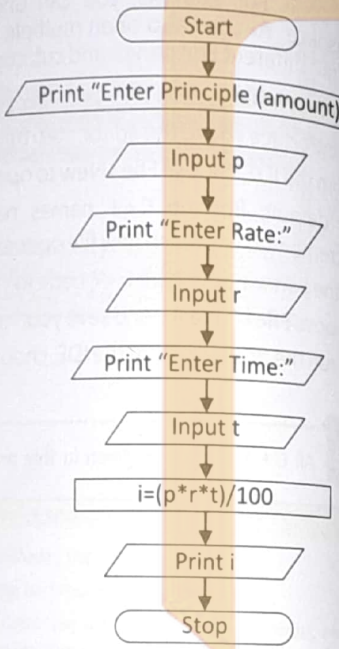
Practical 1

Write a program which accept[illegible] and time from user and print the simple interest.

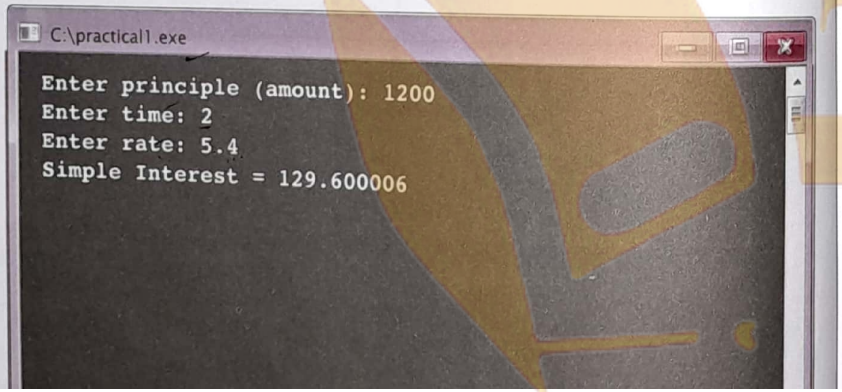
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 float p, r, t, i;

 cout << "Enter Principle (amount): ";
 cin >> p;
 cout << "Enter Rate: ";
 cin >> r;
 cout << "Enter Time: ";
 cin >> t;

 i = (p * r * t) / 100;
 cout << "Simple interest is : " << i;

 getch();
 return 0;
}
```

Flowchart



Output



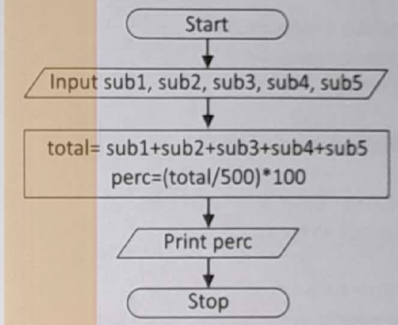
Practical 2

Write a program to find the marks percentage.

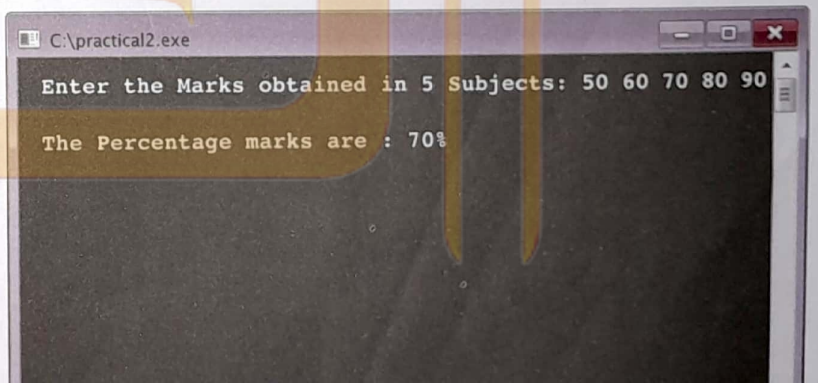
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 float sub1,sub2,sub3,sub4,sub5,perc,total;

 cout << "Enter the Marks obtained in 5 Subjects: ";
 cin >> sub1 >> sub2 >> sub3 >> sub4 >> sub5;

 total = sub1 + sub2 + sub3 + sub4 + sub5;
 perc = (total / 500) * 100;
 cout << "\nThe Percentage marks are : " << perc << "%";

 getch();
 return 0;
}
```

Flowchart



Output



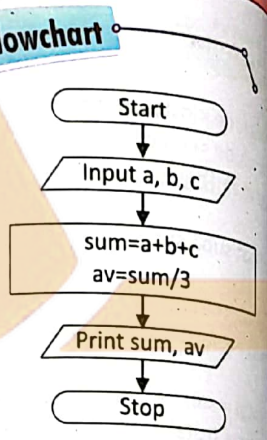
Practical 3

Write a program to calculate sum and average of three numbers.

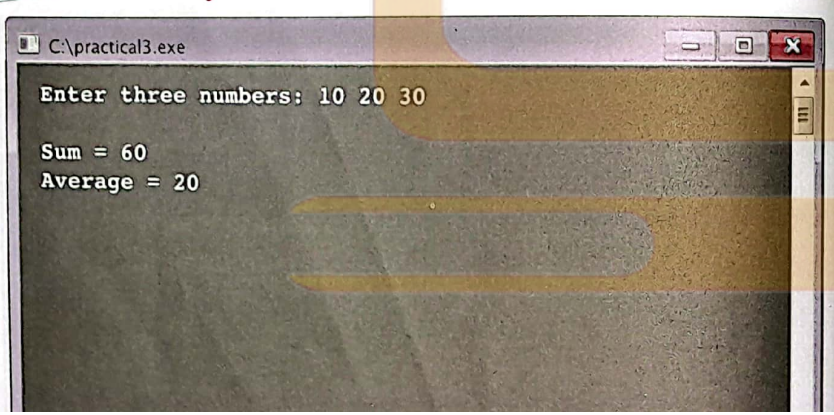
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 float a, b, c, sum, av;

 cout << "Enter three numbers: ";
 cin >> a >> b >> c;

 sum = a + b + c;
 av = sum / 3;

 cout << "\nSum = " << sum;
 cout << "\nAverage = " << av;

 getch();
 return 0;
}
```

Flowchart



Output



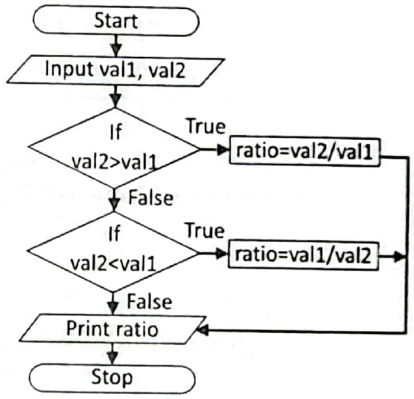
Practical 4

Write a program to calculate the ratio of two numbers.

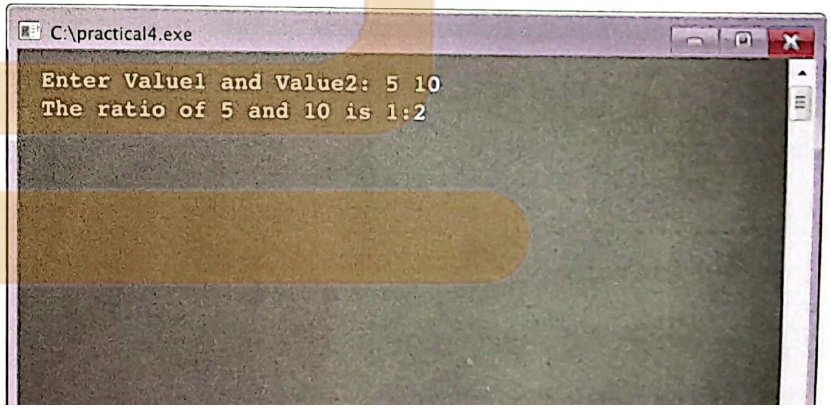
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 double val1, val2, ratio;

 cout << "Enter Value1 and Value2: ";
 cin >> val1 >> val2;

 if (val2 > val1)
    ratio = (val2 / val1);
 if (val2 < val1)
    ratio = (val1 / val2);

 cout << "The ratio of " << val1 << " and " << val2 << " is 1:" << ratio << '\n';

 getch();
 return 0;
}
```

Flowchart



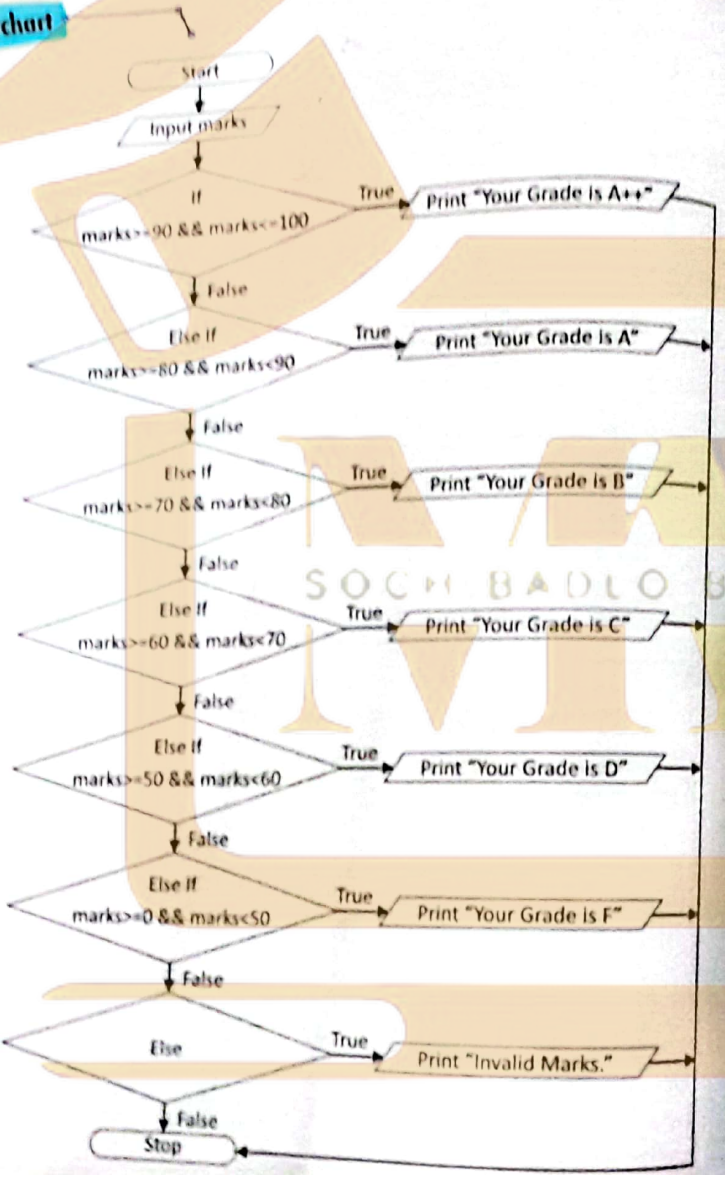
Output



Practical 5

Write a program to find grade of a student using if else statement.

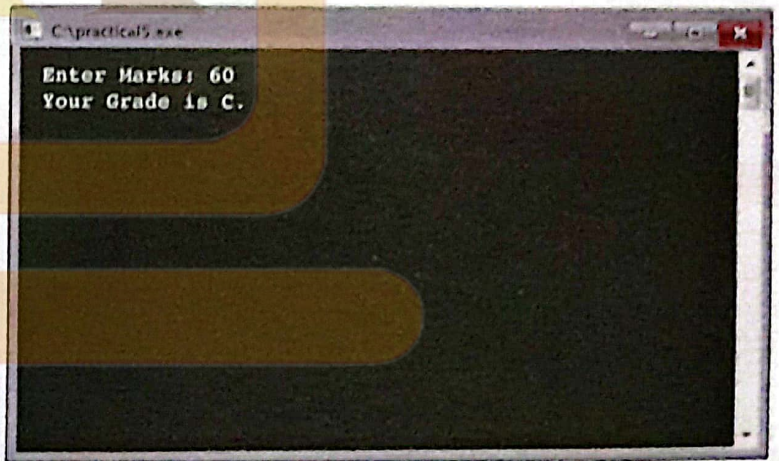
Flowchart



Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int marks;

 cout << "Enter Marks: ";
 cin >> marks;

if (marks>=90 && marks<=100)
  cout << "Your Grade is A+.";
else if (marks>=80 && marks<90)
  cout << "Your Grade is A.";
else if (marks>=70 && marks<80)
  cout << "Your Grade is B.";
else if (marks>=60 && marks<70)
  cout << "Your Grade is C.";
else if (marks>=50 && marks<60)
  cout << "Your Grade is D.";
else if (marks>=0 && marks<50)
  cout << "Your Grade is F.";
else
  cout << "Invalid Marks.";

getch();
return 0;
}
```

Output



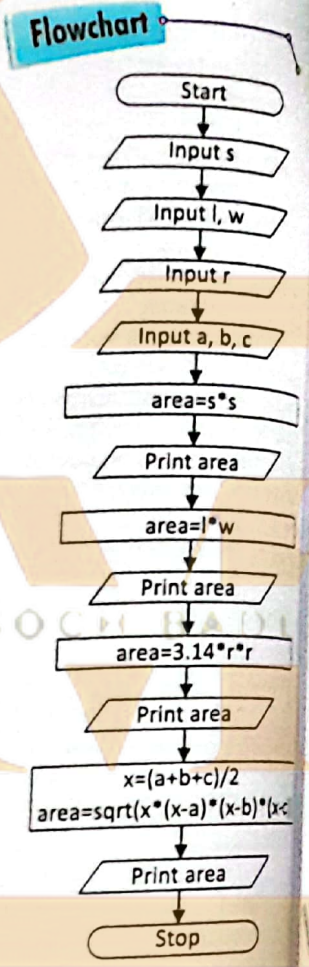
Practical 6

Write a program to find area of square, rectangle, circle and triangle.

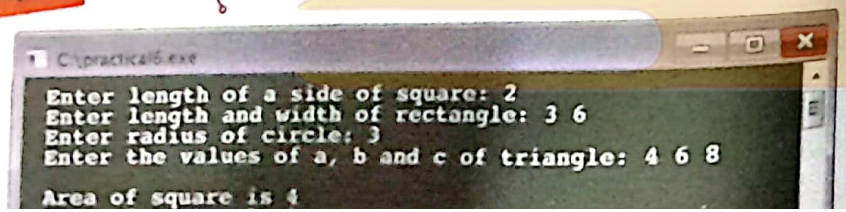
Program

```
#include <iostream.h>
#include <math.h>
#include <conio.h>
int main()
{
 float s, l, w, r, a, b, c, x, area;

 cout << "Enter length of a side of square: ";
 cin >> s;
 cout << "Enter length and width of rectangle: ";
 cin >> l >> w;
 cout << "Enter radius of circle: ";
 cin >> r;
 cout << "Enter the values of a, b and c of triangle: ";
 cin >> a >> b >> c;

 area = s * s;
 cout << "\nArea of square is " << area;
 area = l * w;
 cout << "\nArea of rectangle is " << area;
 area = 3.14 * r * r;
 cout << "\nArea of circle is " << area;
 x = (a + b + c) / 2;
 area = sqrt(x*(x-a)*(x-b)*(x-c));
 cout << "\nArea of triangle is " << area;

 getch();
 return 0;
}
```

Flowchart



Output



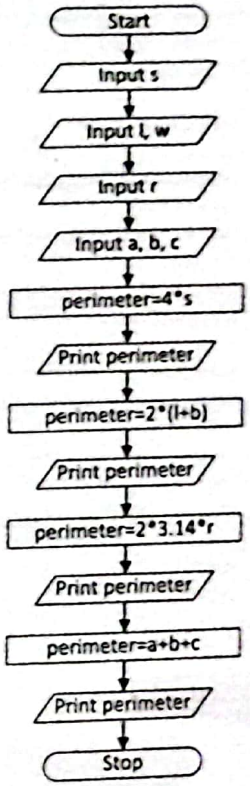
Practical 7

Write a program to find perimeter of square, rectangle, circle and triangle.

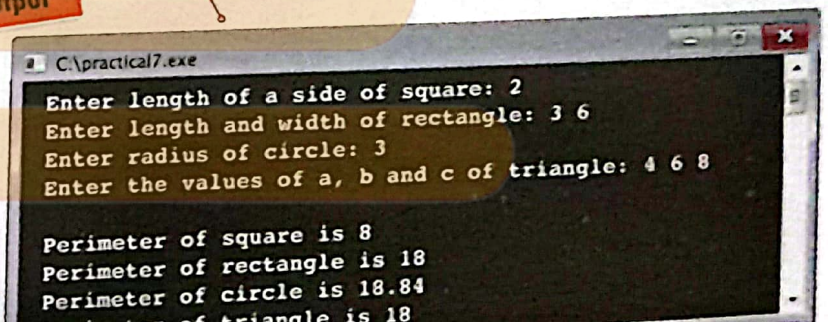
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 float s, l, w, r, a, b, c, x, perimeter;

 cout << "Enter length of a side of square: ";
 cin >> s;
 cout << "Enter length and width of rectangle: ";
 cin >> l >> w;
 cout << "Enter radius of circle: ";
 cin >> r;
 cout << "Enter the values of a, b and c of triangle: ";
 cin >> a >> b >> c;

 perimeter = 4 * s;
 cout << "\nPerimeter of square is " << perimeter;
 perimeter = 2 * (l + b);
 cout << "\nPerimeter of rectangle is " << perimeter;
 perimeter = 2 * 3.14 * r;
 cout << "\nPerimeter of circle is " << perimeter;
 perimeter = a + b + c;
 cout << "\nPerimeter of triangle is " << perimeter;

 getch();
 return 0;
}
```

Flowchart



Output



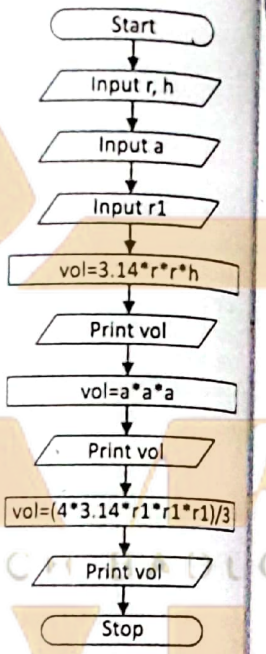
Practical 8

Write a program to find volume of cylinder, cube and sphere.

