

Introduction to C++

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C++ is a general-purpose programming language that was developed by Bjarne Stroustrup as an enhancement of the C language to add object-oriented paradigm. The main features C++ programming language are as follows:

- **Simple:** It is a simple language in the sense that programs can be broken down into logical units and parts, and has a rich library support and a variety of datatypes.
- **Machine Independent:** C++ code can be run on any machine as long as a suitable compiler is provided.
- **Low-level Access:** C++ provides low-level access to system resources, which makes it a suitable choice for system programming and writing efficient code.
- **Fast Execution Speed:** C++ is one of the fastest high-level languages. There is no additional processing overhead in C++, it is blazing fast.
- **Object-Oriented:** One of the strongest points of the language which sets it apart from C. Object-Oriented support helps C++ to make maintainable and extensible programs. i.e. large-scale applications can be built.

First C++ Program

The below C++ code shows the basic structure of a program. Learn more about how it works in this [article](#).

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

int main() {
    cout << "Hello, World!";
    return 0;
}
```

Output

```
Hello, World!
```

Structure of the C++ program

The basic structure of a C++ program defines the standard way every program must be written; otherwise, it will cause a compilation error. The structure includes:

1. **Header File:** `#include <iostream>` adds input/output objects (cin, cout, etc.) via the preprocessor. Common headers: `fstream` (files), `string` (strings), `vector` (STL), `bits/stdc++.h` (all-in-one).
2. **Namespace Declaration:** `using namespace std;` allows direct use of standard names like "cout" without `std::`.
3. **Main Function:** `int main()` is the program's entry point; execution starts here and returns an integer with 0 return mean successful execution.
4. **Comments:** `//` for single line, `/*...*/` for multi-line are ignored by the compiler and used only for code documentation.
5. **Statement:** Contains executable code. Here, `cout << "Hello World!"`, prints the text on the screen using the insertion operator (`<<`).
6. **Return:** The `return 0;` statement terminates the `main()` function and indicates that the program executed successfully.

History of C++

C++ is an object-oriented, **middle-level** programming language developed by Bjarne Stroustrup at Bell Labs in 1979, originally called "**C with Classes**" and renamed to C++ in 1983. It extended C by adding features like classes, inheritance, and type checking to support **object-oriented programming**. Over time, it evolved through standards like C++98, C++11, C++17, C++20, and the latest C++23, adding modern features for performance and safety. Today, C++ remains widely used in system software, game engines, competitive programming, and high-performance applications.

Timeline of C++ Language Versions



