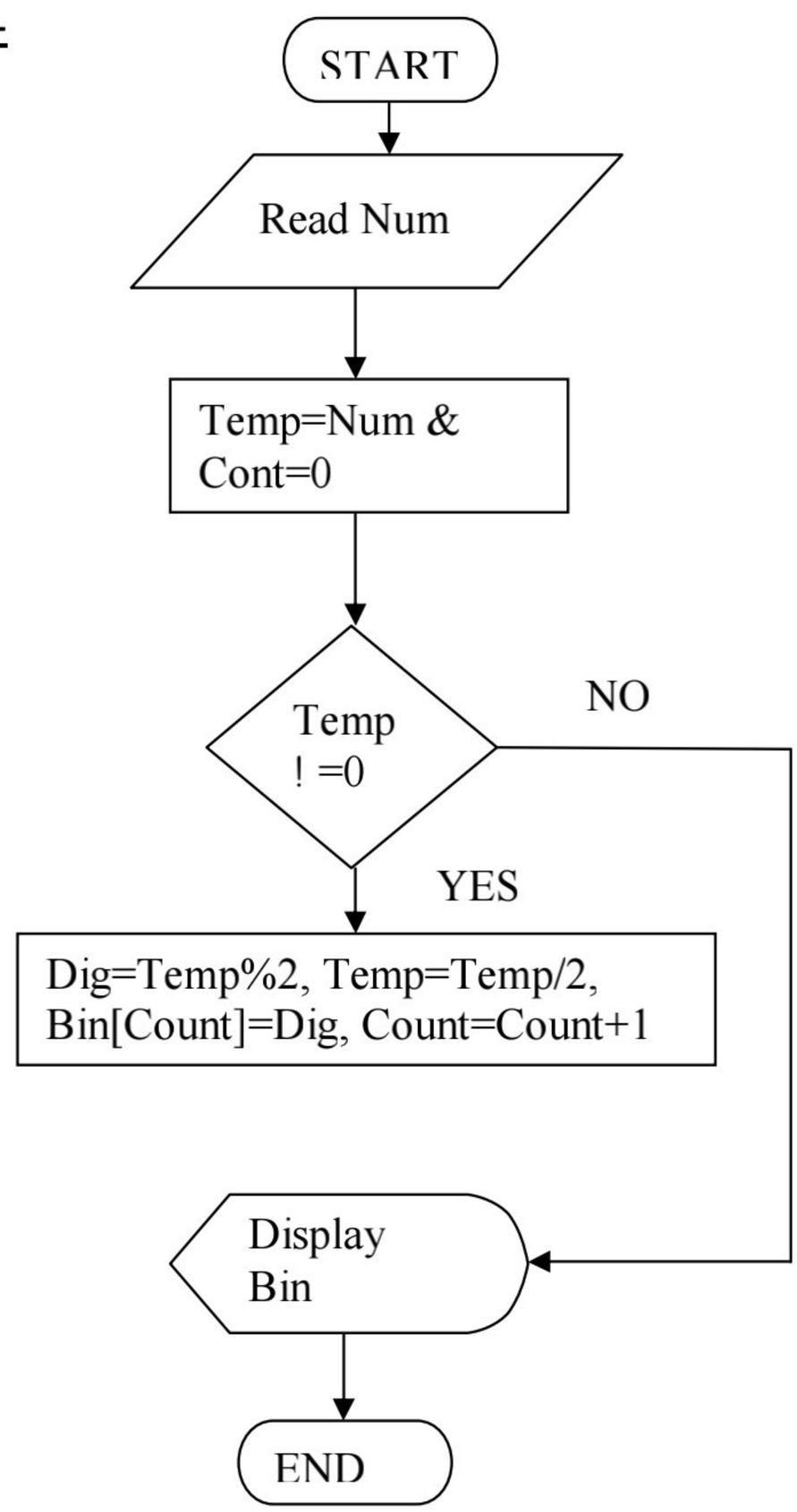
```
    printf("%f",i);

    for(j=0.1;j<=0.5;j+=0.1)
    {
            sum=i+j;
            Ex=exp(sum);
            printf("    %f",Ex);
    }
    printf("\n");
  }

  getch();
}
```

6.11 Write a program that will read a positive integer and determine and print its binary equivalent.

<u>Algorithm:--</u>

Step 1: Read Num.
Step 2: Store Temp=Num, Count=0.
Step 3: Repeat Step while Temp!=0
Step 4: Compute Dig=Temp%2, Temp=Temp/2, Bin[Count]=Dig, Count=Count+1.
Step 5: Display Bin.

<u>Flowchart:--</u>



CamScanner

Program:--

```
//Write a program that will read a positive integer and determine and print its binary equivalent.
// Date : 15/03/2010

 #include<stdio.h>
 #include<conio.h>


 void main()
 {
   int Num,Dig,Bin[10],i,Temp,Count;

   clrscr();

   printf("Enter any Number:--\n");
   scanf("%d",&Num);


   Temp=Num;

   Count=0;

   while(Temp!=0)
   {
           Dig=Temp%2;
           Temp=Temp/2;
           Bin[Count]=Dig;
           Count++;
   }

   printf("Binary Number of Integer Number %d is \n",Num);

   for(i=(Count-1);i>=0;i--)
           printf("%d",Bin[i]);


   getch();
 }
```

Output:--

```
Enter any Number:--
5
Binary Number of Integer Number 5 is 101
```

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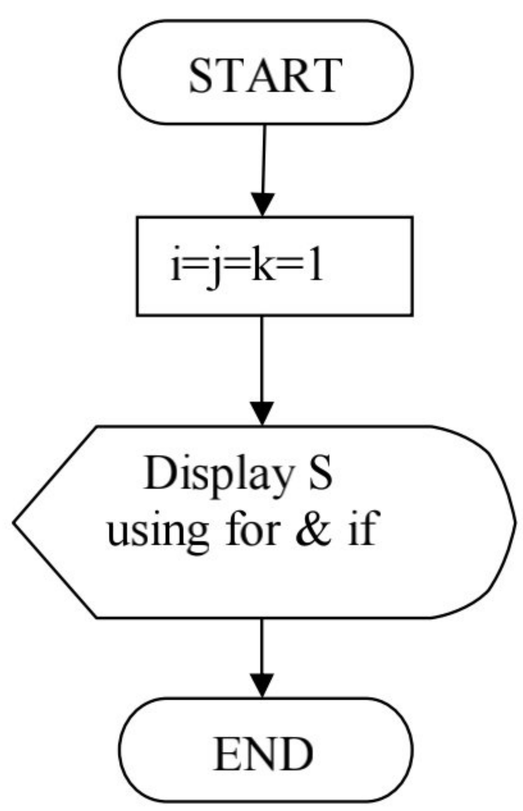
6.12 Write a program using for and if statement to display the capital letter S in a grid of 15 rows & 18 columns as shown below.

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

Algorithm:--

Step 1: Store 1 to i, j & k
Step 2: Display S using for & if

Flowchart:--



Program:--

```
// Write a program using for and if statement to display the S.
//15/03/2010


#include<stdio.h>
#include<conio.h>
void main()
{
   int i,j,k;

   clrscr();
```

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```
j=1;

//first
for(i=1;i<=3;i++)
        for(j=1;j<=18;j++)
        {
        printf("*");
        if(j==18)
                printf("\n");
        }

//second
    for(i=1;i<=3;i++)
        for(j=1;j<=4;j++)
         {
        printf("*");
        if(j==4)
                 printf("\n");
         }

//3rd

    for(i=1;i<=3;i++)
        for(j=1;j<=18;j++)
        {
        printf("*");
        if(j==18)
                printf("\n");
        }


 //4th

    for(i=1;i<=3;i++)
    {
         for(k=1;k<=14;k++)
        printf(" ");
        for(j=15;j<=18;j++)
        {
        printf("*");
        if(j==18)
                 printf("\n");
        }
    }

 for(i=1;i<=3;i++)
        for(j=1;j<=18;j++)
        {
        printf("*");
        if(j==18)
                printf("\n");
        }
```

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```
   getch();

}
```

Output:--

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

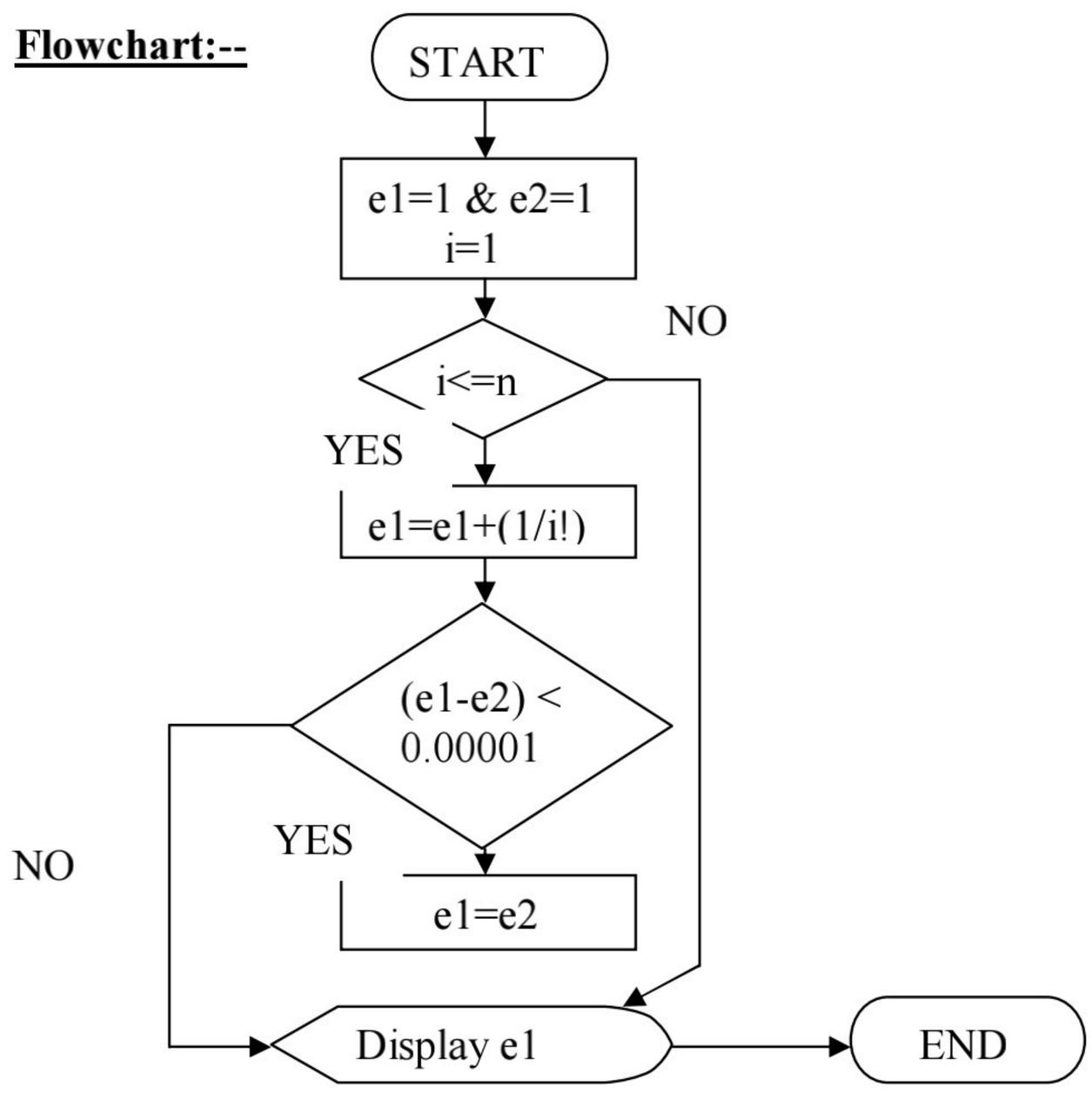
6.13 Write a program to compute the value of Euler's number that is used as the base of natural logarithms. Use the following formula.

e= 1+ 1/1! +1 /2! + 1/3+……. 1/n!

Algorithm:--

Step 1: Read n.
Step 2: Store 1 to e1 & e2.
Step 3: For i=1 to n repeat Step 4 to Step 6
Step 4: Compute e1=e1+(1/i!)
Step 5: Check (e1-e2)<0.00001 then break otherwise go to Step 5
Step 6: Compute e2=e1.
Step 7: Display e1.

Flowchart:--



Program:--

// Write a program to compute the value of Euler's number that is used as the base of natural logarithms.
//Use the following formula.

// e= 1+ 1/1! +1 /2! + 1/3+…… 1/n!

//15/03/2010

```
#include<stdio.h>
#include<conio.h>
void main()
{
  float i,n;
  float e1,e2;

  clrscr();

  printf("Enter No.");
  scanf("%f",&n);

  e2=1;
  e1=1;

  for(i=1;i<=n;i++)
  {
                e1=e1+((float)1/fact(i));

                if((e1-e2)<0.00001)
                        break;
        e2=e1;

    }

    printf("The value of e is  :  %f",e1);

  getch();
}
```

6.14 Write programs to evaluate the following functions to 0.0001% accuracy.

a) $\sin x = x - x^3/3! + x^5/5! - x^7/7! + \ldots\ldots\ldots\ldots$

b) $\cos x = 1 - x^2/2! + x^4/4! - x^6/6! + \ldots\ldots\ldots\ldots$

c) $SUM = 1 + (½)^2 + (1/3)^3 + (1/4)^4 + \ldots\ldots\ldots$

6.16 Write a program to print a square of size 5 by using the character S as shown below

a)
```
S S S S S
S S S S S
S S S S S
S S S S S
S S S S S
```

b)
```
S S S S S
S       S
S       S
S       S
S S S S S
```

Algorithm:--

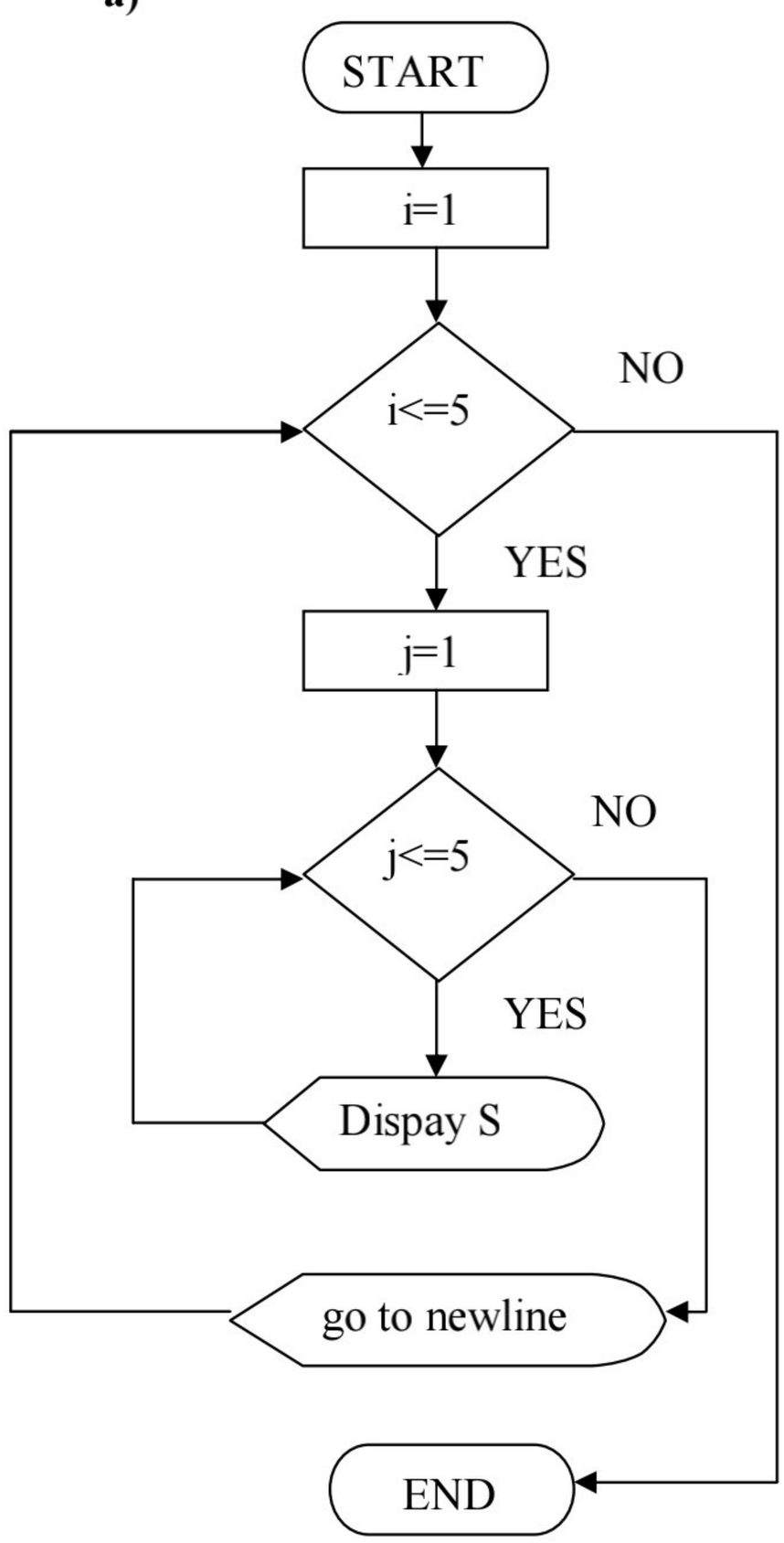
a)

Step 1: For i=1 to 5 repeat Step 2 to Step 4
Step 2: For j=1 to 5 repeat Step 3
Step 3: Dispay S
Step 4: go to newline

b)
Step 1: For i=1 to 5 repeat Step 2
Step 2: Dispay S
Step 3: For j=1 to 3 repeat Step 4
Step 4: Dispay S S
Step 5: For i=1 to 5 repeat Step 2
Step 6: Dispay S

Flowchart:--

a)



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Program:--

a) //Write a program to print a square of size 5 by using the character S as shown below

```
//a)    S S S S S
//      S S S S S
//      S S S S S
//      S S S S S
//      S S S S S
```

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()
{
  int j,i;

  clrscr();

  for (i=1;i<=5;i++)
  {
    for(j=1;j<=5;j++)
    printf("S");

    printf("\n");
  }
  getch();
}
```

b) //Write a program to print a square of size 5 by using the character S as shown below

```
//S S S S S
//S     S
//S     S
//S     S
//S S S S S
```

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


void main()
{
  int j,i,k;

  clrscr();

  for (i=1;i<=5;i++)
          printf("S");

  for(j=2;j<=4;j++)
```

CS CamScanner

```
  {
            printf("\nS   S");
  }

   printf("\n");

  for (i=1;i<=5;i++)
   printf("S");

  getch();
}
```

6.17 Write a program to graph the function

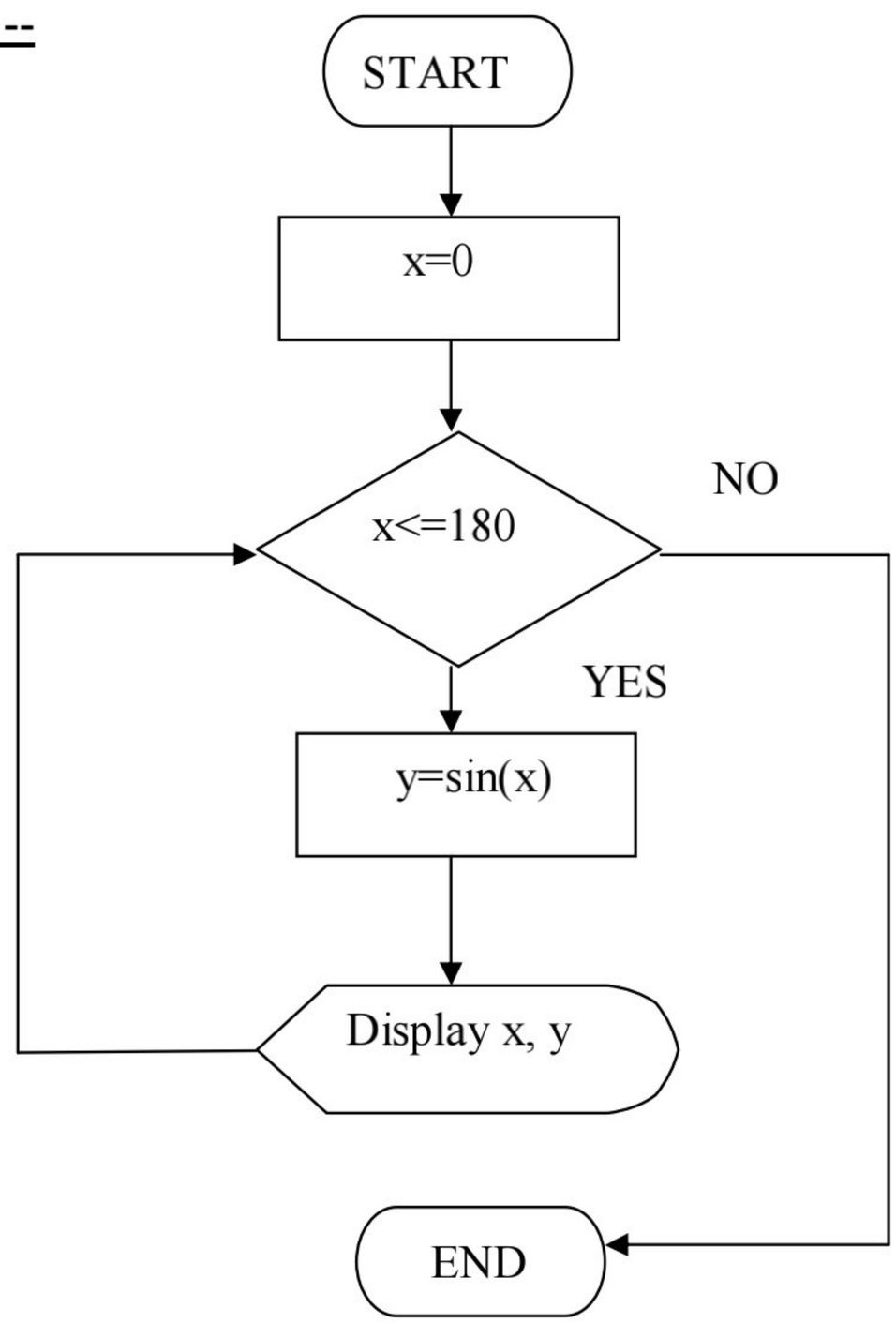
y = sin(x)

in the interval 0 to 180 degrees in steps of 15 degrees.

Algorithm:--

Step 1: For x=0 to 180 repeat Step 2 to Step 3
Step 2: Compute y = sin(x)
Step 3: Display x, y.

Flowchart:--



Program:--

```
//Write a program to graph the function
//                    y = sin(x)
//      in the interval 0 to 180 degrees in steps of 15 degrees.
```

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```
// Date : 15/03/2010

#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()

{
  float y;
  int x,i;

  clrscr();

  printf("X      Sin(X)\n");

  for(i=0;i<=180;i+=15)
  {
  y=sin(x);
  printf("%d     %f\n",x,y);
  }

  getch();
}
```

6.18 Write a program to print all integers that are not divisible by either 2 or 3 and lie between 1 and 100. Program should also account the number of such integers and print the result.

<u>Algorithm:--</u>

Step 1: For i=1 to 100 repeat Step 2 to Step 4
Step 2: Check i%2!=0 && i%3!=0 then go to Step 3 otherwise go to Step 1
Step 3: Compute Count=Count+1
Step 4: Display i & Count.

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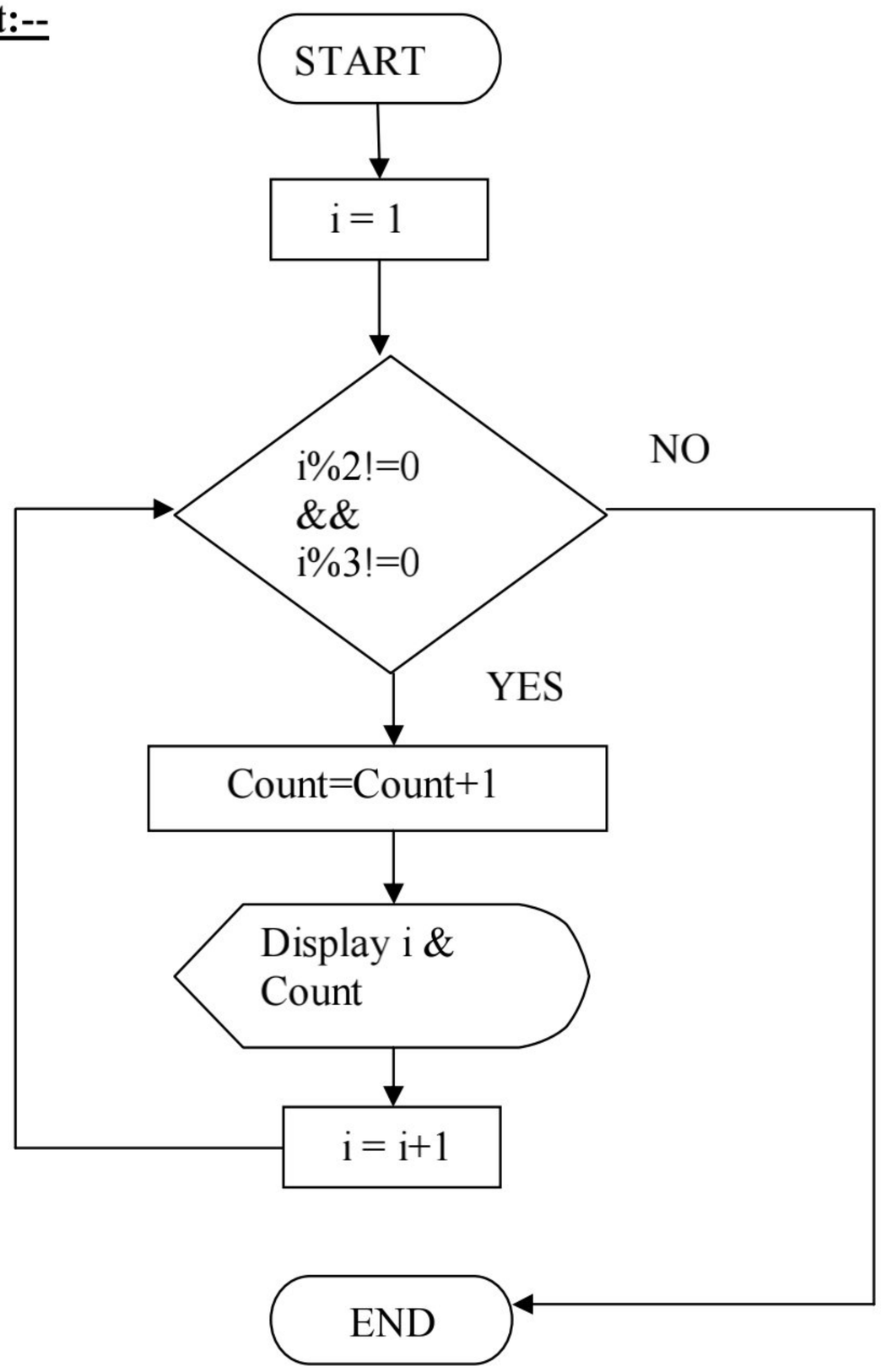
Flowchart:--



Program:--

```
//Write a program to print all integers that are not divisible by either 2 or 3 and lie
//      between 1 and 100. Program should also account the number of such integers and print
//      the result.


