



الأسبوع	تفاصيل المفردات
الأول	<p>Basic essentials for C++ language/ C++ language concepts</p> <ul style="list-style-type: none">• What's C++ program contains?• What are the basic files? Simple explanation for basic files, that C++ program include

C++ Programming Language

C++ is one of the most popular and fundamental programming languages in the IT sector. According to the TIOBE index, C++ ranks 3rd position in 2019 which makes it a worthy investment of your time and effort. Although it has been around 3 decades since C++ came into existence, it continues to inevitably dominate the information technology sector across the globe. If you are still reluctant to learn C++ programming, you need to step out of your delusional belief that it is obsolete. C ++ tutorial is specially designed for beginners like you, to get a complete overview of this language.

1. What is C++ Programming?

C++ is a high-level, object-oriented, general-purpose programming language. Not only does C++ support the latest features that represent real-world problems, but it also supports the implementation of low-level manipulation problems.

Here you will learn from basic to advanced and will give you a detailed introduction to C++ programming.



2. Importance of C++ Programming Language

Without significance, we can't start our C++ tutorial. Every beginner should know the importance and purpose of C++:

Modern-day programming languages include Java, Python, C# (C Sharp), Javascript, R, Scala and many more. But, the question arises – What is the requirement to learn C++ out of all these languages?

Before we answer this question, let us ponder why are we here to learn C++? More like, what is the need to learn programming? Well, let us tell you that the web browser you're probably using to read this blog was written in C++.

Google Chrome, Mozilla Firefox, Safari, Netscape Navigator and Opera was designed using C++. Isn't that fascinating?

Not only this, Mark Zuckerberg used to code in C++ during his initial days at Harvard University which later on led to the development of what we know as Facebook.

Top notch software companies like Microsoft, Google, Amazon have developed their file systems and projects in C++. Even your favorite childhood games were developed using C++ like Counter-Strike and StarCraft.

Feeling nostalgic, are we? Stepping out of our pool of reminiscent rhapsodies, let's take a step forward to unravel what the enticing realm of C++ programming has to offer!



3. History of C++ Language

The developer of C++, Bjarne Stroustrup found that the C programming language lacks simulations and decided to develop a language that would overcome the drawbacks offered by C and called it “C with Classes”.

He developed C++ in 1979 by adding features from his favorite programming language, Simula. The motivation for developing C++ was driven by the fact that he faced certain problems while analyzing the UNIX kernel with respect to distributed systems when he began working in AT&T Bell Labs. The term “C++” was coined by Rick Mascitti.

Gradually, C++ evolved into what is it today essentially because of two reasons:

- **The ANSI (American National Standard Institute)- C++ committee** was formed that led to the maturation of C++ to tackle real-world problems by the implementation of object-oriented programming.
- The Annotated C++ Reference Manual was drafted by Ellis and Stroustrup.

4. Features of C++

C++ has a lot of features to offer than any other programming language.

- **Object-oriented programming (OOP):** The major reason for the popularity of C++ is that it efficiently supports the concept of OOP. These include data abstraction and encapsulation, data hiding, inheritance, and polymorphism.
- **Platform independent and portable:** C++ is supported on any platform, may it be Windows or Linux.
- **Simple:** The syntax of C++ is pretty similar to the English language and hence it is easily comprehensible.
- **High-level programming language:** Since the addition of features to C and Simula 67, the first object-oriented language led to the development of C++, it is regarded as a high-level programming language.



- **Case-sensitive:** Uppercase and lowercase characters are treated differently in C++, giving the user a wide range of choice of seemingly similar identifier names.
- **Compiler-based:** The C++ language has a compiler to compile the program before we run it.
- **DMA:** DMA stands for Dynamic Memory Allocation in which we can choose the size of variables or Data Structures at the run-time of the program.
- **Existence of Libraries:** We can access the wide range of functions available in C++ with the help of the Standard C++ Library.
- **Speed:** Since C++ is compiler-based, it inevitably proves to be much faster than Python and Java which are interpreter-based.