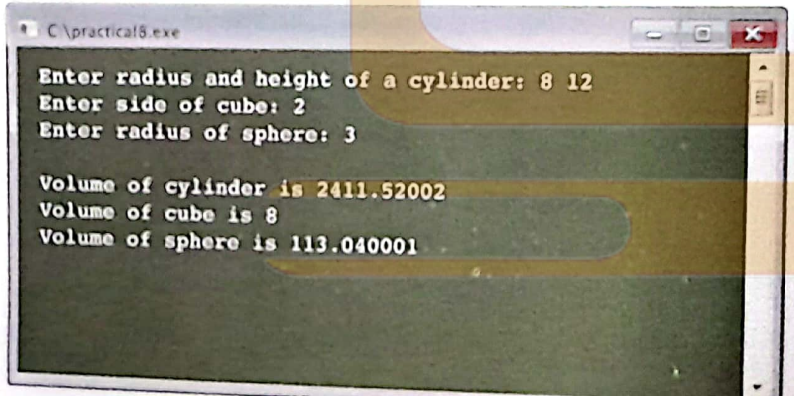
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 float r, h, a, r1, vol;

 cout << "Enter radius and height of a cylinder: ";
 cin >> r >> h;
 cout << "Enter side of cube: ";
 cin >> a;
 cout << "Enter radius of sphere: ";
 cin >> r1;

 vol = 3.14 * r * r * h;
 cout << "\nVolume of cylinder is " << vol;
 vol = a * a * a;
 cout << "\nVolume of cube is " << vol;
 vol = (4 * 3.14 * r1 * r1* r1) / 3;
 cout << "\nVolume of sphere is " << vol;

 getch();
 return 0;
}
```

Flowchart



Output



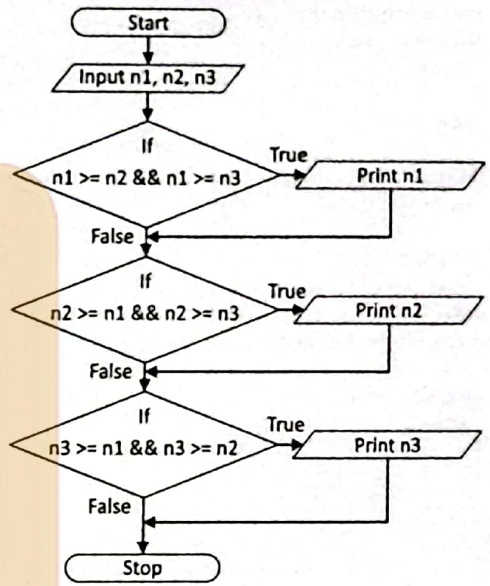
Practical 9

Write a program to find largest number among three numbers.

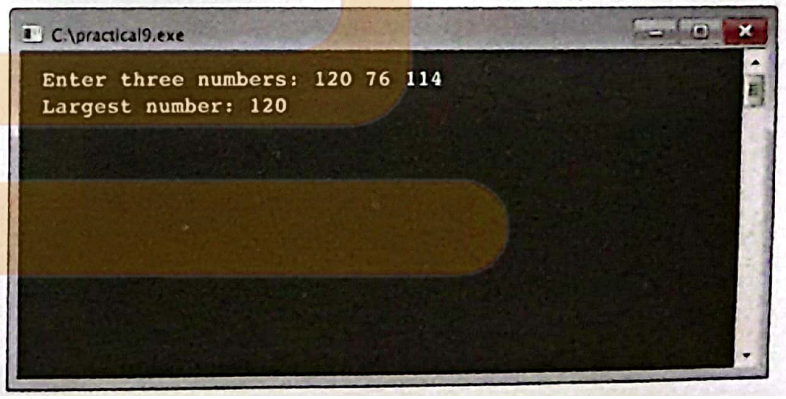
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 float n1, n2, n3;

 cout << "Enter three numbers: ";
 cin >> n1 >> n2 >> n3;

 if (n1 >= n2 && n1 >= n3)
  cout << "Largest number: " << n1;

 if (n2 >= n1 && n2 >= n3)
  cout << "Largest number: " << n2;

 if(n3 >= n1 && n3 >= n2) {
  cout << "Largest number: " << n3;

 getch();
 return 0;
}
```

Flowchart



Output



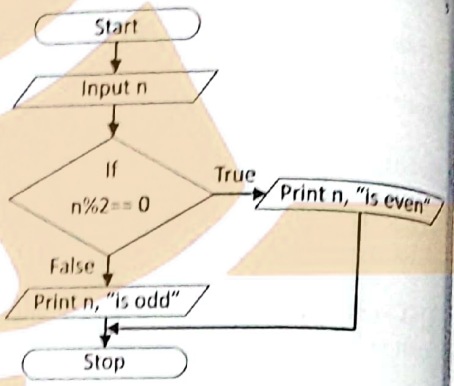
Practical 10

Write a program to check whether number is even or odd.

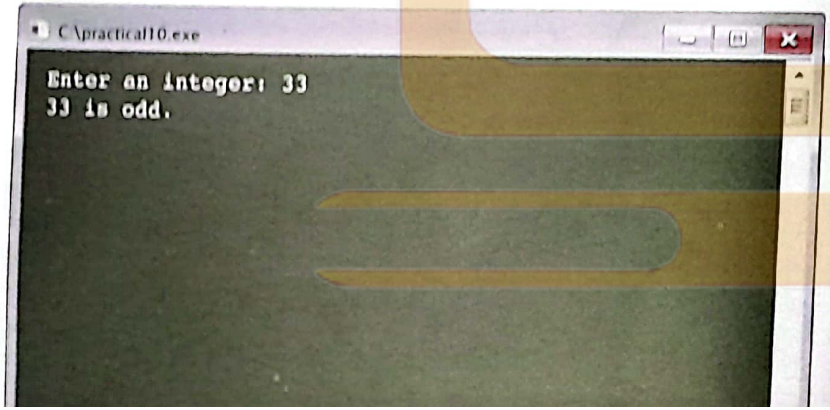
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int n;

 cout << "Enter an integer: ";
 cin >> n;

 if ( n % 2 == 0)
  cout << n << " is even.";
 else
  cout << n << " is odd.";

 getch();
 return 0;
}
```

Flowchart



Output



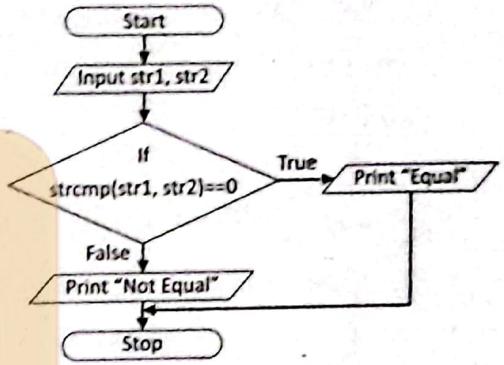
Practical 11

Write a program to compare two strings.

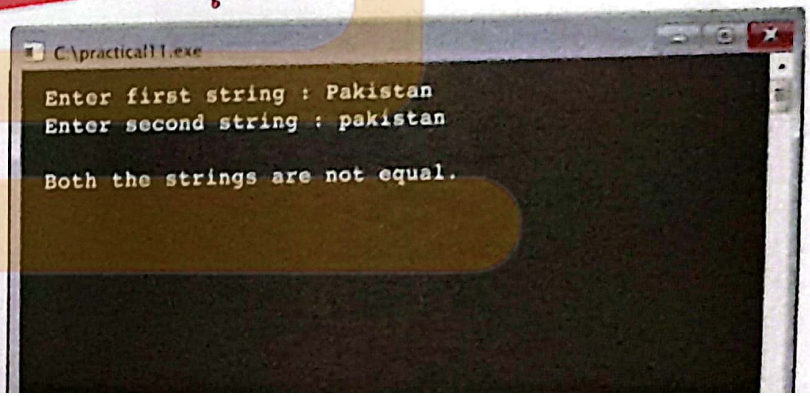
Program

```
#include <iostream.h>
#include <string.h>
#include <conio.h>
int main()
{
 char str1[100], str2[100];

 cout << "Enter first string : ";
 cin.getline(str1, 100);
 cout << "Enter second string : ";
 cin.getline(str2, 100);

 if (strcmp(str1, str2)==0)
  cout<<"\nBoth the strings are equal.";
 else
  cout<<"\nBoth the strings are not equal.";

 getch();
 return 0;
}
```

Flowchart



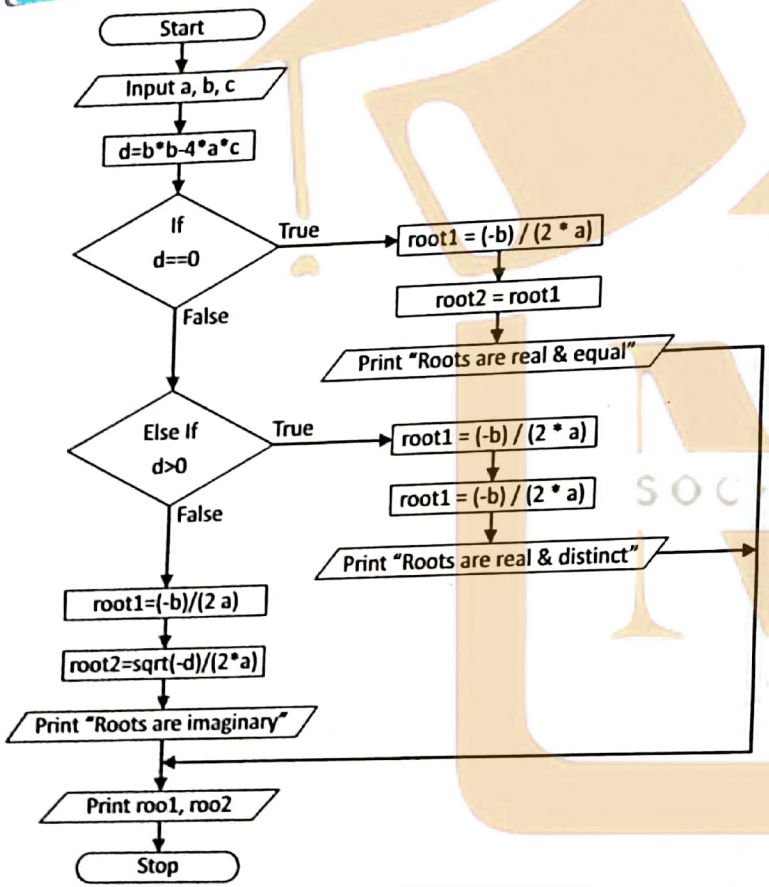
Output



Practical 12

Write a program to find the roots of a quadratic equation.

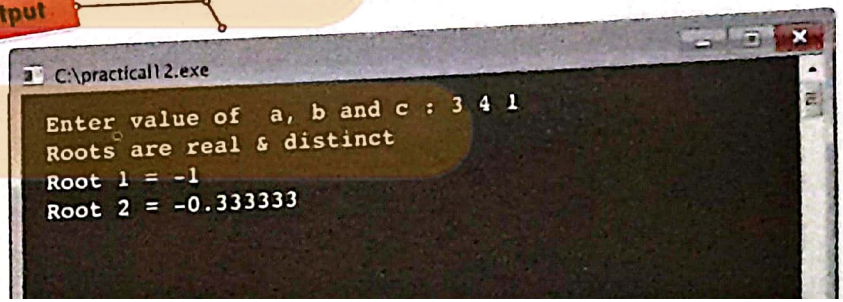
Flowchart



Program

```
#include <iostream.h>
#include <math.h>
#include <conio.h>
 int main()
{
  float a, b, c, d, root1, root2;

 cout << "Enter value of  a, b and c : ";
  cin >> a >> b >> c;

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

  if (d==0) {
    root1 = (-b) / (2 * a);
    root2 = root1;
    cout<<"Roots are real & equal";
  }
  else if (d>0) {
    root1 = -(b + sqrt(d) ) / (2 * a);
    root2 = -(b - sqrt(d)) / (2 * a);
    cout << "Roots are real & distinct";
  }
  else {
    root1 = (-b) / (2 * a);
    root2 = sqrt(-d) / (2 * a);
    cout << "Roots are imaginary";
  }

  cout << "\nRoot 1 = " << root1 << "\nRoot 2 = " << root2;

  getch();
  return 0;
}
```

Output



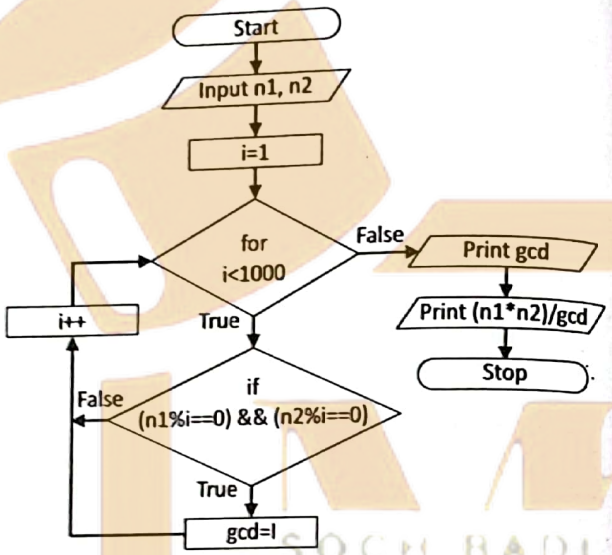
Practical 13

Write a program to find GCD (greatest common divisor) and LCM (least common multiple) of two numbers.

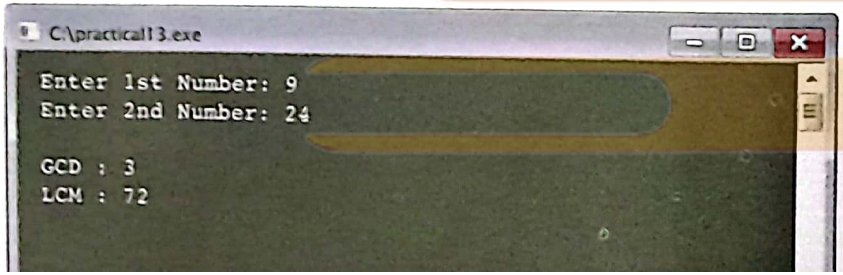
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int i, n1, n2, gcd=1;

 cout << "Enter 1st Number: ";
 cin >> n1;
 cout << "Enter 2nd Number: ";
 cin >> n2;

 for (i=1; i<1000; i++)
  if ((n1%i==0) && (n2%i==0))
    gcd=i;

 cout << "\nGCD : " << gcd;
 cout << "\nLCM : " << (n1*n2)/gcd;

 getch();
 return 0;
}
```

Flowchart



Output



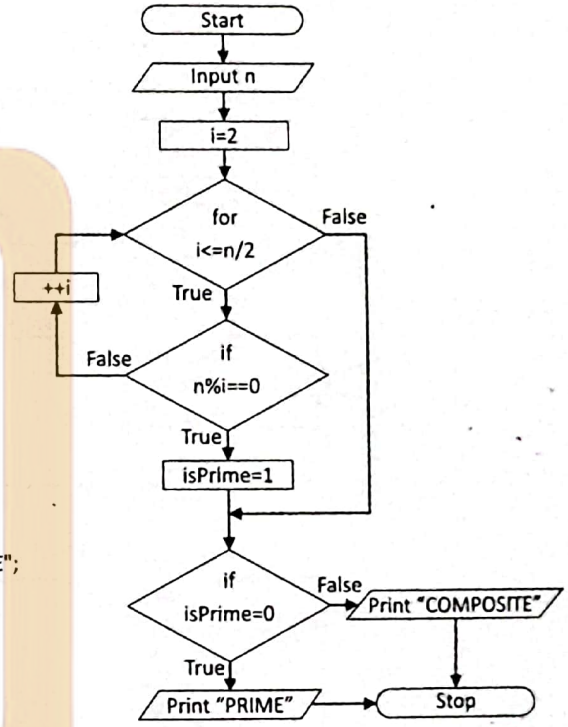
Practical 14

Write a program to check whether a number is prime or not.

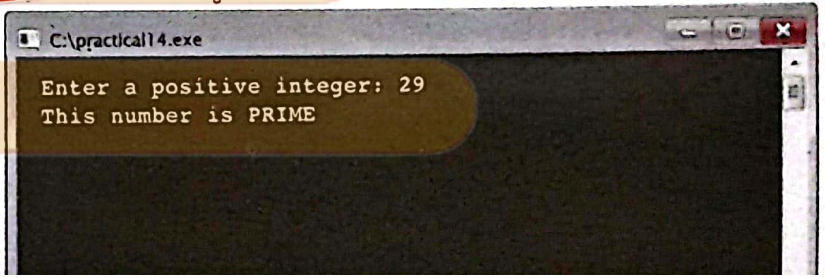
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int n, i, isPrime = 0;

 cout << "Enter a positive integer: ";
 cin >> n;

 for (i = 2; i <= n / 2; ++i) {
  if (n % i == 0) {
    isPrime = 1;
    break;
  }
 }

 if (isPrime==0)
    cout << "The number is PRIME";
 else
    cout << "The number is COMPOSITE";