// Date : 15/03/2010

#include<stdio.h>
#include<conio.h>
#include<math.h>

void main()

{
   int i,Count;

  clrscr();

  Count=0;

  for(i=1;i<=100;i++)
```

```
    {
    if(i%2!=0 && i%3!=0)
    {
            Count=Count+1;
            printf("%d",i);
    }

    printf("%d\n",Count);
    }

    getch();
}
```

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7.1 Write a program for fitting a straight line through a set of points (xi, yi),i=1,2,3….n. The straight line equation is:

$$Y = mx + c$$

and the values of m and c are given by:

$$m = ((n \sum(xi,yi)) - (\sum xi)(\sum yi)) / (n(\sum xi^2) - (\sum xi)^2)$$
$$c = 1/n(\sum yi - m(\sum xi))$$

All summations are from 1 to n.

<u>Algorithm:-</u>

Step 1: Store n=10
Step 2: For i=1 to i=10, Enter the values of x[i]=v1.
Step 3: For i=1 to i=10, Enter the values of y[i]=v2.
Step 4: Assign 0 to total_x,total_y,total_xy,total_x2.
Step 5: For i=0 to i=10,repeat step 6.
Step 6: Compute total_x=total_x+x[i]
total_y=total_y+y[i]
total_xy=total_xy+(x[i]*y[i])
total_x2=total_x2+(x[i]*x[i])

Step 7: Compute temp=total_x*total_y
templ=total_x+total_x
m=((n*total_xy)-(temp))/((n*total_x2)-temp1)
c=((total_y)-(m*total_x))/n

Step 8: Display y=mx+c.
Step 9: Stop

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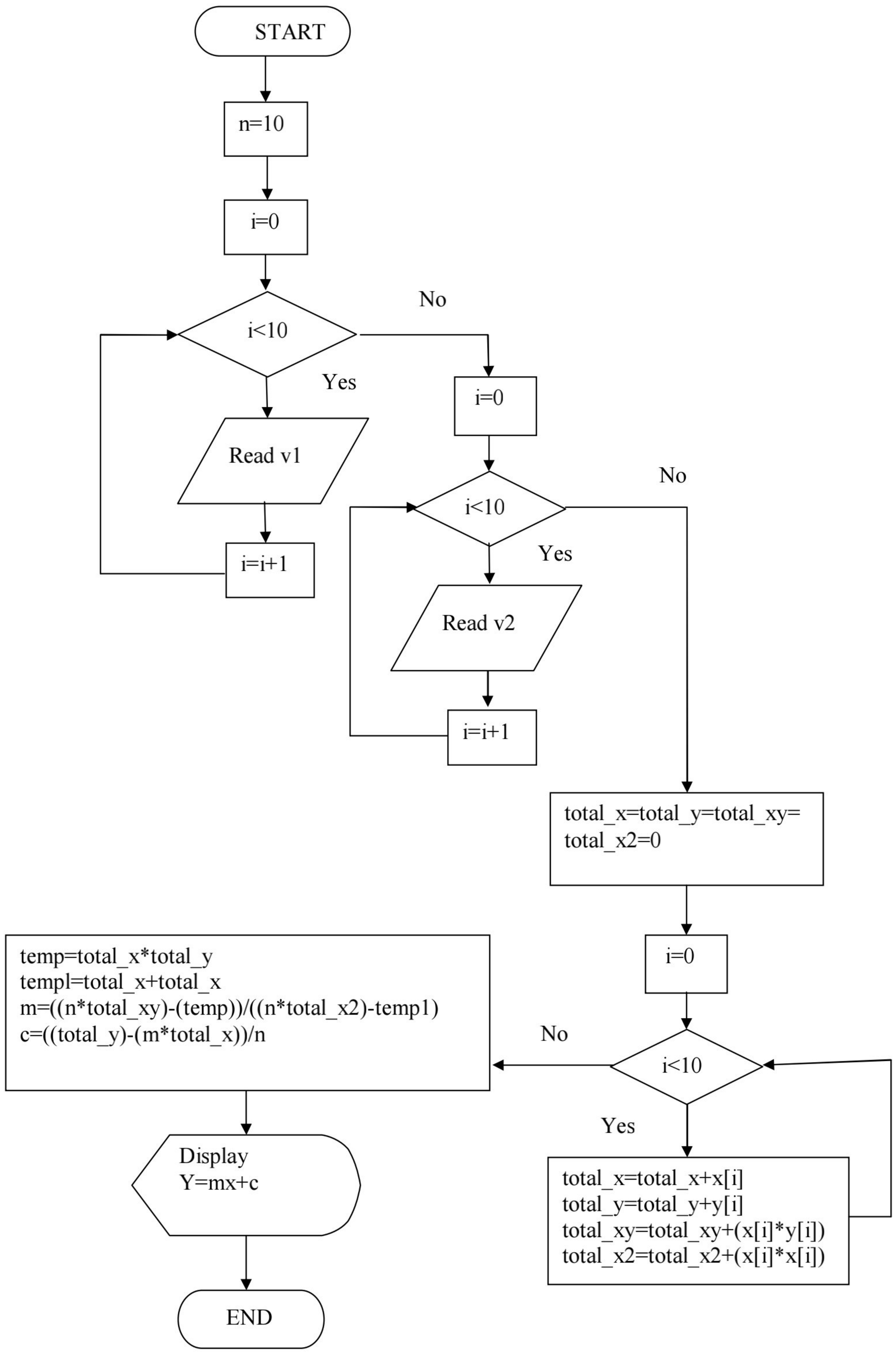
Flowchart:--


START
n=10
i=0
i<10
No
Yes
Read v1
i=i+1
i=0
i<10
No
Yes
Read v2
i=i+1
total_x=total_y=total_xy=
total_x2=0
i=0
i<10
No
Yes
total_x=total_x+x[i]
total_y=total_y+y[i]
total_xy=total_xy+(x[i]*y[i])
total_x2=total_x2+(x[i]*x[i])
temp=total_x*total_y
templ=total_x+total_x
m=((n*total_xy)-(temp))/((n*total_x2)-temp1)
c=((total_y)-(m*total_x))/n
Display
Y=mx+c
END

Program

```
/* Write a program for fitting a straight line through a set of points (xi, yi),i=1,2,3….n.
The straight line equation is:
Y =mx+c
and the values of m and c are given by:
m=((n ∑(xi,yi))- (∑xi)(∑yi) )/( n(∑xi2)-(∑xi)2)
c=1/n(∑yi -m(∑xi))
All summations are from 1 to n. */

// Date March 16,2010

#include<stdio.h>
#include<conio.h>

void main()

{
 int i,n=10,v1,v2,x[10],y[10];
 int total_x,total_y,total_xy,total_x2;
 float m,c,temp,temp1;

 clrscr();

 printf("Enter the values for x: ");

 for(i=0;i<10;i++)
 {
   scanf("%d",&v1);
   x[i]=v1;
 }

 printf("Enter the values for y: ");

 for(i=0;i<10;i++)
 {
   scanf("%d",&v2);
   y[i]=v2;
 }

 total_x=total_y=total_xy=total_x2=0;

 for(i=0;i<10;i++)
 {
   total_x=total_x+x[i];
   total_y=total_y+y[i];
   total_xy=total_xy+(x[i]*y[i]);
   total_x2=total_x2+(x[i]*x[i]);
 }

  temp= total_x*total_y;
  temp1=total_x*total_x;
  m=((n*total_xy)-(temp))/((n*total_x2)-temp1);
```

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```
  c=((total_y)-(m*total_x))/n;

 printf(" \nThe equation of the straight line is: ");
 printf(" Y=%fX+%f",m,c);

 getch();
}
```

Output

Enter the values for x:
1 2 3 4 5 6 7 8 9 10
Enter the values for y:
1 2 3 4 5 6 7 8 9 10
The equation of the straight line is:
Y=1.00000X+0.000000

7.2 The daily maximum temperature recorded in 10 cities during the month of January (for all 31 days) have been tabulated as follows:

Day \ City	1	2	3	4	5	6 ……	10
1							
2							
3							
.							
.							
.							
.							
31							

Write a program to read the table elements into a two-dimensional array temperature, and to find the city and day corresponding to

a) the highest temperature
b) the lowest temperature

Algorithm:--

Step 1: Read Array Temp.
Step 2: Display Temp
Step 3: Store MinTemp=MaxTemp=Temp [0][0],City1=0,City2=0.
Step 4: For i=0 to 2 repeat Step 5 to Step
Step 5: For j=0 to 2 repeat Step 6 to Step
Step 6: Check MaxTemp<Temp[i][j] go to Step 7
Step 7: Compute MaxTemp=Temp[i][j],City1=j+1
Step 8: Check MinTemp>Temp[i][j] go to Step 9
Step 9: Compute MinTemp=Temp[i][j], City2=j+1
Step 10: Display MaxTemp & MinTemp

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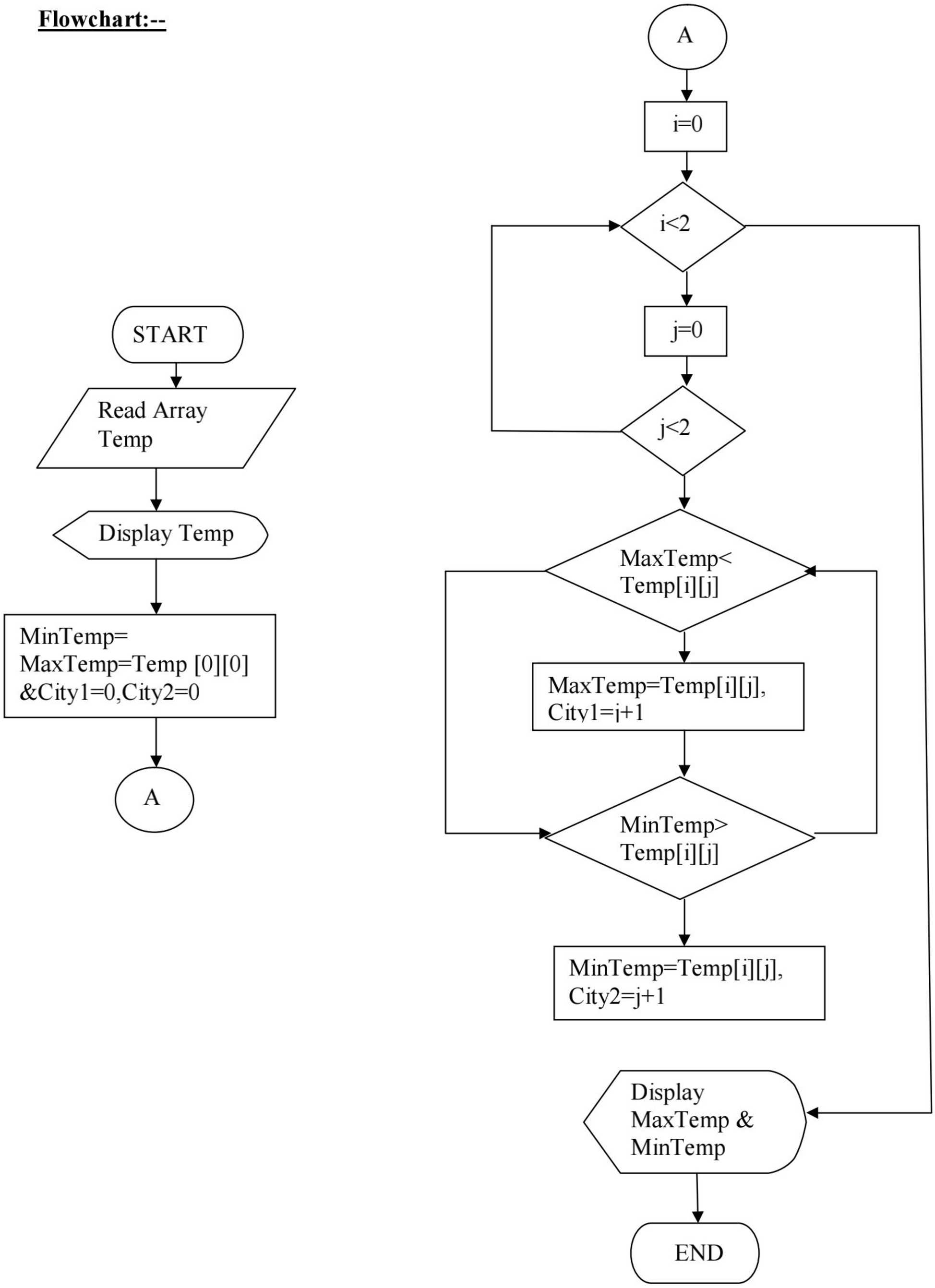
Flowchart:--



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Program:--

```
//Write a program to read the table elements into a two-dimensional array temperature, and to
find the city and day corresponding to
//a)      the highest temperature
//b)      the lowest temperature

// Date : 16/03/2010

#include<stdio.h>
#include<conio.h>

void main()
{
        int Temp[2][2];
        int i,j,City1,City2,MaxTemp,MinTemp;

        clrscr();

        printf("Enter temperature:--\n\n");

        for(i=0;i<2;i++)
        {
                printf("For City %d ->\n",i);

                for(j=0;j<2;j++)
                {
                        printf("For Day %d ->",j);
                        scanf("%d",&Temp[i][j]);
                }
        }

        clrscr();

        printf("Temperature Matix :--- \n");

        printf("     City \n            ");

        for(i=0;i<2;i++)
                printf("%d     ",i+1);

        printf("\n Day\n");

        for(i=0;i<2;i++)
        {
                printf("     %d ",i+1);

                for(j=0;j<2;j++)
                {
                        printf("     %d",Temp[i][j]);
                }
                printf("\n");
        }
```

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```
MinTemp=MaxTemp=Temp[0][0];
City1=0;
City2=0;

for(i=0;i<2;i++)
{
        for(j=0;j<2;j++)
        {
                if(MaxTemp<Temp[i][j])
                {
                        MaxTemp=Temp[i][j];
                        City1=j+1;
                }

                if(MinTemp>Temp[i][j])
                {
                        MinTemp=Temp[i][j];
                        City2=j+1;
                }
        }
}

printf("\n\nHighest Temperature of City %d is %d\n",City1,MaxTemp);
printf("Lowest Temperature of City %d is %d\n",City2,MinTemp);

getch();
}
```

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7.3 An election is contested by 5 candidates. The candidate are numbered are 1 to 5 and the voting is done by marking the candidate number on the ballot paper. Write a program to read the ballots and count the votes cast for each candidate using an array variable count. In case, a number, read is outside the range 1 to 5,the ballot should be considered as a 'spoilt ballot' and the program should also count the number of spoilt ballots.

Algorithm:--

Step1. Initialize c1,c2, c3,c4,c5,count,count_sp with 0.
Step2. For i=0 to i=5, repeat step3.
Step3. Enter the value of v and store in vote[i]
Step4. For i=0 to i=5, repeat from step5 till step14 and for i>5,go to step15.
Step5. Check if vote[i]==1,if true, go to step6,if false go to step7.
Step6.Calculate c1=c1+1
Step7. Check if vote[i]==2,if true, go to step8,if false go to step9.
Step8.Calculate c2=c2+2
Step9.Check if vote[i]==3,if true, go to step10,if false go to step11.
Step10. Calculate c3=c3+2
Step 11.Check if vote[i]==4,if true, go to step12,if false go to step13.
Step12.Calculate c4=c4+2
Step13.Check if vote[i]==5,if true, go to step14,if false go to step15.
Step14.Calculate c5=c5+2
Step15. Display c1,c2,c3,c4 and c5.
Step16. For i=0 to i=5, repeat from step 17 to step, and i>5,go to step 20
Step17.Check if vote[i]<5,if true go to step18 and if false, go to step 19.
Step18.count=count+1 and go to step 20.
Step19.count_sp=count_sp+1 and go to step 20.
Step20. Display count and count_sp
Step21. Stop.

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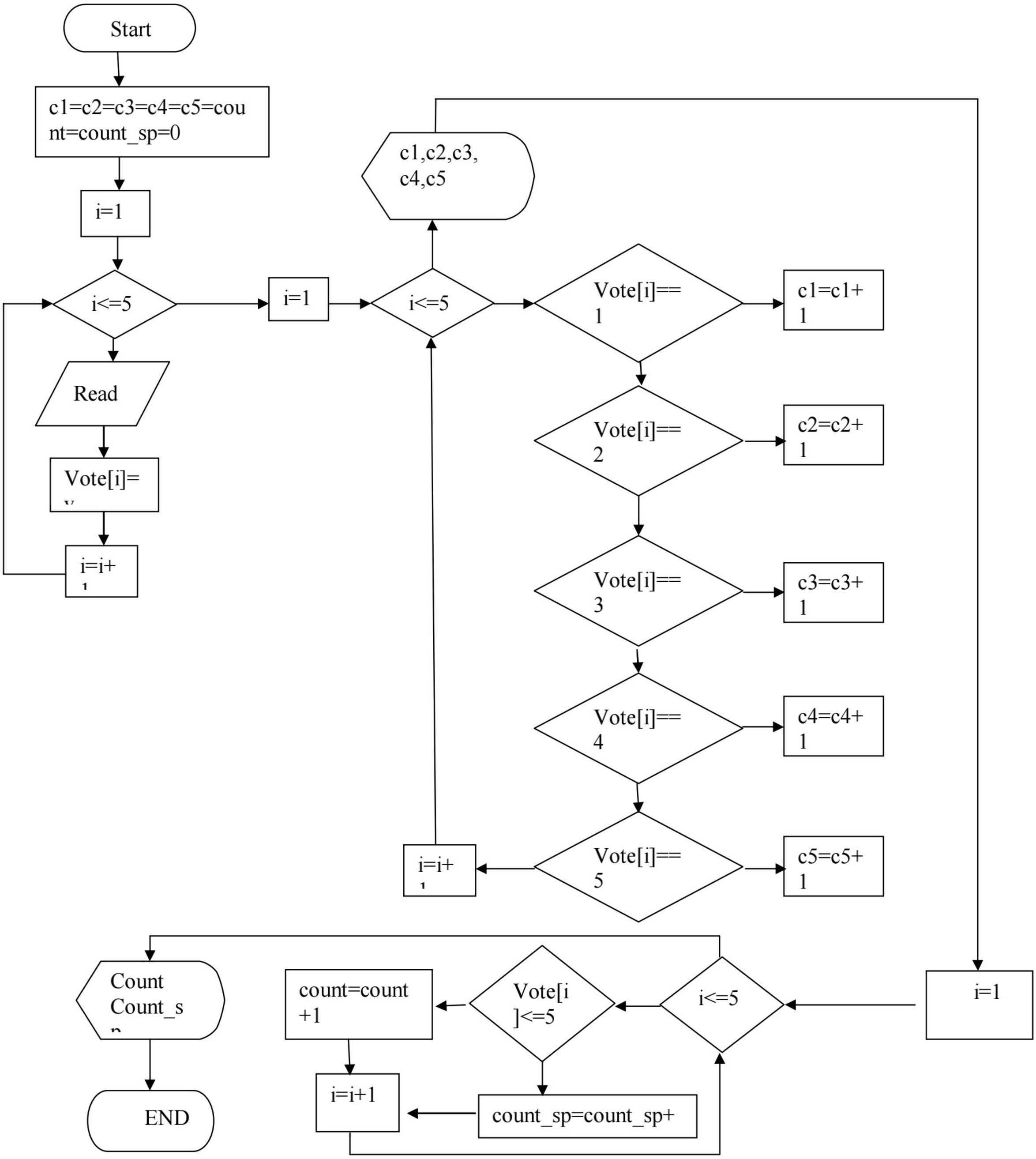
Flowchart:--


Start
c1=c2=c3=c4=c5=cou
nt=count_sp=0
i=1
i<=5
Read
Vote[i]=
i=i+
1
i=1
i<=5
c1,c2,c3,
c4,c5
Vote[i]==
1
c1=c1+
1
Vote[i]==
2
c2=c2+
1
Vote[i]==
3
c3=c3+
1
Vote[i]==
4
c4=c4+
1
Vote[i]==
5
c5=c5+
1
i=i+
1
i=1
i<=5
Vote[i
]<=5
count=count
+1
i=i+1
count_sp=count_sp+
Count
Count_s
END

Program:--

/* An election is contested by 5 candidates.

The candidate are numbered are 1 to 5 and the voting is done by marking the candidate number on the ballot paper. Write a program to read the ballots and count the votes cast for each candidate using an array variable count. In case, a number, read is outside the range 1 to 5,the ballot should be considered as a 'spoilt ballot' and the program should also count the number of spoilt ballots. */

// Date March 16,2010

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

void main()

{
 int i,vote[5],c1=0,c2=0,c3=0,c4=0,c5=0,count=0,count_sp=0,v;

 clrscr();

 printf("Enter your votes for 5 candidates:");
 for(i=1;i<=5;i++)
 {
     scanf("%d",&v);
    vote[i]=v;
 }

for(i=1;i<=5;i++)
 {
    if(vote[i]==1)
      c1=c1+1;
   else
    {
            if(vote[i]==2)
              c2=c2+1;
          else
          {
           if(vote[i]==3)
             c3=c3+1;
           else
              {
           if(vote[i]==4)
                  c4=c4+1;
              else
                  if(vote[i]==5)
                      c5=c5+1;
              }
          }
    }
 }
printf(" votes to candidate1=%d",c1);
```

```
  printf(" \nvotes to candidate2=%d",c2);
  printf("\n votes to candidate3=%d",c3);
  printf(" \nvotes to candidate4=%d",c4);
  printf(" \nvotes to candidate5=%d",c5);

  for(i=1;i<=5;i++)
  {
   if(vote[i]<=5)
        count=count+1;
   else
        count_sp=count_sp+1;
  }

printf(" The number of valid votes  is:%d",count);
printf(" \nThe number of spoilt votes is:%d",count_sp);
getch();
  }
```

Output

Enter your votes for 5 candidates:
1
3
1
8
2
Votes to Candidate 1: 2
Votes to Candidate 2: 1
Votes to Candidate 3:1
Votes to Candidate 4:0
Votes to Candidate 5:0
The number of valid votes is: 4
The number of spoilt votes is: 1

5.1 The annual examination results of 10 students are tabulated as follows:

Roll No.	Subject1	Subject2	Subject3
.			
.			
.			
.			

Write a program to read the data and determine the following:

(a) Total marks obtained by each student.

(b) The highest marks in each subject and the Roll No. of the student who secured it.

(c) The student who obtained the highest total marks.

Algorithm:--

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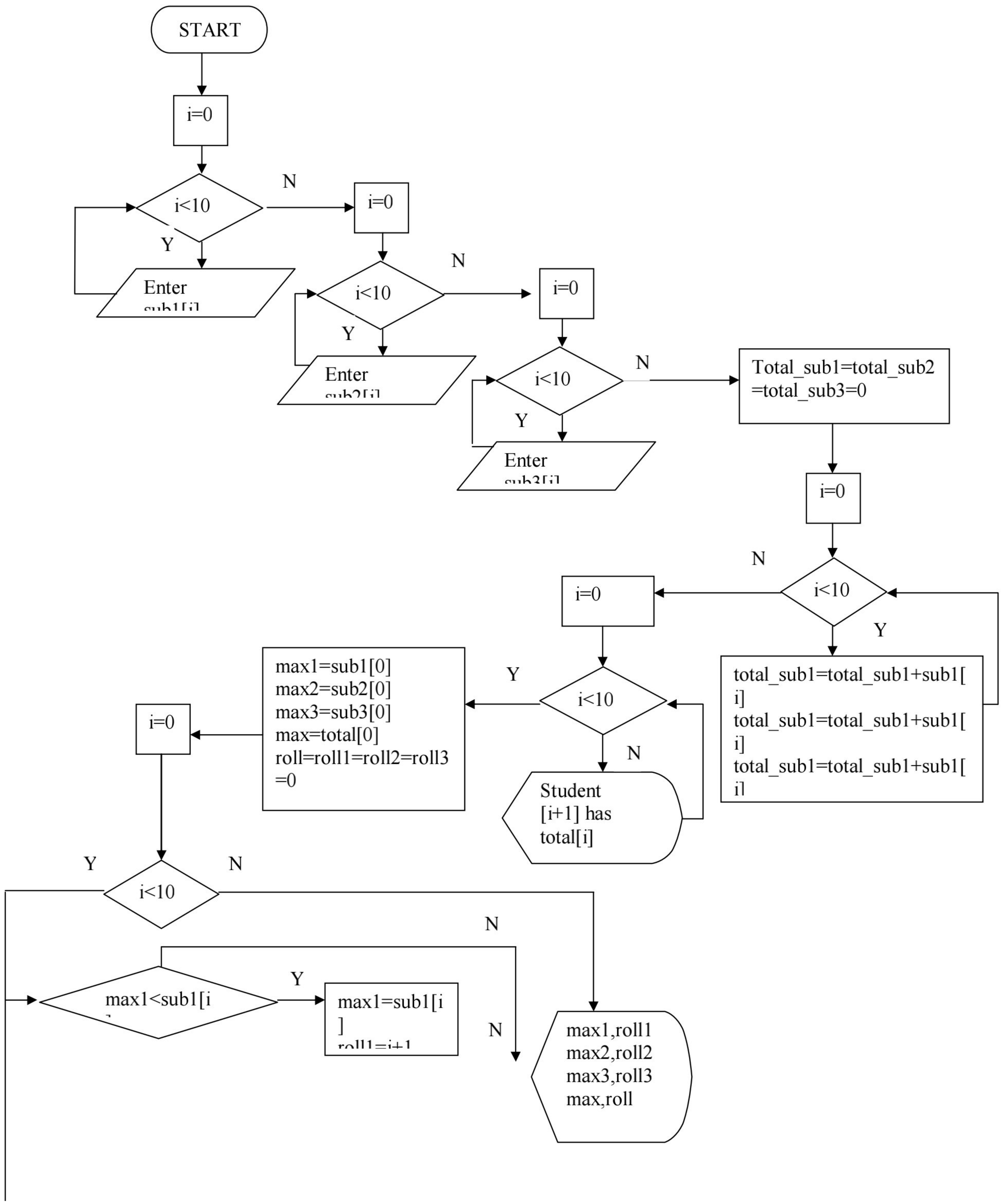
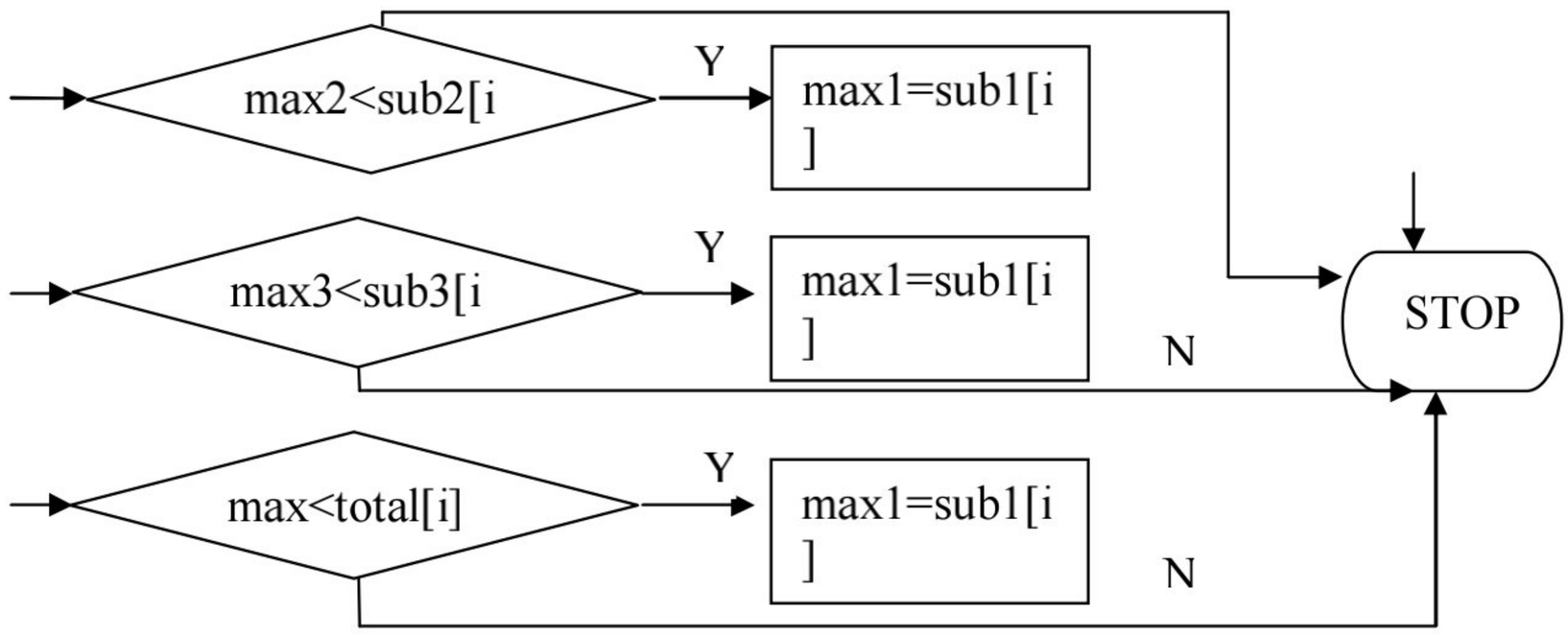
Step1. Declare
Step2. For i=0 to i<10, Enter sub1[i]
Step3. For i=0 to i<10, Enter sub2[i]
Step4. For i=0 to i<10, Enter sub3[i]





Program:--

/* The annual examination results of 10 students are tabulated as follows:

Roll No. Subject1 Subject2 Subject3
.
.
.
.