5. How to write a Program in C++?

- In this C tutorial, you will be acquitted with programming skills in C++.
- Here is a very simple program to print “Hello World!” on the display screen for you to get started with C++:

```
1. #include<iostream>
2. using namespace std;
3.
4. /* This is my first C++ program */
5.
6. int main()
7. {
8.     cout<<"Hello world!"<<endl;
9.     return 0;
10. }
```

Let us try to understand each component of the program one by one:

5.1 Header Files in C++

- The first component of every C++ program is essentially a header file. In the “Hello world!” program, we have used the following header file which is mandatory in every C++ program.

#include<iostream>

- Here, ‘iostream’ refers to the input-output stream.
- In the above program, we used it to display the output with the help of the ‘cout’ function.



5.2 Namespace

- It provides a region for a declaration that provides scope to all the identifiers inside it.

using namespace std;

It is compulsory to write this statement in every C++ program.

5.3 The Main Function

Every program in C++ contains at least one function, that is, the main function.

{AND}

The curly braces ‘{’ and ‘}’ indicate the beginning and end of a block of statements respectively.

5.4 Print Statement

We use the ‘cout’ statement to display a text on the screen.

```
cout<<“Hello world!”<<endl;
```

```
return 0;
```

We use the return 0 statement to indicate that the main function should return a null value.

6. Advantages and Disadvantages of C++

Have you ever thought as to why every C tutorial includes advantages and disadvantages? Because a beginner should know the worthiness of the topic-



6.1 Advantages of C++

- **Portability:** As already discussed, C++ offers the feature of portability or platform independence which allows the user to run the same program on different operating systems or interfaces at ease.
- **Object-oriented:** One of the biggest advantages of C++ is the feature of object-oriented programming which includes concepts like classes, inheritance, polymorphism, data abstraction, and encapsulation that allow code reusability and makes a program even more reliable. Not only this, it helps us deal with real-world problems by treating data as an object.
- **Multi-paradigm:** C++ is a multi-paradigm programming language. The term “Paradigm” refers to the style of programming. It includes logic, structure, and procedure of the program. There are three paradigms followed by C++. They are Generic, Imperative, object-oriented.
- **Large community support:** C++ has a large community that supports it by providing online courses and lectures, both paid and unpaid. Statistically speaking, C++ is the 6th most used and followed tag on StackOverflow and GitHub.
- **Compatibility with C:** C++ is pretty much compatible with C. Virtually, every error-free C program is a valid C++ program.
- **Scalability:** Applications that are very resource intensive are usually built in C++

6.2 Disadvantages of C++

- **Use of pointers:** Pointers is a relatively difficult concept to grasp and it consumes a lot of memory. Misuse of pointers like wild pointers may cause the system to crash or behave anomalously.
- **Security issues:** Although object-oriented programming offers a lot of security to the data being handled as compared to other programming languages that are not object-oriented, like C, certain security issues still exist due to the availability of friend functions, global variables and, pointers.
- **Absence of Garbage collector:** As discussed earlier, C++ gives the user complete control of managing the computer memory using DMA. C++ lacks the feature of a garbage collector to automatically filter out unnecessary data.



- **Absence of built-in threads:** C++ does not support any built-in threads.

7. Applications of C++

The wide range of [applications offered by C++](#). They are:

- **GUI applications:** GUI stands for Graphical User Interface which we use for developing games and for solving real-time mathematical simulations using C++.
- **Job opportunities:** C++ has an enormous job market expanding to industries like Finance, Android Application Development, Game Development, Virtual reality and many more. Top-notch companies like Google, Amazon, Flipkart, HP, IBM, Intel, Microsoft, Sun Microsystems hire C++ professionals.
- **Operating systems:** Most of the operating systems were developed using C++ like Microsoft Windows, Apple Mac OS X, Symbian OS and many more.
- **Web browsers:** C++ is the backbone of web browsers like Internet Explorer, Google Chrome, Mozilla Firefox, Safari, Netscape Navigator, and Opera.
- Reference of lecture from <https://data-flair.training/blogs/cpp>