 getch();
 return 0;
}
```

Flowchart

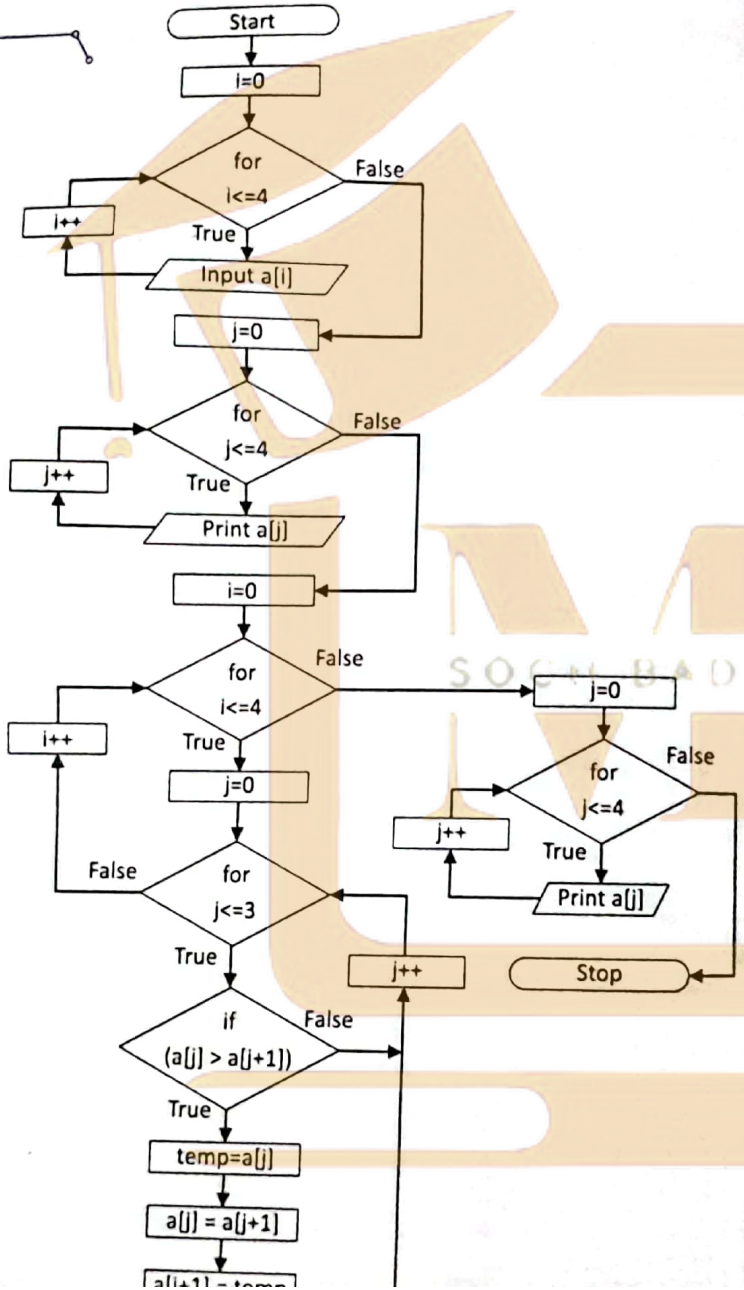


Output



Practical 15 Write a program to sort elements of array in ascending order.

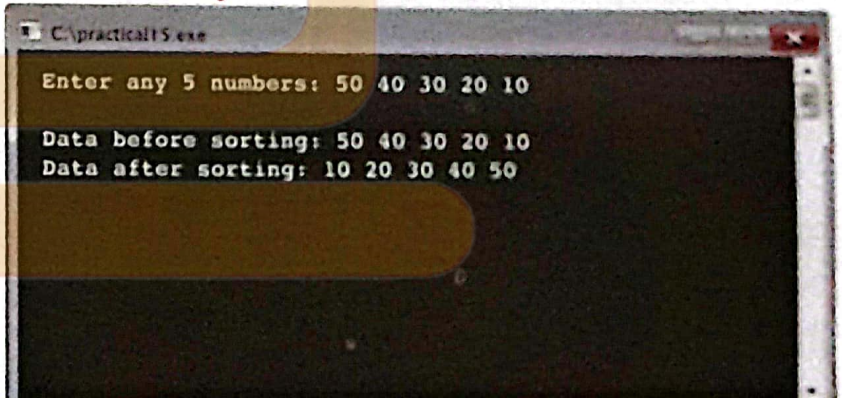
Flowchart



Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int i, a[5], temp, j;

 cout << "Enter any 5 numbers: ";
 for (i=0; i<=4; i++)
  cin >> a[i];

 cout << "\nData before sorting: ";
 for (j=0; j<=4; j++)
  cout << a[j] << " ";

 for (i=0; i<=4; i++)
  for (j=0; j<=3-i; j++)
   if (a[j] > a[j+1])
   {
    temp = a[j];
    a[j] = a[j+1];
    a[j+1] = temp;
   }

 cout << "\nData after sorting: ";
 for (j=0; j<=4; j++)
  cout << a[j] << " ";

 getch();
 return 0;
}
```

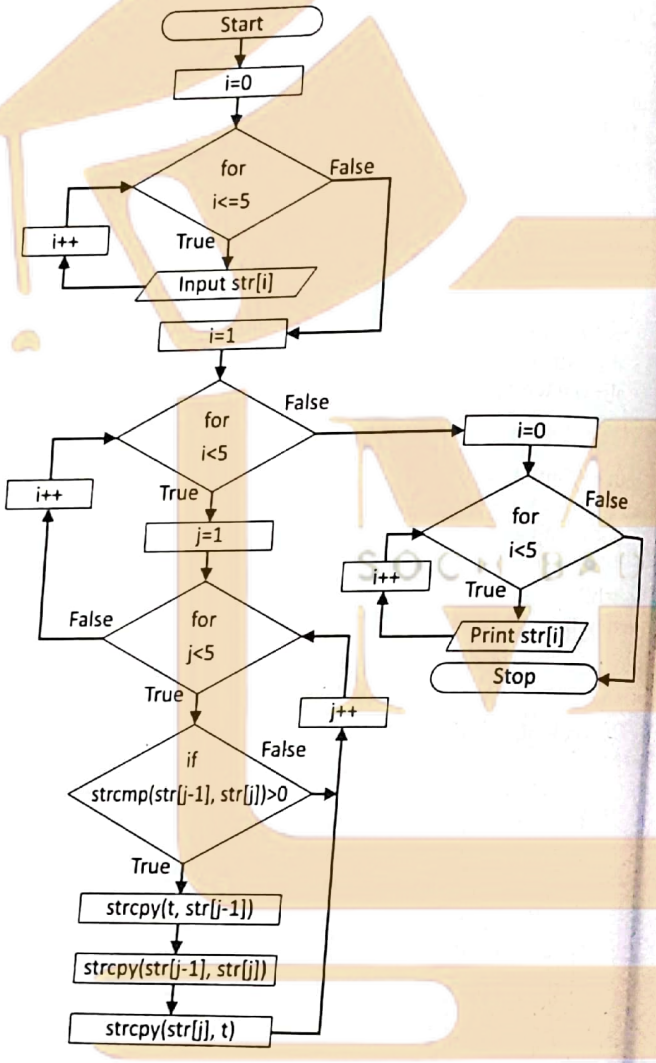
Output



Practical 16

Write a program to sort words in alphabetical order.

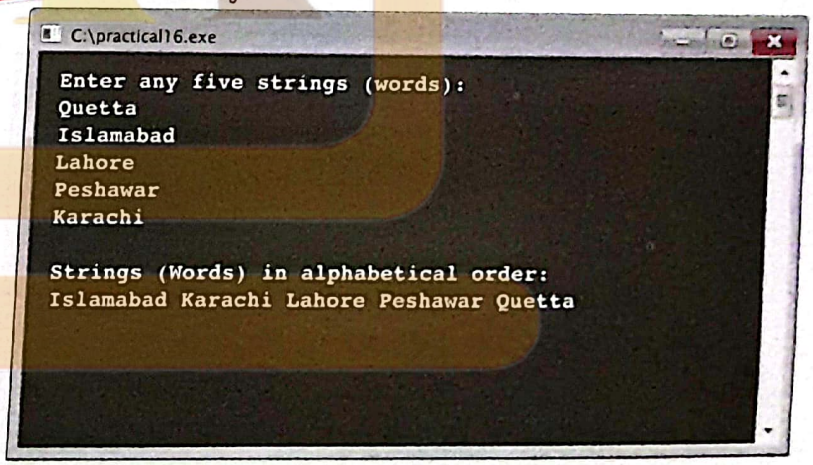
Flowchart



Program

```
#include <iostream.h>
#include <string.h>
#include <conio.h>
int main()
{
 int i, j;
 char str[5][100], t[100];

 cout << "Enter any five strings (words):\n";
 for (i=0; i<5; i++)
  cin>>str[i];

 for (i=1; i<5; i++)
  for (j=1; j<5; j++)
   if (strcmp(str[j-1], str[j])>0)
   {
    strcpy(t, str[j-1]);
    strcpy(str[j-1], str[j]);
    strcpy(str[j], t);
   }

 cout << "\nStrings (Words) in alphabetical order:\n";
 for (i=0; i<5; i++)
  cout << str[i] << " ";

 getch();
 return 0;
}
```

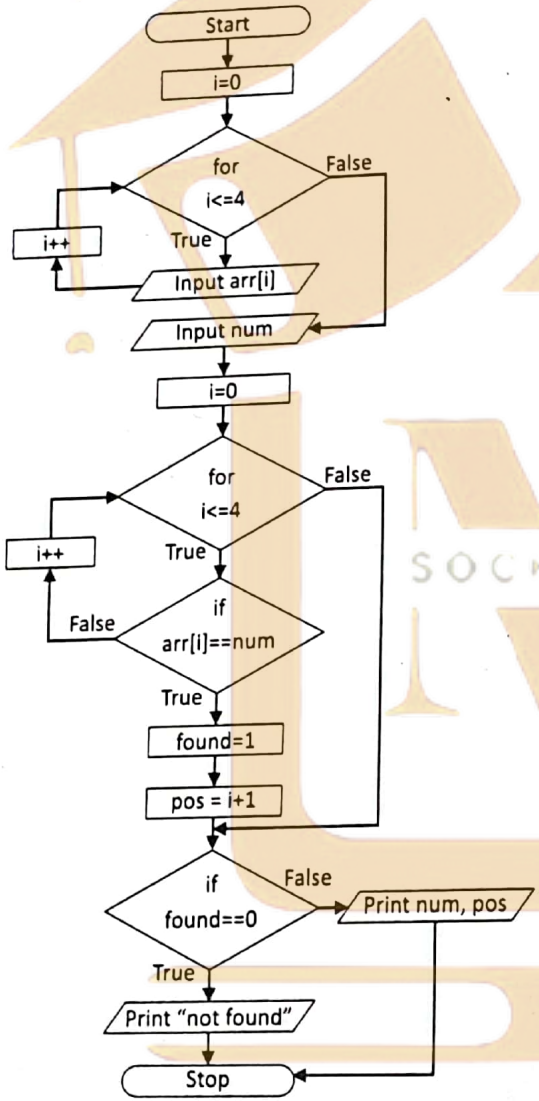
Output



Practical 17

Write a program to search a number in given array to check whether it is present in the array or not.

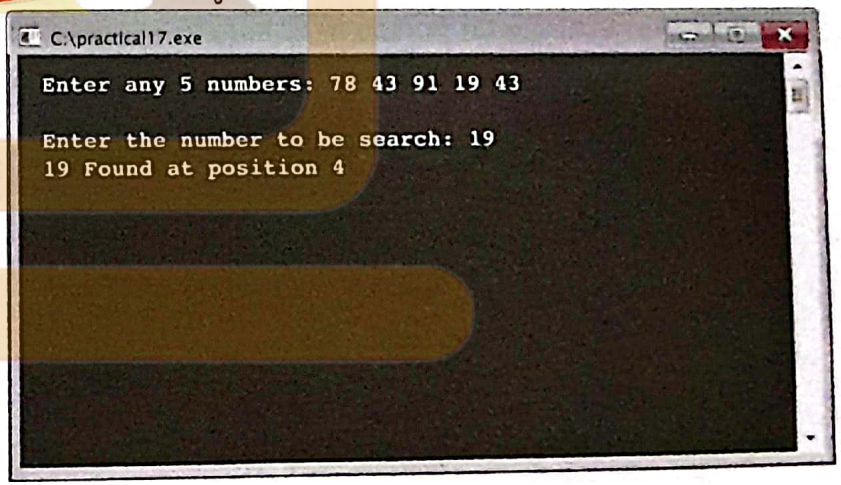
Flowchart



Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int arr[4], i, num, n, found=0, pos;

 cout << "Enter any 5 numbers: ";
 for (i=0; i<=4; i++)
  cin >> arr[i];

 cout << "\nEnter the number to be search: ";
 cin >> num;

 for (i=0; i<=4; i++)
  if(arr[i]==num) {
   found = 1;
   pos = i+1;
   break;
  }

 if (found==0)
  cout << "Number not found..!!";
 else
  cout << num << " Found at position " << pos;

 getch();
 return 0;
}
```

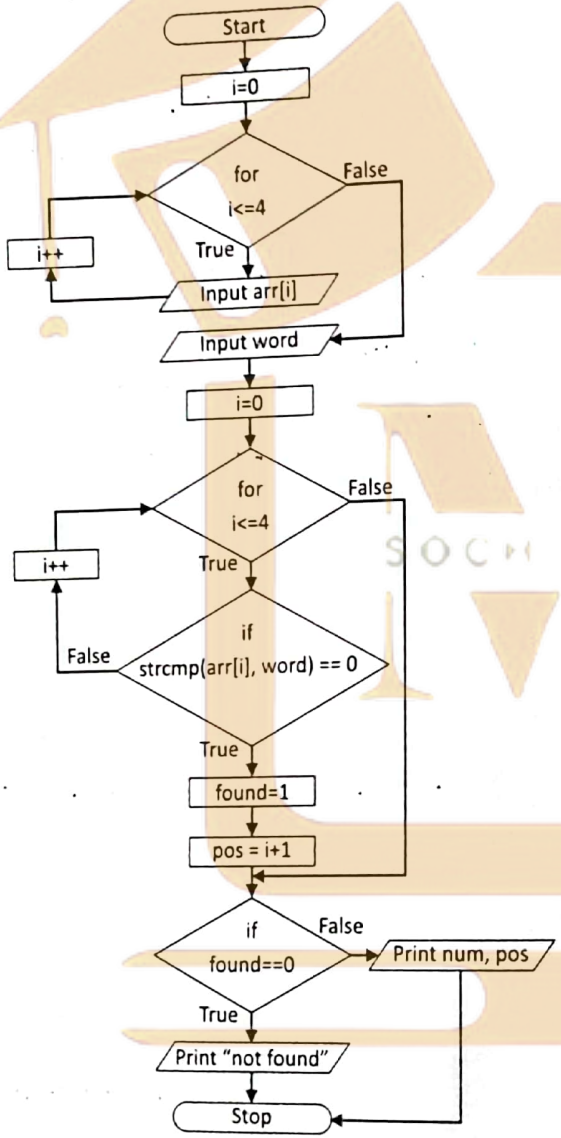
Output



Practical 18

Write a program to search a word in given array to check whether it is present in the array or not.

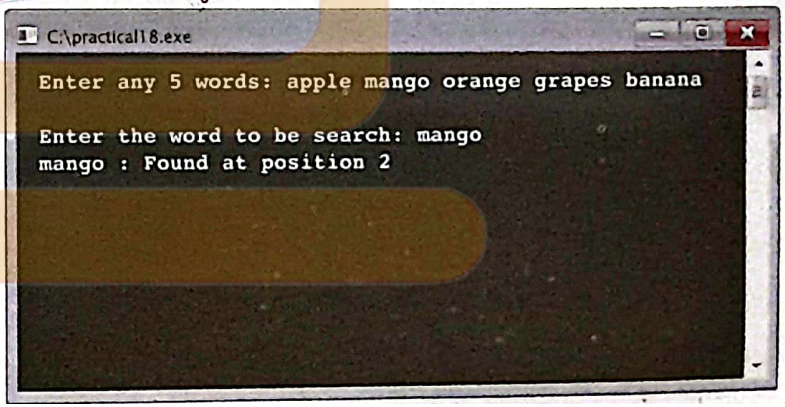
Flowchart



Program

```
#include <iostream.h>
#include <string.h>
#include <conio.h>
int main()
{
 char arr[4][100], word[100];
 int i, n, found=0, pos;

 cout << "Enter any 5 words: ";
 for (i=0; i<=4; i++)
  cin >> arr[i];

 cout << "\nEnter the word to be search: ";
 cin >> word;

 for (i=0; i<=4; i++)
  if (strcmp(arr[i], word) == 0) {
   found = 1;
   pos = i+1;
   break;
  }

 if (found==0)
  cout << "Word not found..!!";
 else
  cout << word << " : Found at position " << pos;

 getch();
 return 0;
}
```

Output



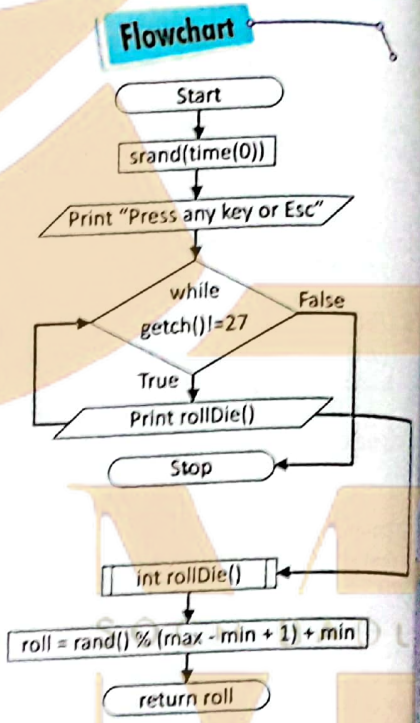
Practical 19

Write a program to generate random numbers for a dice using function.

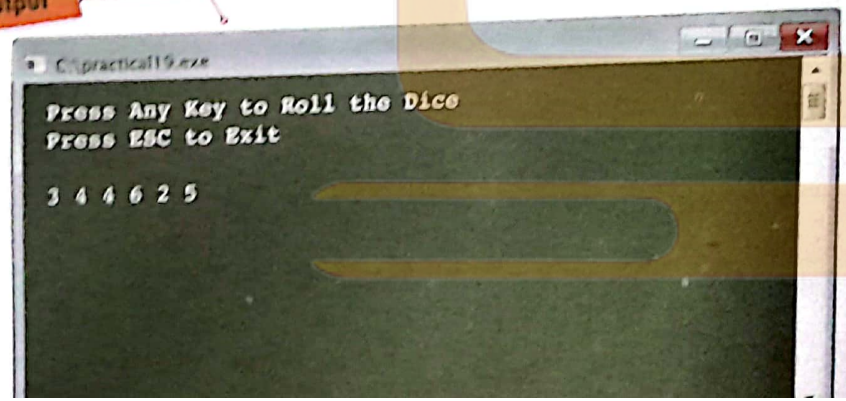
Program

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

int rollDie()
{
  int roll, min=1, max=6;
  roll = rand() % (max - min + 1) + min;
  return roll;
}

int main()
{
 srand(time(0));
 cout << "Press Any Key to Roll the Dice";
 cout << "\nPress ESC to Exit\n\n";

 while (getch() != 27)
  cout << rollDie() << " ";

 return 0;
}
```

Flowchart



Output



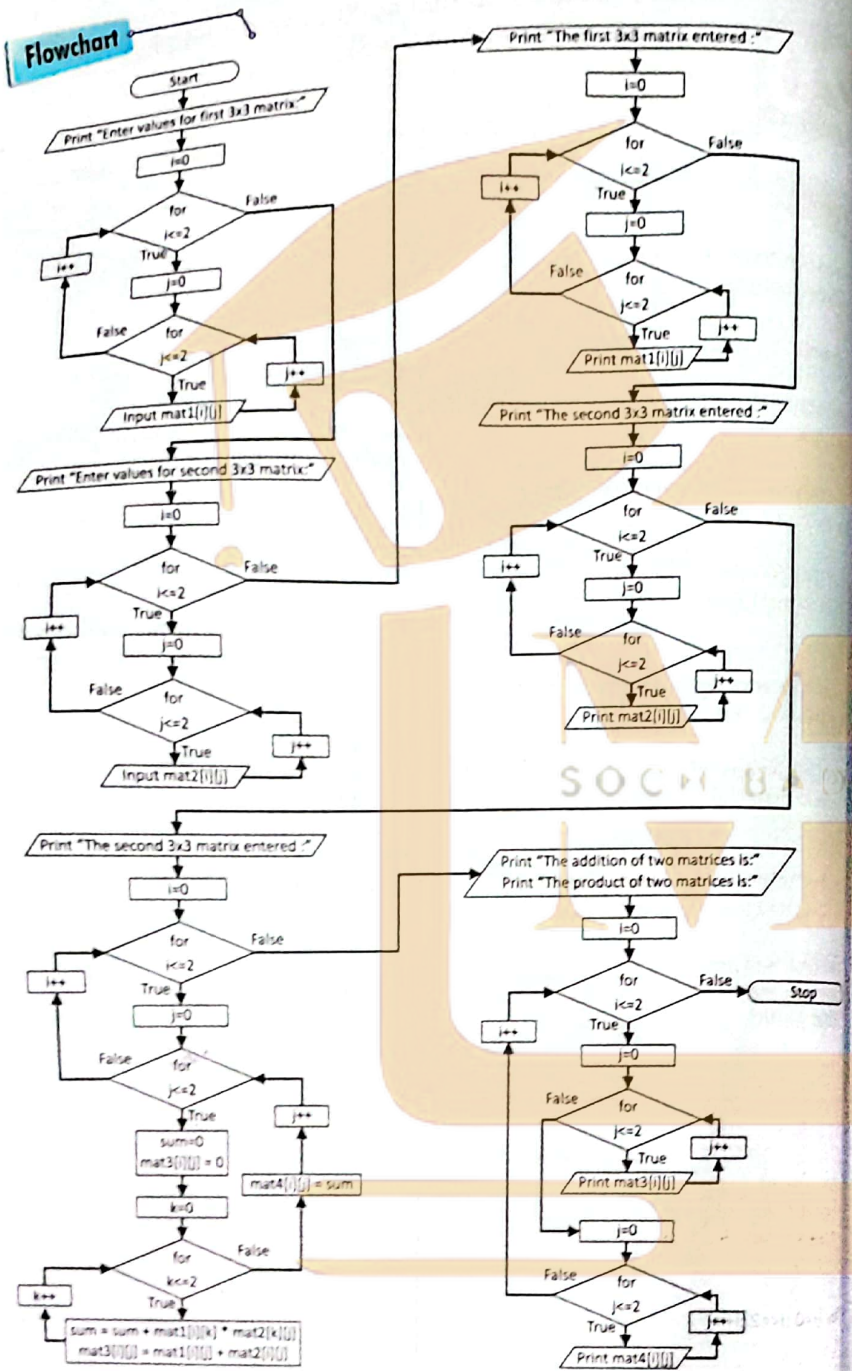
Practical 20

Write a program to find addition and multiplication of matrices (maximum 3 x 3).