Write a program to read the data and determine the following:
(a)Total marks obtained by each student.
(b) The highest marks in each subject and the Roll No. of the student who secured it.
(c) The student who obtained the highest total marks.
*/

```
// Date March 16,2010

#include<stdio.h>
#include<conio.h>
#define MAX 10

void main()

{
  int i,roll,m1,m2,m3,sub1[MAX],sub2[MAX],sub3[MAX];
  int total_sub1,total_sub2,total_sub3,total[MAX];
  int max,max1,max2,max3,roll1,roll2,roll3;

  clrscr();

  printf("Enter the marks for subject1 of all the students: ");

  for(i=0;i<MAX;i++)
```

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```
  scanf("%d",&sub1[i]);

printf("Enter the marks for subject2 of all the students: ");

for(i=0;i<MAX;i++)
  scanf("%d",&sub2[i]);

printf("Enter the marks for subject3 of all the students: ");

for(i=0;i<MAX;i++)
  scanf("%d",&sub3[i]);

total_sub1=total_sub2=total_sub3=0;

for(i=0;i<MAX;i++)

{
 total_sub1=total_sub1+sub1[i];
 total_sub2=total_sub2+sub2[i];
 total_sub3=total_sub3+sub3[i];
 total[i]=sub1[i]+sub2[i]+sub3[i];
}


for(i=0;i<MAX;i++)
{
 printf("The total marks obtained by the student%d is =%d\n",i+1,total[i]);
 }

max1=sub1[0];
max2=sub2[0];
max3=sub3[0];
max=total[0];
roll1=0;
roll2=0;
roll3=0;
roll=0;
for (i=0;i<MAX;i++)
{
 if(max1<sub1[i])
  {
   max1=sub1[i];
   roll1=i+1;
  }
 if(max2<sub2[i])
  {
   max2=sub2[i];
   roll2=i+1;
  }

 if(max3<sub3[i])
 {
  max3=sub3[i];
```

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```
 roll3=i+1;
 }
if(max<total[i])
{
 max=total[i];
 roll=i+1;
}
}


printf("\nThe highest marks in subject1 is %d and the roll number is %d",max1,roll1);
printf("\nThe highest marks in subject2 is %d and the roll number is %d",max2,roll2);
printf("\nThe highest marks in subject3 is %d and the roll number is %d",max3,roll3);
printf("\n The highest total marks is %d and the roll number is %d ",max,roll);

getch();

}
```

7.6 Given are one dimensional arrays A and B which are sorted in ascending order. Write a program to merge them into a single sorted array C that contains every item form array A and B, in ascending order.

<u>Algorithm:--</u>

Step 1: Read m, n, Array a & Array b.
Step 2: Store 0 to ax, bx and cx.
Step 3: Compute mn=m+n
Step 4: Repeat Step 5 to Step 8 while ax<n && bx<m otherwise go to Step 9
Step 5: Check a[ax]<b[bx] then go to Step 6 otherwise go to Step 7
Step 6: Compute c[cx]=a[ax], ax=ax+1
Step 7: Compute c[cx]=b[bx], bx=bx+1
Step 8: Compute cx=cx+1
Step 9: Check ax==n then go to Step 10 otherwise go to Step 12
Step 10: Repeat Step 11 while bx<m
Step 11: Compute c[cx]=b[bx], bx=bx+1, cx=cx+1.
Step 12: Repeat Step 13 while ax<n
Step 13: Compute c[cx]=a[ax], ax=ax+1, cx=cx+1.
Step 14: Display Sorted Array c.

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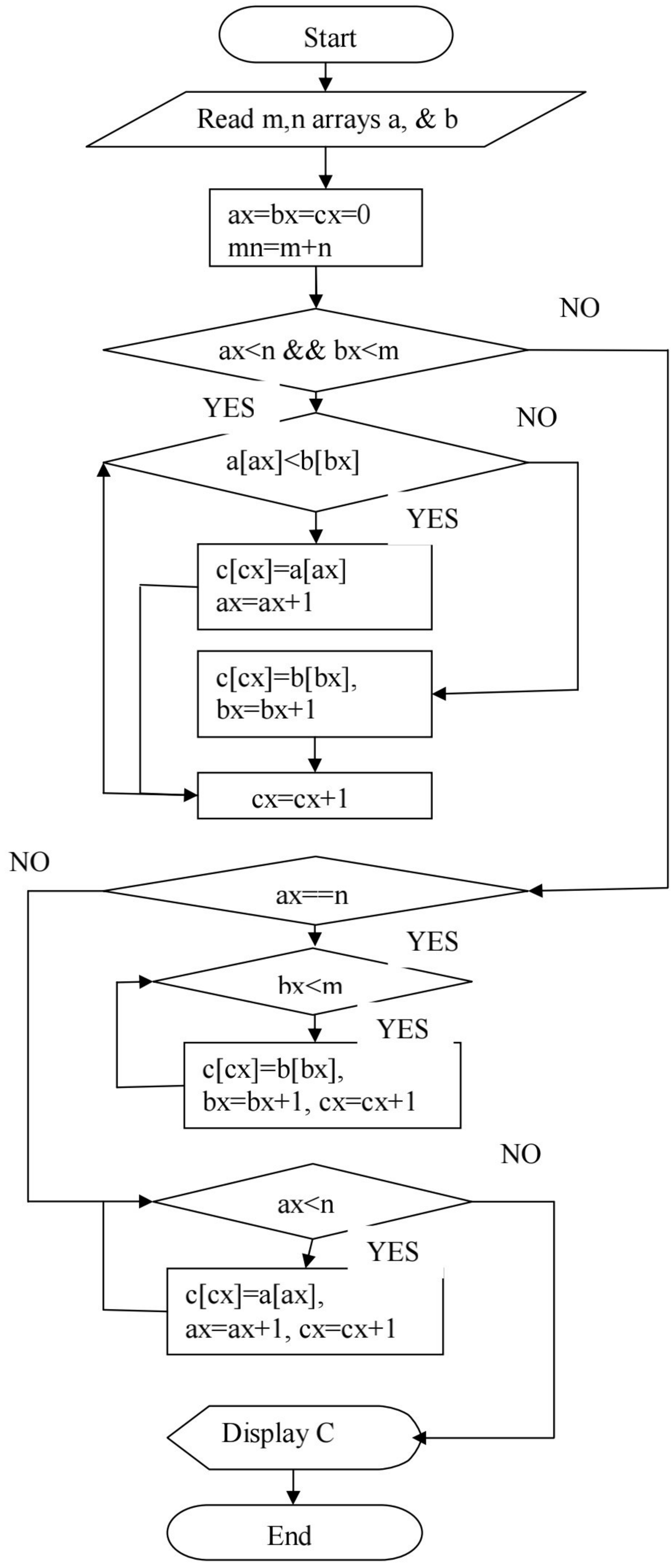
Flowchart:--



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Program:--

```
// Given are one dimensional arrays A and B which are sorted in ascending
//      order. Write a program to merge them into a single sorted array C that contains
//      every item form array A and B, in ascending order.



//Date: 16/03/2010

#include<stdio.h>
#include<conio.h>

#define MAX 50

void main()
{

        int a[MAX],b[MAX],c[MAX];
        int ax,bx,cx,n,m,mn;

        clrscr();

        ax=bx=cx=0;

        printf("Enter no. of elements of array : ");
        scanf("%d %d",&n,&m);

        printf("Enter elements of first array :\n");
                for(i=0;i<n;i++)
                        scanf("%d",&a[i]);

        printf("Enter elements of Second array :");
                for(i=0;i<m;i++)
                        scanf("%d",&b[i]);

        mn=m+n;

        while(ax<n && bx<m)
        {
                if(a[ax]<b[bx])
                {
                        c[cx]=a[ax];
                        ax++;
                }
                else
                {
                        c[cx]=b[bx];
                        bx++;
                }
                cx++;
        }
```

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```
        if(ax==n)
        {
                while(bx<m)
                {
                        c[cx]=b[bx];
                        bx++;
                        cx++;
                }
        }
        else
        {
                while(ax<n)
                {
                        c[cx]=a[ax];
                        ax++;
                        cx++;
                }
        }
                //sorted array
                printf("the sorted array is : \n");
                for(i=0;i<mn;i++)
                        printf("%d ",c[i]);

    getch();
}
```

7.7 Write a program that will read the values of elements of A and B and produce the product matrix C.

<u>Algorithm:--</u>

Step 1: Read row, col, Array a and Array b.
Step 2: Display Array a and b.
Step 3: For i=0 to row repeat Step 4 to Step 7
Step 4: For j=0 to col repeat Step 5 to Step 7
Step 5: Store 0 to c[i][j]
Step 6: For k=0 to col repeat Step 7
Step 7: Compute c[i][j]=c[i][j]+(a[i][k]*b[k][j])
Step 8: Display c.

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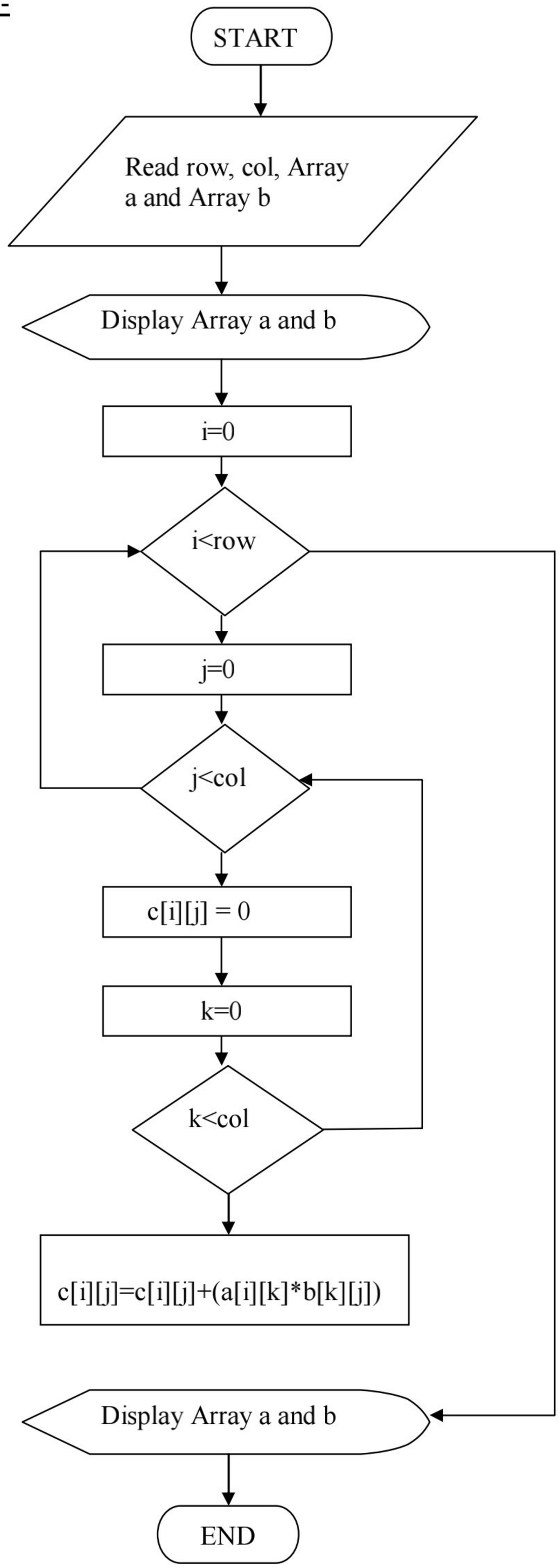
Flowchart:--



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Program:--

// Write a program that will read the values of elements of A and B and produce the
// product matrix C.

```
//Date: 16/03/2010

#include<stdio.h>
#include<conio.h>

#define MAX 10

void main()
{

        int a[MAX][MAX],b[MAX][MAX],c[MAX][MAX];
        int i,j,k,row,col;

        clrscr();

        printf("Enter row of matrix");
        scanf("%d",&row);

        printf("Enter column of matrix");
        scanf("%d",&col);

        printf("Enter first matrix\n");

        for(i=0;i<row;i++)
           for(j=0;j<col;j++)
                scanf("%d",&a[i][j]);

        printf("\nEnter second matrix \n");

         for(i=0;i<row;i++)
            for(j=0;j<col;j++)
                scanf("%d",&b[i][j]);

        printf("\nFirst matrix is : \n");

        for(i=0;i<row;i++)
        {
           for(j=0;j<col;j++)
                printf("%d ",a[i][j]);
           printf("\n");
        }

        printf("\nSecond matrix is\n");

        for(i=0;i<row;i++)
        {
           for(j=0;j<col;j++)
```

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```
            printf("%d ",b[i][j]);
        printf("\n");
    }

    for(i=0;i<row;i++)
        for(j=0;j<col;j++)
        {   c[i][j]=0;
            for(k=0;k<col;k++)
                c[i][j]=c[i][j]+(a[i][k]*b[k][j]);
        }

printf("\nMultiplication is\n");

    for(i=0;i<row;i++)
    {
        for(j=0;j<col;j++)
            printf("%d ",c[i][j]);
        printf("\n");
    }

    getch();
}
```

7.8 Write a program that fills a five-by-five as follows:

- **Upper left triangle with +1s**
- **Lower right triangle with -1s**
- **Right to left diagonal with zeros**

Display the contents of the matrix using not more than two printf statements.

<u>Algorithm:--</u>

Step 1: Store Upper left triangle with +1s
Step 2: Store Lower right triangle with -1s
Step 3: Store Right to left diagonal with zeros
Step 4: Display A

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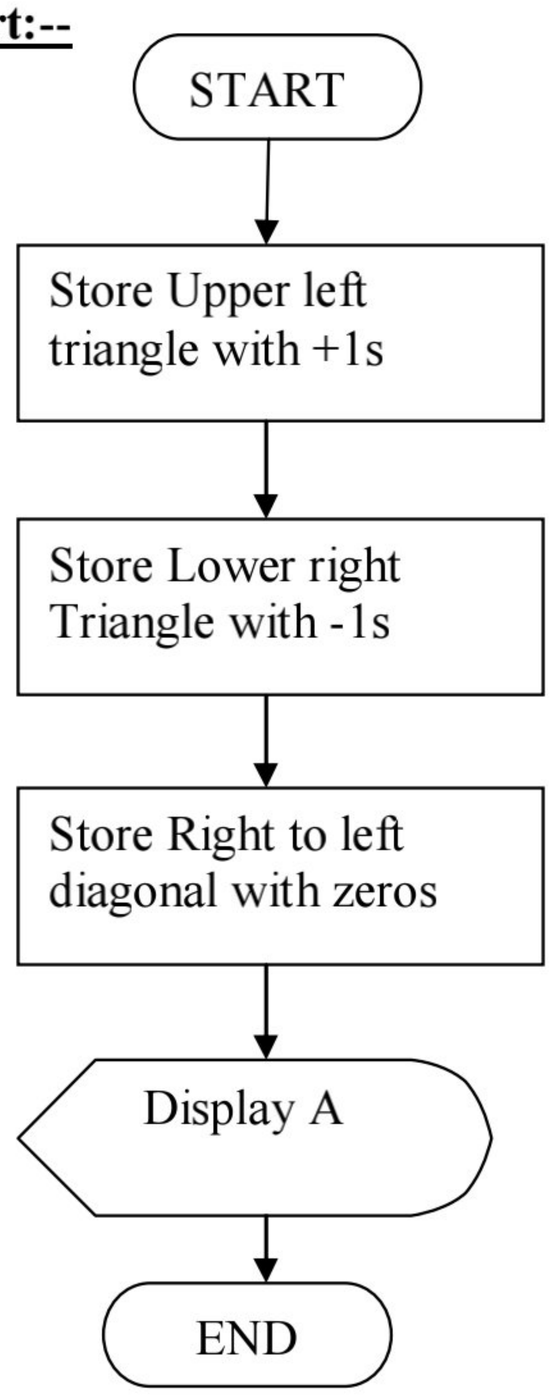
Flowchart:--



Program:--

```
//Write a program that fills a five-by-five as follows:
//•     Upper left triangle with +1s
//•     Lower right triangle with -1s
//•     Right to left diagonal with zeros
//Display the contents of the matrix using not more than two printf statements.

// Date : 16/03/2010

#include<stdio.h>
#include<conio.h>

void main()
{
        int A[5][5];
        int a,i,k,j;

        clrscr();

        a=3;

        for(i=0;i<=3;i++)
        {
                for(j=0;j<=a;j++)
                {
                        A[i][j]=+1;
```

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```
        }
        a--;
    }

    j=4;

    for(i=0;i<=4;i++)
    {
        A[i][j]=0;
        j--;
    }

    a=4;

    for(i=1;i<=4;i++)
    {
        for(j=4;j>=a;j--)
        {
            A[i][j]=-1;
        }
        a--;
    }


    printf("Array is:--\n\n");

    for(i=0;i<=4;i++)
    {
        for(j=0;j<=4;j++)
            printf("%d  ",A[i][j]);
        printf("\n");
    }


    getch();
}
```

7.9 Write a program to implement selection sort.

<u>Algorithm:--</u>

Step 1: Read Array A.
Step 2: For k=0 to 9 repeat Step 3 to Step 8.
Step 3: Compute Small=A[k] & Loc=k.
Step 4: For i=0 to 9 repeat Step 5 to Step 7 otherwise go to Step 7.
Step 5: Check Small>A[i] then go to Step 6 otherwise go to Step 4.
Step 6: Compute Small=A[i] & Loc=i.
Step 7: Compute A[Loc]=A[k], A[k]=Small.
Step 8: Display Sorted Array A.

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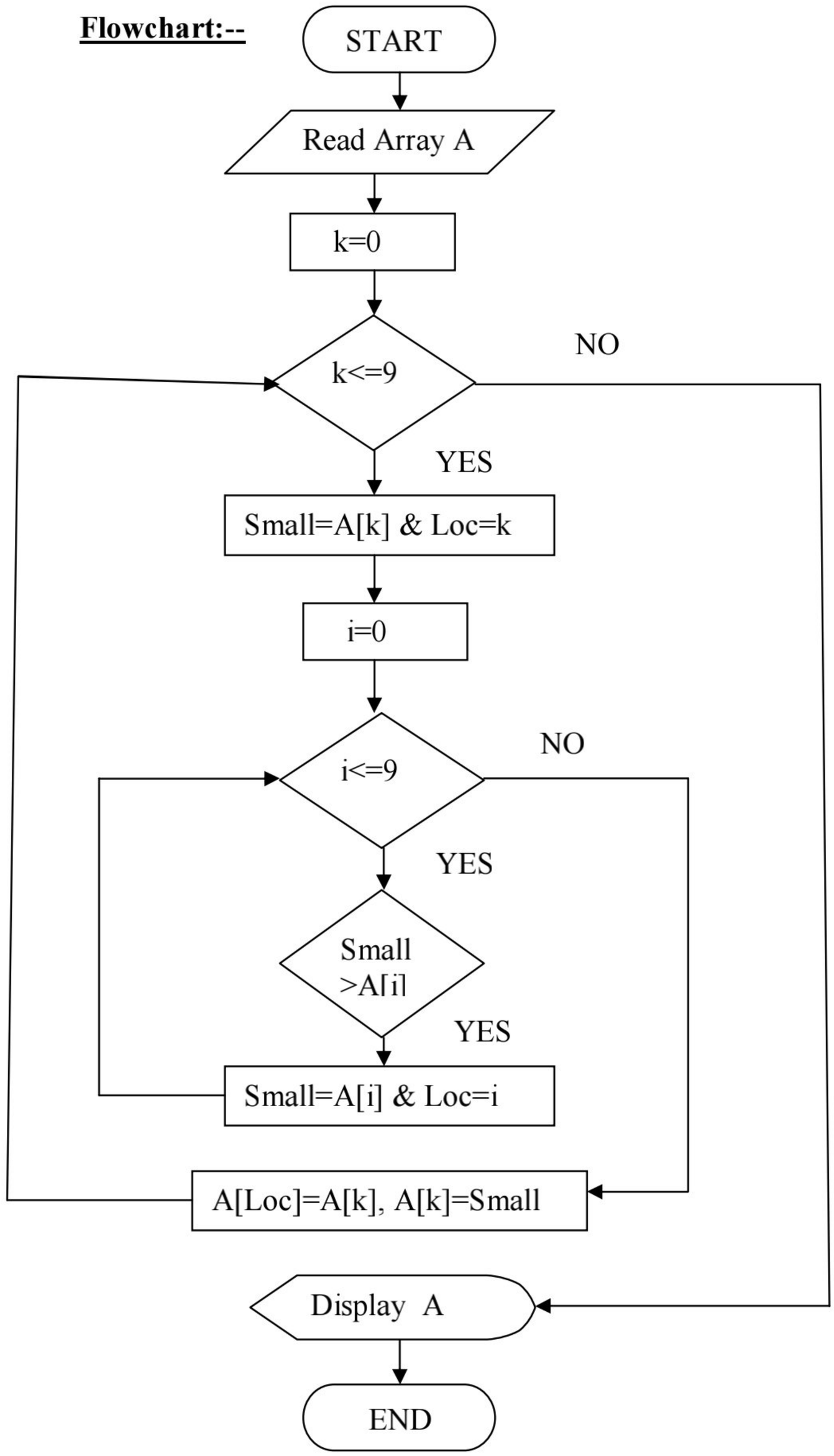
Flowchart:--



Program:--

```
//Write a program to implement selection sort.
// Date : 16/03/2010

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

```
void main()
{
        int A[10];
        int i,k,Small,Loc;

        clrscr();

        printf("Enter Elements of Array:---\n");

        for(i=0;i<=9;i++)
                scanf("%d",&A[i]);

        for(k=0;k<=9;k++)
        {
                Small=A[k];
                Loc=k;

                for(i=k;i<=9;i++)
                        if(Small>A[i])
                        {
                                Small=A[i];
                                Loc=i;
                        }

                A[Loc]=A[k];
                A[k]=Small;
        }

        printf("Sorted Array is:--\n\n");

        for(i=0;i<=9;i++)
                printf("%d  ",A[i]);


        getch();
}
```

7.10 Write a program to implement Binary Search algorithm.

<u>Algorithm:--</u>

Step 1: Store 0 to Beg & 9 to End.
Step 2: Compute Mid=(Beg+End)/2.
Step 3: Read a Sorted Array Str & an Item to Search.
Step 4: Repeat Step 5 to Step 8 while Item!=Str[Mid])&&(Beg<=End) otherwise go to Step 9
Step 5: Check Item<Str[Mid] then go to Step 6 otherwise go to Step 7
Step 6: Compute End=Mid-1
Step 7: Compute Beg=Mid+1
Step 8: Compute Mid=(Beg+End)/2
Step 9: Check Beg>End go to Step 10 otherwise go to Step 11
Step 10: Display “Item Not Found”
Step 11: Display “Item Found”

