Introduction

C++ is a general-purpose programming language and is widely used nowadays for competitive programming. It has imperative, object-oriented, and generic programming features. C++ runs on lots of platforms like Windows, Linux, Unix, Mac, etc. It can be used to develop operating systems, browsers, games, and so on. This makes C++ powerful as well as flexible.

For this course, you will be provided with the in-built compiler of Coding Ninjas. However, if you want to run programs and practice them on your local desktop, various compilers like Code blocks, VS Code, Dev C++, Atom, and many more exist. You may choose one for yourself.

Features of C++

C++ provides a lot of **features** that are given below.

- Simple
- Portability
- Powerful and Fast
- Rich Library
- Platform Dependent
- Mid-level programming language
- Structured programming language
- Object-Oriented
- Case Sensitive
- Compiler Based
- Syntax based language
- Pointers
- Dynamic Memory Management

1) Simple: C++ is a simple language because it provides a structured approach (to break the problem into parts), a rich set of library functions, data types, etc. It allows us to follow both procedural as well as functional approach to design our flow of control.

2) Portability: It is the concept of carrying the instruction from one system to another system. In C++, Language **.cpp** file contains source code, and we can also edit this code. **.exe** file contains the application, which is the only file that can be executed. When we write and compile any C++ program on the Windows operating system, it efficiently runs on other window-based systems.

3) Powerful: C++ is a very powerful programming language, and it has a wide variety of data types, functions, control statements, decision-making statements, etc. C++ is a fast language as compilation and execution time is less. Also, it has a wide variety of data types, functions & operators.

4) Rich Library: C++ library is full of in-built functions that save a tremendous amount of time in the software development process. As it contains almost all kinds of functionality, a programmer can need in the development process. Hence, saving time and increasing development speed.

5) Platform Dependent: Platform dependent language means the language in which programs can be executed only on that operating system where it is developed & compiled. It cannot run or execute on any other operating system. E.g., compiled programs on Linux won't run on Windows.

6) Mid-level programming language: C++ can do both low-level & high-level programming. That is the reason why C++ is known as a mid-level programming language.

7) Structured programming language: C++ is a structured programming language as it allows to break the program into parts using functions. So, it is easy to understand and modify.

8) Object-oriented: C++ is an object-oriented programming language. OOPs make development and maintenance easier, whereas, in Procedure-oriented programming language, it is not easy to manage if code grows as project size grows. It follows the concept of oops like polymorphism, inheritance, encapsulation, abstraction.

9) Case sensitive: C++ is a case-sensitive programming language. In C++ programming, 'break and BREAK' both are different.

10) Compiler Based: C++ is a compiler-based language, unlike Python. C++ programs used to be compiled, and their executable file is used to run it due to which C++ is a relatively faster language than Java and Python.

11) Syntax-based language: C++ is a strongly typed syntax-based programming language. If any language follows the rules and regulations strictly, it is known as a strongly syntax-based language.Other examples of syntax-based languages are C, C++, Java, .net etc.

12) Pointer: C++ supports pointers that allow the user to deal directly with the memory and control the programmer. This makes it very suitable for low-level tasks and very complicated projects. It is known to increase the speed of execution by decreasing the memory access overhead.

13) Dynamic Memory Management: It supports the feature of dynamic memory allocation. In C++ language, we can free the allocated memory by calling the free() function. These features are missing in languages like C.