G H RAISONI INSTITUTE OF ENGINEERING & TECHNOLOGY
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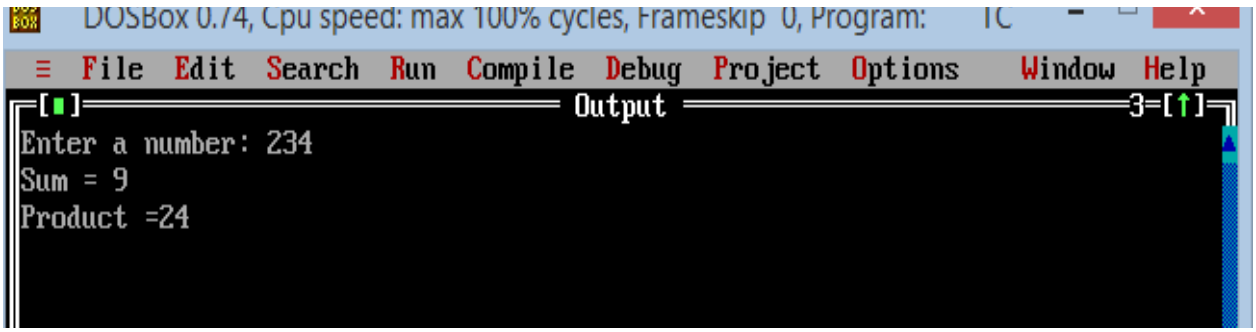
Department of Commerce and Management

Bachelor of Commerce in Computer Application
2nd Semester

OOPs with C++ Practical

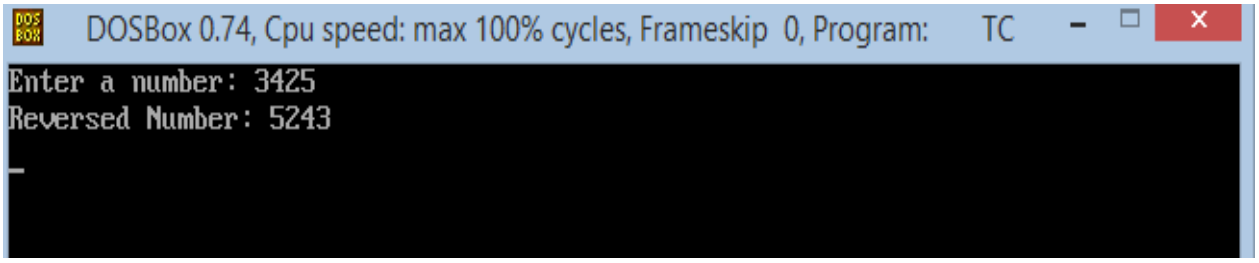
1. **Write an algorithm, draw a flowchart and develop a C++ program to print the sum and product of digits of an integer.**

```
#include <iostream.h>
int main()
{
int n, sum=0, m, product=1;
cout<<"Enter a number: ";
cin>>n;
while(n>0)
{
m = n % 10;
sum= sum + m;
product = product * m;
n = n / 10;
}
cout<<"Sum = "<<sum<<endl;
cout<<"Product ="<<product;
return 0;
}
```



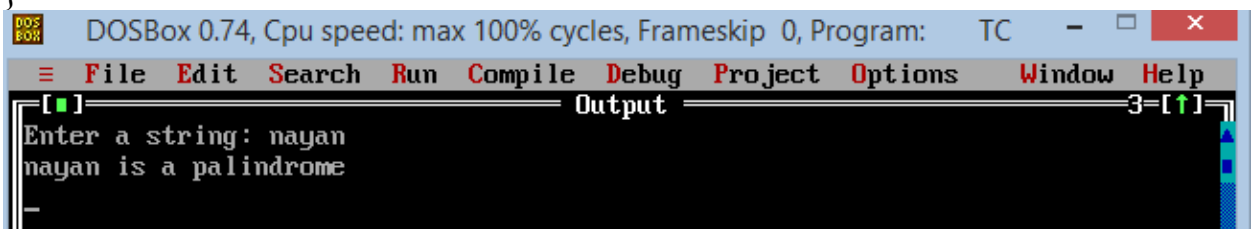
2. Write an algorithm, draw a flowchart and develop a C++ program to reverse of a number.