Program

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

int main()
{
 int mat1[3][3], mat2[3][3], mat3[3][3], mat4[3][3];
 int i , j, k, sum;

 cout<<"Enter values for first 3x3 matrix : ";
 for (i=0; i<=2; i++)
 {
  for (j=0; j<=2 ;j++)
   cin >> mat1[i][j];
 }

 cout<<"Enter values for second 3x3 matrix : ";
 for (i=0; i<=2; i++)
 {
  for (j=0 ;j<=2 ;j++)
   cin >> mat2[i][j];
 }

 cout<<"\nThe first 3x3 matrix entered :\n";
 for (i=0; i<=2 ;i++)
 {
  for (j=0; j<=2 ;j++)
   cout << mat1[i][j] << "\t";
  cout << "\n";
 }

 cout<<"\nThe second 3x3 matrix entered :\n";
 for (i=0; i<=2 ;i++)
 {
  for (j=0; j<=2 ;j++)
   cout << mat2[i][j] << "\t";
  cout << "\n";
 }

 for (i=0 ;i<=2 ;i++)
  for (j=0 ; j<=2 ;j++)
  {
   sum = 0;
   mat3[i][j] = 0;
   for (k=0; k<=2; k++)
   {
sum = sum + mat1[i][k] * mat2[k][j];
mat3[i][j] = mat1[i][j] + mat2[i][j];
   }
   mat4[i][j] = sum ;
  }
 }

 cout<<"\nThe addition of two matrices is:\t";
 cout<<"The product of two matrices is:\n";
 for (i=0; i<=2; i++)
 {
  for (j=0; j<=2; j++)
   cout << mat3[i][j] << "\t";
  cout << "\t";
  for (j=0; j<=2; j++)
cout << "\t" << mat4[i][j];
   cout << "\n";
  }

 getch();
 return 0;
}
```

Flowchart



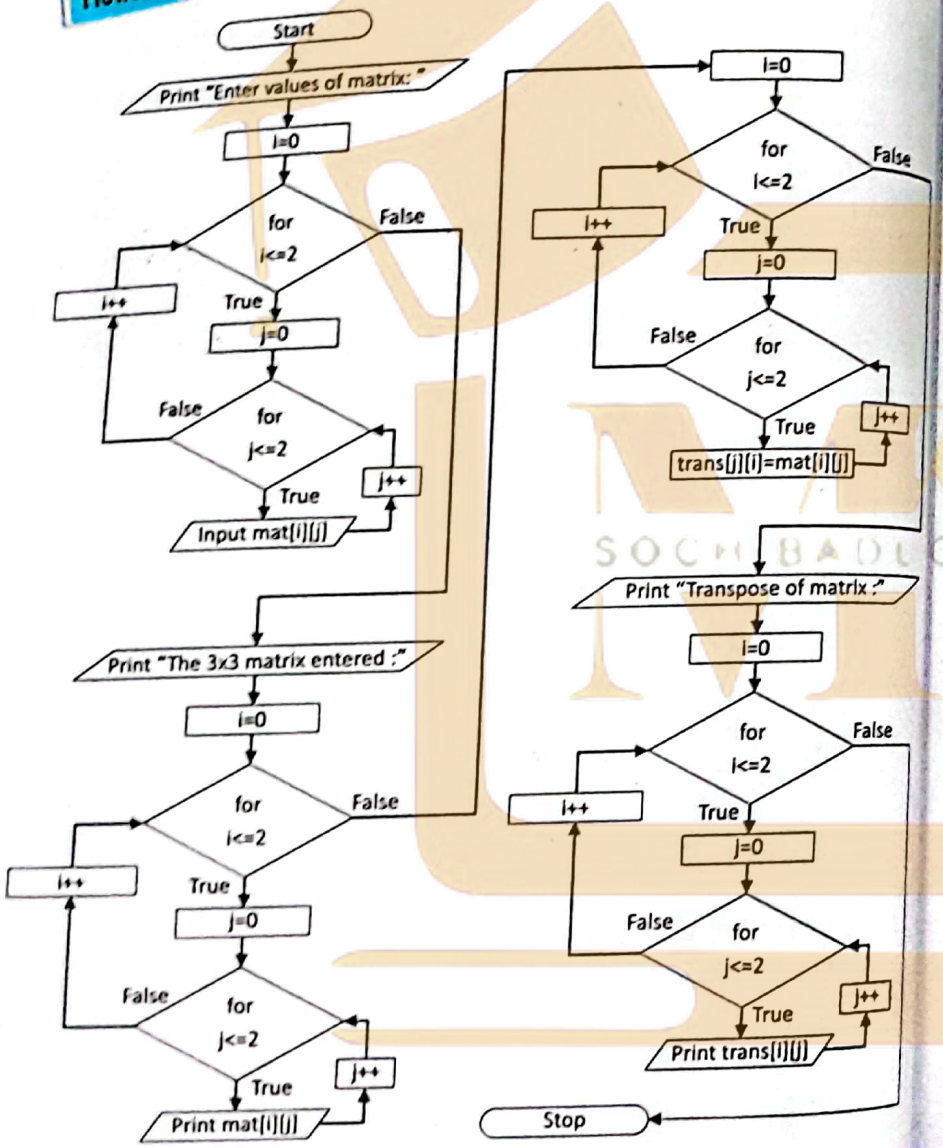
Output

```
C:\practical20.exe
Enter values for first 3x3 matrix : 1 2 3 4 5 6 7 8 9
Enter values for second 3x3 matrix : 1 1 1 1 1 1 1 1 1

The first 3x3 matrix entered :
1       2       3
4       5       6
7       8       9

The second 3x3 matrix entered :
1       1       1
1       1       1
1       1       1

The addition of two matrices is:    The product of two matrices is:
2       3       4                   6       6       6
5       6       7                   15      15      15
8       9       10                  24      24      24
```

Practical 21

Write a program to find the transpose of a matrix (maximum 3x3).

Flowchart



Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int mat[3][3], trans[3][3], i, j;

 cout << "Enter values of matrix: ";
 for (i=0; i<=2; i++)
  for (j=0; j<=2 ;j++)
   cin >> mat[i][j];

cout<<"\nThe 3x3 matrix entered :\n";
for (i=0; i<=2 ;i++)
{
  for (j=0; j<=2 ;j++)
   cout << mat[i][j] << "\t";
  cout << "\n";
}

for(i=0; i<=2; ++i)
  for(j=0; j<=2; ++j)
     trans[j][i]=mat[i][j];

cout<<"\nTranspose of matrix :\n";
for (i=0; i<=2; i++)
{
  for (j=0; j<=2; j++)
   cout << trans[i][j] << "\t";
  cout << "\n";
}

getch();
return 0;
}
```

Output

```
C:\practical21.exe
Enter values of matrix: 1 3 6 5 9 2 4 1 7

The 3x3 matrix entered :
1       3       6
5       9       2
4       1       7

Transpose of matrix :
1       5       4
3       9       1
6       2       7
```

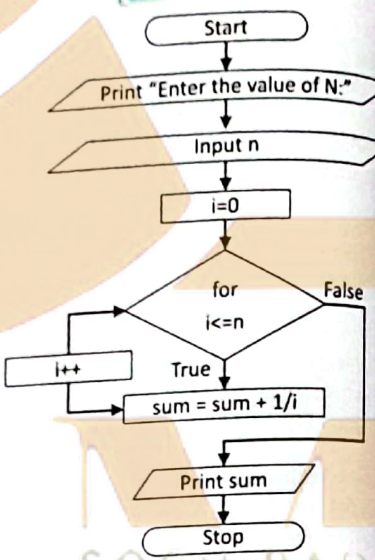
Practical 22

Write a program to find sum of simple series 1/1+ 1/2 + 1/3 + 1/4 + 1/5 + .. 1/N.

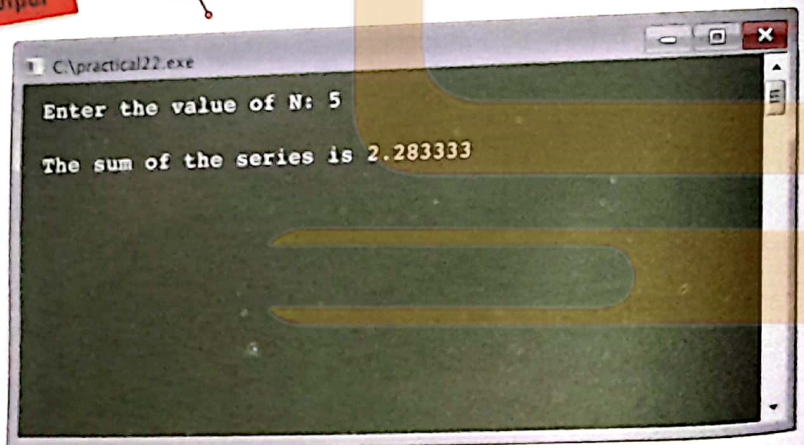
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int n;
 double i, sum=0.0;

 cout << "Enter the value of N: ";
 cin >> n;

 for (i=1; i<=n; i++)
  sum = sum + 1/i;

 cout <<"\nThe sum of the series is " << sum;
 getch();
 return 0;
}
```

Flowchart



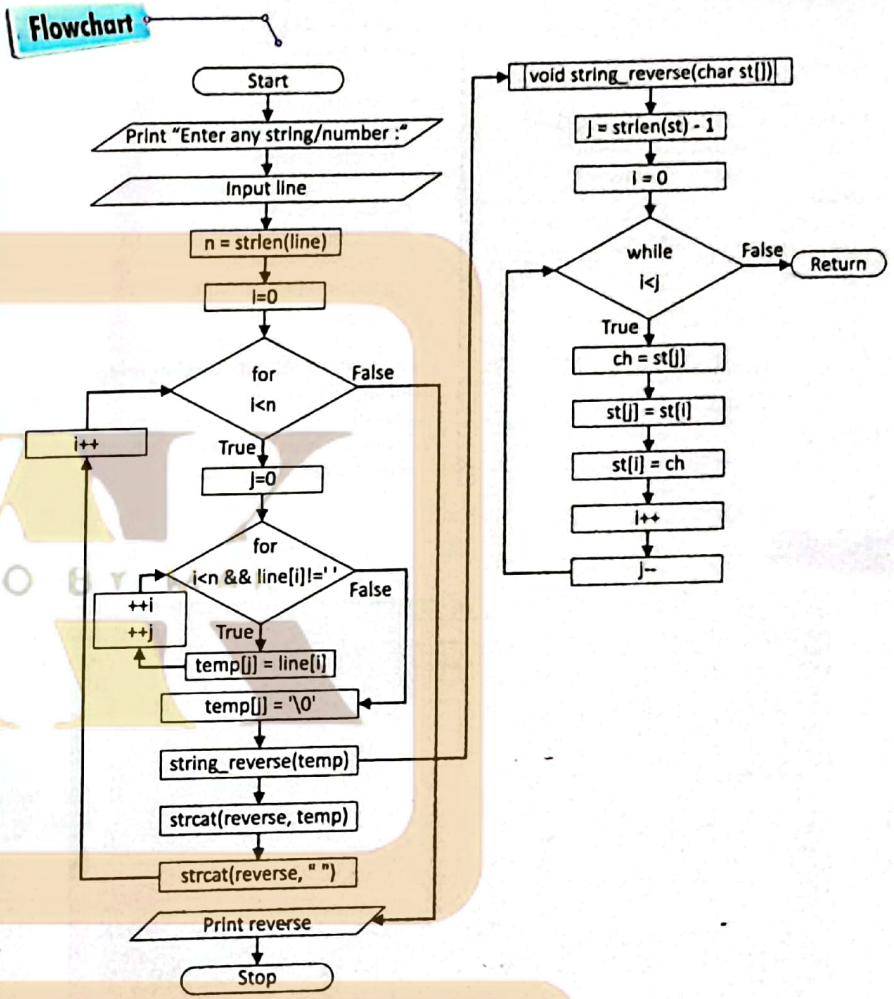
Output



Practical 23

Write a program to reverse given number / string.

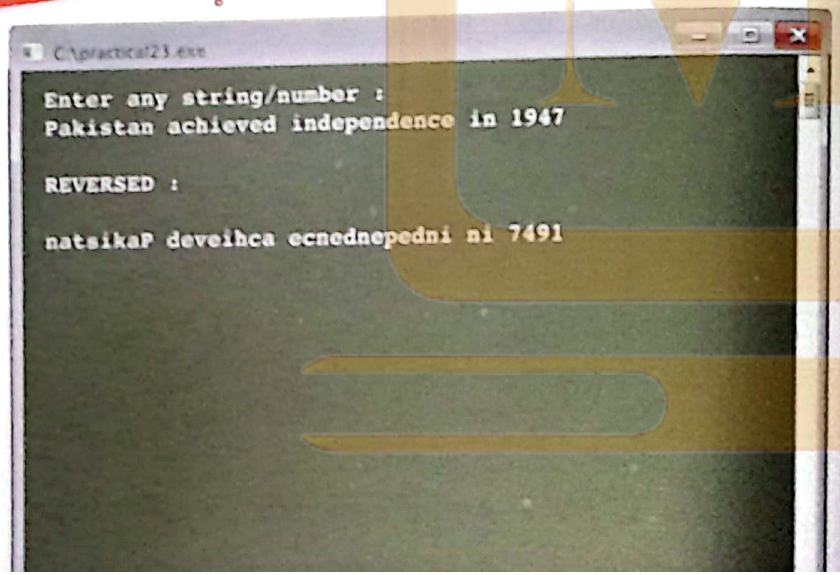
Flowchart



Program

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

void string_reverse(char st[])
{
  int i,j;
  char ch;

  j = strlen(st) - 1;
  i = 0;

  while(i < j) {
    ch = st[j];
    st[j] = st[i];
    st[i] = ch;
    i++;
    j--;
  }
}

int main()
{
  char line[100];
  char reverse[100]="",temp[50];
  int i,j,n;

  cout << "Enter any string/number : \n";
  cin.get(line,100);
  n = strlen(line);

  for (i=0; i<n; i++) {
    for (j=0; i<n && line[i]!=' '; ++i, ++j)
      temp[j] = line[i];

    temp[j] = '\0';
    string_reverse(temp);
    strcat(reverse, temp);
    strcat(reverse, " ");
  }

  cout << "\nREVERSED :\n\n" << reverse;
  getch();
  return 0;
}
```

Output



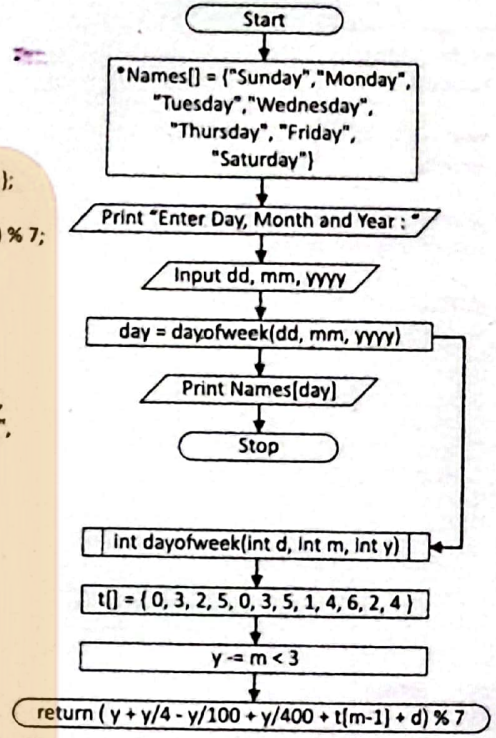
Practical 24

Write a program to find out a specific day of a week for a given data using function.