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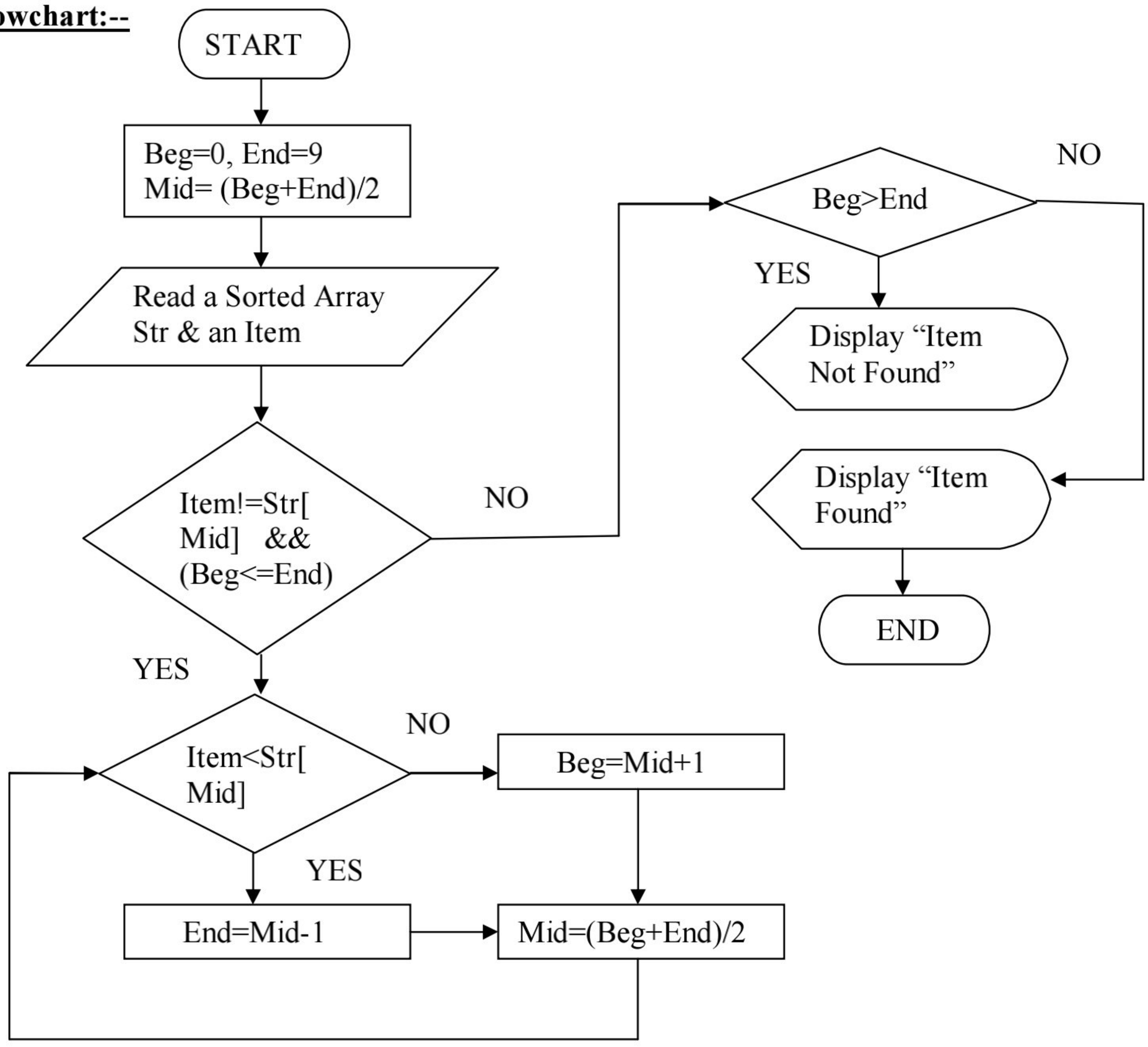
Flowchart:--



Program:--

```
//Write a program to implement Binary Search algorithm.
// Date : 16/03/2010

 #include<stdio.h>
 #include<conio.h>

void main()
{
        int Str[10];
        int i,Beg,End,Mid,Item;

        clrscr();

        Beg=0;
        End=9;

        Mid=(Beg+End)/2;

        printf("Enetr Any Sorted Array:--\n");

        for(i=0;i<10;i++)
```

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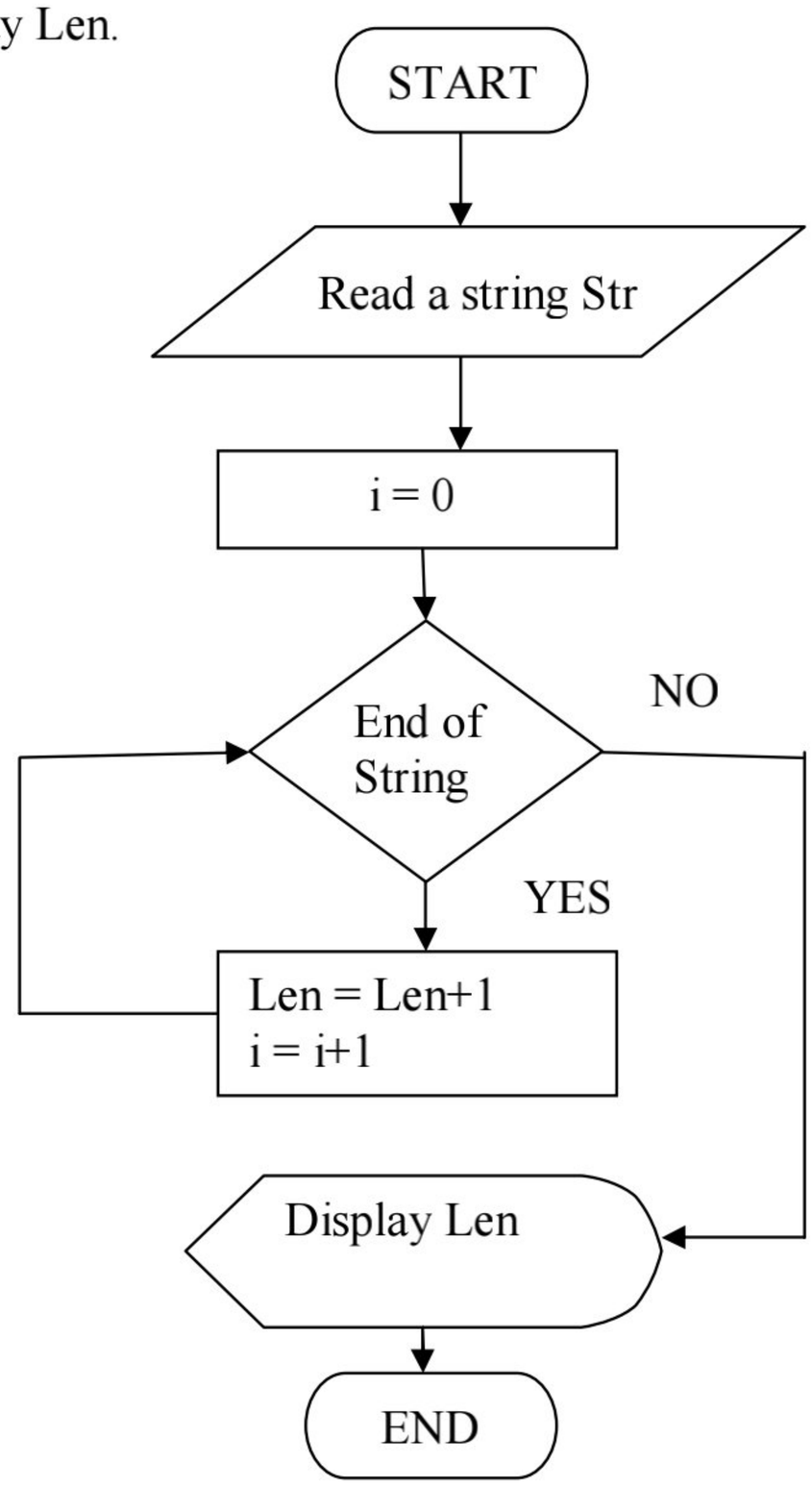
```
        scanf("%d",&Str[i]);

    printf("Enter Item Which U want to Search:--\n");
    scanf("%d",&Item);

    while((Item!=Str[Mid])&&(Beg<=End))
    {
        if(Item<Str[Mid])
            End=Mid-1;
        else
            Beg=Mid+1;

        Mid=(Beg+End)/2;
    }

    if(Beg>End)
        printf("Item Not Found\n");
    else
        printf("%d Found At Index %d\n",Item,Mid);

        getch();
}
```

7.11 Write a program that will compute the length of a given character string.

<u>Algorithm:--</u>

Step 1: Read a string Str.
Step 2: For i=0 to End of String repeat Step 3 to Step
Step 3: Compute Len=Len+1
Step 4: Display Len.

<u>Flowchart:--</u>



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Program:--

```
//Write a program that will compute the length of a given character string.
// Date : 16/03/2010

 #include<stdio.h>
 #include<conio.h>

void main()
 {
        char Str[50];
        int i,Len;

        clrscr();

        Len=0;

        printf("Enter a String:---\n");
        scanf("%[^\n]s",&Str);

        for(i=0;Str[i]!='\0';i++)
                Len=Len+1;

        printf("Length of String is %d",Len);
        getch();

 }
```

7.12 Write a program that will count the number occurrences of a specified character in a given line of text.

Algorithm:--

Step 1: Read a string Str & a Character CheckChar
Step 2: Length of String is Len
Step 3: For i=0 to Len repeat Step 4 to Step 5
Step 4: Check CheckChar==Str[i] go to Step 5 otherwise go to Step 3
Step 5: Count=Count+1
Step 6: Display Count

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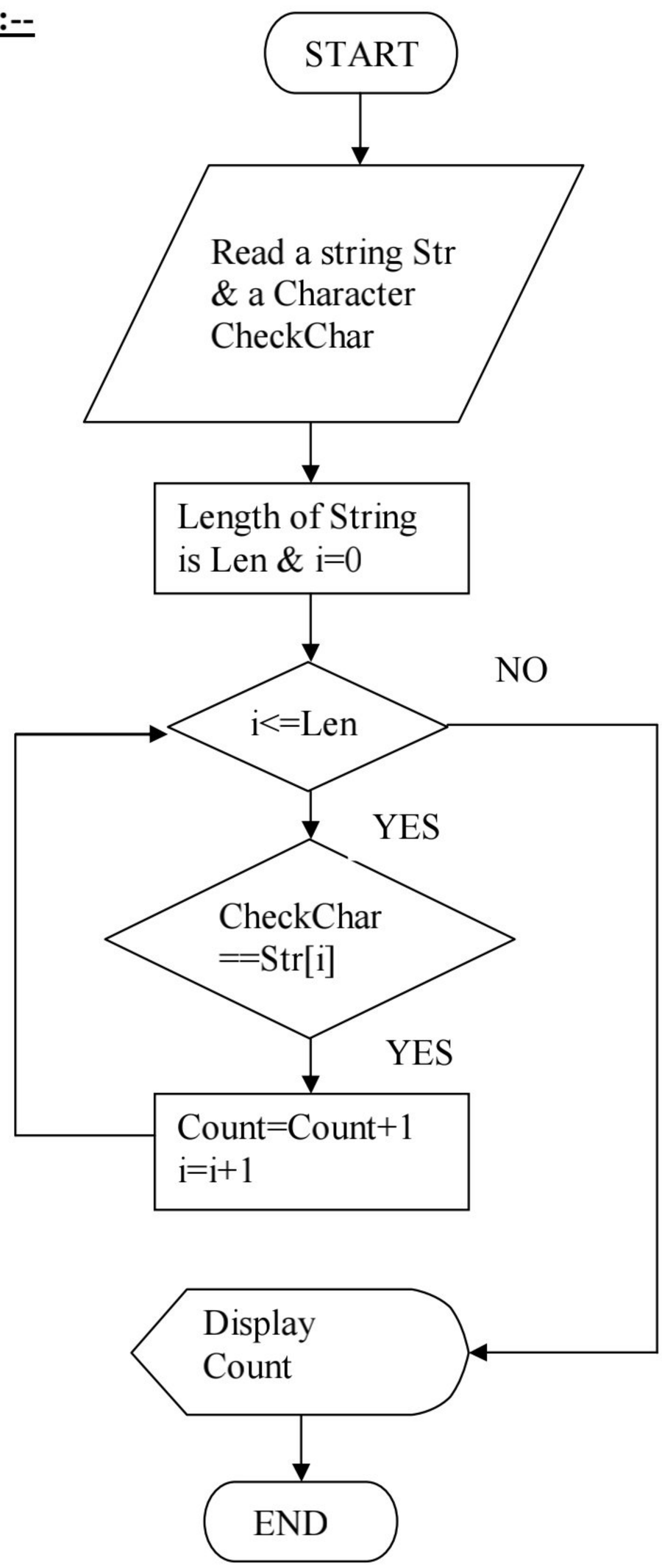
Flowchart:--



Program:--

```
//Write a program that will count the number occurrences of a specified character in a
//        given line of text.

// Date : 16/03/2010

 #include<stdio.h>
 #include<conio.h>

void main()
 {
        char Str[50],CheckChar;
        int i,Count,Len;
```

```
clrscr();

Count=0;

printf("Enter a String:---\n");
scanf("%[^\n]s",&Str);

Len=strlen(Str);

fflush(stdin);

printf("Enter a charatcer:--\n");
scanf("%c",&CheckChar);

for(i=0;i<=Len;i++)
        if(CheckChar==Str[i])
                Count=Count+1;

        printf("Number of occurences of %c is %d",CheckChar,Count);
        getch();

}
```

7.13 Write a program to read a matrix of size m*n and print its transpose.

<u>Algorithm:--</u>

Step 1: Read Row, Col & Matrix A
Step 2: Display A
Step 3: For i=0 to Col repeat Step 4 to Step 5 otherwise go to Step 6
Step 4: For j=0 to Row repeat Step 5 otherwise go to Step 3
Step 5: Compute C[i][j]=A[j][i]
Step 6: Display C

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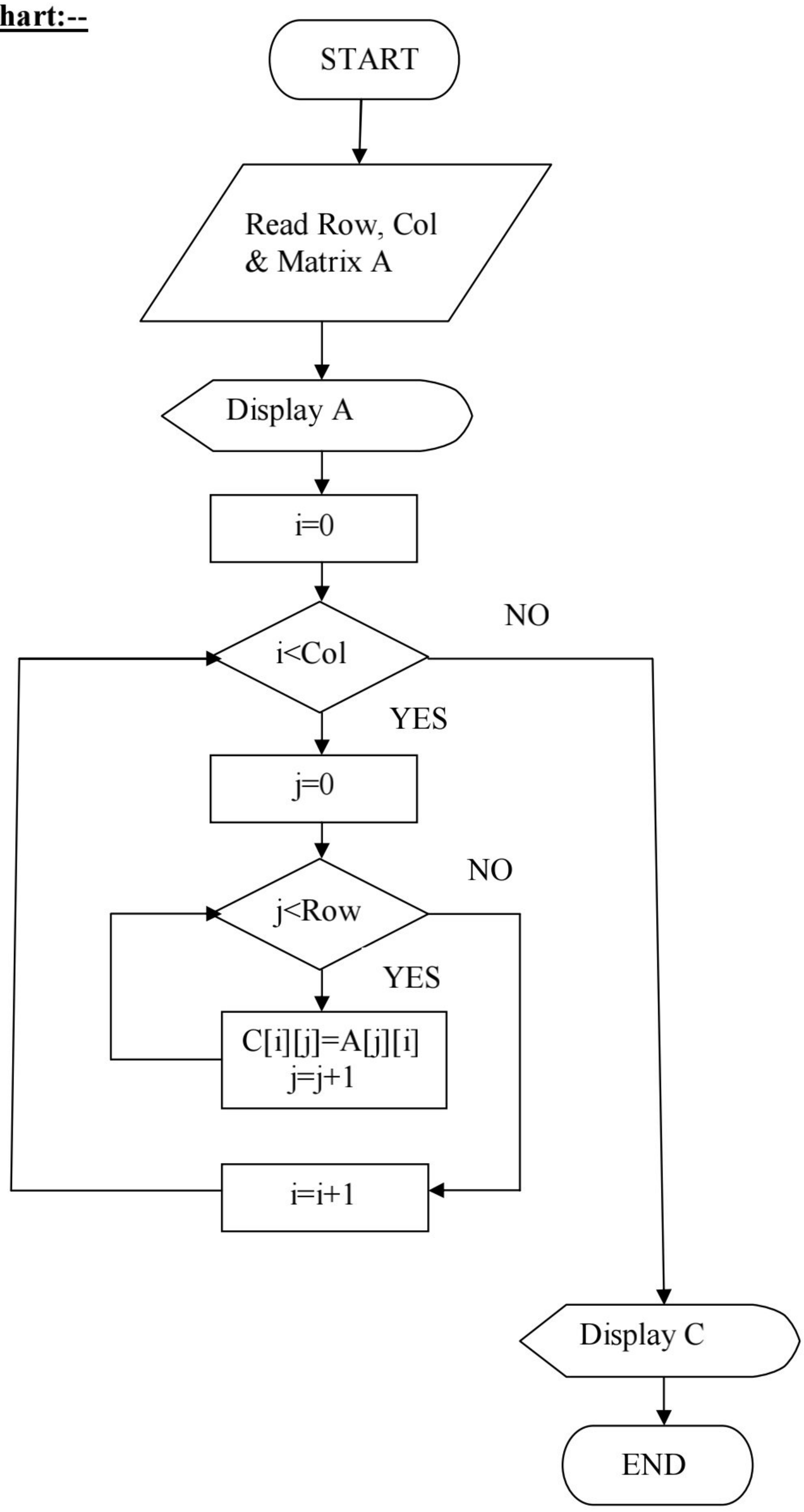
Flowchart:--



Program:--

//Write a program to read a matrix of size m*n and print its transpose.

// Date : 16/03/2010

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

```
#define MAX 10

void main()
{
        int A[MAX][MAX],C[MAX][MAX];
        int Row,Col,i,j;

        clrscr();

        printf("Enter Number of Rows:--\n");
        scanf("%d",&Row);

        printf("Enter Number of Column:--\n");
        scanf("%d",&Col);

        printf("Enter Matrix:---\n");

        for(i=0;i<Row;i++)
                for(j=0;j<Col;j++)
                        scanf("%d",&A[i][j]);

        clrscr();

        printf("Matrix:---\n");

        for(i=0;i<Row;i++)
        {
                for(j=0;j<Col;j++)
                        printf("%d  ",A[i][j]);
                printf("\n");
        }

        for(i=0;i<Col;i++)
                for(j=0;j<Row;j++)
                        C[i][j]=A[j][i];

        printf("Transpose of Matrix:---\n");

        for(i=0;i<Col;i++)
        {
                for(j=0;j<Row;j++)
                        printf("%d  ",C[i][j]);
                printf("\n");
        }

        getch();

}
```

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7.14 Every book published by international publishers should carry an International Standard Book Number (ISBN). It is a 10 character 4 part number as shown below.

0-07-041183-2

The first part denotes the region, the second represents publisher, the third identifies the book and the fourth is the check digit. The check digit is computed as follows:

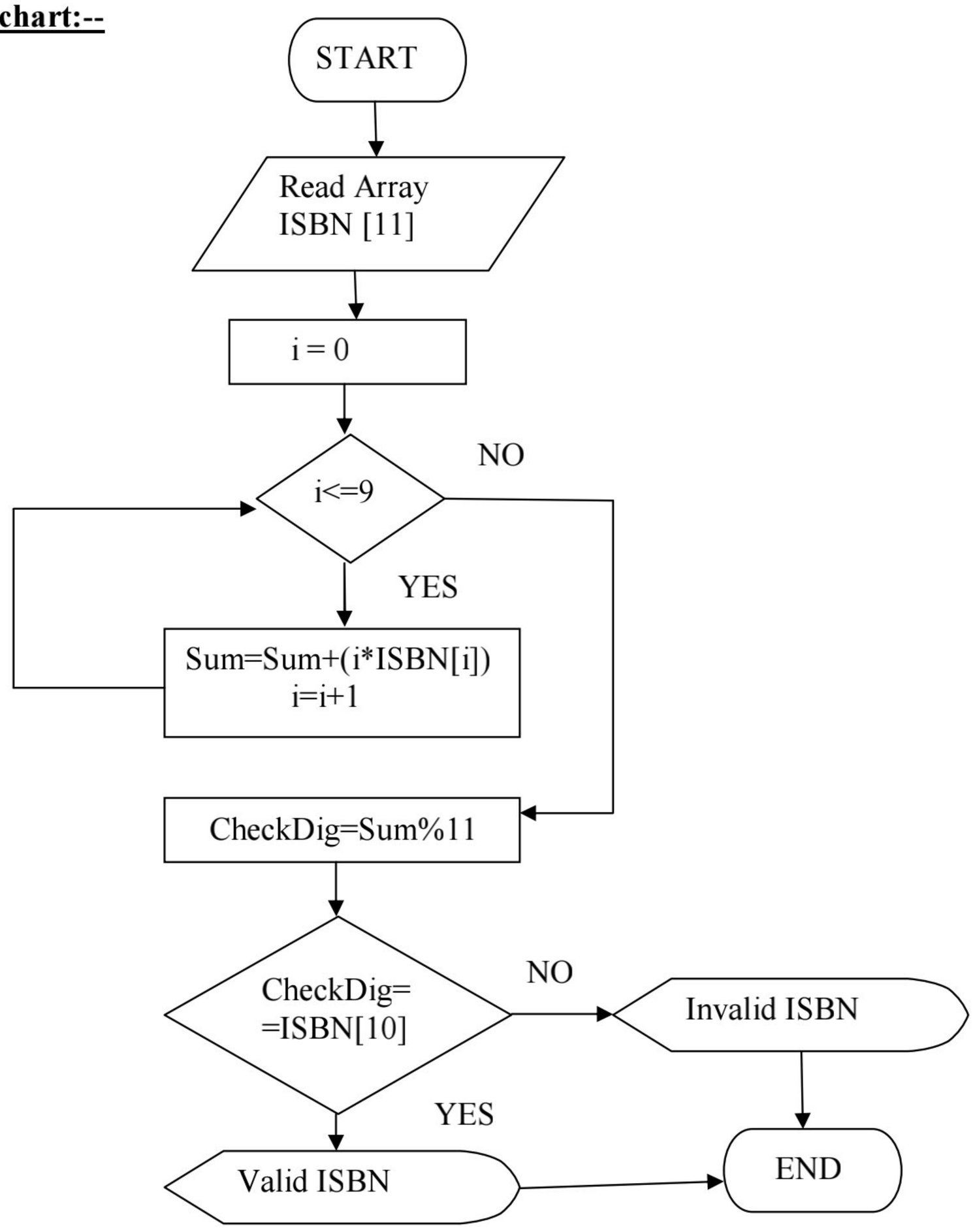
Sum= (1*first digit) + (2*second digit) + (3*third digit)+……+ (9*ninth digit)

Check digit is the remainder when Sum is divided by 11. Write a program that reads a given ISBN number and check whether it represents a valid ISBN.

<u>Algorithm:--</u>

Step 1: Read Array ISBN.
Step 2: Compute Sum=Sum+(i*ISBN[i]) for i=0 to 9
Step 3: Compute CheckDig=Sum%11
Step 4: Check CheckDig=ISBN[10] then go to Step 5 Otherwise go to Step 6
Step 5: Display "Valid ISBN"
Step 6: Display "Invalid ISBN"

<u>Flowchart:--</u>



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Program:--

//Write a program that reads a given ISBN number and check whether it represents a valid ISBN.

// Date : 16/03/2010

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

#define MAX 10

void main()
{
        int ISBN[11];
        int i,j,Sum,CheckDig;

        clrscr();

        Sum=0;

        printf("Enter ISBN Number:---\n");

        for(i=1;i<=10;i++)
                scanf("%d",&ISBN[i]);

        for(i=1;i<=9;i++)
                Sum=Sum+(i*ISBN[i]);

        CheckDig=Sum%11;

        if(CheckDig==ISBN[10])
                printf("\nValid ISBN\n");
        else
                printf("\nInvalid ISBN\n");

        getch();

}
```

7.15 Write a program to read two matrices A and B and print the following:

a) A + B and
b) A – B.

Algorithm:--

Step 1: Read Row, Col, Array A & B.
Step 2: Display Array A & B.
Step 3: Compute Addition of Array A & B & Store in Array C.
Step 4: Display Array C

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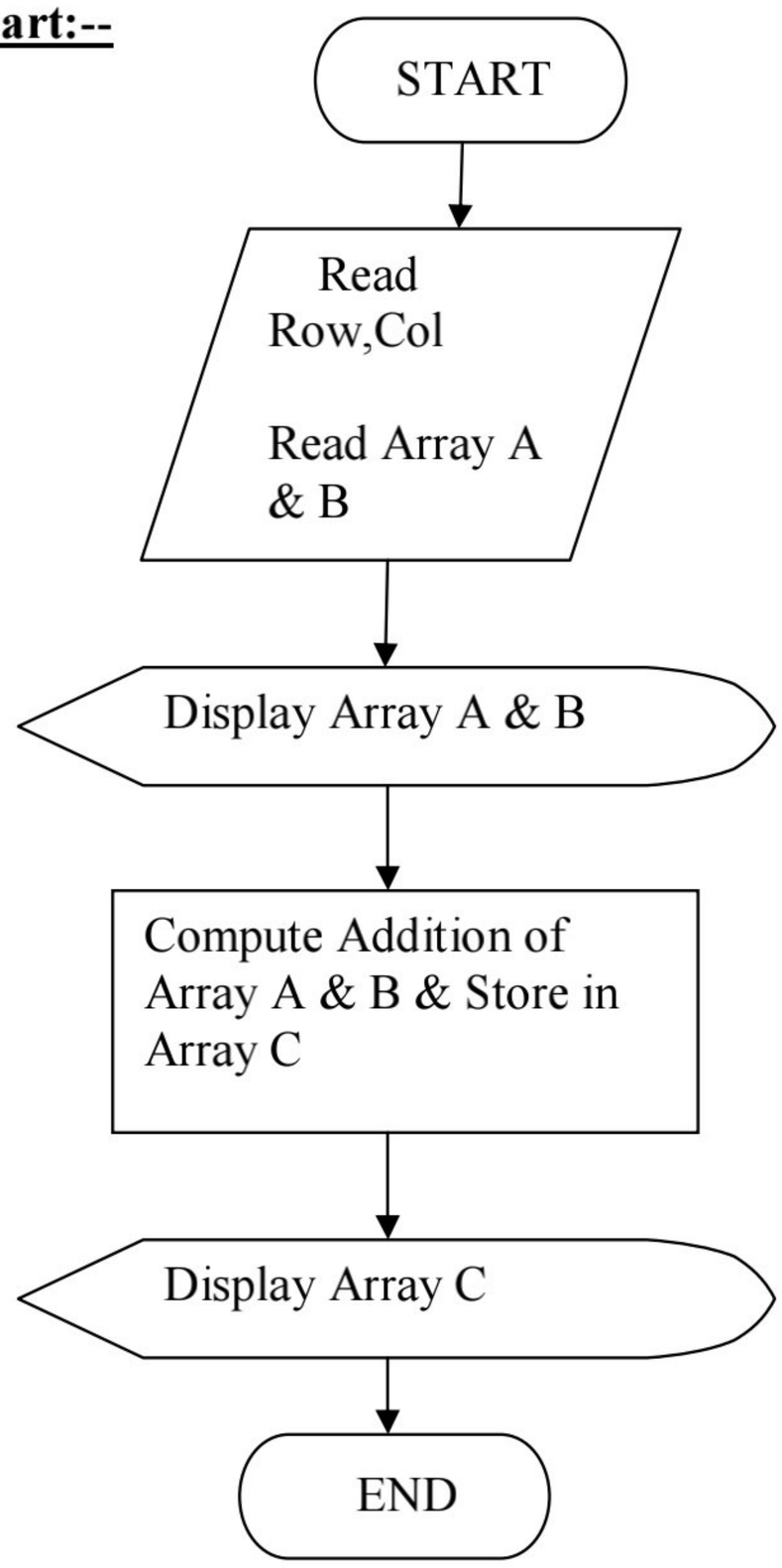
Flowchart:--



Program:--

//Write a program to read two matrices A and B and print the following:

//a) A + B and
//b) A – B.

// Date : 16/03/2010

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

#define MAX 10

void main()
{
        int A[MAX][MAX],B[MAX][MAX],C[MAX][MAX];
        int Row,Col,i,j;

        clrscr();

        printf("Enter Number of Rows:--\n");
        scanf("%d",&Row);
```

```
printf("Enter Number of Column:--\n");
scanf("%d",&Col);

printf("Enter First Matrix:---\n");

for(i=0;i<Row;i++)
        for(j=0;j<Col;j++)
                scanf("%d",&A[i][j]);

printf("Enter Second Matrix:---\n");

for(i=0;i<Row;i++)
        for(j=0;j<Col;j++)
                scanf("%d",&B[i][j]);

clrscr();

printf("First Matrix:---\n");

for(i=0;i<Row;i++)
{
        for(j=0;j<Col;j++)
                printf("%d  ",A[i][j]);
        printf("\n");
}

printf("Second Matrix:---\n");

for(i=0;i<Row;i++)
{
        for(j=0;j<Col;j++)
                printf("%d  ",B[i][j]);
        printf("\n");
}

for(i=0;i<Row;i++)
        for(j=0;j<Col;j++)
                C[i][j]=A[i][j]+B[i][j];

printf("Addition of Matrix:---\n");

for(i=0;i<Row;i++)
{
        for(j=0;j<Col;j++)
                printf("%d  ",C[i][j]);
        printf("\n");
}

for(i=0;i<Row;i++)
        for(j=0;j<Col;j++)
                C[i][j]=A[i][j]-B[i][j];
```

