

Introduction to C++

What is C++?

C++ is an general purpose object-oriented programming (OOPs) language. It was developed by Bjarne Stroustrup at AT & T's Bell Laboratory in Murray Hill, New Jersey, USA in 1979. C++ is a superset of C. C++ has solved many other problems faced by C programmers. C++ is a versatile language for handling very large programs. Most of the C concept applies to C++ also. The most important facilities that C++ adds is the concept of OOP's (Object Oriented Programming).

History of C++

- 1) Initially, in 1979, the language was called "C with classes" as it had all the properties of the C language with an additional concept of "classes."
- 2) In 1983, 'C with classes' was renamed to 'C++', adding new features like virtual functions, operator overloading, references, memory allocation/de-allocation/ with new/delete keywords.
- 3) In 1985, the first version of C++ was released
- 4) In 1989, C++ 2.0 was released includes features like multiple inheritance, abstract classes, static member functions.
- 5) Later feature additions included templates, exceptions, namespace, boolean type. As of 2017, C++ remains the third most popular programming language, behind Java and.

Features of C++

1. **Simple:** C++ program is written in simple English language, so that it is very easy to understand and developed by programmer.
2. **Platform dependent:** A language is said to be platform dependent, if the program is execute on the same operating system where it was developed and compiled. C++ is a platform dependent language.
3. **Portability:** It is the concept of carrying the instruction from one system into another system. In C++, .cpp file contain source code, .exe file contain application (executable file). When we write and compile any C++ program on window operating system that program can easily run on other window based system. Hence, C++ is a portable language.
4. **Case sensitive:** C++ is a case sensitive programming language means lowercase letter is different from uppercase letter.

5. **Compiler based:** C++ is a compiler based programming language, it means without compilation no C++ program can be executed. First we need compiler, to compile the program (machine code) and then we can execute it.
6. **Syntax based language:** C++ is a strongly tight syntax based programming language. If any language follow rules and regulation very strictly known as strongly tight syntax based language
7. **Mid-level programming language:** C++ is also used for low level programming. It is used to develop system applications such as kernel, driver etc. C++ also support the feature of high level language. That is why it is known as mid-level programming language.
8. **Structured programming language:** C++ is a structured programming language it breaks the large problem into smaller parts. So, it is easy to understand and modify.
9. **Memory Management:** C++ supports the feature of dynamic memory allocation. In C++, we can free the allocated memory at any time by calling the free() function.
10. **Object Oriented:** C++ is object oriented programming language. OOPs makes development and maintenance easier where as in Procedure-oriented programming language it is not easy to manage large projects.

Advantage of C++ Programming Language:

1. C++ is much suitable for large projects.
2. C++ Programming is easy to maintain and modify.
3. C++ forced to declare functions so that the compiler can check their use.
4. C++ has a feature called references that allows more convenient handling of addresses for function arguments and returned values.
5. Template feature reuses same source code with automatic modification for different classes.
6. The main advantage of C++ is that, it supports object oriented features.

Difference between C and C++

No	C	C++
1.	C is the function or procedure programming language.	C++ is the object oriented programming language.
2.	Top down approach is used in C.	Bottom up approach is used in C++.
3.	C is less secure than C++	C++ is more secure than C, because OOP's concept provide the facility of data hiding and protecting data.
4.	In C programming variable declaration is possible only in top of the program.	In C++ you can declare variable anywhere in between the program, but before it is used.
5.	C is a middle level language.	C++ is a high level language.
6.	In C, programs are divided into functions.	In C++, programs are divided into classes and objects.

7.	C uses printf() and scanf() function for standard input and output.	C++ uses cin>> and cout<< for standard input and output.
8.	Features like function overloading and operator overloading is not present.	C++ supports function overloading and operator overloading.
9.	In C, no exception handling and no template classes concept.	It support exception handling and template classes.
10.	C program file is saved with .c. The C program file extension.	C++ program file is saved with .cpp.