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

int main()
{
int n, reverse=0, rem;
clrscr();

cout<<"Enter a number: ";
cin>>n;

while(n!=0)
{
    rem=n%10;
    reverse=reverse*10+rem;
    n/=10;
  }
 cout<<"Reversed Number: "<<reverse<<endl;
getch();
return 0;
}
```



3. Write an algorithm, draw a flowchart and develop a C++ function that checks whether a given string is Palindrome or not.

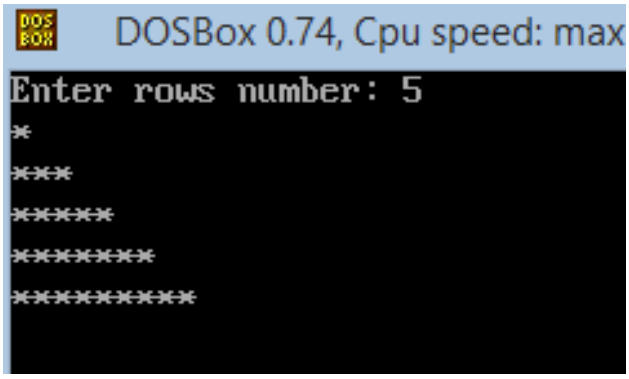
```
#include<iostream.h>
#include<string.h>
#include<stdio.h>
#include<conio.h>

int main()
{
   clrscr();
   char string1[20];
   int i, length;
   int flag = 0;
   cout << "Enter a string: ";
   cin >> string1;

   length = strlen(string1);

   for(i=0;i < length ;i++)
   {
      if(string1[i] != string1[length-i-1])
      {
         flag = 1;
         break;
                        }
}

   if (flag)
   {
      cout << string1 << " is not a palindrome" << endl;
   }
   else
   {
      cout << string1 << " is a palindrome" << endl;
   }
   getch();
   return 0;
}
```



4. **Write an algorithm, draw a flowchart and develop a C++ program to print a triangle of stars as follows (take number of lines from user):**

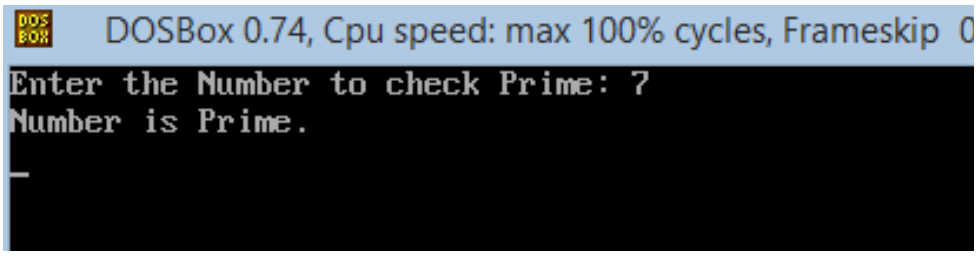
```
*
***
*****
*******
*********
```

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

int main()
{
                clrscr();
                int rows;
                cout<<"Enter rows number: ";
                cin>>rows;      // rows = 5

                for(int i=1; i<=rows; i++)
                {
                    for(int j=1; j<=2*i-1; j++)
                    {
                     cout<<"*";
                    }
                    cout<<"\n";
                }
                getch();
                return 0;
 }
```



5. **Write an algorithm, draw a flowchart and develop a C++ function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.**