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```
        printf("Subtration of Matrix:---\n");

        for(i=0;i<Row;i++)
        {
                for(j=0;j<Col;j++)
                        printf("%d  ",C[i][j]);
                printf("\n");
        }

        getch();

}
```

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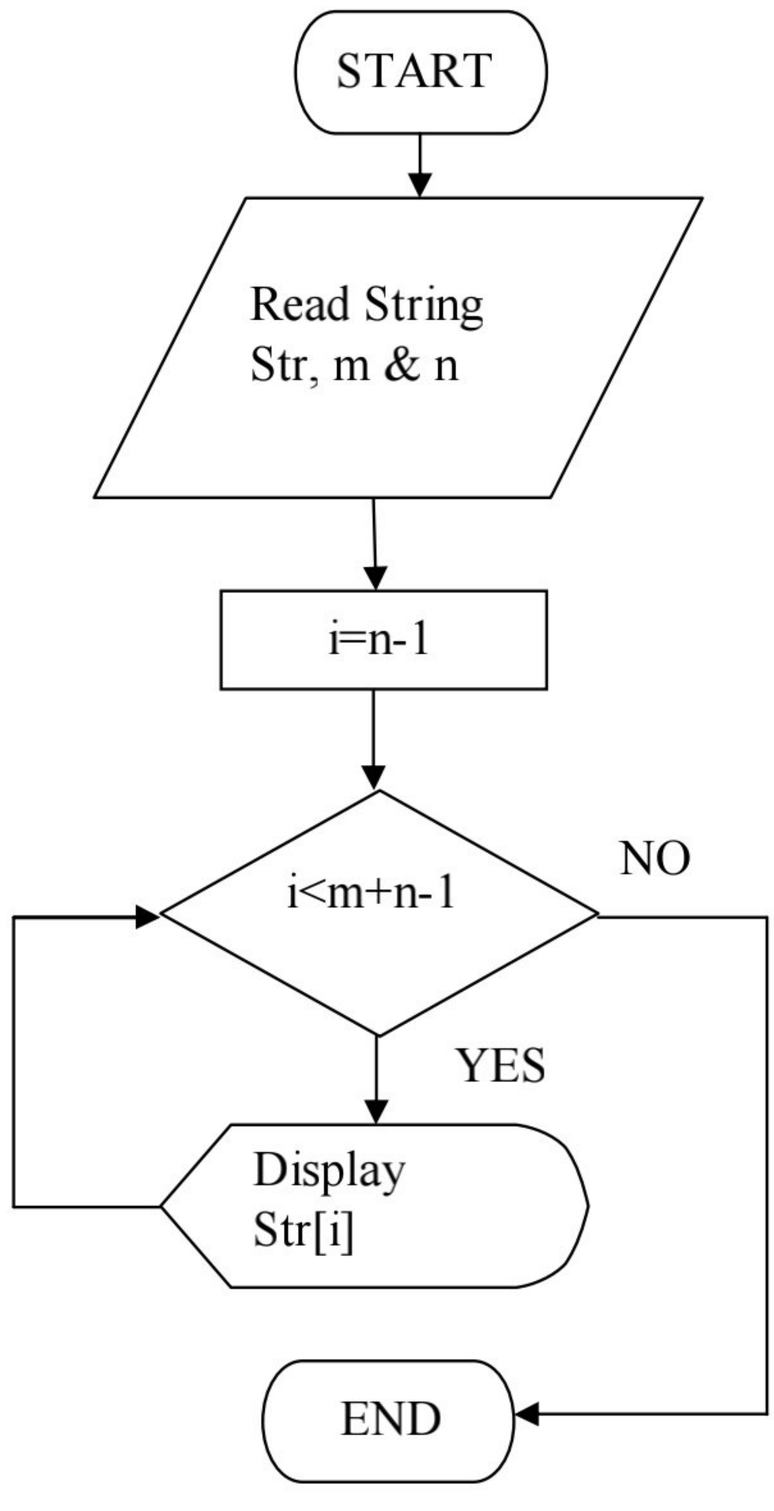
8.3 Write a program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted, starting with the nth character.

Algorithm:--

Step 1: Read a String Str.
Step 2: Read Number of Characters Which We Want to Extract Say m.
Step 3: Read Beginnig Index from Which We Want to Extract Say n.
Step 4: For i=n-1 to m+n-1 repeat Step 5.
Step 5: Display Str[i].

Flowchart:--



Program:--

```
//Write a program to extract a portion of a character string and print the extracted string.
//Assume that m characters are extracted, starting with the nth character.
//Date: 18/03/2010

#include<stdio.h>
#include<conio.h>

#define MAX 50

void main()
```

```
{
  char Str1[MAX];
  int i,m,n,j;

  clrscr();

  printf("Enter A String:--\n");
  scanf("%[^\n]s",Str1);

  printf("\nEnter Number of Characters Which U Wnat to Extract-->\n");
  scanf("%d",&m);

  printf("\nEnter Beginnig Index from Which U Want to Extract-->\n");
  scanf("%d",&n);

  printf("\nExtracted String is:--\n\n");

  for(i=n-1;i<m+n-1;i++)
  {
        printf("%c",Str1[i]);
  }

  getch();
}
```

Output:--

```
Enter A String:--
Ritesh Kumar Jain
Enter Number of Characters Which U Wnat to Extract-->
6
Enter Beginnig Index from Which U Want to Extract-->
4
Extracted String is:--
esh  Ku
```

8.7 A Maruti car dealer maintains a reecord of sales of various vehicles in the following form:

Vehicle Type	Month of sales	Price
MARUTI-800	02/01	210000
MARUTI-DX	07/01	265000
GYPSY	04/02	315750
MARUTI-VAN	08/02	240000

Write a program to read this data into a table of strings and output the details of a particular vehicle sold during a specified period. The program should request the user to input the vehicle type and the period (starting month, ending month).

Algorithm:--

Step 1: Read Entries We Want to Enter Say n
Step 2: Read Vehcle Type, Starting Month, Ending Month & Price for i=1 to n-1

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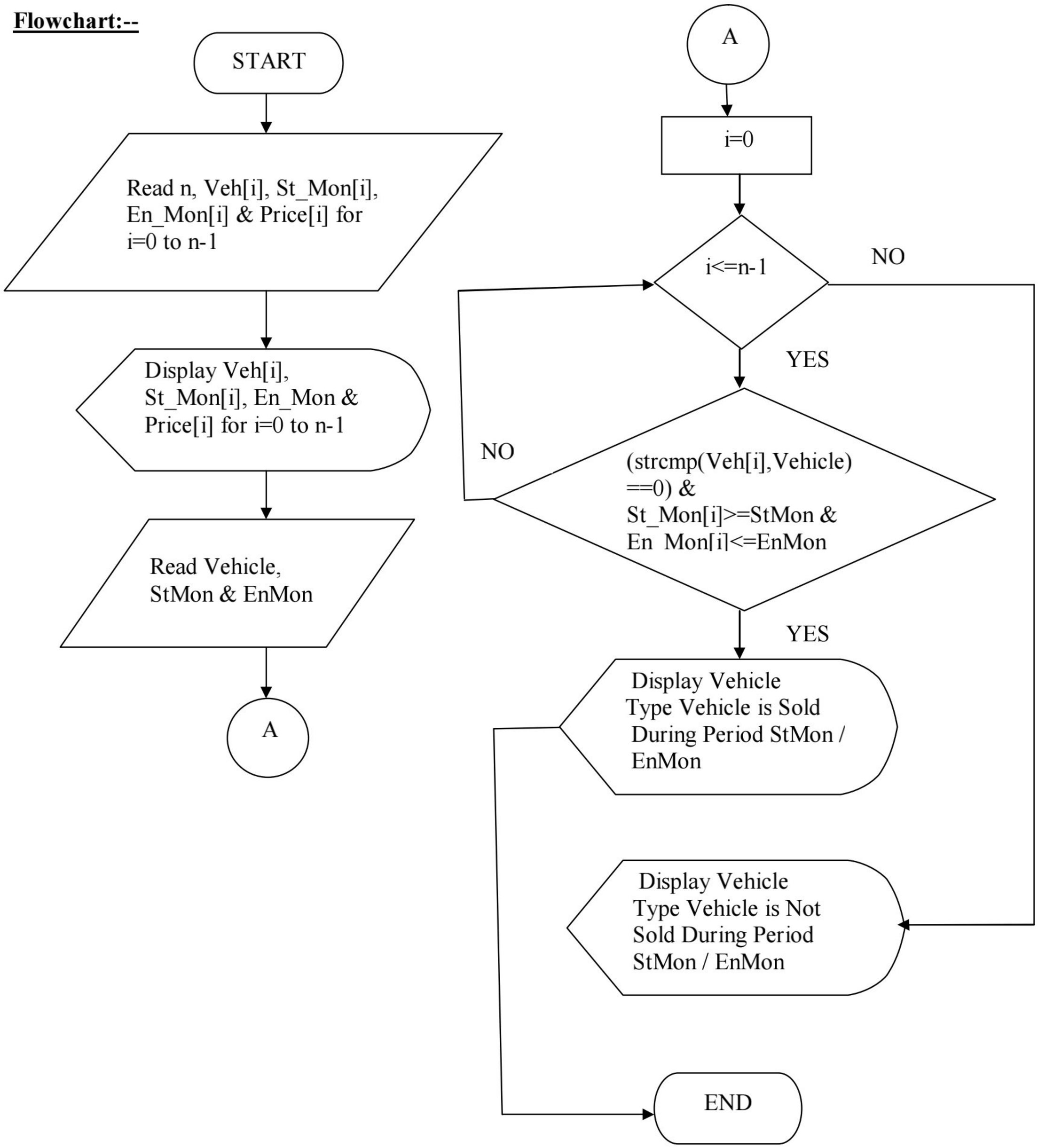
Say Veh[i], St_Mon[i], En_Mon[i] & Price[i].
Step 3: Display Veh[i], St_Mon[i], En_Mon & Price[i] for i=0 to n-1.
Step 4: Read Type of Vehicle Say Vehicle.
Step 5: Read Starting & Ending Month Say StMon & EnMon.
Step 6: For i=0 to n-1 repeat Step 7
Step 7: Check (strcmp(Veh[i],Vehicle)==0) & St_Mon[i]>=StMon & En_Mon[i]<=EnMon then go to Step 8 otherwise go to Step 9
Step 8: Display Vehicle Type Vehicle is Sold During Period StMon / EnMon
Step 9: Display Vehicle Type Vehicle is Not Sold During Period StMon / EnMon

Flowchart:--



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Program:--

```
//A Maruti car dealer maintains a reecord of sales of various vehicles in the following
//      form:

//          Vehicle Type            Month of sales              Price
//          MARUTI-800              02/01                       210000
//          MARUTI-DX               07/01                       265000
//          GYPSY                   04/02                       315750
//          MARUTI-VAN              08/02                       240000

//  Write a program to read this data into a table of strings and output the details of a
//    particular vehicle sold during a specified period. The program should request the user to
//    input the vehicle type and the period (starting month, ending month).

//Date: 18/03/2010

#include<stdio.h>
#include<conio.h>

#define MAX 10

void main()
{

   char Veh[MAX][MAX]={""};
   char Vehicle[MAX];
   int St_Mon[MAX],En_Mon[MAX],StMon,EnMon;
   long int Price[MAX];
   int n,i;

   clrscr();

   printf("How Entries U Want to Enter\n");
   scanf("%d",&n);

   printf("Enter Vehcle Type,Starting Month, Ending Month & Price:--\n");

   for(i=0;i<n;i++)
   {
            scanf("%s",Veh[i]);
            scanf("%d",&St_Mon[i]);
            scanf("%d",&En_Mon[i]);
            scanf("%ld",&Price[i]);
   }

   clrscr();

   printf("Vehicle Type       Month of Sales        Price\n");
   for(i=0;i<n;i++)
   {
            printf("%s          0%d / 0%d            %ld\n",Veh[i],St_Mon[i],En_Mon[i],Price[i]);
   }
```

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```
  printf("Enter The Type of Vehicle\n");
  scanf("%s",Vehicle);

  printf("Enter the Starting & Ending Month\n");
  scanf("%d %d",&StMon,&EnMon);

  for(i=0;i<n;i++)
  {
        if((strcmp(Veh[i],Vehicle)==0))
        {
              if(St_Mon[i]>=StMon)
              {
                    if(En_Mon[i]<=EnMon)
                    {
                          printf("Vehicle Type  %s is Sold During Period
0%d/0%d\n",Vehicle,StMon,EnMon);
                          getch();
                          exit(0);
                    }
              }
        }
  }

  printf("Vehicle Type  %s Not Sold During Period 0%d/0%d\n",Vehicle,StMon,EnMon);

  getch();
}
```

Output:--

```
How Entries U Want to Enter 4
Enter Vehcle Type,Starting Month, Ending Month & Price:--
MARUTI-800          02/01          210000
MARUTI-DX           07/01          265000
GYPSY               04/02          315750
MARUTI-VAN          08/02          240000


Vehicle Type        Month of sales      Price
MARUTI-800          02/01               210000
MARUTI-DX           07/01               265000
GYPSY               04/02               315750
MARUTI-VAN          08/02               240000

Enter The Type of Vehicle MARUTI-800
Enter the Starting & Ending Month 02 01

Vehicle Type MARUTI-800 is Sold During Period 02/01
```

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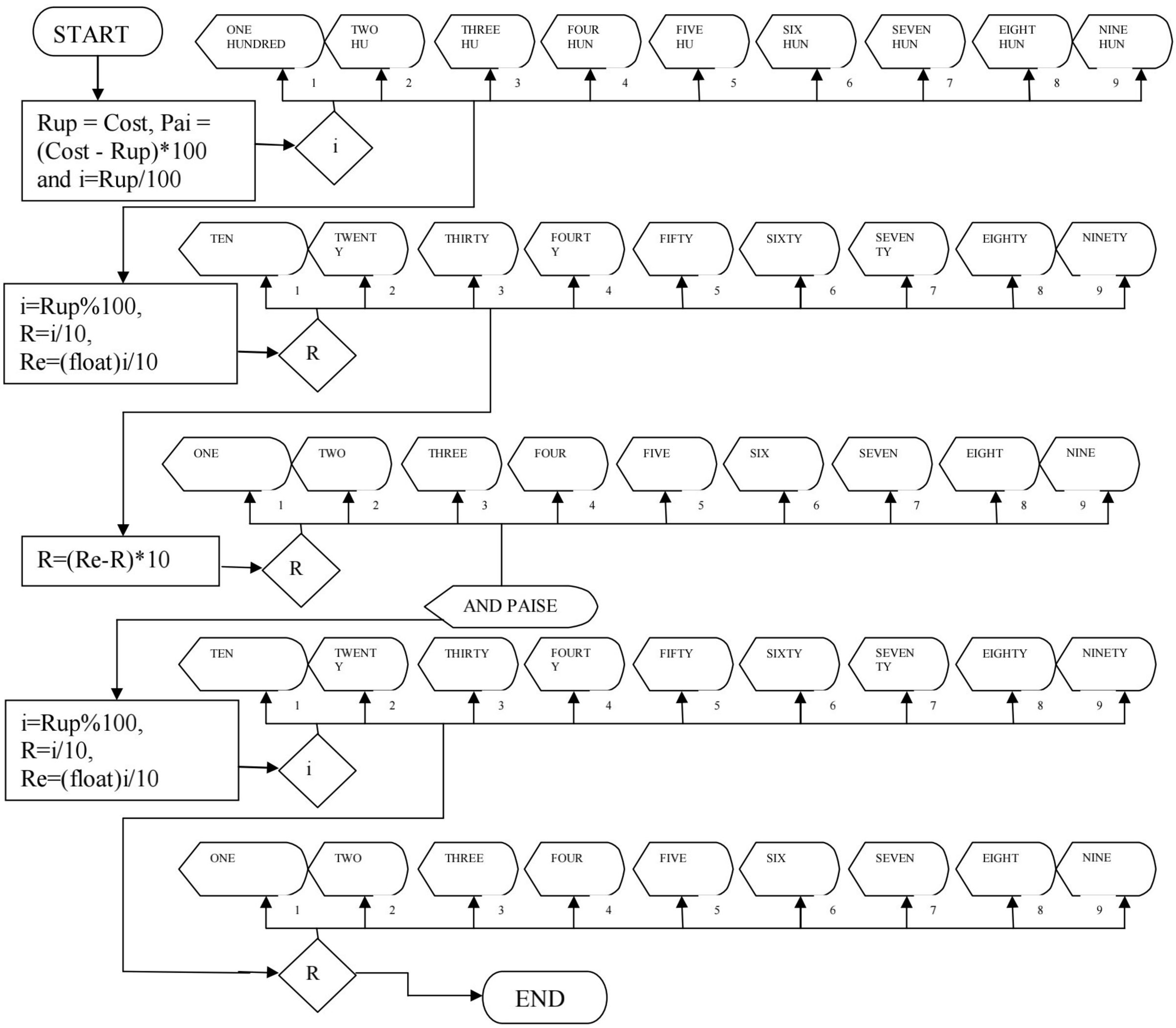
8.9 Write a program that reads the cost of an item in the form RRRR.PP (where RRRR denotes Rupees and PP denotes Paise) and converts the value to a string of words that express the numeric value in words. For example, if we input 125.75 the ouput should be "ONE HUNDRED TWENTY FIVE AND PAISE SEVENTY FIVE".

Algorithm:--

Step 1: Read Cost.
Step 2: Compute Rup = Cost, Pai = (Cost - Rup)*100 and i=Rup/100.
Step 3: Check i=1 Display "ONE HUNDRED"…….i=9 Display "NINE HUNDRED"
Step 4: Compute i=Rup%100, R=i/10, Re=(float)i/10.
Step 5: Check R=1 Display "TEN"……i=9 Display "NINETY"
Step 6: Compute R=(Re-R)*10.
Step 7: Check R=1 Display "ONE"……..R=9 Display "NINE" & Display "AND PAISE"
Step 8: Compute i=Pai/10, Re=(float)Pai/10, R=(Re-i)*10
Step 9: Check i=1 Display "TEN"……i=9 Display "NINETY"
Step 10: Check R=1 Display "ONE"……..R=9 Display "NINE"

Flowchart:--



Program:--

```
//Write a program that reads the cost of an item in the form RRRR.PP (where RRRR
//      denotes Rupees and PP denotes Paise) and converts the value to a string of words that
//      express the numeric value in words. For example, if we input 125.75 the ouput should be
//      "ONE HUNDRED TWENTY FIVE AND PAISE SEVENTY FIVE".

//Date: 18/03/2010

#include<stdio.h>
#include<conio.h>

void main()
{

   float Cost,Pai,Re,j;
   int Rup,i,R;

   clrscr();

   printf("\nEnter Cost of an ITEM-->\n");
   scanf("%f",&Cost);

   Rup = Cost;
   Pai = (Cost - Rup)*100;

   i=Rup/100;

   switch(i)
   {
            case 1: printf("ONE HUNDRED "); break;
            case 2: printf("TWO HUNDRED "); break;
            case 3: printf("THREE HUNDRED "); break;
            case 4: printf("FOUR HUNDRED "); break;
            case 5: printf("FIVE HUNDRED "); break;
            case 6: printf("SIX HUNDRED "); break;
            case 7: printf("SEVEN HUNDRED "); break;
            case 8: printf("EIGHT HUNDRED "); break;
            case 9: printf("NINE HUNDRED "); break;
   }

   i=Rup%100;
   R=i/10;
   Re=(float)i/10;

   switch(R)
   {
            case 1: printf("TEN"); break;
            case 2: printf("TWENTY "); break;
            case 3: printf("THIRTY "); break;
            case 4: printf("FOURTY "); break;
            case 5: printf("FIFTY "); break;
            case 6: printf("SIXTY "); break;
```

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```
        case 7: printf("SEVENTY "); break;
        case 8: printf("EIGHTY "); break;
        case 9: printf("NINETY "); break;
    }

    R=(Re-R)*10;

    switch(R)
    {
        case 1: printf("ONE"); break;
        case 2: printf("TWO "); break;
        case 3: printf("THREE "); break;
        case 4: printf("FOUR "); break;
        case 5: printf("FIVE "); break;
        case 6: printf("SIX "); break;
        case 7: printf("SEVEN "); break;
        case 8: printf("EIGHT "); break;
        case 9: printf("NINE "); break;
    }

    printf("AND PAISE ");

    i=Pai/10;
    Re=(float)Pai/10;
    R=(Re-i)*10;

    switch(i)
    {
        case 1: printf("TEN"); break;
        case 2: printf("TWENTY "); break;
        case 3: printf("THIRTY "); break;
        case 4: printf("FOURTY "); break;
        case 5: printf("FIFTY "); break;
        case 6: printf("SIXTY "); break;
        case 7: printf("SEVENTY "); break;
        case 8: printf("EIGHTY "); break;
        case 9: printf("NINETY "); break;
    }

