 **Difference between structure and class**

The language, through which user can interact with computer is known as computer language or programming language.

**Data types**

The table below shows the fundamental data types, their meaning, and their sizes (in bytes):

1. C++ int

The int keyword is used to indicate integers.

Its size is usually 4 bytes. Meaning, it can store values from -2147483648 to 2147483647.

For example,

int salary = 85000;

2. C++ float and double

float and double are used to store floating-point numbers (decimals and exponential).

The size of float is 4 bytes and the size of double is 8 bytes. Hence, double has two times the precision of float. To learn more, visit C++ float and double.

For example,

float area = 64.74;

double volume = 134.64534;

As mentioned above, these two data types are also used for exponential. For example,

double distance = 45E12   // 45E12 is equal to 45\*10^12

3. C++ char

Keyword char is used for characters.

Its size is 1 byte.

Characters in C++ are enclosed inside single quotes ' '.

For example,

char test = 'h’;

4. C++ bool

The bool data type has one of two possible values: true or false.

Booleans are used in conditional statements and loops (which we will learn in later chapters).

For example,

bool cond = false;

5. C++ void

The void keyword indicates an absence of data. It means "nothing" or "no value".

We will use void when we learn about functions and pointers.

Note: We cannot declare variables of the void type.

**C++ Type Modifiers**

We can further modify some of the fundamental data types by using type modifiers. There are 4 type modifiers in C++. They are:

signed

unsigned

short

Long

We can modify the following data types with the above modifiers:

int

double

char

**Derived Data Types**

Data types that are derived from fundamental data types are derived types. For example: arrays, pointers, function types, structures, etc. We will learn about these derived data types in later tutorials

**Input and output streams (cin, cout)**

C++ comes with libraries that provide us with many ways for performing input and output. In C++ input and output are performed in the form of a sequence of bytes or more commonly known as streams.

**Input Stream:** If the direction of flow of bytes is from the device(for example, Keyboard) to the main memory then this process is called input.

**Output Stream:** If the direction of flow of bytes is opposite, i.e. from main memory to device( display screen ) then this process is called output.

Header files available in C++ for Input/Output operations are:

**iostream**: iostream stands for standard input-output stream. This header file contains definitions to objects like cin, cout, cerr etc.

**iomanip:** iomanip stands for input output manipulators. The methods declared in this files are used for manipulating streams. This file contains definitions of setw, setprecision, etc.

**fstream**: This header file mainly describes the file stream. This header file is used to handle the data being read from a file as input or data being written into the file as output.

The two keywords cout in C++ and cin in C++ are used very often for printing outputs and taking inputs respectively. These two are the most basic methods of taking input and printing output in C++. To use cin and cout in C++ one must include the header file iostream in the program.

**Standard output stream (cout):**

Usually the standard output device is the display screen.

The C++ cout statement is the instance of the ostream class.

It is used to produce output on the standard output device which is usually the display screen.

The data needed to be displayed on the screen is inserted in the standard output stream (cout) using the insertion operator(<<).

**Example:**

#include <iostream>

using namespace std;

int main()

{

   char sample[] = "GeeksforGeeks";

   cout << sample << " - A computer science portal for geeks";

   return 0;

}

**Standard input stream (cin):**

Usually the input device in a computer is the keyboard.

C++ cin statement is the instance of the class istream and is used to read input from the standard input device which is usually a keyboard.

The extraction operator(>>) is used along with the object cin for reading inputs.

The extraction operator extracts the data from the object cin which is entered using the keyboard.

**Example:**

#include <iostream>

using namespace std;

int main()

{

   int age;

   cout << "Enter your age:";

   cin >> age;

   cout << "\nYour age is: " << age;

   return 0;

}

**Summary**

In this lecture we have discussed about difference between structure and class. We have discussed about various data types in C++. Moreover we have learnt about basic I/O in C++.

**FAQs**

**Q1 What is the difference between structure and class?**

C++ is an object oriented language that mainly focuses on objects. A class in C++ can be defined as a collection of related variables and functions encapsulated in a single structure. Instances of the class are termed as objects. A structure in C++ can be referred to as an user defined data type possessing its own operations. Unlike in the C language, they both are quite similar in C++. The main difference that exists between them is regarding the access modifier; the members of a class are private by default, whereas members of a struct are public by default.

A class in C++ is just an extension of a structure used in the C language. It is a user defined data type. It actually binds the data and its related functions in one unit. A structure and a class in C language differs a lot as a structure has limited functionality and features as compared to a class. On the other hand, structure and class in C++ are quite similar. The main difference arises due to the fact that by default, all the members of a class are private, whereas by default all the members of a structure are public.

Structure is also a user defined data type with a certain template. It is generally used for grouping of logically related data items. After the creation of a structure, the variables pertaining to the type of structure can be defined and used. A structure is used to represent a record. In C++, a structure can have both data members and functions as classes. Many people find it difficult to differentiate between a class and a structure. Technically they both are regarded as the same in C++.

**Q2 What are the various I/O in C++?**

Answer: C++ comes with libraries that provide us with many ways for performing input and output. In C++ input and output are performed in the form of a sequence of bytes or more commonly known as streams.

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