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

int main()
{
 clrscr();
 int n, i, m=0, flag=0;
 cout << "Enter the Number to check Prime: ";
 cin >> n;
 m=n/2;
 for(i = 2; i <= m; i++)
 {
    if(n % i == 0)
    {
       cout<<"Number is not Prime."<<endl;
       flag=1;
       break;
    }
 }
 if (flag==0)
    cout << "Number is Prime."<<endl;
 getch();
 return 0;
}
```



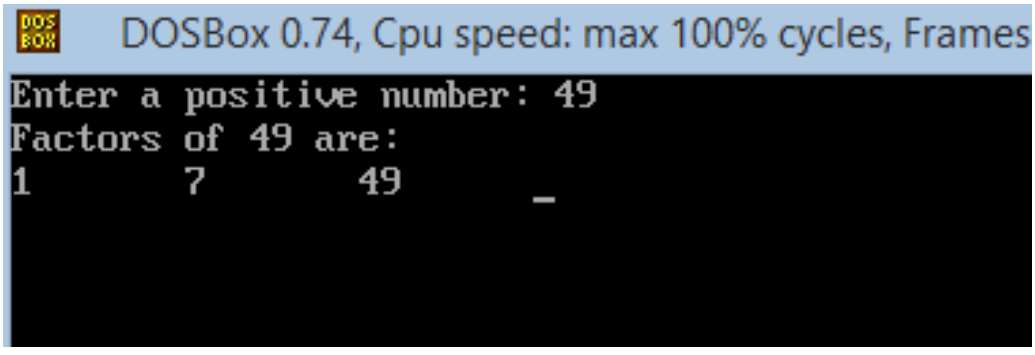
6. Write an algorithm, draw a flowchart and develop a C++ program to compute the factors of a given number.

Algorithm:

1. Take input number to factorize.
2. Input is stored in an **int** type variable say **num**.
3. A factor of num can be found in range 1 to num
4. Initialize factor=1
5. Run a loop from factor=1 to num
    1. if **num%factor==0** (if num is divisible by factor)
        1. print factor
    2. increment factor , factor ++

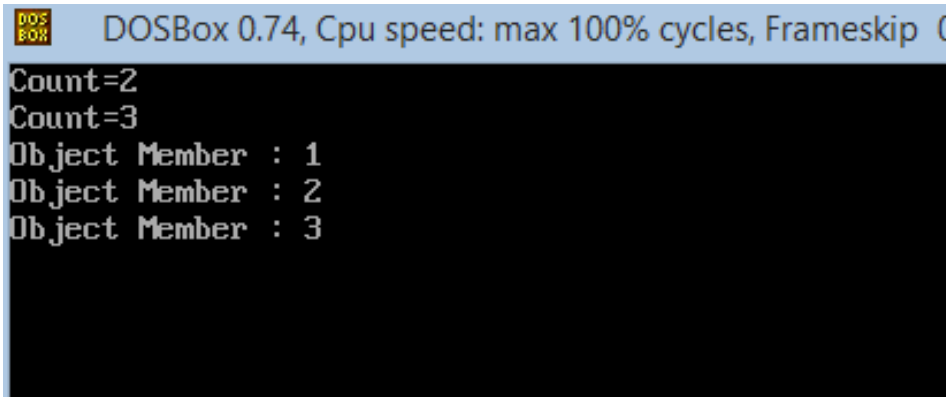
Program:

```
#include<iostream.h>
#include<conio.h>
int main()
{
   int num;
   clrscr();
   cout << "Enter a positive number: ";
   cin >> num;
   cout << "Factors of " << num << " are: " << endl;
   //finding and printing factors
   for(int i = 1; i <= num; i++
   {
        if(num % i == 0)
                cout << i << "\t";
   }
   getch();
   return 0;
}
```



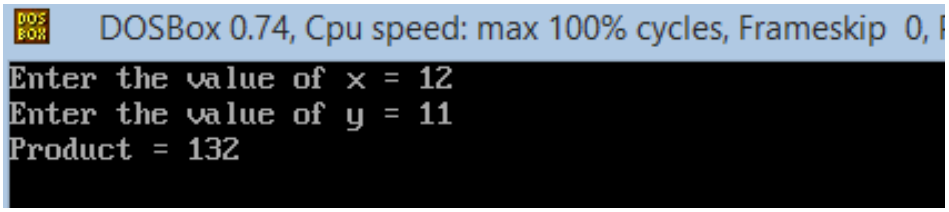
7. Write an algorithm, draw a flowchart and develop a C++ to demonstrate the static data member and static member function

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

class test
{
        int code;
        static int count; // static member variable

        public:

        void setcode()
        {
                code=++count;
        }
        void showcode(void)
        {
                cout<<"Object Member : "<<code<<endl;
        }

        static void showcount(void)
        {
                cout<<"Count="<<count<<endl;
        }
};
int test:: count;
int main()
{
        clrscr();
        test t1,t2;
        t1.setcode( );
        t2.setcode( );
        test :: showcount ( );        // Count = 2

        test t3;
        t3.setcode( );
        test:: showcount( ); // Count = 3
        t1.showcode( );
        t2.showcode( );
        t3.showcode( );
        getch();
        return(0);
}
```


DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip
Count=2
Count=3
Object Member : 1
Object Member : 2
Object Member : 3