    switch(R)
    {
        case 1: printf("ONE"); break;
        case 2: printf("TWO "); break;
        case 3: printf("THREE "); break;
        case 4: printf("FOUR "); break;
        case 5: printf("FIVE "); break;
        case 6: printf("SIX "); break;
        case 7: printf("SEVEN "); break;
        case 8: printf("EIGHT "); break;
        case 9: printf("NINE "); break;
    }
    getch();
}
```

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Output:--

Enter Cost of an ITEM-->
125.25

ONE HUNDRED TWENTY FIVE AND PAISE TWENTY FIVE

8.10 Develop a program that will read and store the details of a list of students in the format

Roll No.	Name	Marks Obtained
……	……	……..
……	……	……..

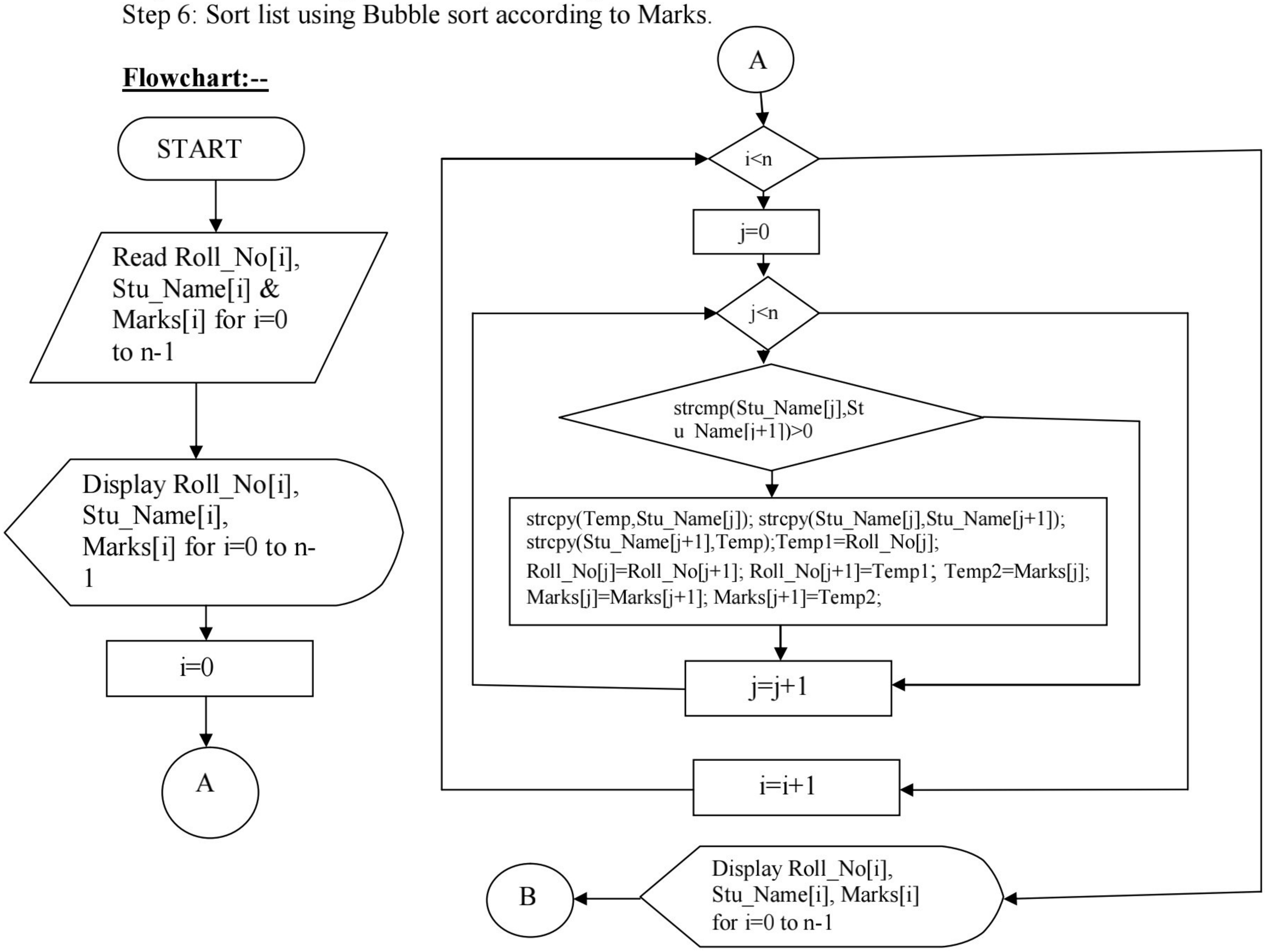
And produce the following output lists:

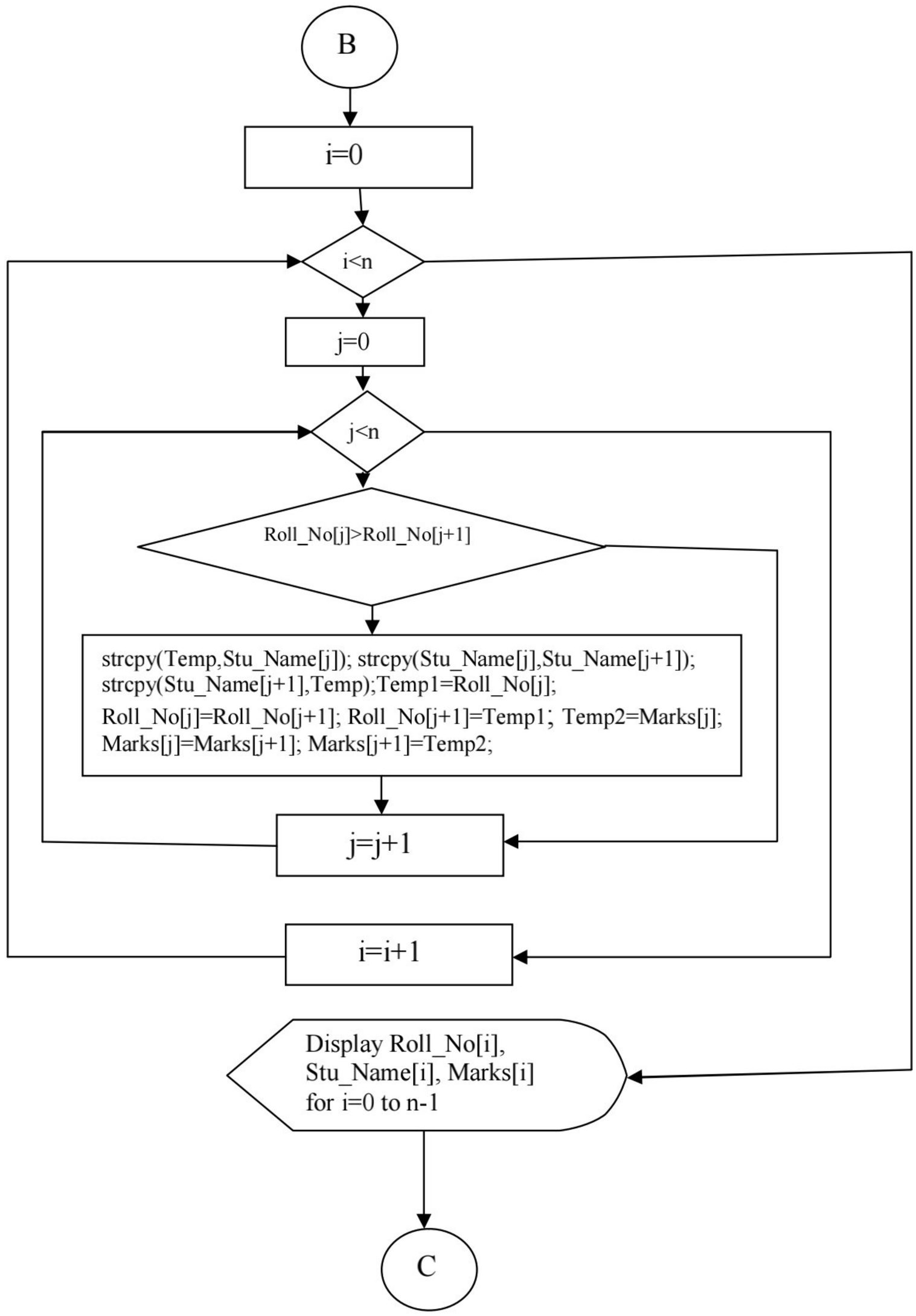
a) Alphabetical list of names, roll numbers and marks obtained.
b) List sorted on roll numbers.
c) List sorted on marks (rank-wise list)

Algorithm:--

Step 1: Read n
Step 2: Read Roll_No[i], Stu_Name[i] & Marks[i] for i=0 to n-1.
Step 3: Display Roll_No[i], Stu_Name[i], Marks[i] for i=0 to n-1.
Step 4: Sort list using Bubble sort according to Alphabetical list.
Step 5: Sort list using Bubble sort according to Roll numbers.
Step 6: Sort list using Bubble sort according to Marks.

Flowchart:--




B
i=0
i<n
j=0
j<n
Roll_No[j]>Roll_No[j+1]
strcpy(Temp,Stu_Name[j]); strcpy(Stu_Name[j],Stu_Name[j+1]);
strcpy(Stu_Name[j+1],Temp);Temp1=Roll_No[j];
Roll_No[j]=Roll_No[j+1]; Roll_No[j+1]=Temp1; Temp2=Marks[j];
Marks[j]=Marks[j+1]; Marks[j+1]=Temp2;
j=j+1
i=i+1
Display Roll_No[i],
Stu_Name[i], Marks[i]
for i=0 to n-1
C

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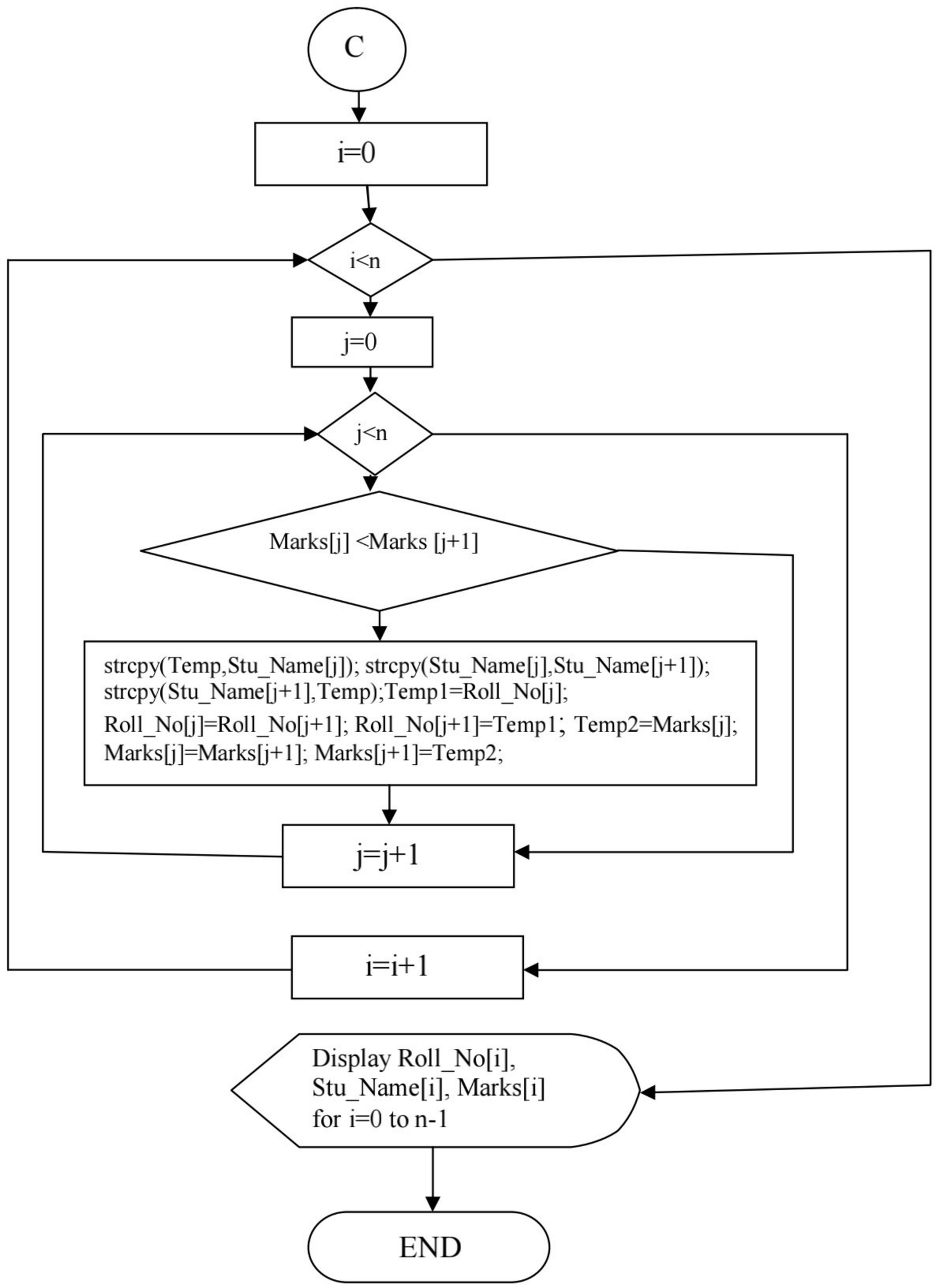

Program:--

```
//Date: 18/03/2010

#include<stdio.h>
#include<conio.h>

#define MAX 50

void main()
{
        char Stu_Name[MAX][MAX]={""};
        //char Stu_Name1[MAX][MAX]={""};
```

```
char Temp[MAX]="";
int Roll_No[MAX],Marks[MAX],n,i,In[MAX],Roll_No1[MAX],Marks1[MAX];
int Temp1,Temp2;
int j;

clrscr();

printf("How Many Student Name U Want to Enter\n\n");
scanf("%d",&n);

printf("Enter Roll No. & Students Name & Total Marks:--\n");

for(i=0;i<n;i++)
{
        scanf("%d",&Roll_No[i]);
        scanf("%s",Stu_Name[i]);
        scanf("%d",&Marks[i]);
}

clrscr();

printf("Roll No     Name        Marks\n");
for(i=0;i<n;i++)
{
        printf("%d          %s          %d\n",Roll_No[i],Stu_Name[i],Marks[i]);
}

for(i=0;i<n;i++)
{
        for(j=0;j<n-i-1;j++)
        {
                if(strcmp(Stu_Name[j],Stu_Name[j+1])>0)
                {
                        strcpy(Temp,Stu_Name[j]);
                        strcpy(Stu_Name[j],Stu_Name[j+1]);
                        strcpy(Stu_Name[j+1],Temp);

                        Temp1=Roll_No[j];
                        Roll_No[j]=Roll_No[j+1];
                        Roll_No[j+1]=Temp1;

                        Temp2=Marks[j];
                        Marks[j]=Marks[j+1];
                        Marks[j+1]=Temp2;
                }
        }
}

printf("\nAccording to Student Names:--\n");
printf("Roll No     Name        Marks\n");

for(i=0;i<n;i++)
{
```

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```
        printf("%d          %s          %d\n",Roll_No[i],Stu_Name[i],Marks[i]);
    }

    for(i=0;i<n;i++)
    {
        for(j=0;j<n-i-1;j++)
        {
            if(Roll_No[j]>Roll_No[j+1])
            {
                strcpy(Temp,Stu_Name[j]);
                strcpy(Stu_Name[j],Stu_Name[j+1]);
                strcpy(Stu_Name[j+1],Temp);

                Temp1=Roll_No[j];
                Roll_No[j]=Roll_No[j+1];
                Roll_No[j+1]=Temp1;

                Temp2=Marks[j];
                Marks[j]=Marks[j+1];
                Marks[j+1]=Temp2;
            }
        }
    }

    printf("\nAccording to Marks:--\n");
    printf("Roll No     Name        Marks\n");

    for(i=0;i<n;i++)
    {
        printf("%d          %s          %d\n",Roll_No[i],Stu_Name[i],Marks[i]);
    }

    for(i=0;i<n;i++)
    {
        for(j=0;j<n-i-1;j++)
        {
            if(Marks[j]<Marks[j+1])
            {
                strcpy(Temp,Stu_Name[j]);
                strcpy(Stu_Name[j],Stu_Name[j+1]);
                strcpy(Stu_Name[j+1],Temp);

                Temp1=Roll_No[j];
                Roll_No[j]=Roll_No[j+1];
                Roll_No[j+1]=Temp1;

                Temp2=Marks[j];
                Marks[j]=Marks[j+1];
                Marks[j+1]=Temp2;
            }
        }
    }
```

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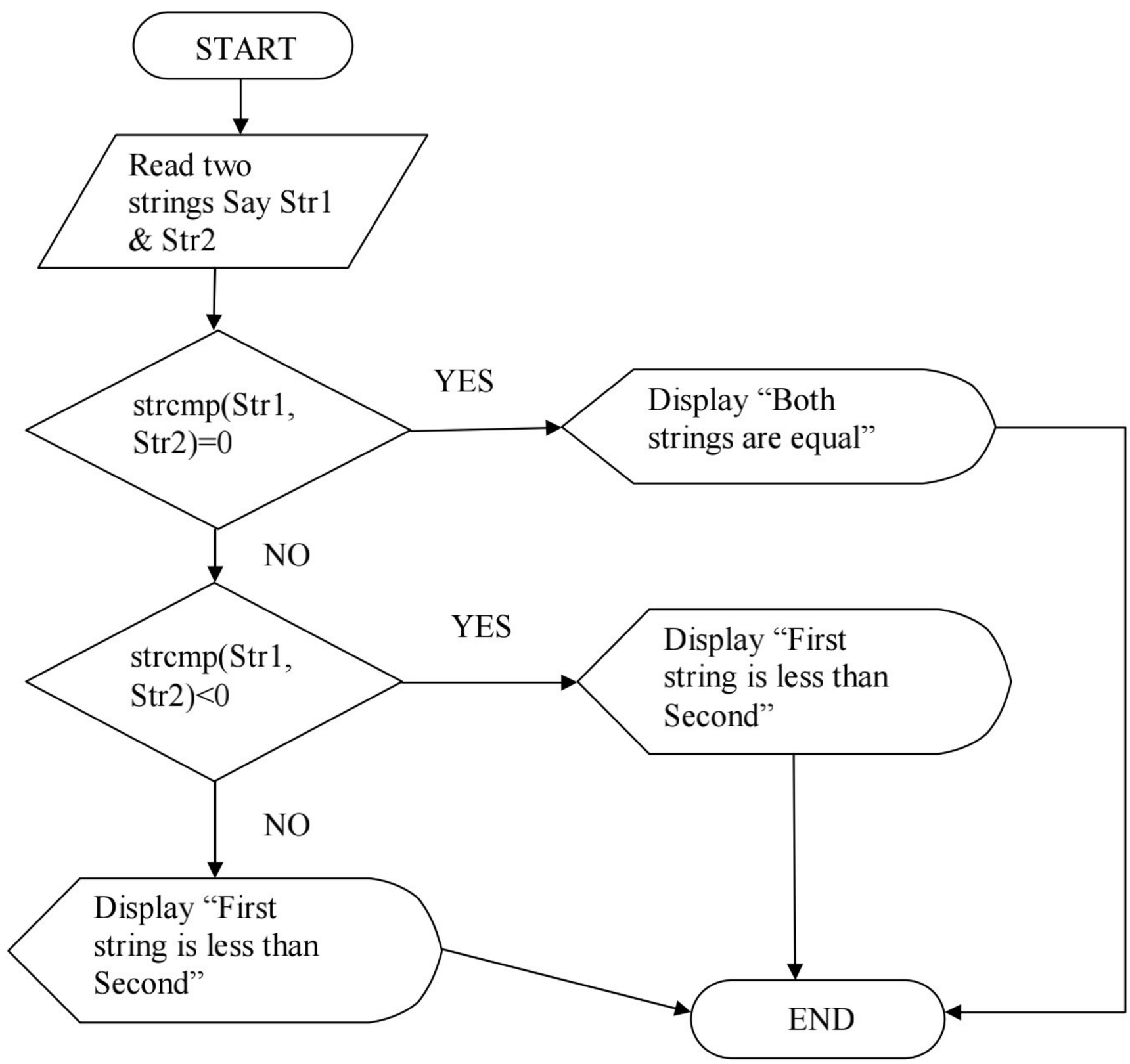
```
        printf("\nAccording to Roll No:--\n");
        printf("Roll No     Name        Marks\n");

        for(i=0;i<n;i++)
        {
                printf("%d          %s          %d\n",Roll_No[i],Stu_Name[i],Marks[i]);
        }

        getch();
}
```

8.11 Write a program to read to strings and compare them using the function strcmp() and print a mesaage that the first string is equal, less or greater than the second one.

<u>Algorithm:--</u>

Step 1: Read two strings Say Str1 & Str2.
Step 2: Check strcmp(Str1,Str2)=0 true then Display "Both strings are equal" otherwise go to Step 3.
Step 3: Check strcmp(Str1,Str2)<0 then Display "First string is less than Second" otherwise go to Step 4.
Step 4: Display "First string is greater than Second".

<u>Flowchart:--</u>



Program:--

```
//Write a program to read to strings and compare them using the function strcmp() and
//        print a mesaage that the first string is equal, less or greater than the second one.


//Date: 18/03/2010

#include<stdio.h>
#include<conio.h>

#define MAX 50

void main()
{
        char Str1[MAX],Str2[MAX];

        clrscr();

        printf("Enter First String:--\n");
        scanf("%[^\n]s",Str1);

        fflush(stdin);

        printf("Enter Second String:--\n");
        scanf("%[^\n]s",Str2);

        if(strcmp(Str1,Str2)==0)
                printf("\nBoth Strings are Equal\n");
        else if(strcmp(Str1,Str2)<0)
                printf("\nFirst String is Less Than\n");
        else
                printf("\nFirst String is Greater Than\n");
        getch();
}
```

Output:--

```
Enter First String:--
Ritesh
Enter Second String:--
Jain
First String is Greater Than
```

8.12 Write a program to read a line of text from the keyboard and print out the number of occurrences of a given substring using the function strstr().

Algorithm:--

Step 1: Read text Str1 & substring Str2, Count=0.
Step 2: Compute Len=strlen(Str1), Len1=strlen(Str2).
Step 3: Copy Str1 to Str3.
Step 4: For i=0 to Len repeat Step 5 to Step 6 otherwise go to Step 8

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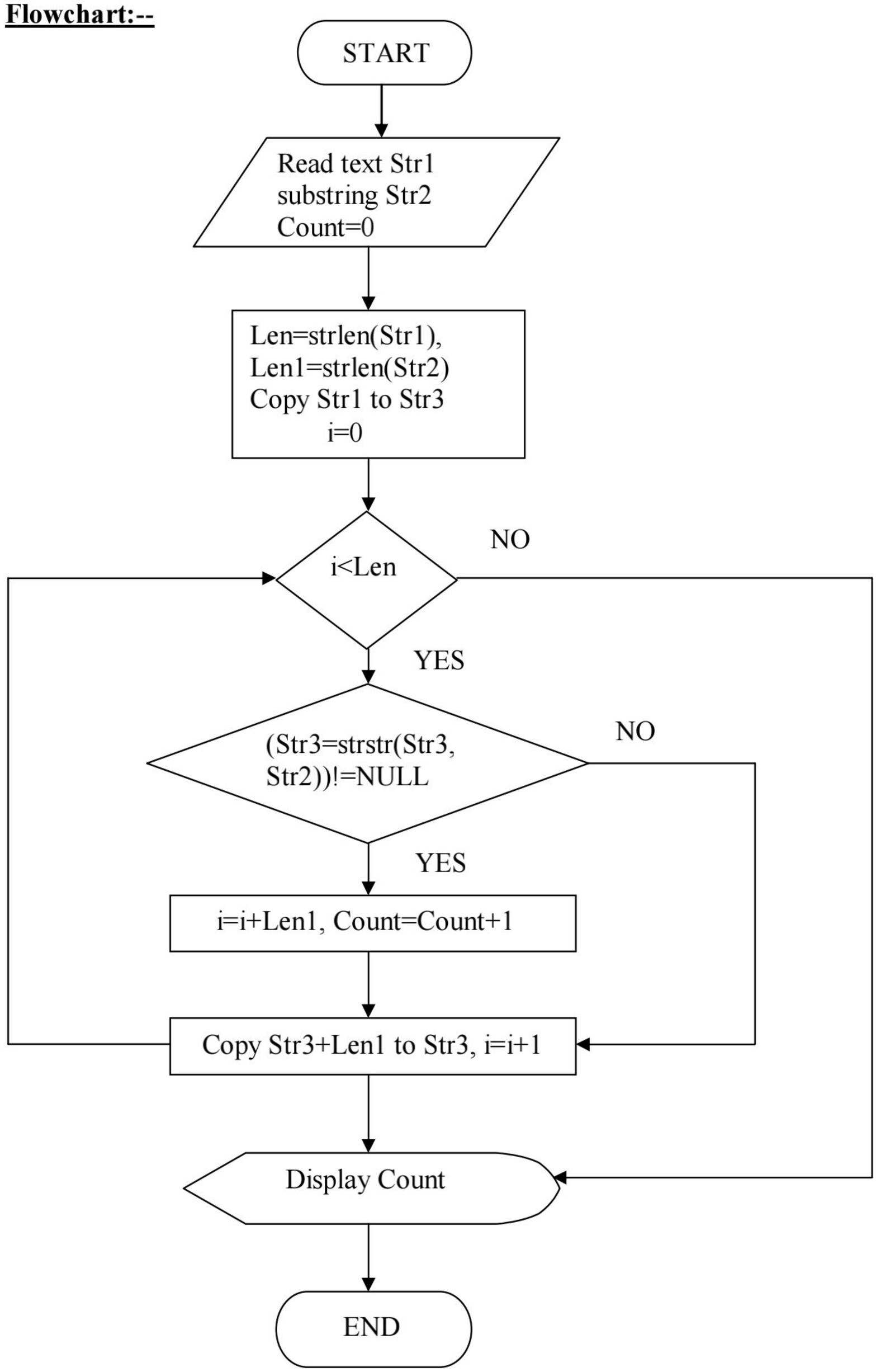
Step 5: Check (Str3=strstr(Str3,Str2))!=NULL then go to Step 6 otherwise go to Step 7
Step 6: Compute i=i+Len1, Count=Count+1.
Step 7: Copy Str3+Len1 to Str3.
Step 8: Display Count.

Flowchart:--



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Program:--

```
//Write a program to read a line of text from the keyboard and print out the number of
//      occurrences of a given substring using the function strstr().


//Date: 18/03/2010

#include<stdio.h>
#include<conio.h>

#define MAX 50

void main()
{
        char *Str1,*Str2,*Str3;
        int i,Len,Len1,Count;

        clrscr();

        Count=0;

        printf("Enter Text:--\n");
        scanf("%[^\n]s",Str1);

        fflush(stdin);

        printf("Enter Substring:--\n");
        scanf("%[^\n]s",Str2);

        Len=strlen(Str1);
        Len1=strlen(Str2);

        strcpy(Str3,Str1);

        for(i=0;i<Len;i++)
        {
                if((Str3=strstr(Str3,Str2))!=NULL)
                {
                        i=i+Len1;
                        Count=Count+1;
                }
                strcpy(Str3,(Str3+Len1));
        }

        printf("\n\nNumber of occurences is:-- %d",Count);
        getch();
}
```

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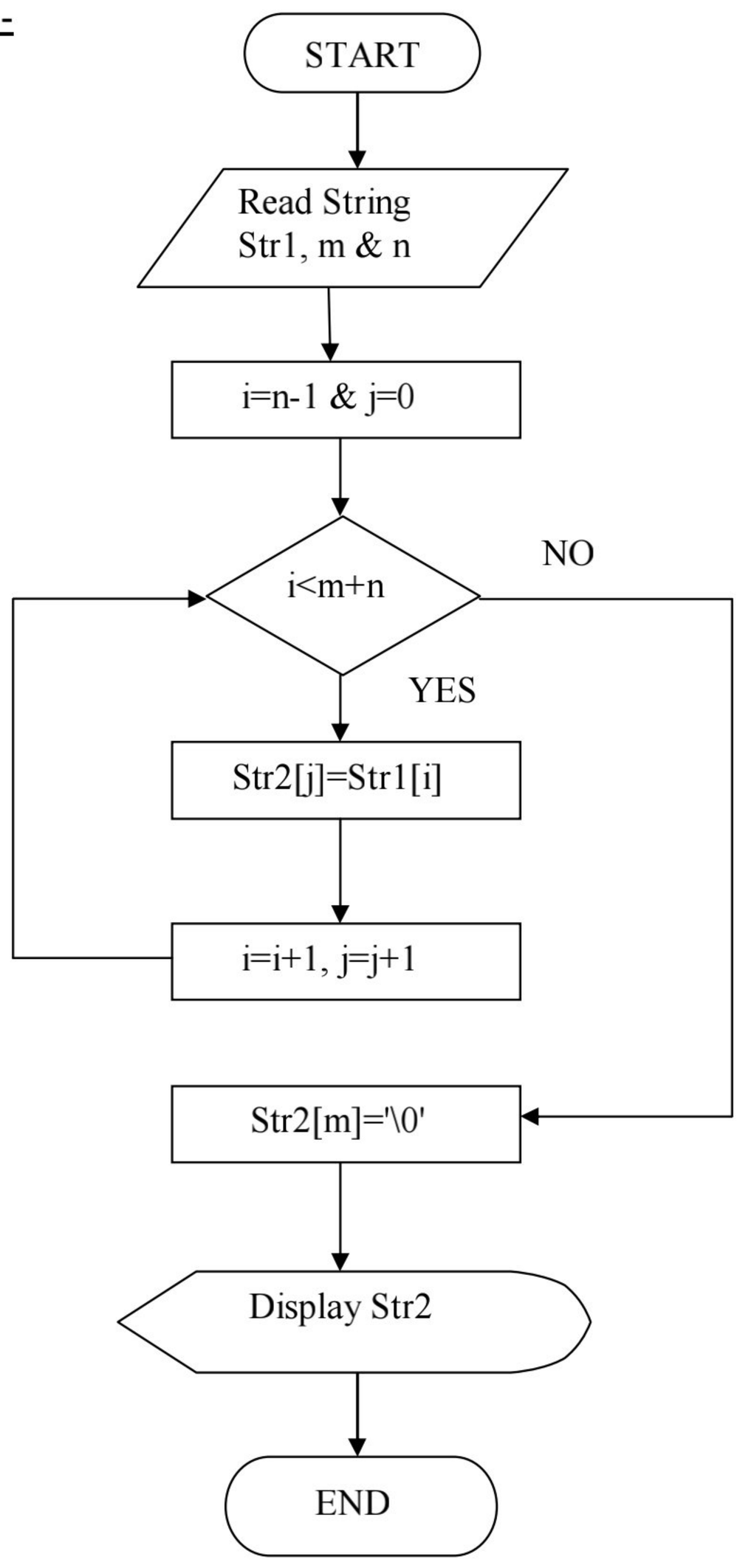
8.13 Write a program that will copy m consecutive characters from a string s1 beginning at position n into another string s2.

Algorithm:--

Step 1: Read String Str1 & Value of m (Number of Characters Which U Wnat to Copy) & n (Beginnig Index from Which U Want to Copy).
Step 2: Compute i=n-1 & j=0.
Step 3: For i=n-1 to m+n repeat Step 4.
Step 4: Compute Str2[j]=Str1[i].
Step 5: Compute Str2[m]='\0'.
Step 6: Display Str2.