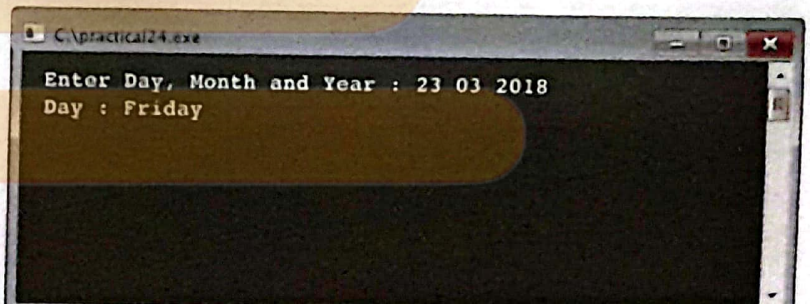
Program

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

int dayofweek(int d, int m, int y)
{
  static int t[] = { 0, 3, 2, 5, 0, 3, 5, 1, 4, 6, 2, 4 };
  y -= m < 3;
  return ( y + y/4 - y/100 + y/400 + t[m-1] + d) % 7;
}

int main()
{
  int day, dd, mm, yyyy;
  const char *Names[] = {"Sunday","Monday",
"Tuesday","Wednesday", "Thursday", "Friday",
"Saturday"};

  cout << "Enter Day, Month and Year : ";
  cin >> dd >> mm >> yyyy;
  day = dayofweek(dd, mm, yyyy);
  cout<<"Day : "<<Names[day]<<endl;
  getch();
  return 0;
}
```

Flowchart



Output



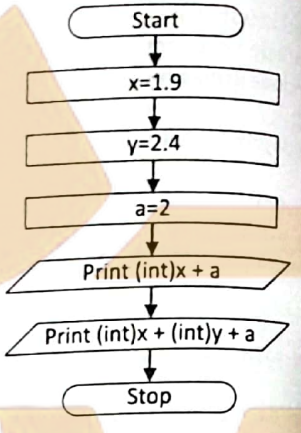
Practical 25

Write a program to sum two and three numbers of different data types.

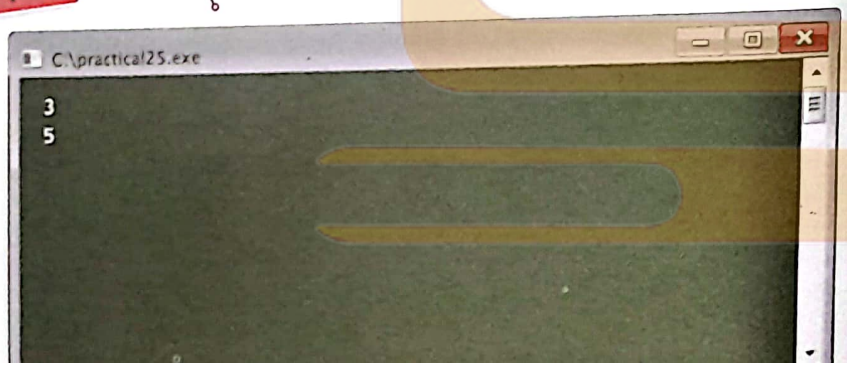
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 float x=1.9, y=2.4;
 int a=2;

 cout << (int)x + a << endl;
 cout << (int)x + (int)y + a;

 getch();
 return 0;
}
```

Flowchart



Output



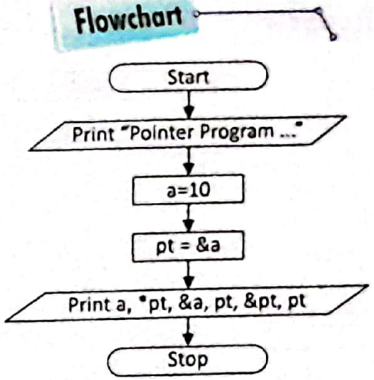
Practical 26

Write a program to display the address and the value of a variable using pointer.

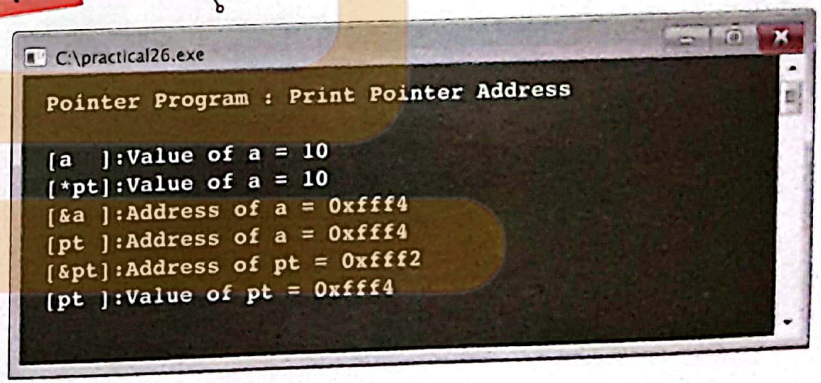
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int a;
 int *pt;

 cout << "Pointer Program : Print Pointer Address\n";
 a = 10;
 pt = &a;

 cout << "\n[a  ]:Value of a = " << a;
 cout << "\n[*pt]:Value of a = " << *pt;
 cout << "\n[&a ]:Address of a = " << &a;
 cout << "\n[pt ]:Address of a = " << pt;
 cout << "\n[&pt]:Address of pt = " << &pt;
 cout << "\n[pt ]:Value of pt = " << pt;

 getch();
 return 0;
}
```

Flowchart



Output

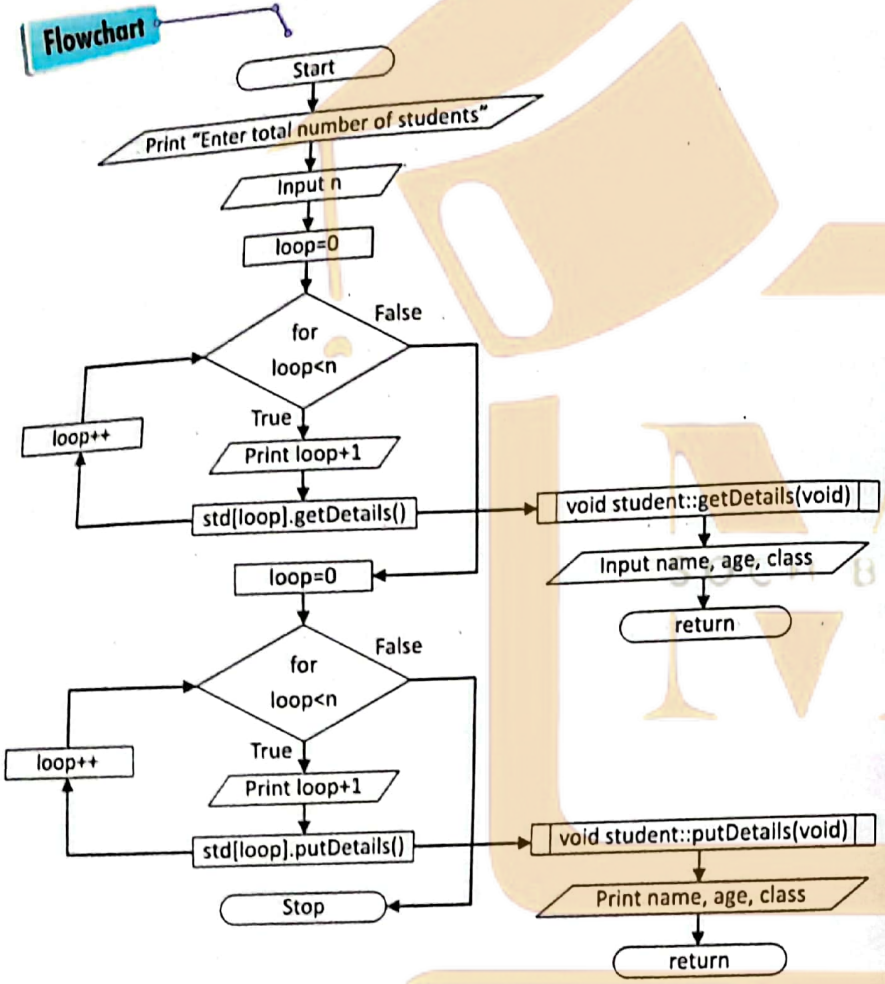


...may vary based on system

Practical 27

Write a program to create and display student object with data members as name, age and class.

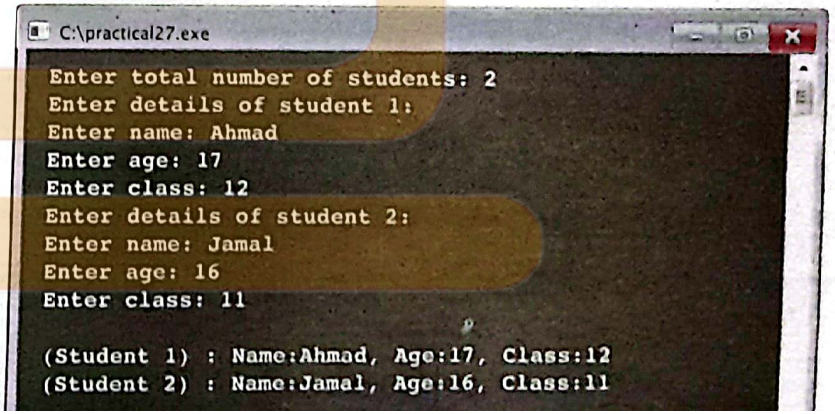
Flowchart



Program

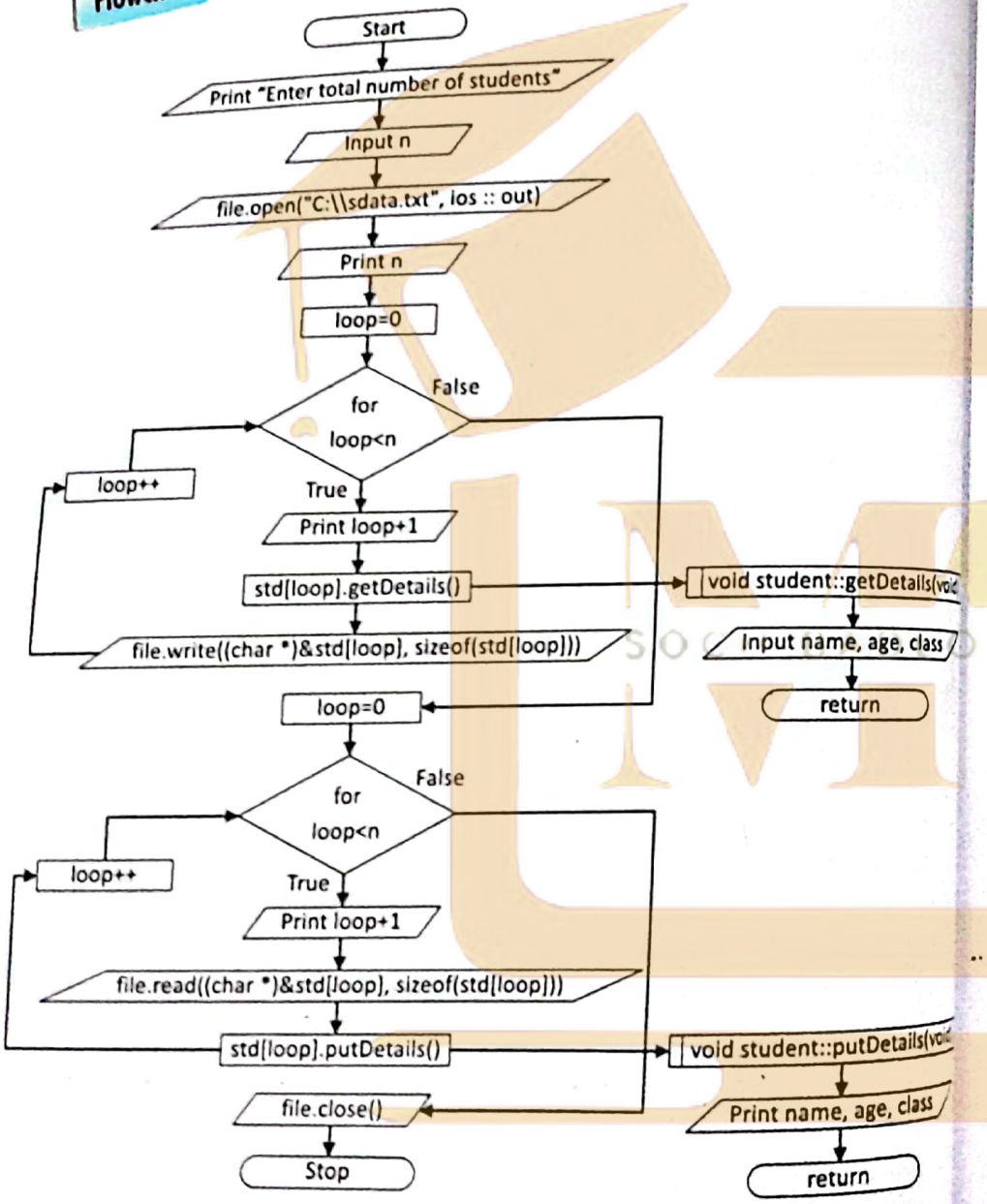
```
#include <iostream.h>
#include <conio.h>

#define MAX 10

class student
{
 private:
   char  name[30];
   int   age;
   int   sclass;
 public:
   void getDetails(void);
   void putDetails(void);
};

void student::getDetails(void)
{
 cout << "Enter name: " ;
 cin >> name;
 cout << "Enter age: ";
 cin >> age;
 cout << "Enter class: ";
 cin >> sclass;
}

void student::putDetails(void)
{
  cout << "Name:" << name;
  cout << ", Age:" << age;
  cout << ", Class:" << sclass;
}

int main()
{
  student std[MAX];
  int n, loop;

  cout << "Enter total number of students: ";
  cin >> n;

  for (loop=0; loop<n; loop++) {
    cout << "Enter details of student " <<
loop+1 << ":\n";
    std[loop].getDetails();
  }

  for (loop=0; loop<n; loop++) {
    cout << "\n(Student " << (loop+1) << ") : ";
    std[loop].putDetails();
  }

  getch();
  return 0;
}
```

Output



28

Flowchart



Program

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

#define MAX 10

class student
{
 private:
  char  name[30];
  int   age;
  int   sclass;
 public:
  void getDetails(void);
  void putDetails(void);
};

void student::getDetails(void)
{
 cout << "Enter name: " ;
 cin >> name;
 cout << "Enter age: ";
 cin >> age;
 cout << "Enter class: ";
 cin >> sclass;
}

void student::putDetails(void)
{
 cout << "Name:" << name;
 cout << ", Age:" << age;
 cout << ", Class:" << sclass;
}

int main()
{
 student std[MAX];
 fstream file;
 int n, loop;

 cout << "Enter total number of
students: ";
 cin >> n;

 file.open("C:\\sdata.txt", ios :: out);
 cout << "Writing Student information
to the file :-\n";
 cout << "Enter " << n << " Students Details to the file\n";

 for (loop=0; loop<n; loop++) {
  cout << "Enter details of student " << loop+1 << ":\n";
  std[loop].getDetails();
  file.write((char *)&std[loop], sizeof(std[loop]));
 }

 file.close();

 file.open("C:\\sdata.txt", ios :: in);
 cout << "\nReading Student information to the file :- \n";

 for (loop=0; loop<n; loop++) {
  cout << "\n(Student " << (loop+1) << ") : ";
  file.read((char *)&std[loop], sizeof(std[loop]));
  std[loop].putDetails();
 }

 file.close();

 getch();
 return 0;
}
```

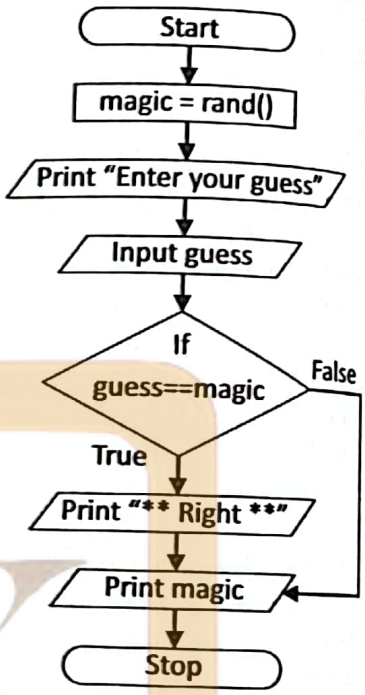
Practical 31

Write a program to generate a random number and let the user guess it.

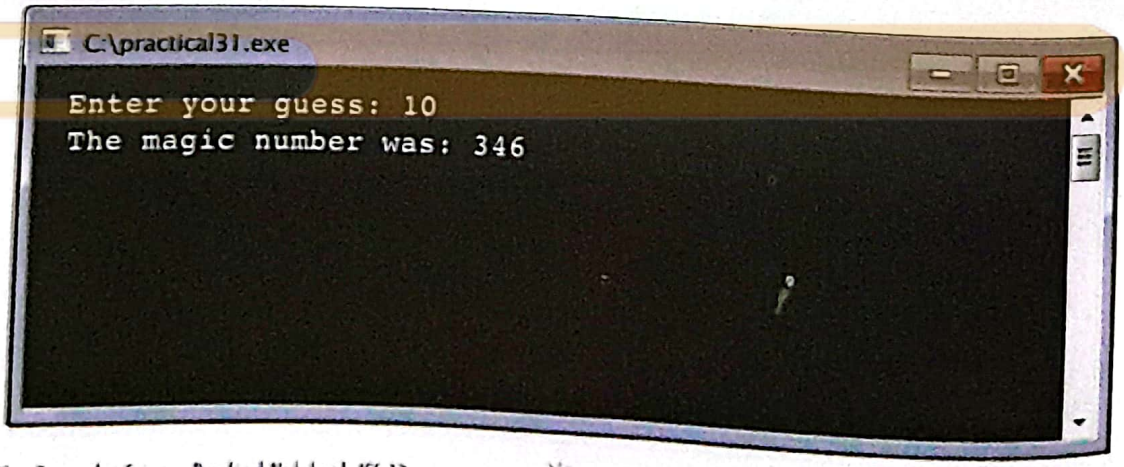
Program

```
#include <iostream.h>
#include <stdlib.h>
#include <conio.h>
int main()
{
 int magic;
 int guess;

 magic = rand();

 cout << "Enter your guess: ";
 cin >> guess;

 if(guess == magic)
     cout << "** Right **";
 cout << "The magic number was: " << magic << endl;

 getch();
 return 0;
}
```

Flowchart



Output



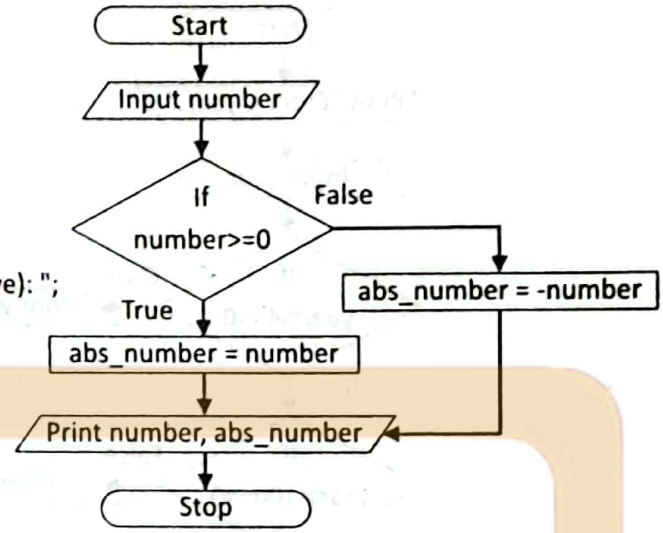
Practical 32

Write a program to find the absolute value of an integer.

