**C++ Vs. C# - What’s the Difference?**

**What is C++?**

C++ is a computer programming language that contains the feature of C programming language as well as Simula67 (a first object Oriented language). C++ introduced the concept of Class and Objects.

It encapsulates high and low-level language features. So, it is seen as an intermediate level language. Earlier it was called "C with classes" as it had all the properties of the C language.

**What is C#?**

C-Sharp is an object-oriented programming language developed by Microsoft that runs on .Net Framework. It has features like strong typing, imperative, declarative, object-oriented (class-based), and component-oriented programming. It was developed by Microsoft within the .NET platform.

The name "C sharp" was inspired by musical notations. Here '#' symbol indicates that the written note must be made a semitone higher in pitch.

**History of C++**

C++ language was developed by Bjarne Stroustrup at AT & T Bell Laboratories. Stroustrup was a strong supporter of C an admirer of Simula67. He wanted to combine the best of both the languages. He was aiming to create a language which supports object-oriented programming features and still retains the power of C. This resulted in C++.

**History of C#**

Anders Hejlsberg is the key contributor to C# language development. In 1999, he built a team to develop a new language which was then called "Cool.". The project was approved and announced in July 2000 at the .Net Developers Conference. The language was later renamed as C#.

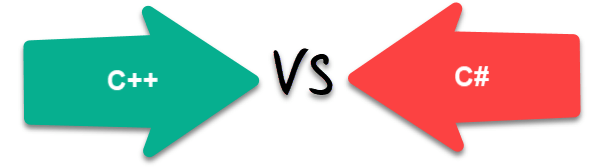
**Principles of C++ development**

* The program should be simple, object-oriented and easy to understand
* Development should be conducted in the robust and secure environment.
* Code should follow specific architecture and must be portable.
* Code should be easily "interpreted and dynamic "

**Principles of C# development**

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* The language and implementations should provide support for software engineering principles
* C# is an ideal choice for building applications for both hosted and embedded systems.

**Difference between C++ and C#**

[](https://www.guru99.com/images/1/051818_1307_CVsCW1.png)C++ Vs. C#

| **Parameter** | **C++** | **C#** |
| --- | --- | --- |
| Type of language | C++ is a low level and platform neutral programming language. | C# is a high-level language. |
| Compiling | C++ compiles down to machine code | C# 'compiles' down to CLR (Common Language Runtime), which is interpreted by JIT in ASP.NET |
| Memory management | In C++, you need to manage memory manually if you dynamically allocate object. | C# runs memory management automatically |
| Multiple inheritances | C++ support the multiple inheritances | C# does not support multiple inheritances. |
| Level of difficulty | C++ includes more complex features. | C# doesn't have any complex features. It has a simple hierarchy and quite easy to understand. |
| Default access Specifier | Public in C++ for Struct. Private for classes | Private in C# .net. |
| Platform | C++ is a language that runs on all sorts of platforms. It is also equally popular on Unix and Linux systems. | C#, while standardized, is rarely seen outside windows. |
| Standalone applications | C++ can create standalone applications. | C# can't make a standalone application. |
| Object Oriented | C++ is not a complete object orient language. | C# is a pure object-oriented language. |
| Bound checking | Does not support bound checking of arrays. | Supports bound checking of arrays. |
| Garbage Collection | C++ does not support garbage collection. | C# supports garbage collection. |
| Multiple inheritance | C++ supports multiple inheritance. | C# does not offer multiple class inheritance. |
| Foreach Loop | C++ does not support for each loop. | C# supports for each loop. |
| Use of pointers | You can use pointers anywhere in the program. | You can use pointer only in the unsafe mode. |
| Used for | Widely used in gaming. | C# programming can be used to create Windows, mobile, and console applications. |
| Size of binaries | C++ is much more lightweight. | C# has a lot of overhead and libraries should be included before it will compile. |
| Type of Projects | C++ programmers generally focus on applications that work directly with hardware or that need better performance than other languages can offer. | C# is used for modern app development. |
| Compiler warnings | C++ allows you to do almost anything provided the syntax is right. Therefore, it is flexible language, but you may cause serious damage running OS. | C# is highly protected. as it Compiler will throw errors and warnings in case you inadvertently write code that can cause damage. |
| Compilation result | After compiling, C++ code is converted into machine code. | After compiling, C# code is converted into an intermediate language code. |
| Switch statement | In C++ Switch Statement, the test variable can't be a string. | In a C# switch statement, may or may not be a string. |

**KEY DIFFERENCE:**

* C++ is a low level programming language that adds object-oriented features to its base language C whereas C# is a high level language.
* C++ compiles down to machine code whereas C# 'compiles' down to CLR (Common Language Runtime), which is interpreted by JIT in ASP.NET.
* C++ is an object-oriented language while C# is considered a component-oriented programming language.
* In C++ you need to manage memory manually whereas C# runs in a virtual machine, which performs memory management automatically.
* In C++ development should follow any specific architecture and must be portable whereas C# development should be simple, modem, general-purpose, object-oriented programming language.