Flowchart:--



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Program:--

```
//Write a program that will copy m consecutive characters from a string s1 beginning at
//        position n into another string s2.


//Date: 18/03/2010

#include<stdio.h>
#include<conio.h>

#define MAX 50

void main()
{
        char Str1[MAX],Str2[MAX];
        int i,m,n,j;

        clrscr();

        printf("Enter A String:--\n");
        scanf("%[^\n]s",Str1);

        printf("\nEnter Number of Characters Which U Wnat to Copy-->\n");
        scanf("%d",&m);

        printf("\nEnter Beginnig Index from Which U Want to Copy-->\n");
        scanf("%d",&n);

        for(i=n-1,j=0;i<m+n;i++,j++)
        {
                Str2[j]=Str1[i];
        }

        Str2[m]='\0';

        printf("\n\nCopied String is--> %s \n\n",Str2);
        getch();
}
```

Output:--

```
Enter A String:--
Ritesh Kumar Jain
Enter Number of Characters Which U Wnat to Copy-->
4
Enter Beginnig Index from Which U Want to Copy-->
8
Copied String is-->
esh K
```

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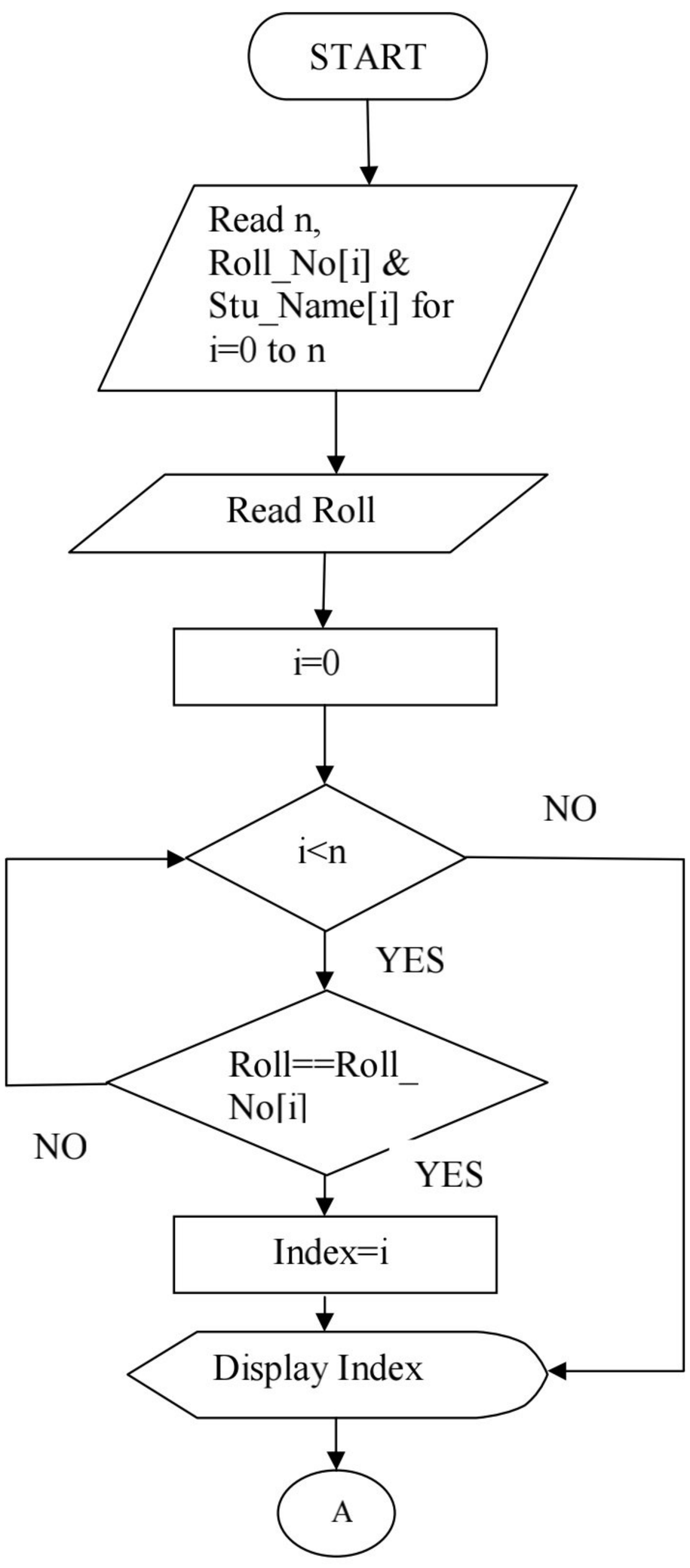
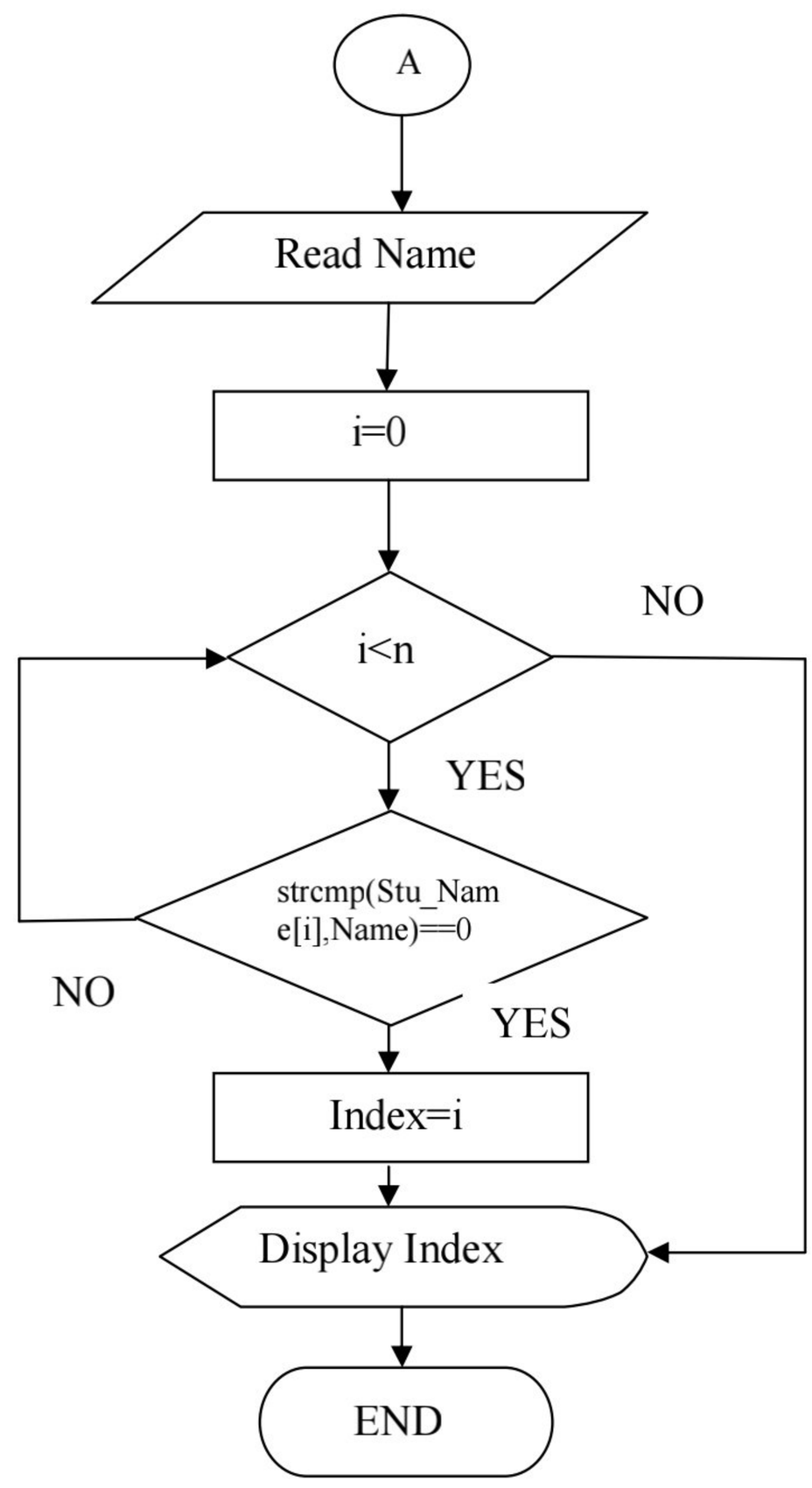
8.14 Write a program to create a directory of students with roll numbers.The program should display the roll number for a specified name and vice-versa.

Algorithm:--

Step 1: Read n (Number of Student Name U Want to Enter).
Step 2: Read Roll_No[i] & Stu_Name[i] for i=0 to n.
Step 3: Read Roll (Student Roll No which U want to Search).
Step 4: For i=0 to n repeat Step 5 to Step 6
Step 5: Check Roll==Roll_No[i] then go to Step 6
Step 6: Compute Index=i
Step 7: Display Index.
Step 8: Read Name (Student Name which U want to Search).
Step 9: For i=0 to n repeat Step 5 to Step 6
Step 10: Check strcmp(Stu_Name[i],Name)==0 then go to Step 6
Step 11: Compute Index=i
Step 12: Display Index.

Flowchart:--





Program:--

// Write a program to create a directory of students with roll numbers.The program should
//display the roll number for a specified name and vice-versa.

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

#define MAX 50
void main()
{
        char Stu_Name[MAX][MAX],Name[MAX];
        int Roll_No[MAX],n,i,Roll,Index;

        clrscr();

        printf("How Many Student Name U Want to Enter\n\n");
        scanf("%d",&n);

        printf("Enter Roll No. & Students Name:--\n");

        for(i=0;i<n;i++)
        {
                scanf("%d",&Roll_No[i]);
                scanf("%s",Stu_Name[i]);
        }

        printf("\nEnter Student Roll No which U want to Search:--\n");
        scanf("%d",&Roll);

        for(i=0;i<n;i++)
        {
                if(Roll==Roll_No[i])
                {
                        Index=i;
                }
        }

        printf("\nName of Student is --> %s whose Roll No is:--%d",Stu_Name[Index],Roll);

        printf("\n\nEnter Student Name which U want to Search:--\n");
        scanf("%s",Name);

        for(i=0;i<n;i++)
        {
                if(strcmp(Stu_Name[i],Name)==0)
                {
                        Index=i;
                }
        }

        printf("\n\nRoll No of is:-- %d Student Whose Name is:--
%s\n",Roll_No[Index],Stu_Name[Index]);
```

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```
        getch();
}
```

Output:--

```
How Many Student Name U Want to Enter
3
Enter Roll No. & Students Name:--
2     Ritesh
7     Amit
12    Pooja
Enter Student Roll No which U want to Search:--
7
Name of Student is --> Amit whose Roll No is:--7

Enter Student Name which U want to Search:--
Pooja
Roll No of is:-- 12 Student Whose Name is:-- Pooja
```

8.15 Given a string

char str[ ] =”123456789”;

Write a program that displays the following:

```
        1
      2 3 2
    3 4 5 4 3
  4 5 6 7 6 5 4
5 6 7 8 9 8 7 6 5
```

Algorithm:--

Step 1: Store “123456789” to Str.
Step 2: For i=0 to 5 repeat Step 3 to Step to Step 13
Step 3: For k=4 to i repeat Step 4
Step 4: Display “ ” (Space).
Step 5: Store i to l.
Step 6: For j=0 to i repeat Step 7 to Step 8
Step 7: Display Str[l]
Step 8: Compute l=l+1
Step 9: Compute l=l-2
Step 10: For k=0 to i repeat Step 11 to Step 12
Step 11: Display Str[l]
Step 12: l=l-1.
Step 13: Display “\n”

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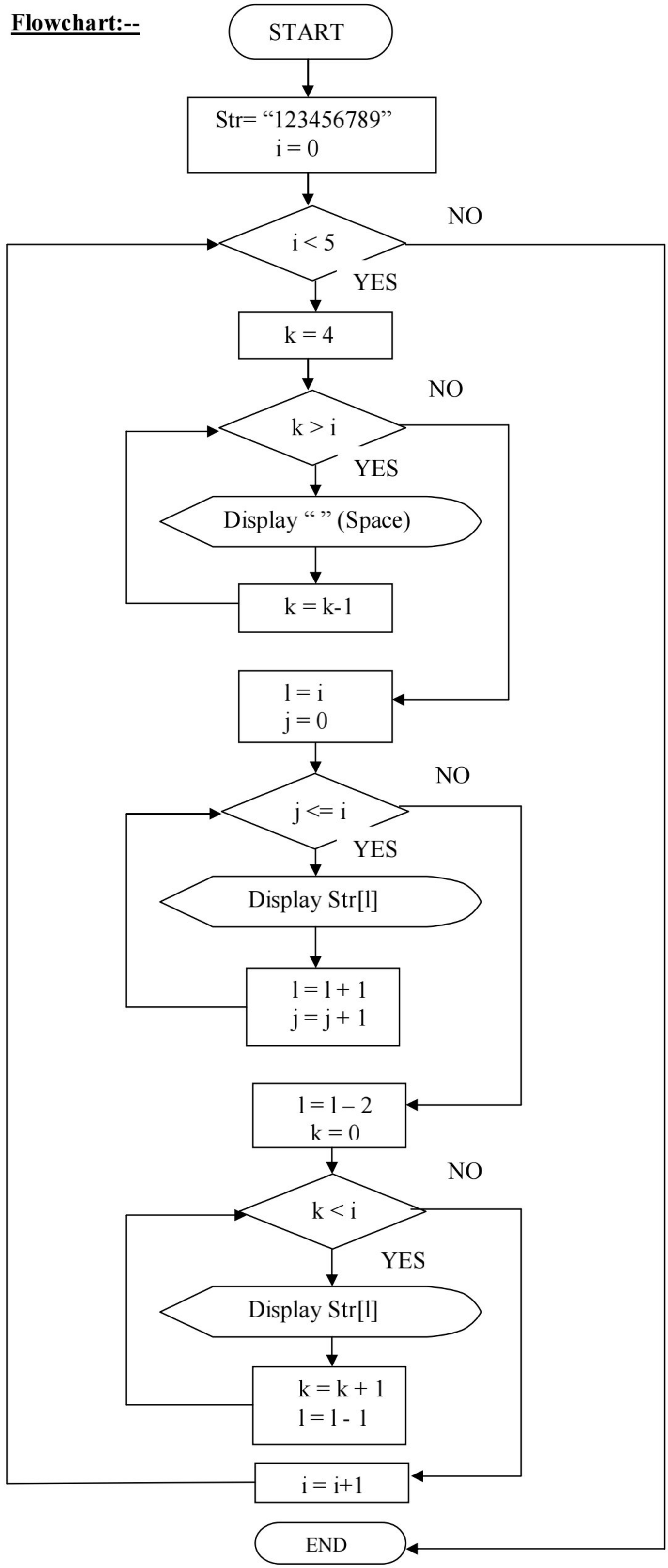
Flowchart:--



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Program:--

```
//Given a string
                    // char str[ ] =”123456789”;
//Write a program that displays the following:
 //          1
 //        2 3 2
 //      3 4 5 4 3
 //  4 5 6 7 6 5 4
//5 6 7 8 9 8 7 6 5


#include<stdio.h>
#include<conio.h>

void main()
{
        char Str[]="123456789";
        int i,j,k,l;

        clrscr();

          for(i=0;i<5;i++)
          {
                for(k=4;k>i;k--)
                {
                        printf(" ");
                }

                for(j=0,l=i;j<=i;j++,l++)
                {
                        printf("%c",Str[l]);
                }
                l=l-2;
                for(k=0;k<i;k++,l--)
                printf("%c",Str[l]);


                printf("\n");
          }
        getch();

}
```

Output:--

```
        1
      2 3 2
    3 4 5 4 3
  4 5 6 7 6 5 4
5 6 7 8 9 8 7 6 5
```

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9.3 Use recursive function calls to evaluate

$$F(x) = x - x^3/3! + x^5/5! - x^7/7! + \ldots\ldots\ldots\ldots\ldots\ldots$$

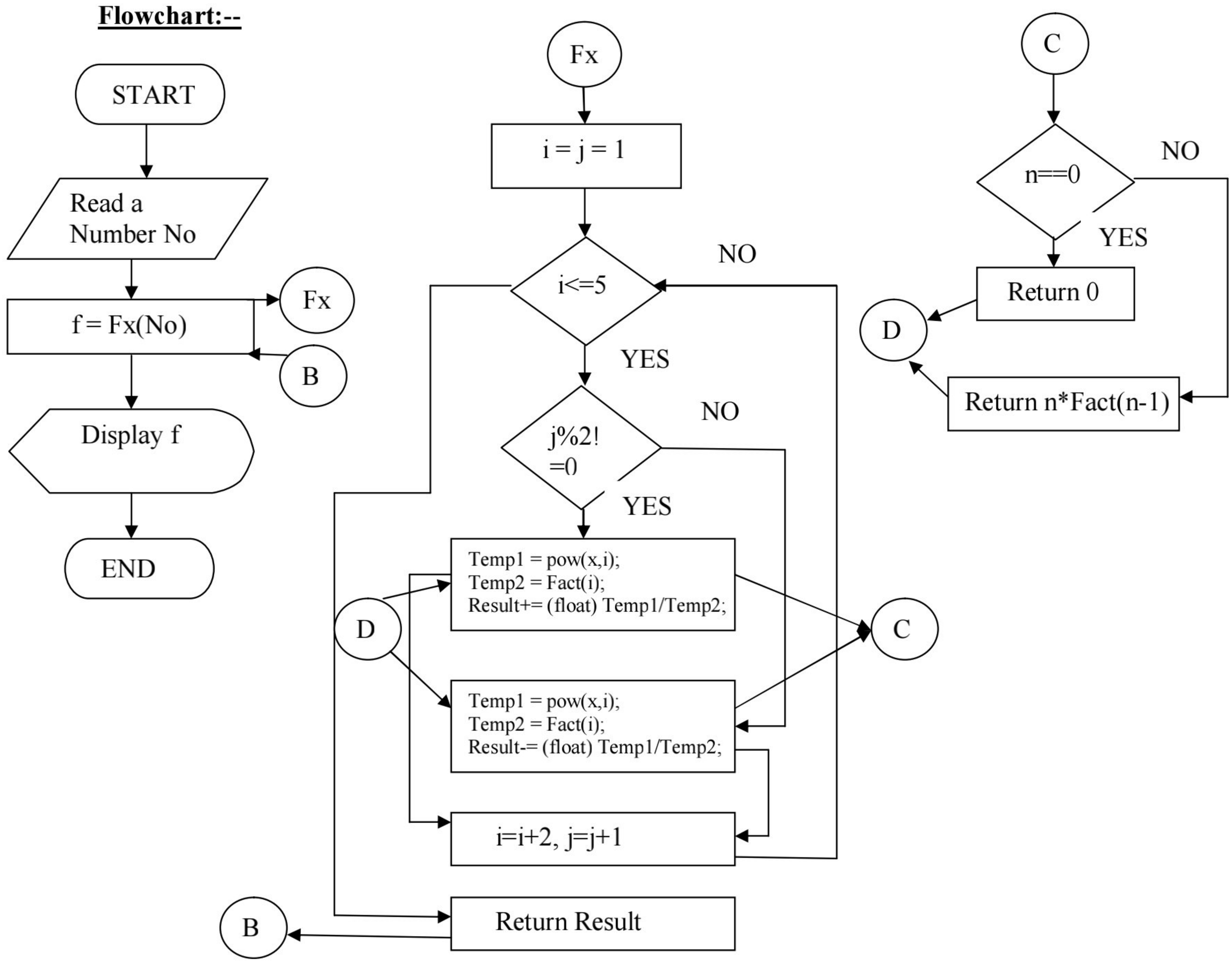
Algorithm:--

Step 1: Read a Number No.
Step 2: Call function f = Fx(No).
Step 3: Display f.

Fx(No)
Step 1: Store 1 to i & j.
Step 2: For i<=5 repeat Step 3 to Step 6
Step 3: Check j%2!=0 then go to Step 4 otherwise go to Step 5
Step 4: Compute Temp1 = pow(x,i), Temp2 = Fact(i), Result += (float) Temp1/Temp2.
Step 5: Compute Temp1 = pow(x,i), Temp2 = Fact(i), Result -= (float) Temp1/Temp2.
Step 6: Compute j=j+1 & i= i+2
Step 7: Return Result.

Fact(n)
Step 1: Check n==0 then return 0 otherwise go to Step 2.
Step 2: return n*Fact(n-1).

Flowchart:--



Program:--

//Use recursive function calls to evaluate

// F(x) = x – x3/3! + x5/5! – x7/7! + …….

//19/03/2010

```
#include<stdio.h>
#include<conio.h>
#include<math.h>

int Fact(int n)
{
	if(n==0)
		return 1;
	else
		return (n*Fact(n-1));
}

float Fx(int x)
{
	float Result=0;
	int i,j,Temp1,Temp2;

	for(i=1,j=1;i<=5;i+=2,j++)
	{
		if(j%2!=0)
		{
			Temp1 = pow(x,i);
			Temp2 = Fact(i);
			Result += (float) Temp1/Temp2;
		}
		else
		{
			Temp1 = pow(x,i);
			Temp2 = Fact(i);
			Result -= (float) Temp1/Temp2;
		}
	}
	return Result;
}

void main()
{
	int No;
	float F;

	clrscr();

	printf("Enter a Number-->\n");
```

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```
        scanf("%d",&No);

        F = Fx(No);

        printf("Result--> %f",F);

        getch();
}
```

9.6 Write a function that will round a floating-point number to an indicated decimal place. For example the number 17.457 would yield the value 17.46 when it is rounded off to two decimal places.

Algorithm:--

Flowchart:--

Program:--

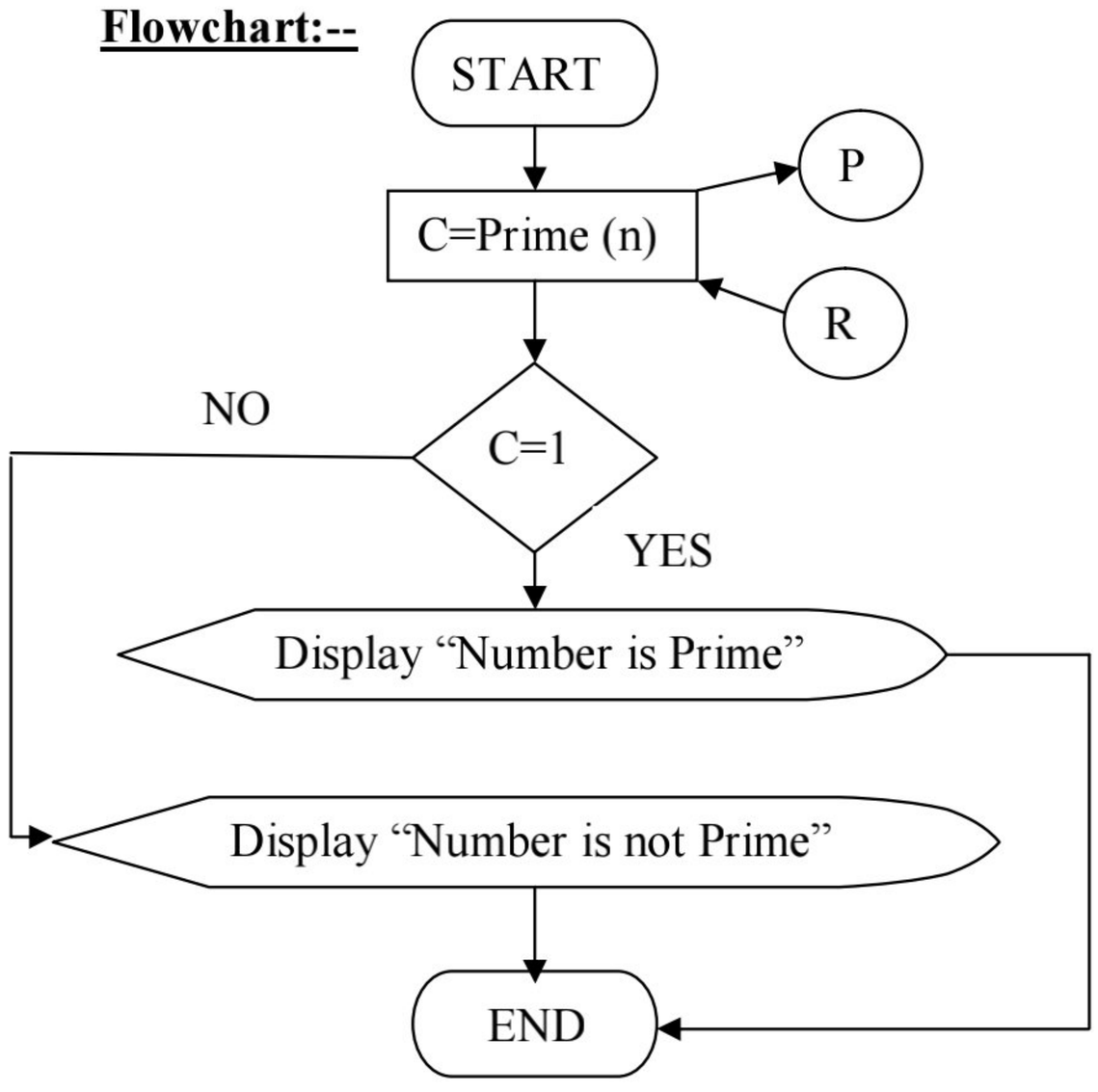
9.7 Write a function that returns 1 if its argument is a prime number and returns zero otherwise.

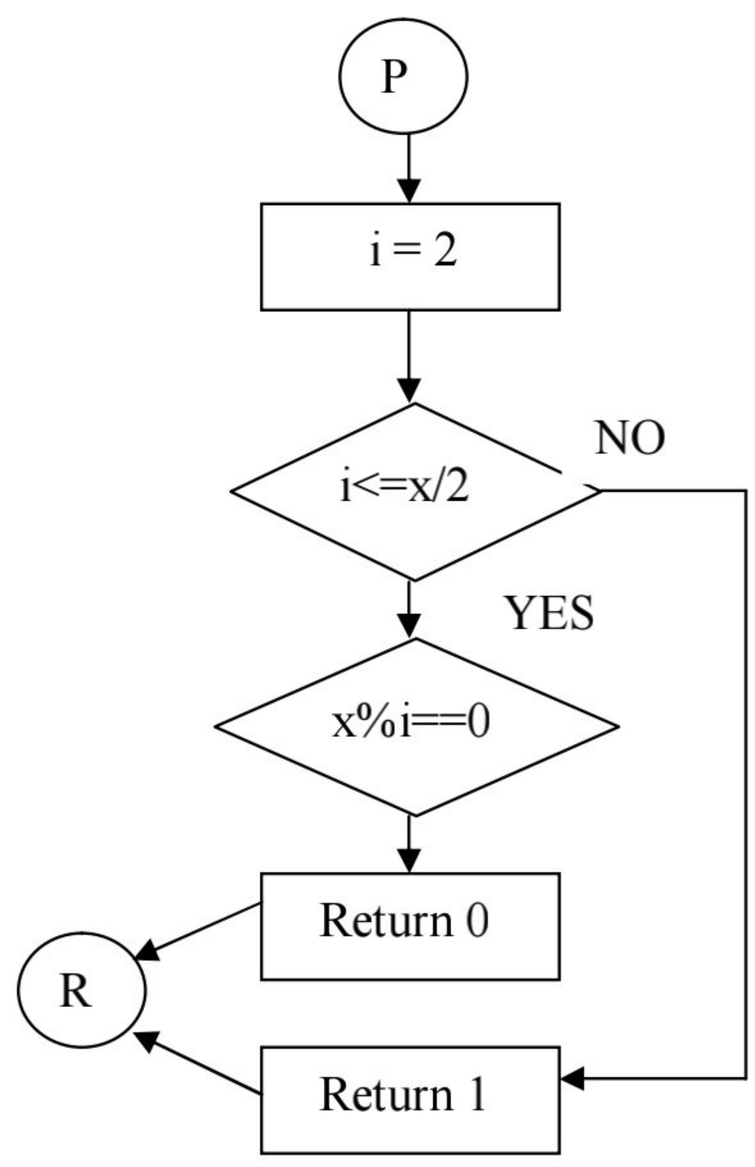
Algorithm:--

Step 1: Read n.
Step 2: Call C=Prime (n).
Step 3: Check C==1 then go to Step 4 otherwise go to Step 5
Step 4: Display "Number is Prime"
Step 5: Display "Number is not Prime"

Prime(x)
Step 1: For i=2 to x/2 repeat Step 2
Step 2: Check x%i == 0 then return 0.
Step 3: return 1.

Flowchart:--





Program:--

```
//Write a function that returns 1 if its argument is a prime number and returns zero
//      otherwise.