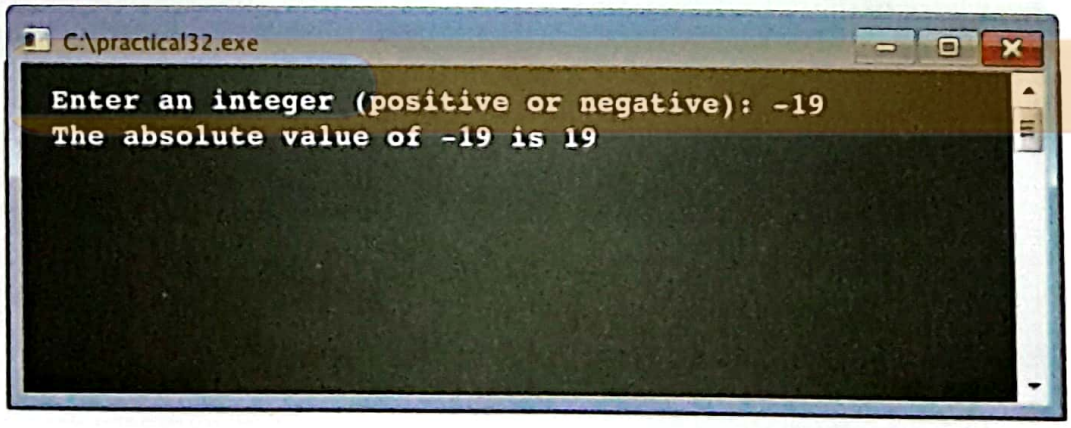
Program

```
#include <iostream>
#include <conio.h>
int main()
{
 int number;
 int abs_number;

 cout << "Enter an integer (positive or negative): ";
 cin >> number;

 if(number >= 0)
 {
  abs_number = number;
 }
 else
  abs_number = -number;

 cout << "The absolute value of " << number << " is " <<
abs_number;
 cout << endl;

 getch();
 return 0;
}
```

Flowchart



Output

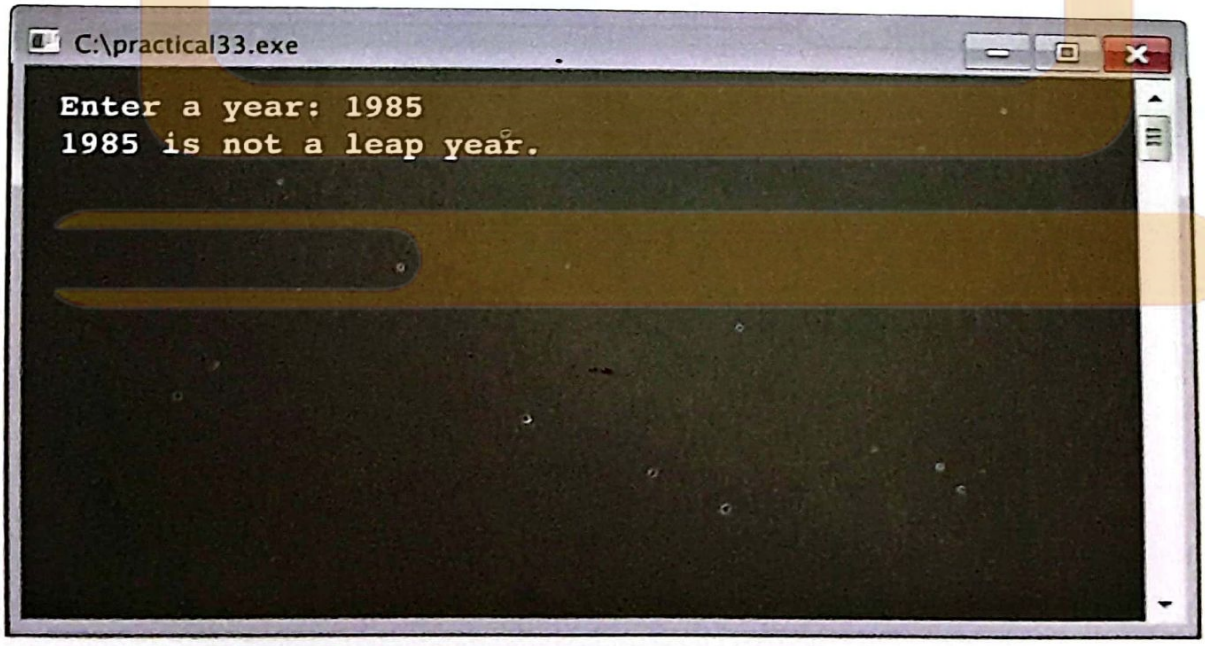


program to check if a year is leap or not

Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int year;

 cout << "Enter a year: ";
 cin >> year;

 if (year % 4 == 0)
 {
  if (year % 100 == 0)
  {
   if (year % 400 == 0)
    cout << year << " is a leap year.";
   else
    cout << year << " is not a leap year.";
  }
  else
   cout << year << " is a leap year.";
 }
 else
  cout << year << " is not a leap year.";

 getch();
 return 0;
}
```

Output

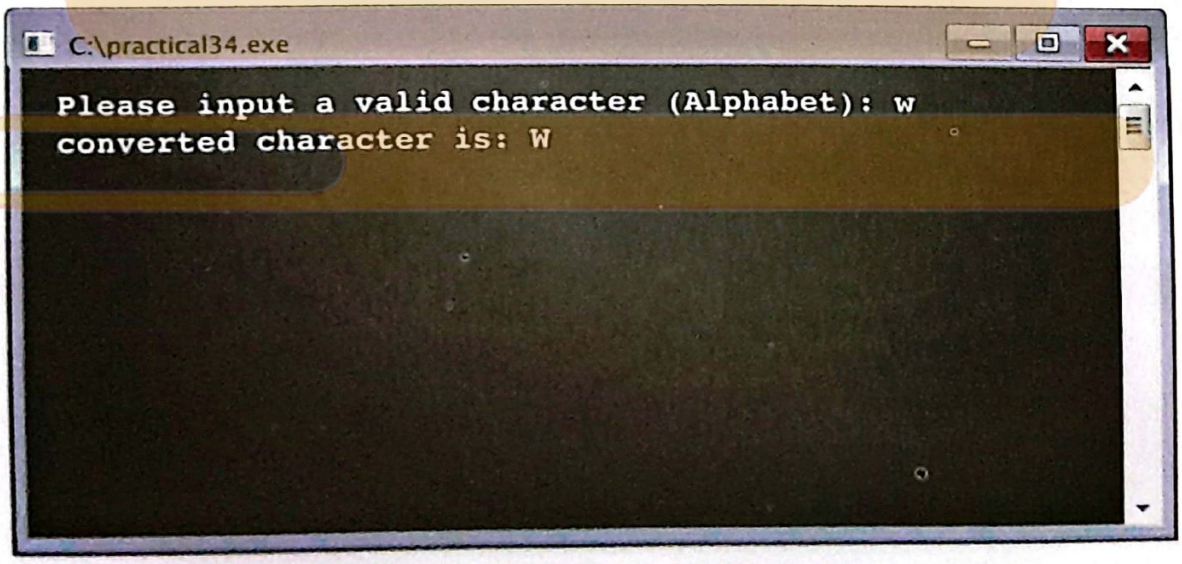


program to convert lowerscase character o upper case and vice verse

Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 char ch;

 cout << "Please input a valid character (Alphabet): ";
 cin >> ch;

 if ((ch >= 'A' && ch <= 'Z') || (ch >= 'a' && ch <= 'z'))
 {
  if(ch>='A' && ch<='Z')
       ch=ch+32;
  else if(ch>='a' && ch<='z')
       ch=ch-32;
      else
       ;

  cout << "converted character is: " << ch << endl;
 }
 else
 {
  cout << "Entered character is not a valid alphabet!!!" <<
endl;
 }

 getch();
 return 0;
}
```

Output



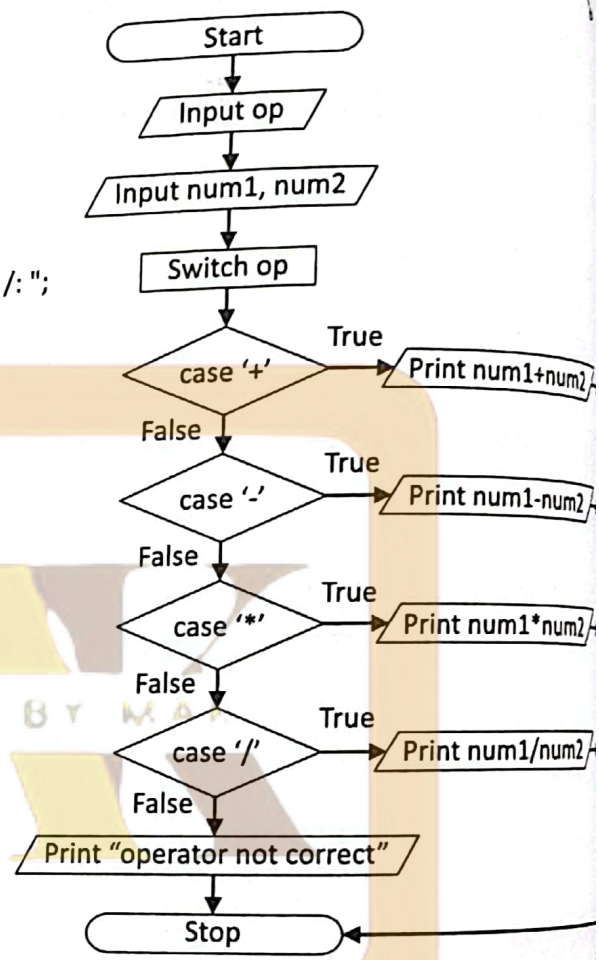
Practical 35

Write a program to make a simple calculator to add, subtract, multiply or divide using switch...case selection statement.

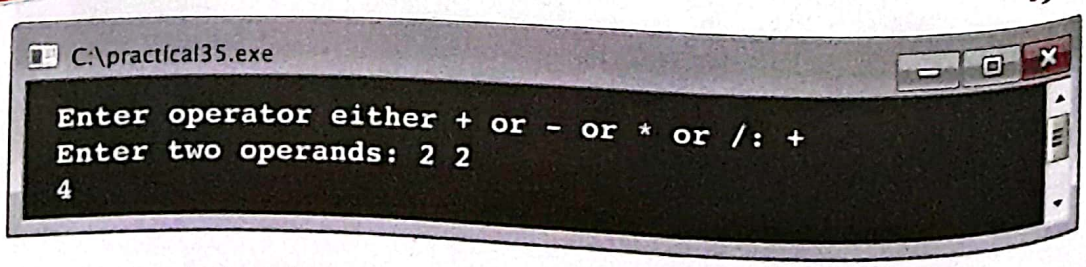
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 char op;
 float num1, num2;

 cout << "Enter operator either + or - or * or /: ";
 cin >> op;

 cout << "Enter two operands: ";
 cin >> num1 >> num2;

 switch (op)
 {
  case '+':
   cout << num1+num2;
   break;
  case '-':
   cout << num1-num2;
   break;
  case '*':
   cout << num1*num2;
   break;
  case '/':
   cout << num1/num2;
   break;
 default:
  cout << "Error! operator is not correct";
  break;
 }

 getch();
 return 0;
}
```

Flowchart



Output



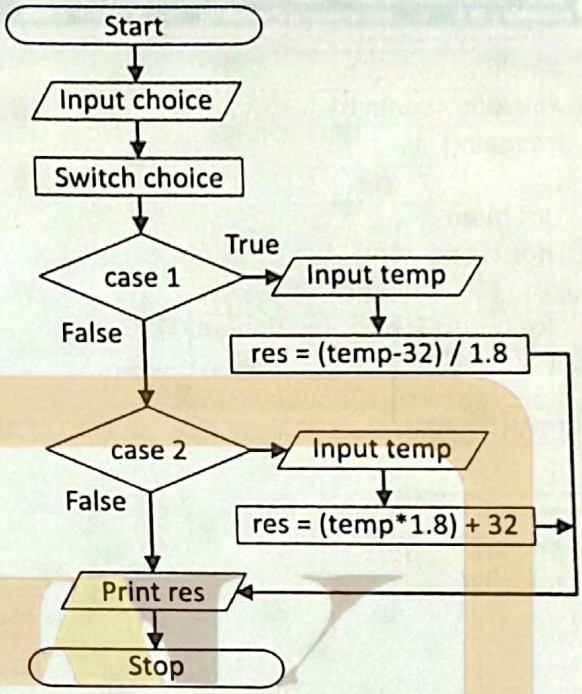
Practical 36

Write a program for temperature conversion which converts Fahrenheit to Celsius or Celsius to Fahrenheit depending upon user's choice.

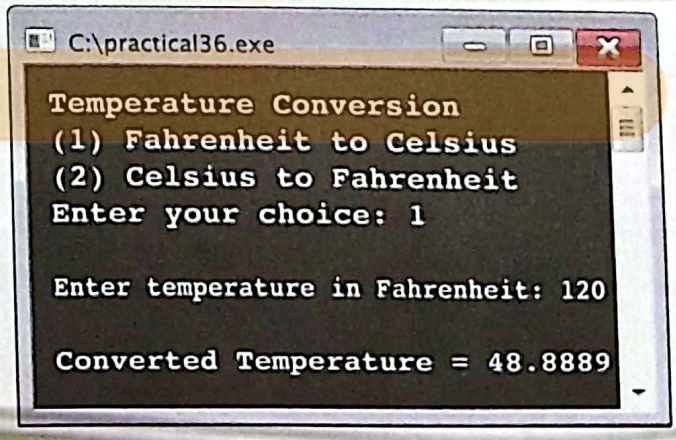
rogram

```
nclude <iostream.h>
nclude <conio.h>
t main()

float temp,res;
int choice;

cout << "Temperature Conversion";
cout << "\n(1) Fahrenheit to Celsius";
cout << "\n(2) Celsius to Fahrenheit";
cout << "\nEnter your choice: ";
cin >> choice;

switch (choice)
{
  case 1:
    {
      cout << "\nEnter temperature in Fahrenheit: ";
      cin >> temp;
      res = (temp-32) / 1.8;
    }
    break;
  case 2:
    {
      cout << "\nEnter temperature in Celcius: ";
      cin >> temp;
      res = (temp*1.8) + 32;
    }
    break;
}

cout << "\nConverted Temperature = " << res;

getch();
return 0;
}
```

Flowchart



Output



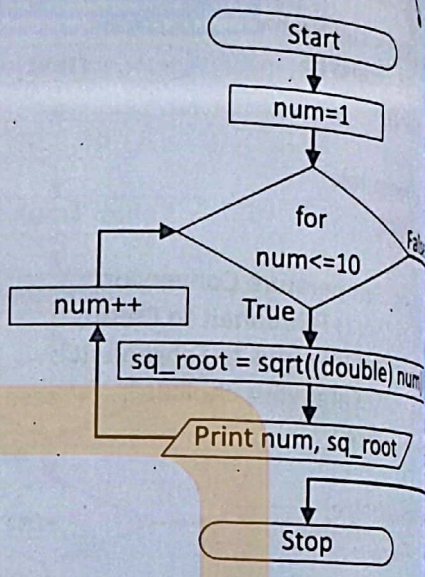
Practical 37

Write a program to generate the square root of 1 to 10.

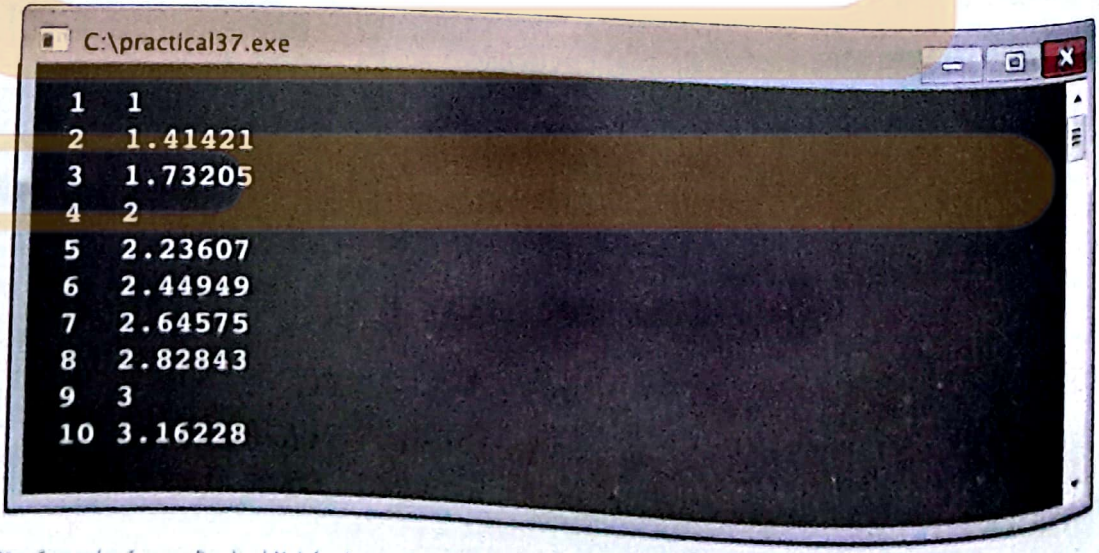
Program

