Content 6

### C++ Header files & Operators

#### Header Files in C++

"**#include"** is used in C++ to import header files in our C++ program. The reason to introduce the**"**<**iostream**>" header file into our program is that functions like "**cout"** and "**cin"** are defined in that header file. There are two types of header files:

##### **System Header Files**

System header files ships with the compiler. For example, “**#include <iostream>**”.

##### **User-Defined Header Files**

The programmer writes User-defined header files himself. To include your header file in the program, you first need to make a header file in the current directory, and then you can add it.

It is like adding or merging two programs:

**Program 1:**

#include<iostream>

using namespace std;

int main()

{

    cout<<"Hello World\n";

    return 0;

}

**Program 2:**

#include <iostream>

#include"cnt1.cpp" // adding of previous program

using namespace std;

int main2()

{

    int n1, n2;

    cout << "Enter number n1: ";  // this '<<' is called insertion.

    cin >> n1;

    cout << "Enter number n2: ";    // this '>>' is called Extraction.

    cin >> n2;

    cout << "The sum " << n1 << " and " << n2 << " is"<< endl << n1 + n2;

    return 0;

}

Here I made main body as main because there could not be two same function in program.

**Output:**

Hello World

#### Operators in C++

Operators are used for producing output by performing various types of calculations on two or more inputs. In this lecture, we will see the operators in C++.

##### **Arithmetic Operators**

Arithmetic operators are used for performing mathematical operations like (+, -, \*).

***Arithmetic Operators***

1. The function "**a+b"**, will add a and b values and print them.
2. The function "**a-b "**will subtract a and b values and print them.
3. The function "**a\*b"** will multiply a and b values and print them.
4. The function "**a/b "**, will divide a and b values and print them.
5. The function "**a%b "**, will take the modulus of a and b values and print them.
6. The function "**a++"** will first print the value of a and then increment it by 1.
7. The function "**a--"**, will first print the value of a and then decrement it by 1.
8. The function "**++a"**, will first increment it by one and then print its value.
9. The function "**--a"**, will first decrement it by one and then print its value.

**Code1:**

#include <iostream>

using namespace std;

int main(int argc, char const \*argv[])

{

    int a = 4, b = 2;

    cout << "The value of a+b is: " << a + b << endl;

    cout << "The value of a-b is: " << a - b << endl;

    cout << "The value of a\*b is: " << a \* b << endl;

    cout << "The value of a/b is: " << a / b << endl;

    cout << "The value of a%b is: " << a % b << endl;

    cout << "The value of a++ is: " << a++ << endl;

    cout << "The value of a-- is: " << a-- << endl;

    cout << "The value of ++a is: " << ++a << endl;

    cout << "The value of --a is: " << --a << endl;

    return 0;

}

**Output:**

The value of a+b is: 6

The value of a-b is: 2

The value of a\*b is: 8

The value of a/b is: 2

The value of a%b is: 0

The value of a++ is: 4

The value of a-- is: 5

The value of ++a is: 5

The value of --a is: 4

**Assignment Operators**

Assignment operators are used for assigning values to variables. For example: **int a = 10, b = 5;**

1. The function "**(a==b)"**, will compare a and b values and check if they are equal. The output will be one if equal, and 0 if not.
2. The function "**(a!=b)"**, will compare a and b values and check if "a" is not equal to "b". The output will be one if not equal and 0 if equal.
3. The function "**(a>=b)"**, will compare a and b values and check if "a" is greater than or equal to "b". The output will be one if greater or equal, and 0 if not.
4. The function "**(a<=b)"**, will compare a and b values and check if "b" is greater than or equal to "a". The output will be one if greater or equal, and 0 if not.
5. The function "**(a>b)"**, will compare a and b values and check if "a" is greater than "b". The output will be one if greater and 0 if not.
6. The function "**(a<b)"**, will compare a and b values and check if "b" is greater than "a". The output will be one if greater and 0 if not.

**Here if value is true then it will return 1 otherwise 0 for false.**

**Logical Operators**

Logical operators are used for comparing two expressions. For example ((a==b) && (a>b)). More examples of logical operators are:

1. The function "(**(a==b)&& (a<b))"** will first compare a and b values and check if they are equal or not; if they are equal, the next expression will check whether "a" is smaller than "b". The output will be one if both expressions are true and 0 if not.
2. The function "(**(a==b) || (a<b))"**, will first compare a and b values and check if they are equal or not, even if they are not equal it will still check the next expression ie whether "a" is smaller than "b" or not. The output will be one if any one of the expressions is true and 0 if both are false.
3. The function "(!**(a==b))"**, will first compare a and b values and check if they are equal or not. The output will be inversed ie if "a" and "b" are equal; the output will be 0 and 1 otherwise.