//19/03/2010

int prime(int x)
{
        int i;

        for(i=2;i<=x/2;i++)
        {
                if(x%i==0)
                        return 0;
        }
        return 1;
}

void main()
{
        int n,c;

        clrscr();

        printf("Enter a Number-->\n");
        scanf("%d",&n);

        c = prime(n);

        if(c==1)
                printf("\nNumber %d is Prime",n);
        else
                printf("\nNumber %d is Not Prime",n);

        getch();
}
```

Output:--

```
Enter a Number-->
5
Number 5 is Prime
```

9.10 Develop a modular interactive program using functions that reads the values of three sides of a triangle and displays either its area or its perimeter as per the request of the user. Given the three sides a, b and c.

Perimeter = a+b+c
Area = Sqrt((s-a)(s-b)(s-c))
Where s = (a+b+c)/2

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Algorithm:--

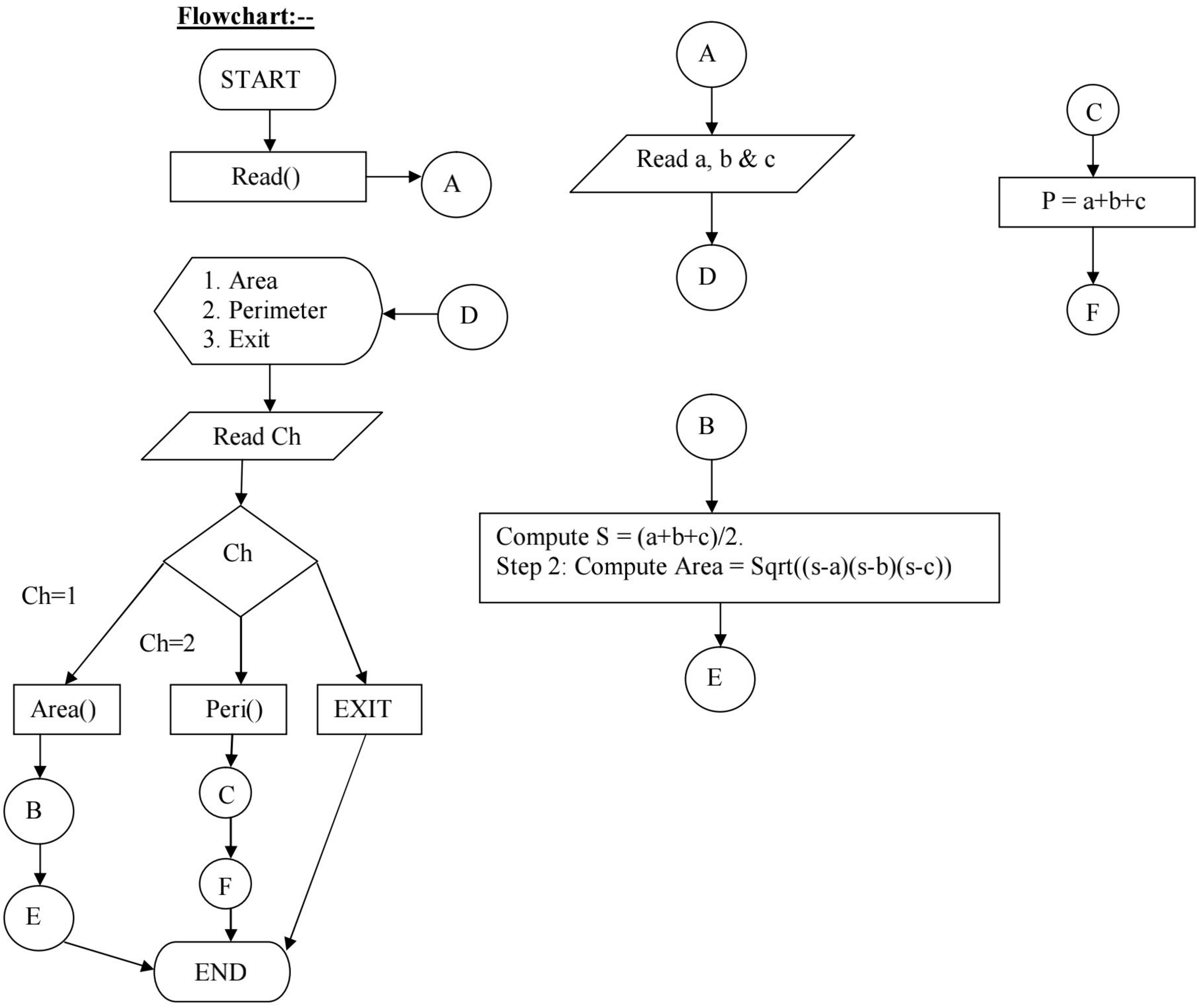
Step 1: Call Read().
Step 2: Display 1. Area 2. Perimeter 3. Exit
Step 3: Read Ch (1 or 2 or 3)
Step 4: Check Ch
Step 5: Ch==1 then call Area().
Step 6: Ch==2 then call Peri().
Step 7: Ch==3 then Exit.

Read()
Step 1: Read a, b & c.

Area()
Step 1: Compute S = (a+b+c)/2.
Step 2: Compute Area = Sqrt((s-a)(s-b)(s-c))
Step 3: Display Area.

Peri()
Step 1: Compute P = a+b+c
Step 2: Display P.

Flowchart:--



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Program:--

```
//Develop a modular interactive program using functions that reads the values of three
//sides of a triangle and displays either its area or its perimeter as per the request of the
//user. Given the three sides a, b and c.

//Perimeter = a+b+c
//Area = Sqrt((s-a)(s-b)(s-c))
//Where s = (a+b+c)/2


#include<math.h>

int a,b,c;

void Read()
{
        printf("Enter three sides of Triangle-->\n");
        scanf("%d %d %d",&a,&b,&c);
}

void Area()
{
        double S,Area,Temp;

        S=(double) (a+b+c)/2;

        Area=sqrt((S-a)*(S-b)*(S-c));

        printf("Area of Triangle:-->  %lf",Area);
}

void Peri()
{
        int P;

        P=a+b+c;

        printf("Perimeter of Triangle:-->  %d",P);
}

void main()
{
        int ch;

        clrscr();

        Read();

        while(1)
        {
                clrscr();
```

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```
        printf("1. Area \n2. Perimeter \n3. Exit\n");
        printf("Enter UR Choice\n");
        scanf("%d",&ch);

        switch(ch)
        {
            case 1:
                Area();
                break;
            case 2:
                Peri();
                break;
            default:
                exit(0);
        }
        getch();
    }
}
```

Output:--

```
Enter three sides of Triangle-->
2 3 4
1. Area
2. Perimeter
3. Exit
Enter UR Choice 2
Perimeter of Triangle:-->
9
```

9.11 Write a function that can be called to find the largest element of an m by n matrix.

Algorithm:--

Step 1: Read m(Number of Rows) & n(Number of Columns).
Step 2: Read Elements of matrix A[i][j] for i=0 to m-1 & j=0 to n-1.
Step 3: Display matrix A.
Step 4: Call L= Largest(A,m,n).
Step 5: Display L.

Largest(a,m,n)
Step 1: Store a[0][0] to Large.
Step 2: For i=0 to m repeat Step 3 to Step 5
Step 3: For j=0 to n repeat Step 4 to Step 5
Step 4: Check Large<a[i][j] then go to Step 5
Step 5: Compute Large=a[i][j].
Step 6: return Large.

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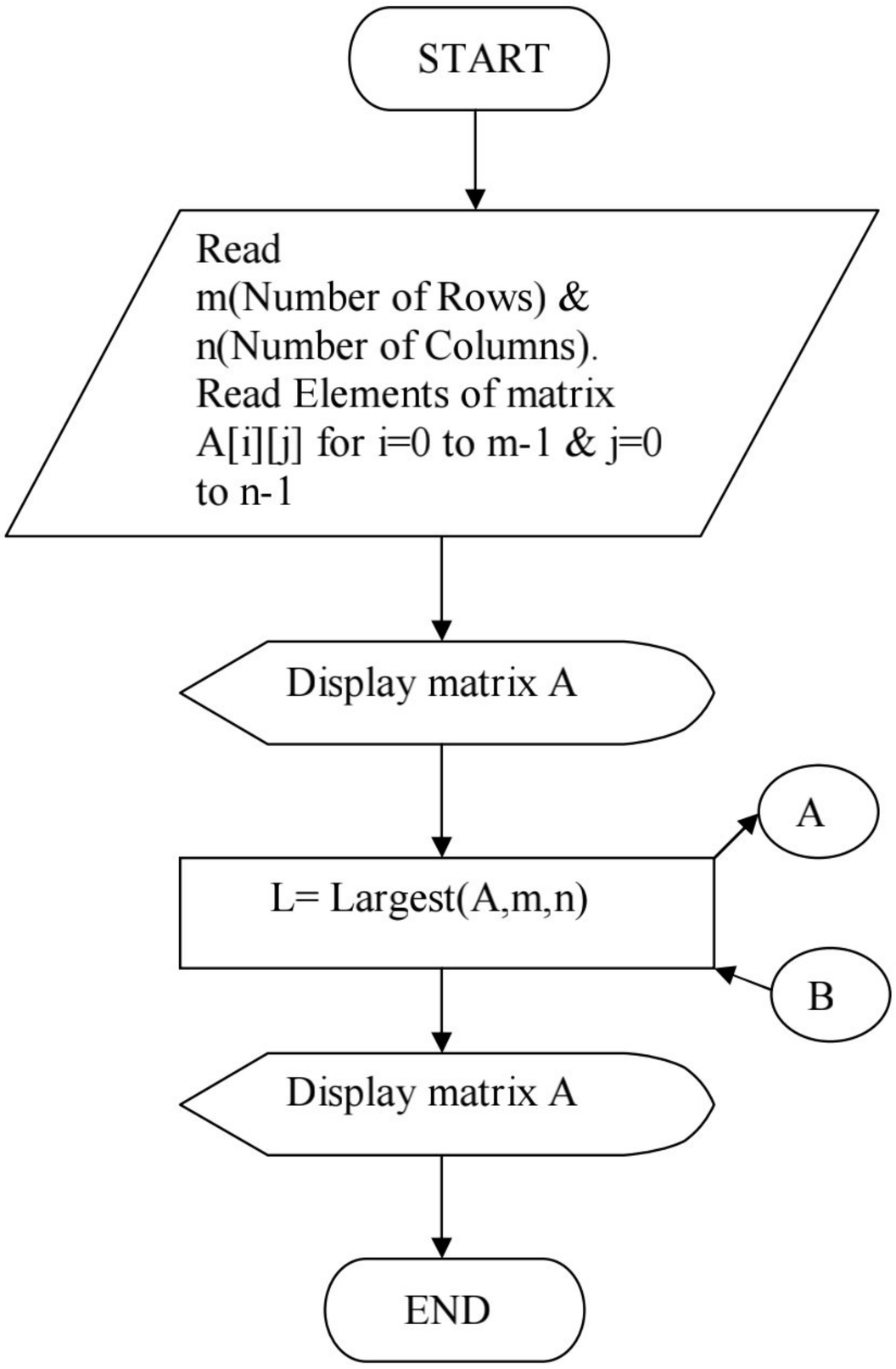
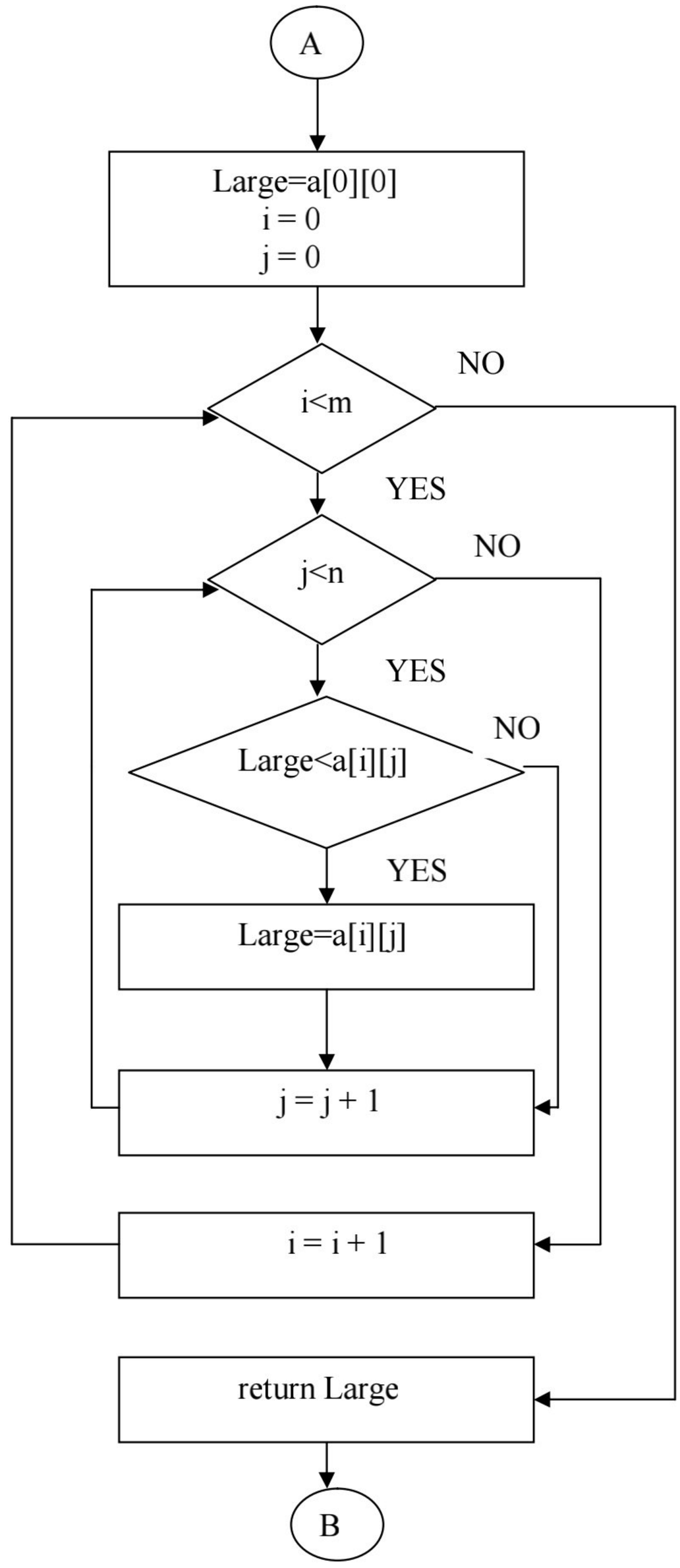
Flowchart:--





Program:--

```
//Write a function that can be called to find the largest element of an m by n matrix.
// Date : 19/03/2010

 #include<stdio.h>
 #include<conio.h>
 #define MAX 10
```

```
int Largest(int a[][MAX],int m,int n)
{
	int Large,i,j;

	Large=a[0][0];

	for(i=0;i<m;i++)
	{
		for(j=0;j<n;j++)
		{
			if(Large<a[i][j])
				Large=a[i][j];
		}
	}

	return Large;
}

void main()
{
	int A[MAX][MAX];
	int L,m,n,i,j;

	clrscr();

	printf("Enter Number of Rows\n");
	scanf("%d",&m);

	printf("Enter Number of Columns\n");
	scanf("%d",&n);

	printf("Enter Elements of Matrix:--\n");

	for(i=0;i<m;i++)
	{
		for(j=0;j<n;j++)
		{
			scanf("%d",&A[i][j]);
		}
	}

	clrscr();

	printf("Matrix is:--\n");

	for(i=0;i<m;i++)
	{
		for(j=0;j<n;j++)
		{
			printf("%d ",A[i][j]);
		}
	}
```

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```
        L = Largest(A,m,n);

        printf("\nLargest Element :-- %d",L);

        getch();
}
```

Output:--

```
Enter Number of Rows
2
Enter Number of Columns
3
Enter Elements of Matrix:--
2 6 7
8 2 5
Matrix is:--
2 6 7
8 2 5
Largest Element:--
8
```

9.12 Write a function that can be called to compute the product of two matrices of size m by n and n by m. The main function provides the values for m and n and two matrices.

Algorithm:--

Step 1: Read m & n (Number of Rows & Columns First Matrix).
Step 2: Read m1 & n1 (Number of Rows & Columns of Second Matrix).
Step 3: Check m==n1 if true than go to Step 4 otherwise go to Step 8.
Step 4: Read First Matrix A.
Step 5: Read Second Matrix B.
Step 6: Display A & B.
Step 7: Call Multiplication(a,b,m,n1).
Step 8: Display "Multiplication is not applicable".

Multiplication(a,b,m,n1)
Step 1: For i=0 to m repeat Step 2 to Step 5
Step 2: For j=0 to n1 repeat Step 3 to Step 5
Step 3: Compute c[i][j]=0.
Step 4: For k=0 to m repeat Step 5
Step 5: Compute c[i][j]=c[i][j]+(a[i][k]*b[k][j]).
Step 6: Display Matrix c.

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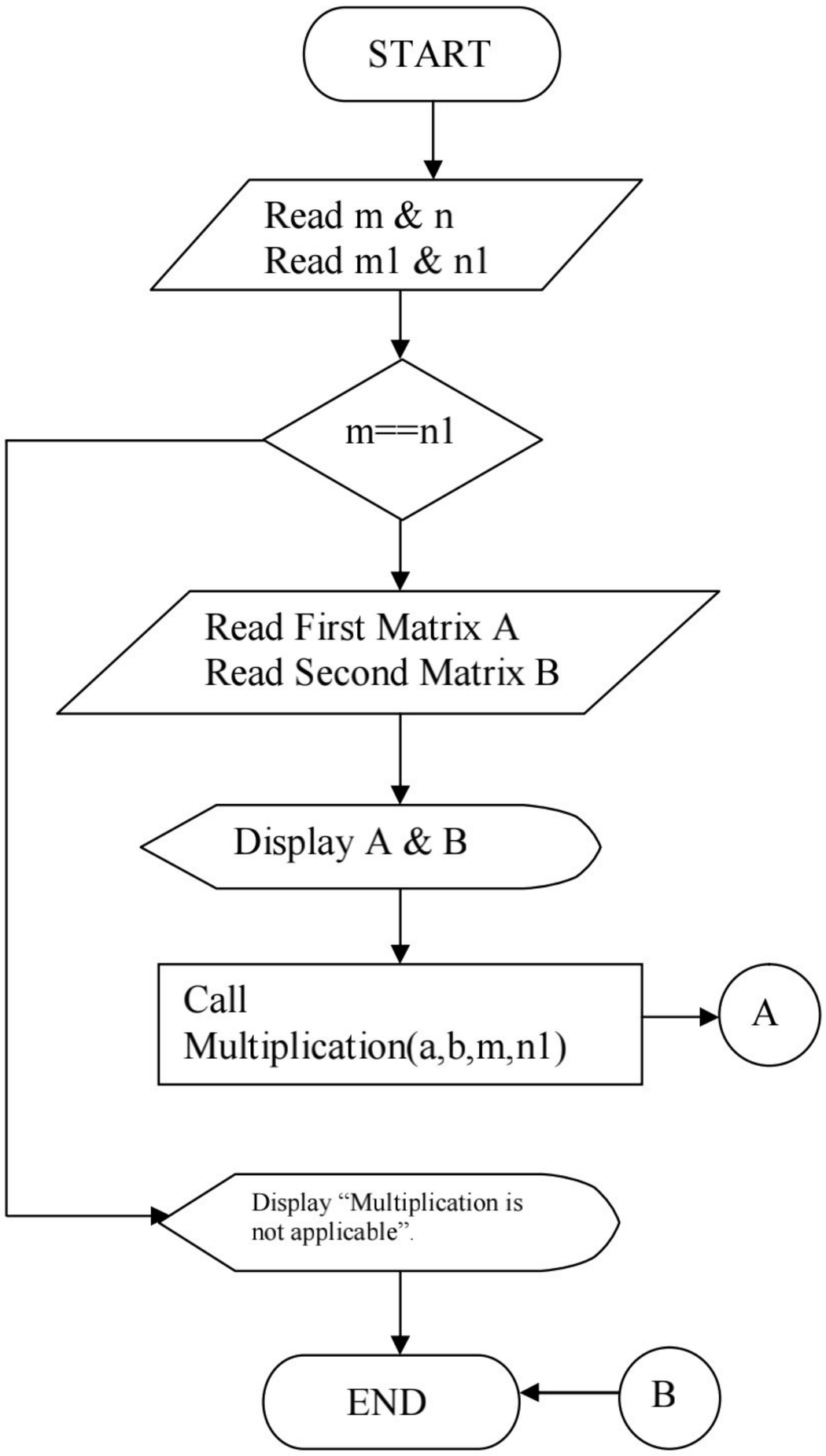
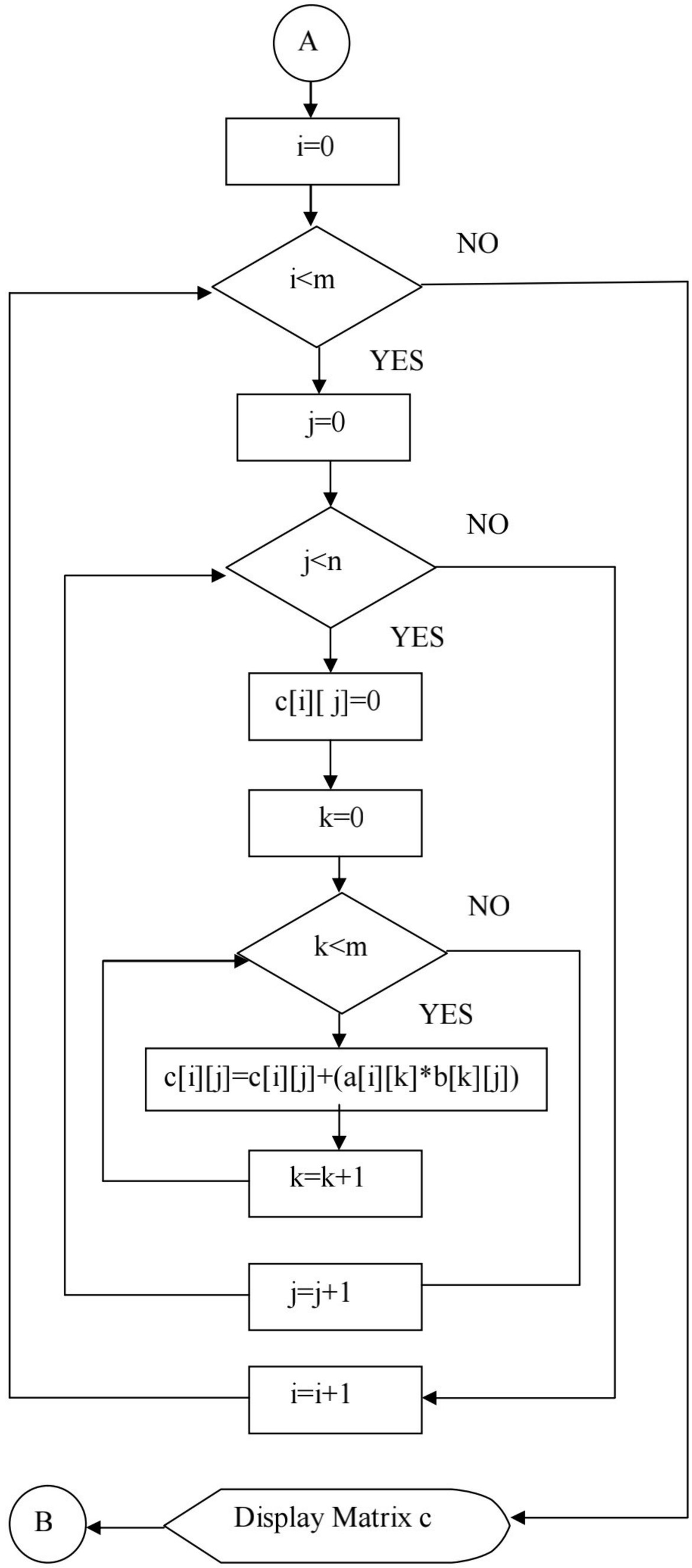
Flowchart:--





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Program:--

```
//Write a function that can be called to compute the product of two matrices of size m
//by n and n by m. The main function provides the values for m and n and two
//matrices.

// Date : 19/03/2010

#include<stdio.h>
#include<conio.h>
#define MAX 10

void Multiplication(int a[][MAX],int b[][MAX],int m,int n1)
{
        int c[MAX][MAX],i,j,k;

        for(i=0;i<m;i++)
        {
                for(j=0;j<n1;j++)
                {
                        c[i][j]=0;
                        for(k=0;k<m;k++)
                                c[i][j]=c[i][j]+(a[i][k]*b[k][j]);

                }
        }

        printf("Multiplication of Matrices is:--\n");

                for(i=0;i<m;i++)
                {
                        for(j=0;j<n1;j++)
                        {
                                printf("%d ",c[i][j]);
                        }
                        printf("\n");
                }

}

void main()
{
        int A[MAX][MAX],B[MAX][MAX];
        int L,m,n,m1,n1,i,j;

        clrscr();

        printf("Enter Number of Rows & Columns First Matrix\n");
        scanf("%d %d",&m,&n);

        printf("Enter Number of Rows & Columns of Second Matrix\n");
        scanf("%d %d",&m1,&n1);
```

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```
if(m==n1)
{
        printf("Enter Elements of First Matrix:--\n");

        for(i=0;i<m;i++)
        {
                for(j=0;j<n;j++)
                {
                        scanf("%d",&A[i][j]);
                }
        }

        printf("Enter Elements of Second Matrix:--\n");

        for(i=0;i<m1;i++)
        {
                for(j=0;j<n1;j++)
                {
                        scanf("%d",&B[i][j]);
                }
        }

        clrscr();

        printf("First Matrix is:--\n");

        for(i=0;i<m;i++)
        {
                for(j=0;j<n;j++)
                {
                        printf("%d ",A[i][j]);
                }
                printf("\n");
        }

        printf("Second Matrix is:--\n");

        for(i=0;i<m1;i++)
        {
                for(j=0;j<n1;j++)
                {
                        printf("%d ",B[i][j]);
                }
                printf("\n");
        }

Multiplication(A,B,m);
}
else
        printf("Multiplication is not applicable\n");

    getch();
```

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}

Output:--

```
Enter Number of Rows & Columns First Matrix
2 3
Enter Number of Rows & Columns of Second Matrix
3 2
Enter Elements of First Matrix:--
1 1 1
1 1 1
Enter Elements of Second Matrix:--
1 1
1 1
1 1
First Matrix is:--
1 1 1
1 1 1
Second Matrix is:--
1 1
1 1
1 1
Multiplication of Matrices is:--
2 2
2 2
```

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