```
#include <iostream.h>
#include <math.h>
#include <conio.h>
int main()
{
 int num;
 double sq_root;

 for (num=1; num <= 10; num++)
 {
  sq_root = sqrt((double) num);
  cout << num << "  " << sq_root << '\n';
 }

 getch();
 return 0;
}
```

Flowchart



Output



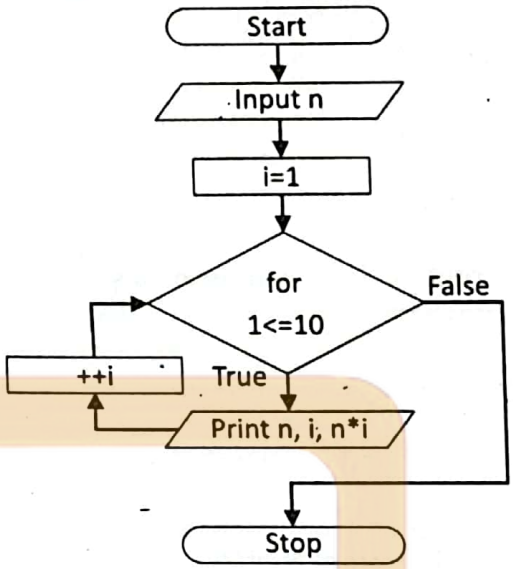
Practical 38

Write a program to display multiplication table up to 10.

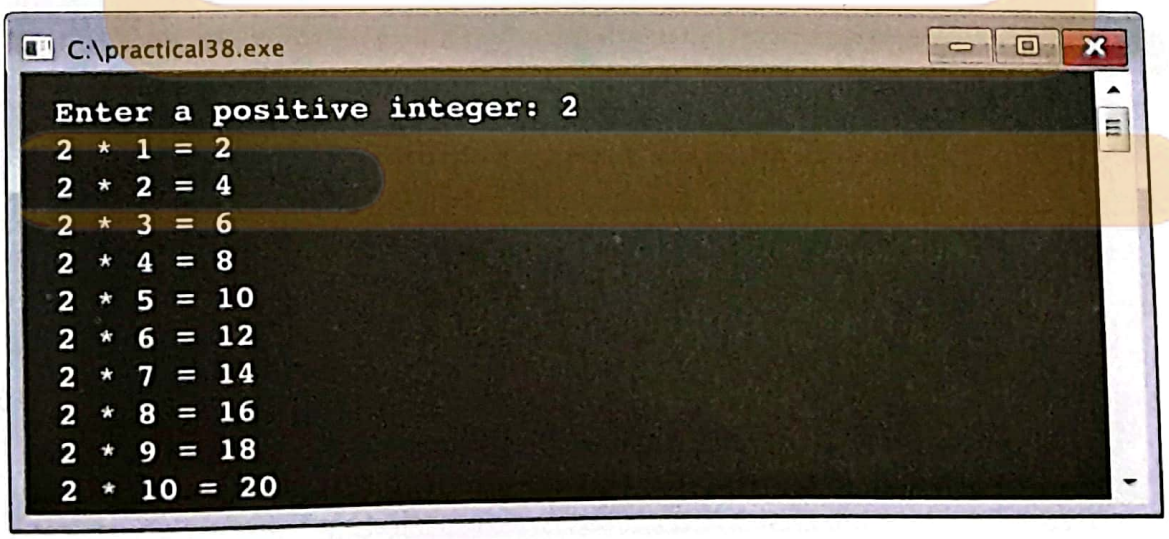
Program

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

int main()
{
 int n;

 cout << "Enter a positive integer: ";
 cin >> n;

 for (int i = 1; i <= 10; ++i)
  cout << n << " * " << i << " = " << n * i << endl;

 getch();
 return 0;
}
```

Flowchart



Output



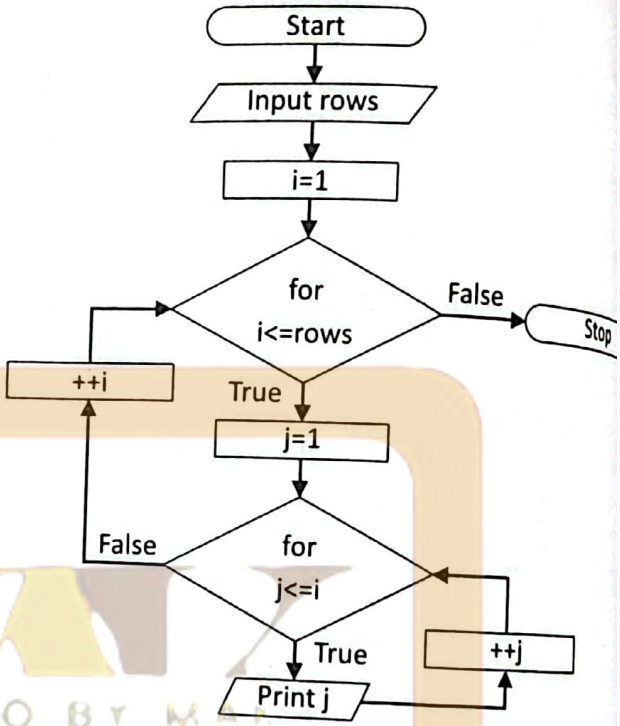
Practical 39

Write a program to print half pyramid using numbers.

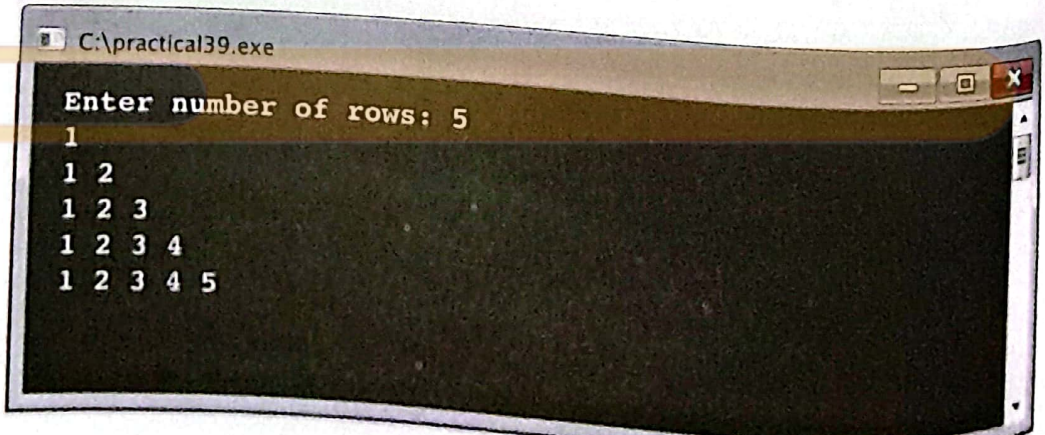
Program

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

int main()
{
 int rows;

 cout << "Enter number of rows: ";
 cin >> rows;

 for (int i = 1; i <= rows; ++i)
 {
  for(int j = 1; j <= i; ++j)
  {
   cout << j << " ";
  }
  cout << "\n";
 }

 getch();
 return 0;
}
```

Flowchart



Output



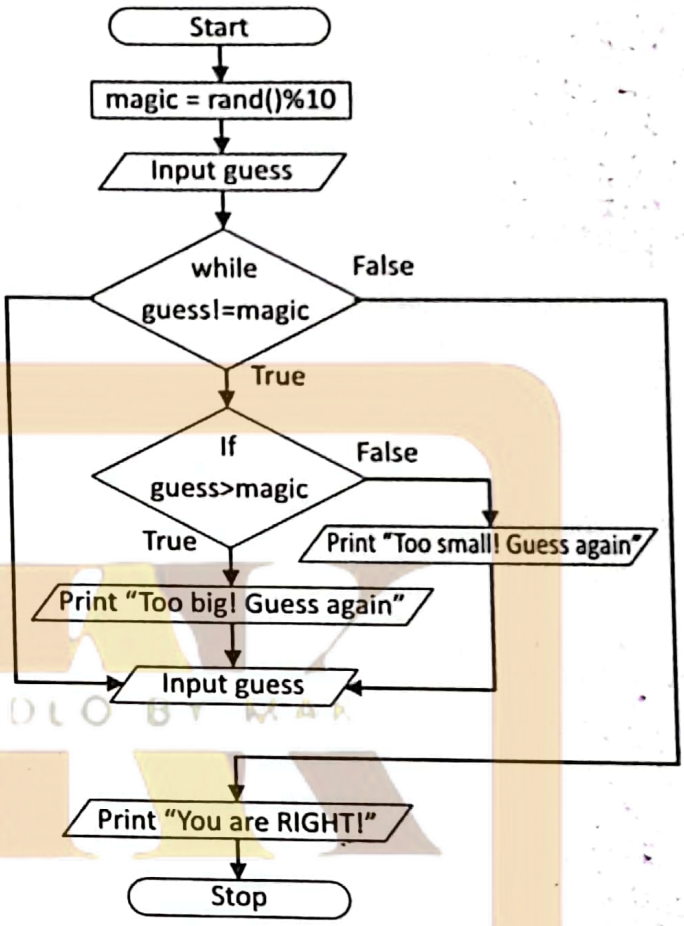
Practical 40

Write a program to generate a random number between 0 and 9 and let the user a guess it. Use a while loop. Exit when user guessed right.

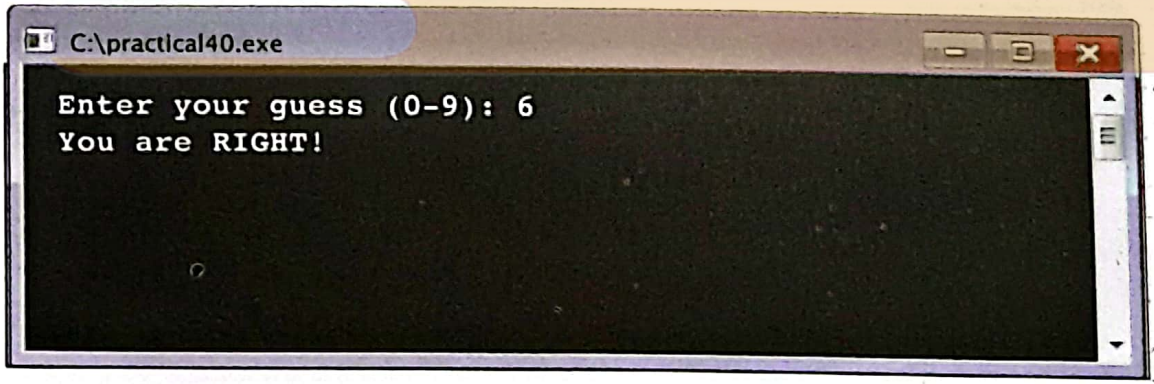
Program

```
#include <iostream.h>
#include <stdlib.h>
#include <conio.h>
int main()
{
 int magic, guess;

 magic = rand()%10;

 cout << "Enter your guess (0-9): ";
 cin >> guess;

 while (guess != magic)
 {
  if(guess > magic)
      cout << "Too big! Guess again..." << endl;
  else
      cout << "Too small! Guess again..." << endl;

  cin >> guess;
 }

 cout << "You are RIGHT!" << endl;;

 getch();
 return 0;
}
```

Flowchart



Output



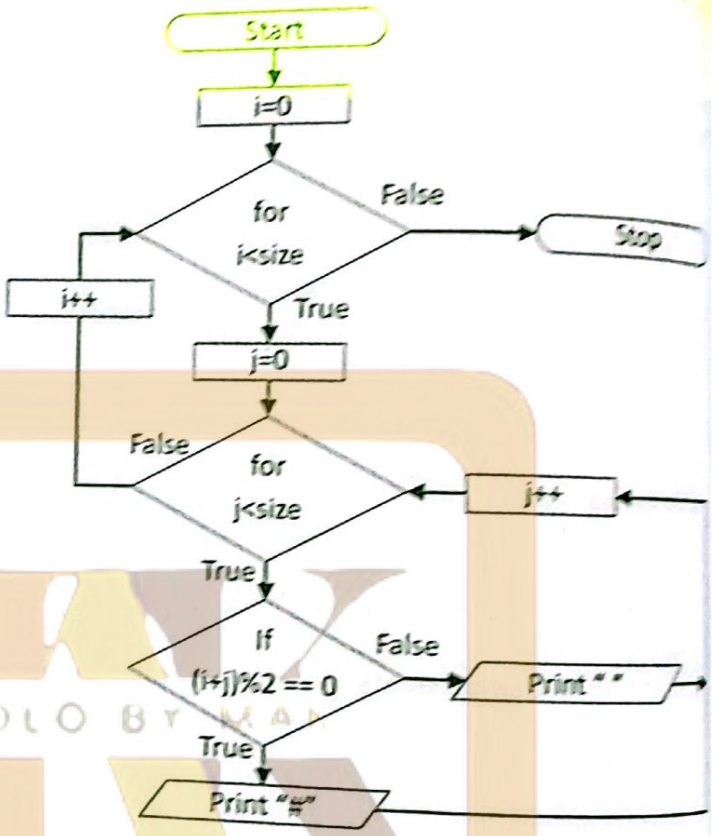
Practical 41

Write a program to print chessboard pattern.

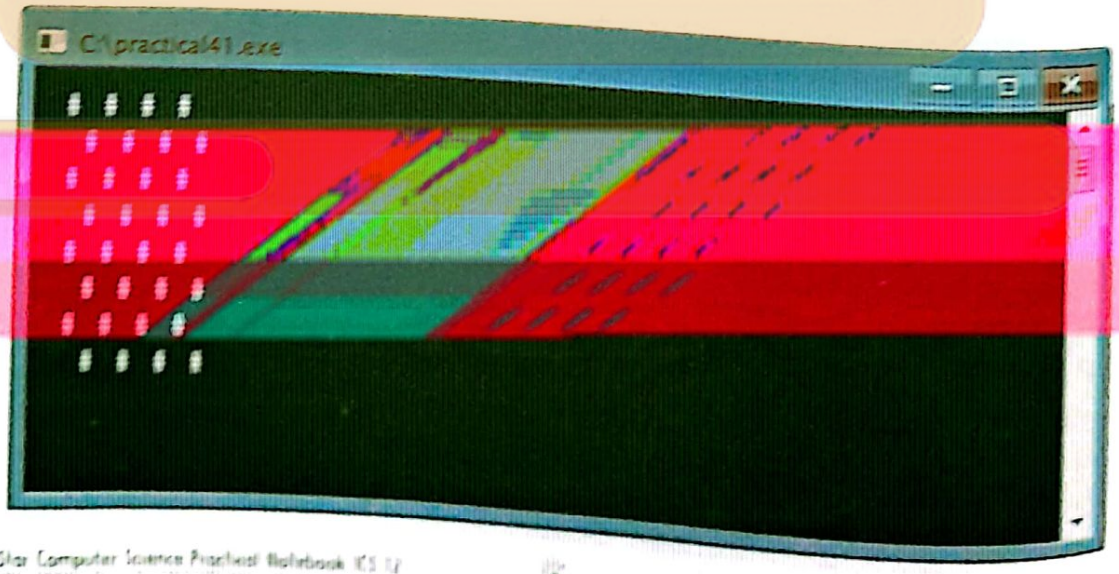
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int size = 8;

 for (int i=0; i<size; i++)
 {
  for(int j=0; j<size; j++)
   if((i+j)%2 == 0)
    cout<<"#";
   else
    cout<<" ";

  cout<<"\n";
 }

 getch();
 return 0;
}
```

Flowchart



Output



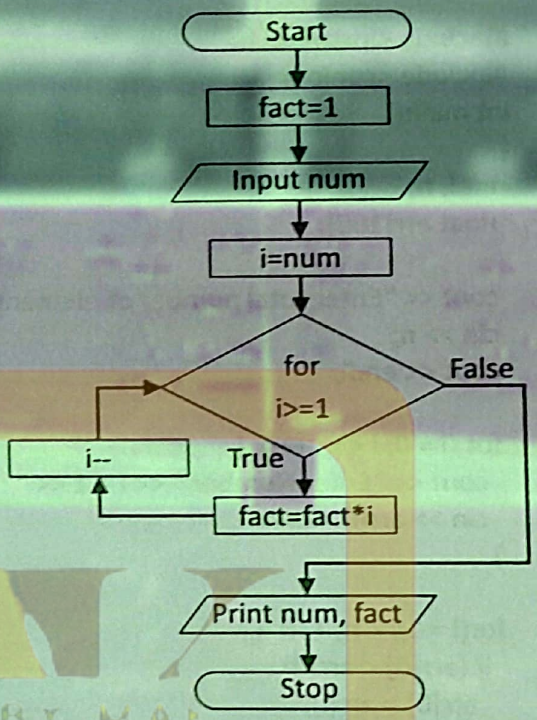
Practical 42

Write a program to find factorial using for loop.