8. Write an algorithm, draw a flowchart and develop a C++ program to demonstrate the use of single inheritance.

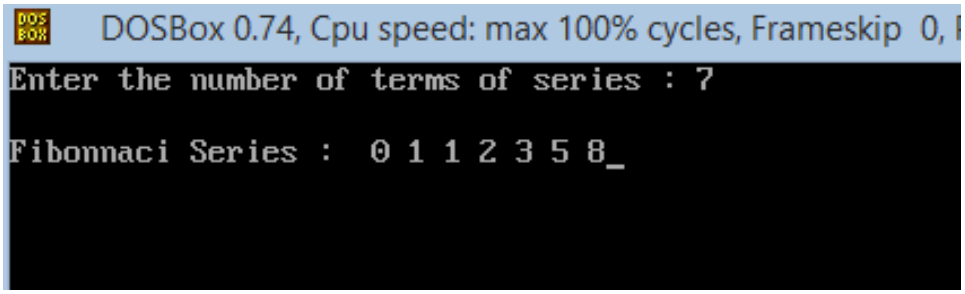
```
#include<iostream.h>
#include<conio.h>

class base
{
  public:
    int x;
  void getdata()
  {
    cout << "Enter the value of x = ";
    cin >> x;
  }
};
class derive : public base
{
  private:
  int y;
  public:
  void readdata()
  {
    cout << "Enter the value of y = "; cin >> y;
  }
  void product()
  {
    cout << "Product = " << x * y;
  }
};

int main()
{
  clrscr();
  derive a;
  a.getdata();
  a.readdata();
  a.product();
  getch();
  return 0;
}
```



9. Write an algorithm, draw a flowchart and develop a C++ program to display Fibonacci series (i)using recursion, (ii) using iteration

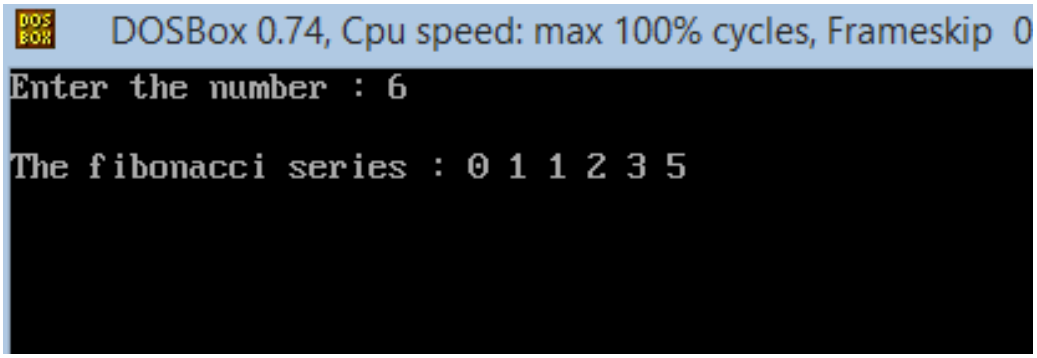
(i) using recursion

```
#include<iostream.h>
#include<conio.h>
int fib(int x)
{
  if((x==1)||(x==0))
  {
    return(x);
  }
  else
  {
    return(fib(x-1)+fib(x-2));
  }
}
int main()
{
  int x , i=0;
  clrscr();
  cout << "Enter the number of terms of series : ";
  cin >> x;
  cout << "\nFibonnaci Series : ";
  while(i < x)
  {
    cout << " " << fib(i);
    i++;
  }
  getch();
  return 0;
}
```



