EXPERIMENT NO. 02

DATE OF PERFORMANCE:	**GRADE:**
DATE OF ASSESSMENT:	**SIGNATURE OF LECTURER/ TTA:**

AIM: To Study Basics of C++.

THEORY:

WHAT IS C++?

C++ is an Object Oriented Programming Language. It was developed by Bjarne Stroustrup at AT&T Bell Laboratories in MarrayHoll, New Jersey, USA. In early 1980's stroustrup ,an admirer of Simula 67 & a strong supporter of C, wanted to combine best of both languages & create more powerful language that could support OOP features and still remain power and elegance of C. The result was C++. Stroustrup initially called new Language 'C with classes'. Later in 1983, the name was changed to C++.

APPLICATIONS OF C++:

Since C++ allows us to create hierarchy related objects, we can build special object oriented libraries which can be used by many programmers.

While C++ is able to map the real world problem properly.

C++ Programs are easily maintainable and expendable.

It is expected that C++ will replace C as a general Purpose feature in nearby.

COMMENTS:

Comments are portions of the code ignored by the compiler which allow the user to make simple notes in the relevant areas of the source code. Comments come either in block form or as single lines.

C++ supports single-line and multi-line comments. All characters available inside any comment are ignored by C++ compiler.

For example:

/* This is a comment */

//This is a Single Line Comment

/* C++ comments can also

*** span multiple lines*/**

BASIC STRUCTURE OF C++ PROGRAM:

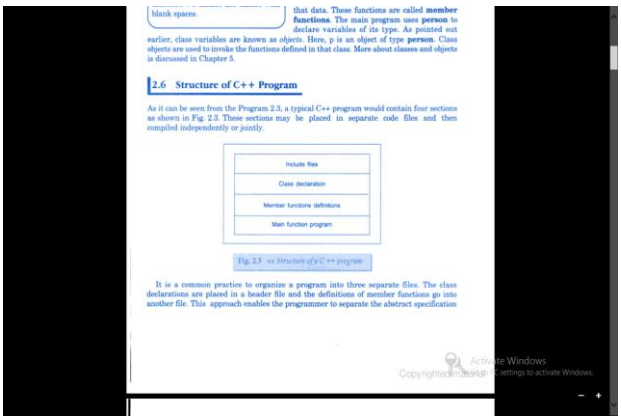

Fig 2.2: Basic Structure of C++

Include Files:

#include<iostream>.

<iostream> represents header file which includes the functionalities of predefined functions. In linking section, the compiler in-built functions such as cout<<, cin>>etc are linked with INCLUDE subdirectory's header file <iostream>. The '#' symbols tells about "address to" or "link to". Iostream is input/output stream which includes declarations of standard input-output library in c++.

Class Declaration:

A class in C++ is a user defined type or data structure declared with keyword *class* that has data and functions. In this function we need to define class with its all variables and member function declaration.

Member function definitions:

A member function of a class is a function that has its definition or its prototype within the class definition like any other variable. It operates on any object of the class of which it is a member, and has access to all the members of a class for that object.

main () Section:

This is the section in which the program coding is written. Basically, it acts as a container for c++ program. The execution of the c++ program begins with main () function and it is independent of the location of main () function in the program. main () is a function as represented by parenthesis "()". This is because it is a function declaration.

INPUT AND OUTPUT OPERATOR:

C++ is able to input and output the built-in data types using the stream extraction operator >> and the stream insertion operator <<. The stream insertion and stream extraction operators also can be overloaded to perform input and output for user-defined types like an object.