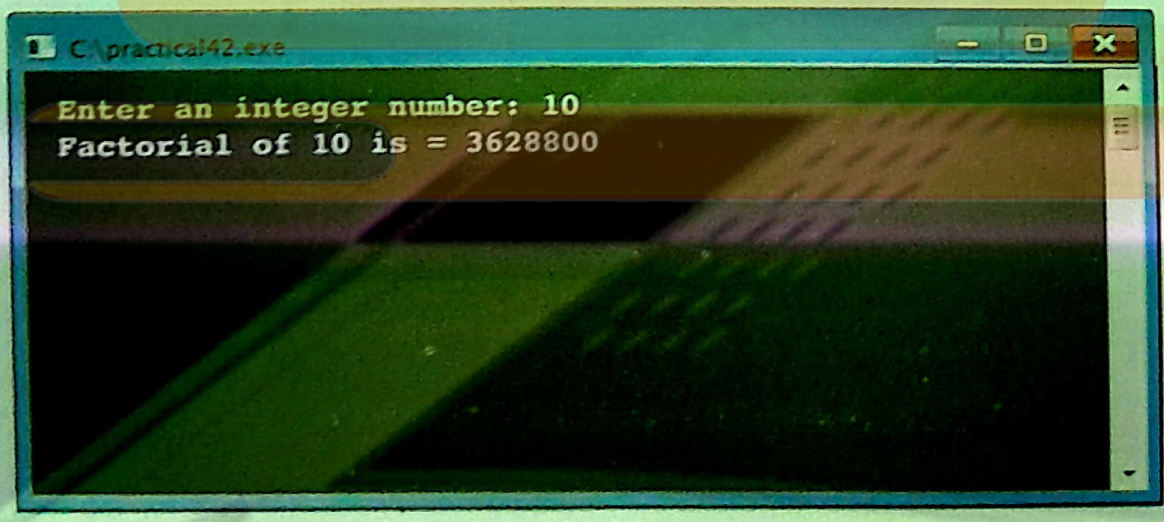
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int num,i;
 long int fact=1;

 cout << "Enter an integer number: ";
 cin >> num;

 for(i=num;i>=1;i--)
  fact=fact*i;

 cout<<"Factorial of "<<num<<" is = "<<fact<<endl;

 getch();
 return 0;
}
```

Flowchart



Output



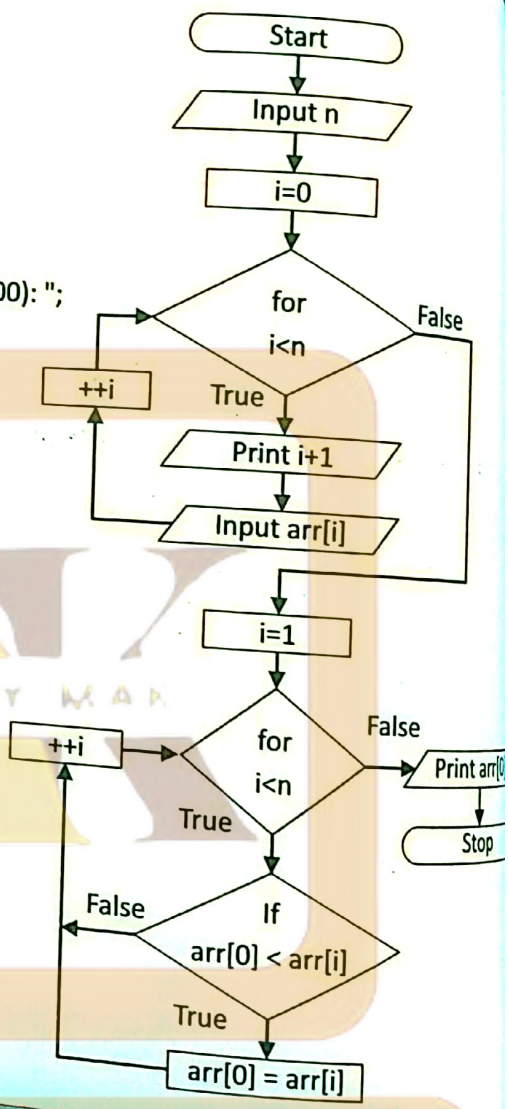
Practical 43

Write a program to find largest element of an array

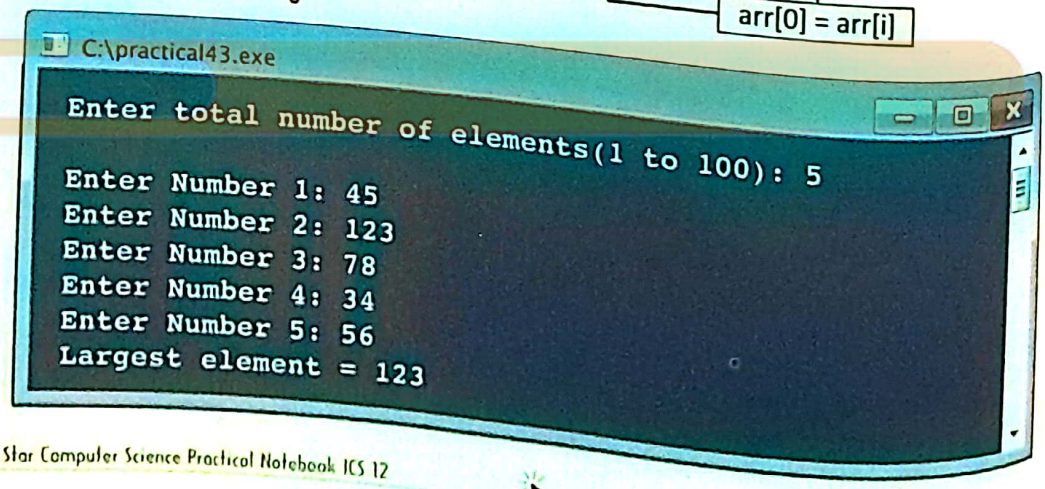
Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int i, n;
 float arr[100];

 cout << "Enter total number of elements(1 to 100): ";
 cin >> n;
 cout << endl;

 for (i = 0; i < n; ++i) {
  cout << "Enter Number " << i + 1 << " : ";
  cin >> arr[i];
 }

 for(i = 1;i < n; ++i) {
  if (arr[0] < arr[i])
   arr[0] = arr[i];
 }
 cout << "Largest element = " << arr[0];

 getch();
 return 0;
}
```

Flowchart



Output

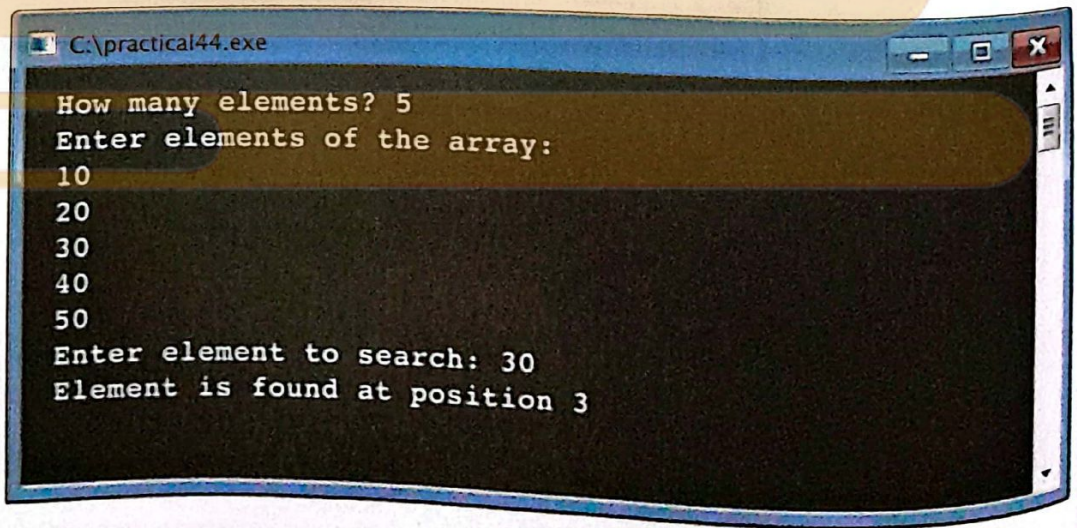


program for linear search in an array

Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int a[20],n,x,i,flag=0;

 cout<<"How many elements?";
 cin>>n;
 cout<<"\nEnter elements of the array\n";

 for(i=0;i<n;++i)
  cin>>a[i];

 cout<<"\nEnter element to search:";
 cin>>x;

 for(i=0;i<n;++i)
  if(a[i]==x) {
   flag=1;
   break;
  }

 if(flag)
  cout<<"\nElement is found at position "<<i+1;
 else
  cout<<"\nElement not found";

 getch();
 return 0;
}
```

Output



program to find the number of vowels consonant digits and space in a string

Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 char line[150];
 int vowels, consonants, digits, spaces;

 vowels =  consonants = digits = spaces = 0;

 cout << "Enter a line of string: ";
 cin.getline(line, 150);

 for (int i = 0; line[i]!='\0'; ++i)  {
  if (line[i]=='a' || line[i]=='e' || line[i]=='i' ||
       line[i]=='o' || line[i]=='u' || line[i]=='A' ||
       line[i]=='E' || line[i]=='I' || line[i]=='O' ||
       line[i]=='U')
  {
   ++vowels;
  }
  else if((line[i]>='a'&& line[i]<='z') || (line[i]>='A'&& line[i]<='Z'))
  {
   ++consonants;
  }
  else if(line[i]>='0' && line[i]<='9')
  {
   ++digits;
  }
  else if (line[i]==' ')
  {
   ++spaces;
  }
 }

 cout << "Vowels: " << vowels << endl;
 cout << "Consonants: " << consonants << endl;
 cout << "Digits: " << digits << endl;
 cout << "White spaces: " << spaces << endl;

 getch();
 return 0;
}
```

Output

```
C:\practical45.exe
Enter a line of string: Independence Day, observed
annually on 14 August, is a national holiday in
Pakistan.
Vowels: 29
Consonants: 38
Digits: 2
White spaces: 12
```

program to remove all characters in a strings except alphabets

Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 char line[100], alphabetString[100];
 int j = 0;

 cout << "Enter a string: ";
 cin.getline(line, 100);

 for (int i = 0; line[i] != '\0'; ++i)
  if ((line[i] >= 'a' && line[i]<='z') || (line[i] >= 'A' &&
line[i]<='Z'))
    alphabetString[j++] = line[i];

 alphabetString[j] = '\0';
 cout << "Output String: " << alphabetString;

 getch();
 return 0;
}
```

Output

```
C:\practical46.exe
Enter a string: Pakistan covers 770875.00 square
kilometers of land and has a population of 190291129.
Output String:
Pakistancoverssquarekilometersoflandandhasapopulationo
```

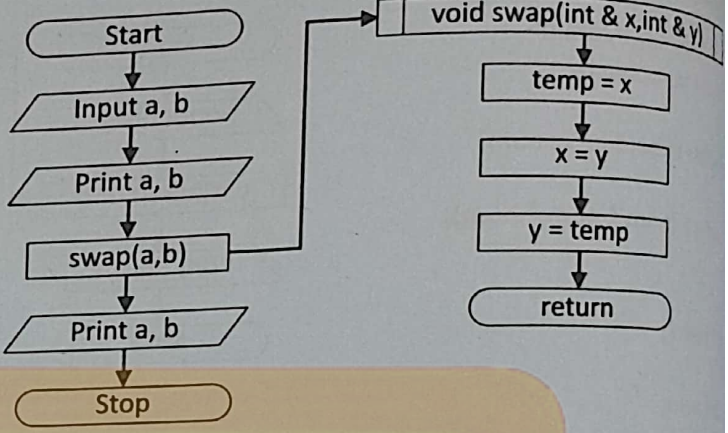
Practical 48

Write a program to swap values of two variables using pass by reference method.

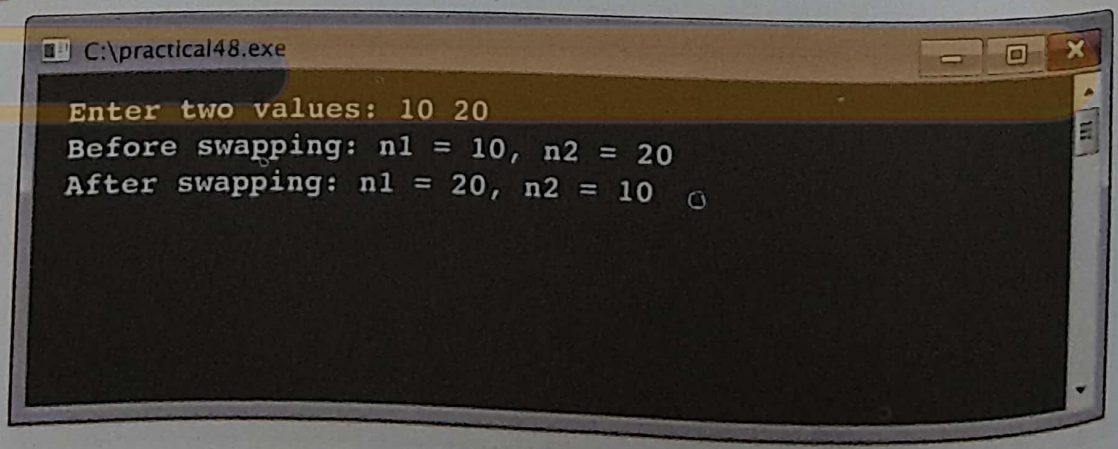
Program

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

void swap(int & x,int & y)
{
 int temp;
 temp = x;
 x = y;
 y = temp;
}

int main()
{
 int a,b;

 cout << "Enter two values: ";
 cin >> a >> b;
 cout << "Before swapping: n1 = "<< a << ", n2 = " << b;

 swap(a,b);

 cout << "\nAfter swapping: n1 = " << a << ", n2 = "<< b;

 getch();
 return 0;
}
```

Flowchart



Output



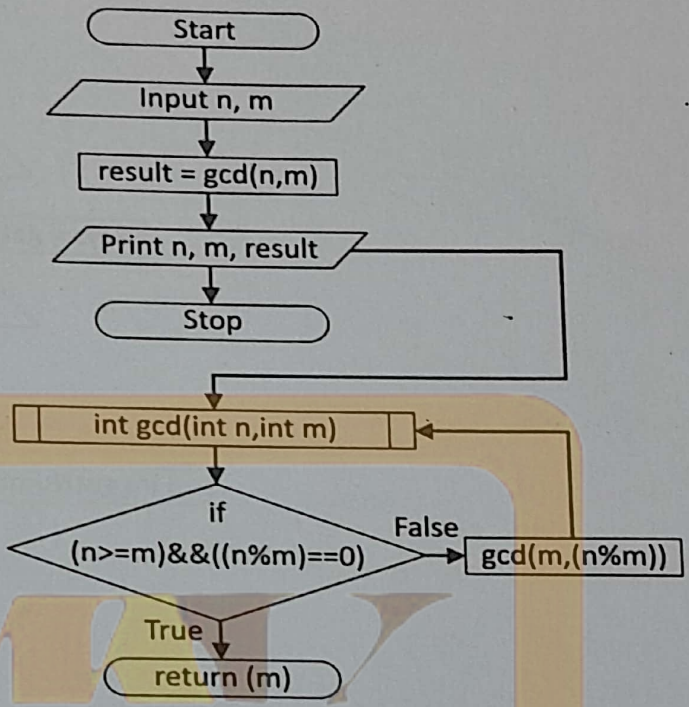
Practical 49

Write a program to find GCD of two numbers using recursion.

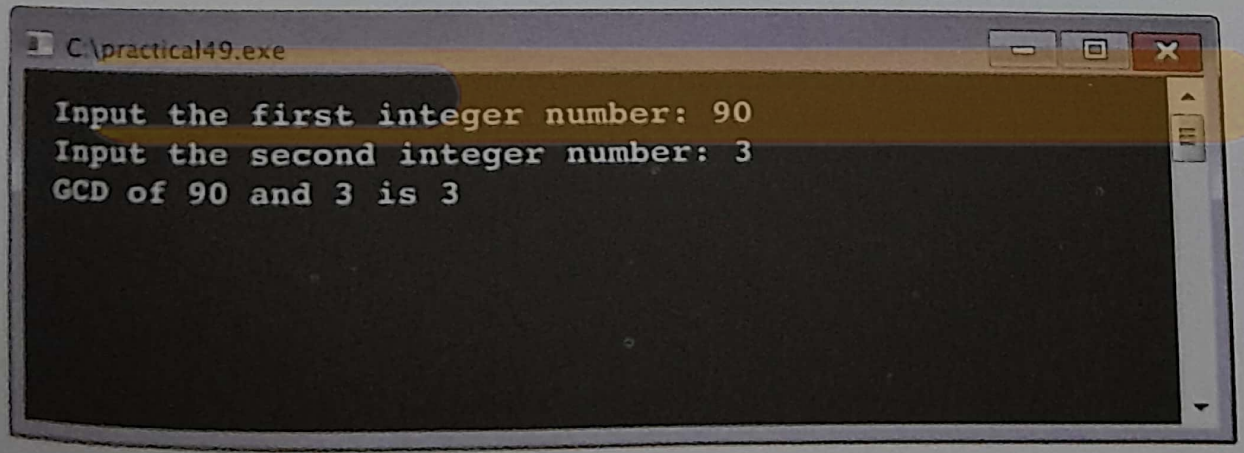
Program

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

int gcd(int n,int m)
{
 if((n>=m)&&((n%m)==0))
  return(m);
 else
  gcd(m,(n%m));
}

int main()
{
 int n, m, result;

 cout << "Input the first integer number: ";
 cin >> n;
 cout << "Input the second integer number: ";
 cin >> m;
 result = gcd(n,m);
 cout << "GCD of "<< n << " and " << m << " is " << result;

 getch();
 return 0;
}
```

Flowchart



Output

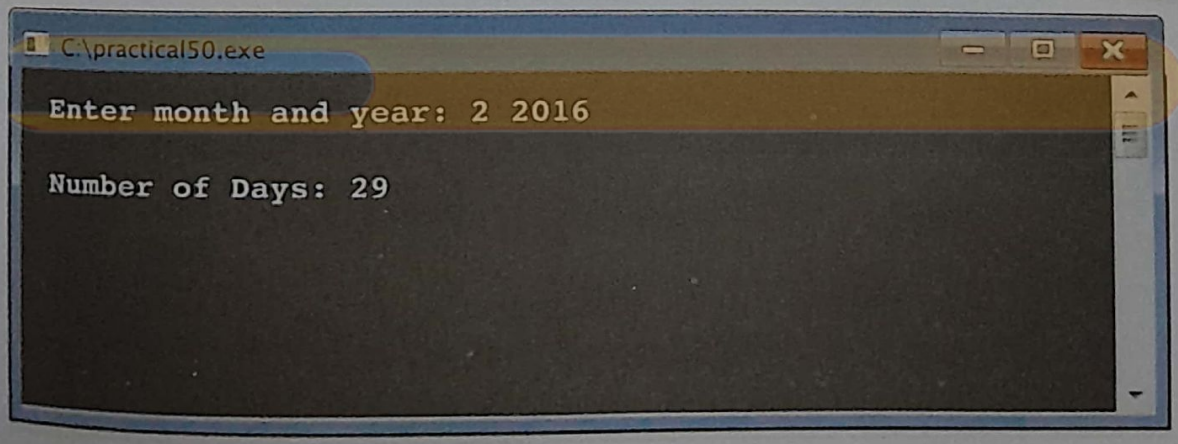


program to find total number of days in month year

Program

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

int getNumberOfDays(int month, int year)
{
 if (month == 2)
 {
  if ((year%400==0) || (year%4==0 && year%100!=0))
   return 29;
  else
   return 28;
 }
 else if (month == 1 || month == 3 || month == 5 ||
month == 7 || month == 8
    ||month == 10 || month==12)
  return 31;
 else
  return 30;
}

int main()
{
 int days=0, month, year;
 cout << "Enter month and year: ";
 cin >> month >> year;
 days = getNumberOfDays(month, year);
 cout << endl << "Number of Days: " << days;

 getch();
 return 0;
}
```

Output



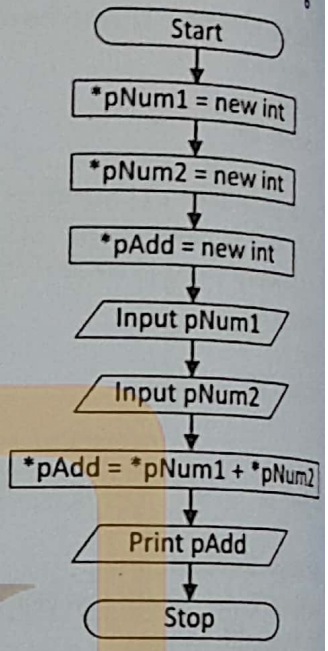
Practical 51

Write a program to add two numbers using pointers.

Program

```
#include <iostream.h>
#include <conio.h>
int main()
{
 int *pNum1 = new int;
 int *pNum2 = new int;
 int *pAdd = new int;

 cout << "Enter first number: ";
 cin >> (*pNum1);
 cout << "Enter second number: ";
 cin >> (*pNum2);

 *pAdd = *pNum1 + *pNum2;

 cout<<"Addition is: "<<*pAdd<<endl;

 getch();
 return 0;
}
```

Flowchart



Output