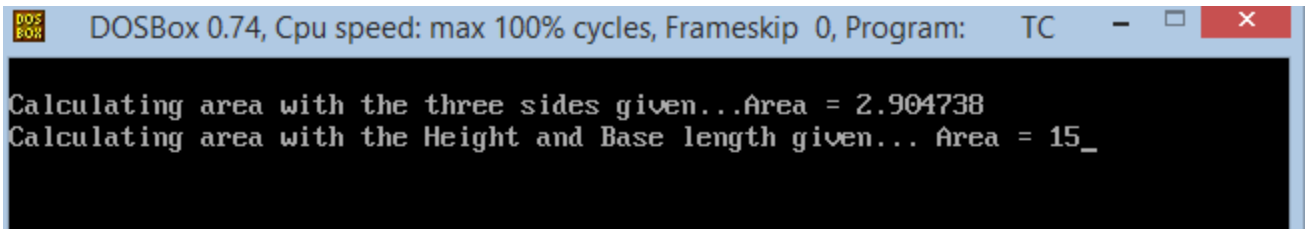
(ii) using iteration

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

void fib(int num)
{
  int x = 0, y = 1, z = 0;
  for (int i = 0; i < num; i++)
  {
    cout << x << " ";
    z = x + y;
    x = y;
    y = z;
  }
}
int main()
{
  int num;
  clrscr();
  cout << "Enter the number : ";
  cin >> num;
  cout << "\nThe fibonacci series : " ;
  fib(num);
  getch();
  return 0;
}
```



10. Write an algorithm, draw a flowchart and develop a C++ program to create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.

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


class triangle // Creating class triangle
{
 public:

 void area(float s1,float s2,float s3)
 {
        cout<<"\nCalculating area with the three sides given...";
        double X;
        float s=s1+s2+s3;
        s = s/2;
        X=sqrt((s)*(s-s1)*(s-s2)*(s-s3));
        cout<<"Area = "<<X;
 }
void area(float h1,float b1)
{
        cout<<"\nCalculating area with the Height and Base length given... ";
        double X;
        X = h1*b1*(0.5);
        cout<<"Area = "<<X;
}
};
void main()
{
        clrscr();
        triangle t;
        t.area(2,3,4);
        t.area(5,6);
        getch();
}
```



11. Write an algorithm, draw a flowchart and develop a C++ program to show the constructor overloading.

```
#include<iostream.h>
#include<conio.h>
class Person
{
  private:
            int age;
  public:

   Person() //Constructor with no arguments
   {
      age = 20;
   }

   Person(int a) //Constructor with an argument
   {
      age = a;
   }

   int getAge()
   {
      return age;
   }
};

int main()
{
   clrscr();
   Person person1, person2(45);
   cout << "Person1 Age = " << person1.getAge() << endl;
   cout << "Person2 Age = " << person2.getAge() << endl;
   getch();
   return 0;
```

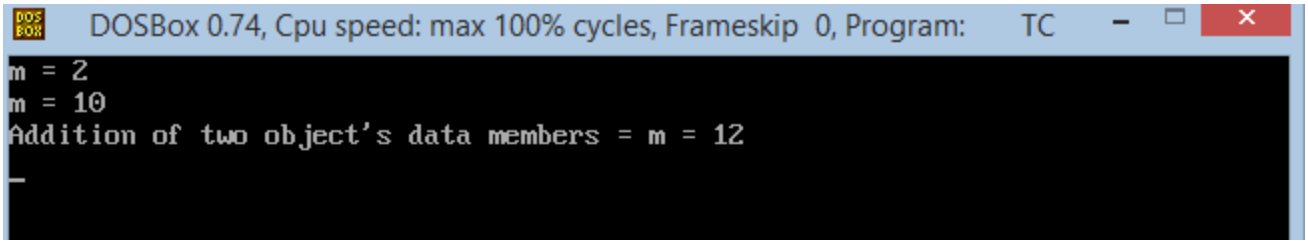
```
}
```

```
Person1 Age = 20
Person2 Age = 45
```

12. Write an algorithm, draw a flowchart and develop a C++ program to perform binary operator overloading with the help of friend function.

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

class Addition
{
        int m;
        public:

        Addition()
        {
          m=0;
        }
        Addition(int x)
        {
          m=x;
        }
        void show()
        {
          cout<<"m = "<<m<<endl;
        }

        friend Addition operator +(Addition &p, Addition &q)
        {
          Addition obj;
          obj.m = p.m + q.m; // obj.m = 2 + 10
          return obj;
        }
};
void main()
{
        clrscr();
        Addition x(2);
        Addition y(10);
        Addition z;
        x.show();
```

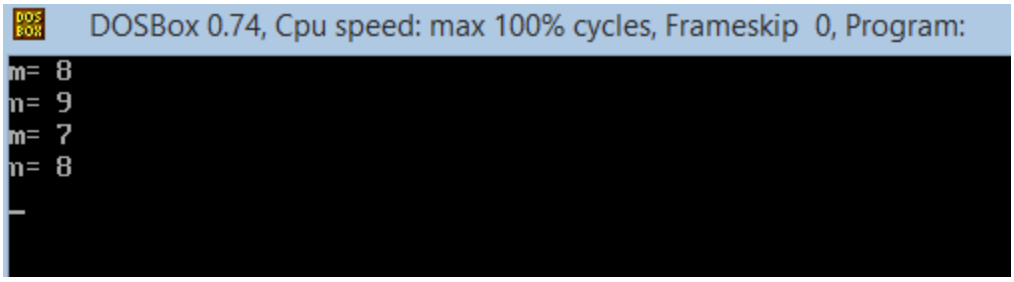
```
        y.show();
        cout<<"Addition of two object's data members = ";
        z = x + y;      // z called function 'operator +' & pass x and y as arguments
        z.show();
        getch();
}
```



13. Write an algorithm, draw a flowchart and develop a C++ program to perform unary operator overloading.