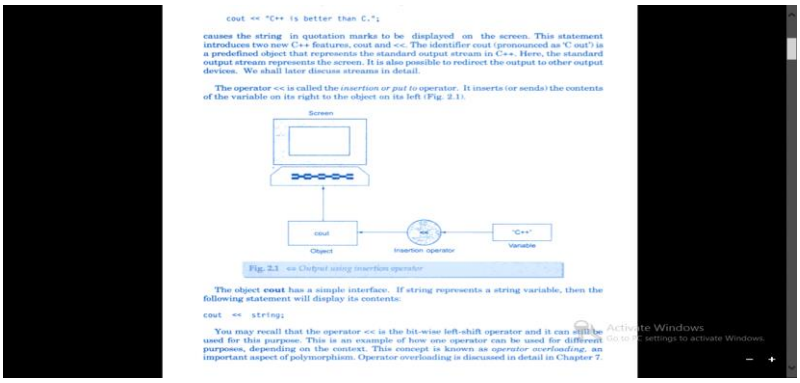

Figure 2.1: Output Operator

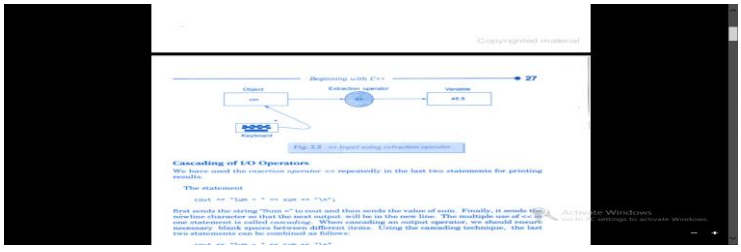

Figure 2.2: Input Operator

CASCADING-OF-IO-OPERATORS:

Successive occurrence of input and output *operators* (“>>” and “<<”) in *C++* can be concatenate to generate a Output.

```
cout<<” Sum is:” <<c<<” and Avg is:” <<avg;
```

Here c and avg is a variable which will be concated to produce a result.

EXAMPLE OF C++ PROGRAM STRUCTURE:

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

// main () is where program execution begins.

int main ()
{
cout<< "Hello World"; // prints Hello World
return 0;
}
```

Let us look various parts of the above program:

- **The C++ language defines several headers, which contain information that is either necessary or useful to your program. For this program, the header <iostream> is needed.**
- **The line using namespace std; tells the compiler to use the std namespace. Namespaces are a relatively recent addition to C++.**
- **The next line // main() is where program execution begins. is a single-line comment available in C++. Single-line comments begin with // and stop at the end of the line.**
- **The line int main() is the main function where program execution begins.**
- **The next line cout<< "This is my first C++ program."; causes the message "This is my first C++ program" to be displayed on the screen.**

Extension of C++ Program will be .cpp.

PROGRAM 1: Program to Print Hello World.

```
#include <iostream>


int main()

{

   std::cout << "Hello World" << std::endl;

   return 0;

}
```

OUTPUT:

Hello World

PROGRAM 2: Program to Add Two Number.

```
#include <iostream>


int main()

{

   int a = 0, b = 0, c = 0;


   std::cout << "Enter the Value 1: ";
```

```
    std::cin >> a;


    std::cout << "Enter the Value 2: ";
    std::cin >> b;


    c = a + b;


    std::cout << "The Sum is: " << c << std::endl;


    return 0;
}
```

OUTPUT:

Enter the Value 1: 5

Enter the Value 2: 3

The Sum is: 8

PROGRAM 3: Program to Find area of a Circle

```
#include <iostream>
```

```
#define PI 3.14


int main()

{

    int r;

    float area;



    std::cout << "Enter the Radius: ";

    std::cin >> r;



    area = PI * r * r;



    std::cout << "The Area is: " << area << std::endl;



    return 0;

}
```

OUTPUT:

Enter the Radius: 4

The Area is: 50.24

PROGRAM 4: Program to Find a Sum of two number using class.

```
#include <iostream>

class Sum
{
   int a, b;

public:
   void set(int a1, int b1)
   {
      a = a1;
      b = b1;
   }

   void get()
   {
      int c;
      c = a + b;
      std::cout << "The Sum is: " << c << "\n";
   }
};

int main()
{
   Sum s1, s2, s3;

   s1.set(10, 20);
```

```
    s1.get();

    s2.set(20, 30);
    s2.get();

    s3.set(50, 40);
    s3.get();

    return 0;
}
```

OUTPUT:

The Sum is: 30

The Sum is: 50

The Sum is: 90

PROGRAM 5: Program to Find a Sum of two number using class outside Method.

```
#include <iostream>

class Sum
{
        int a, b;

public:
        void set(int a1, int b1)
        {
                a = a1;
                b = b1;
        }

        void get()
        {
                int c;
```

```
            c = a + b;
            std::cout << "The Sum is: " << c << "\n";
        }
};

int main()
{
        Sum s1, s2, s3;

        s1.set(10, 20);
        s1.get();

        s2.set(20, 30);
        s2.get();

        s3.set(50, 40);
        s3.get();

        return 0;
}
```

OUTPUT:

The Sum is: 30

The Sum is: 50

The Sum is: 90