```
// Unary – operator overloading with simple member function
#include<iostream.h>
#include<conio.h>

class abc
{
        int m,n;

        public:
        abc()
        {
            m=8;
            n=9;
        }
        void show()
        {
            cout<<"m= "<<m<<endl;
            cout<<"n= "<<n<<endl;
        }
        void operator -- ()
        {
            --m;
            --n;
        }
};
void main()
{
        clrscr();
```

```
        abc x;
        x.show();
        --x;  // invoking the overloaded operator function
        x.show();
        getch();
}
```



14. Write an algorithm, draw a flowchart and develop a C++ program to implement the exception handling with multiple catch statement.

```
#include <iostream>
using namespace std;

void test (int x)
{
        try
        {
            if (x==1)
                    throw x;            //int
            else if(x==0)
                    throw 'x';          //char
            else if (x== -1 )
                    throw 1.0;          //double
            cout<<"end of try- block \n";
        }
        catch(char c) //Catch 1
        {
            cout<<"Caught a character \n";
        }
        catch (int m) //Catch 2
        {
            cout <<"caught an integer\n";
        }
        catch (double d) //catch 3
        {
            cout<<"caught a double \n";
        }
```

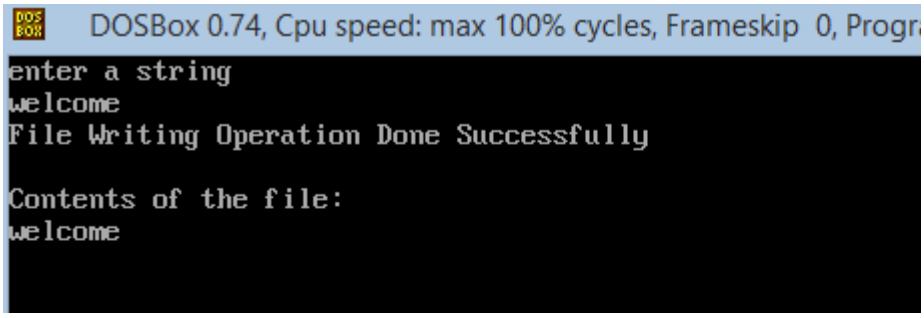
```
        cout<<"end of try –catch system \n\n";
}
int main()
{
        cout<<"Testing multiple catches \n";
        cout<<"x== 1 \n";
        test(1);
        cout<<"x== 0 \n";
        test(0);
        cout<<"x == -1 \n";
        test (-1);
        return 0;
}
```

```
Testing multiple catches
x== 1
caught an integer
end of try -catch system

x== 0
Caught a character
end of try -catch system

x == -1
caught a double
end of try -catch system
```

15. Write an algorithm, draw a flowchart and develop a C++ program to create the file and write a data into that by using the constructor.

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

int main()
{
        char string[80];
        clrscr();
        cout<<"enter a string \n";
        cin>>string;

        int len = strlen(string);

        fstream file;
        file.open("TEXT", ios::in | ios::out);
```

```
                for(int i=0;i<len;i++)
                {
                        file.put(string[i]);
                }
                cout<<"File Writing Operation Done Successfully"<<endl<<endl;
                cout<<"Contents of the file:"<<endl;
                file.seekg(0);
                char ch;
                while(file)
                {
                 file.get(ch);
                 cout<<ch;
                }
                getch();
                return 0;
}
```



16. Write an algorithm, draw a flowchart and develop a C++ program to copy data of one file into another file.

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

int main()
{
  char ch;
  FILE *source, *target;
  char source_file[]="x1.txt";
  char target_file[]="x2.txt";
  clrscr();
```

```
  source = fopen(source_file, "r");
  if (source == NULL)
  {
    cout<<"Press any key to exit..."<<"\n";
    exit(0);
  }
  target = fopen(target_file, "w");
  if (target == NULL)
  {
    fclose(source);
    cout<<"Press any key to exit..."<<"\n";
    exit(0);
  }
  while ((ch = fgetc(source)) != EOF)
    fputc(ch, target);
  cout<<"File copied successfully."<<"\n";
  fclose(source);
  fclose(target);
  getch();
  return 0;
}
```