C# Introduction

Here we will learn the basics of c# programming language; those are what is c#, overview of c# programming, features of c# programming, and history of c# programming.

What is the C# Programming Language?

C# (pronounced as "**C Sharp**") is a simple, modern, object-oriented, and type-safe programming language. C# language has its roots in C languages such as C, C++, and it is mostly similar to Java programming.

C# Programming language will allow developers to build a variety of secure and robust applications such as windows applications, web applications, database applications, etc., which will run on the **.NET Framework**.

C# programming language has been built on **.NET Framework** to run the c# applications. We are required to install a **.NET Framework** component on our machines.

.NET Framework is a development platform to build apps for windows, web, azure, etc., by using programming languages such as C#, F#, and Visual Basic. It consists of two major components, such as **Common Language Runtime** (CLR), an execution engine that handles running apps, and **.NET Framework Class Library**, which provides a library of tested and reusable code that developers can use in their applications.

Overview of C#

- C# is an object-oriented programming language, and it supports the concepts of encapsulation, abstraction, polymorphism, etc.
- In c#, all the variables, methods, and application entry points are encapsulated within the class definitions.
- C# is developed specifically for the .NET Framework, and it enables programmers to migrate from C/C++ and Java easily.
- C# is a fully Event-driven and visual programming language.
- Microsoft provided an IDE (Integrated Development Environment) tool called Visual Studio (https://www.visualstudio.com/) to implement c# programs easily.

Features of C#

C# contains various features similar to other programming languages such as c c++ and Java. There are some additional features in C# that make it different from other languages.

- C# is a modern programming language, and it is very powerful and simple for building applications.
- C# is useful in developing windows, web, and device applications.
- C# provides automatic memory management by clearing unused objects.
- C# is a type-safe programming language, and it makes it impossible to perform unchecked type casts.
- C# provides a structured and extensible approach for error detection and recovery.
- C# is a structure-oriented programming language, and the compilation, and execution of c# applications are faster due to automatic scalability.

History of C#

The C# programming language has been implemented by **Anders Hejlsberj**, an employee of Microsoft. The C# programming language's initial release is in **2002** with **.NET Framework 1.0,** and it's more like Java programming.

The following table lists c# programming language evaluation with multiple features along with .NET Framework and visual studio.

Version	Year	.NET Framework	Visual Studio	Features
C# 1.0	2002	1.0 / 1.1	Visual Studio 2002	Basic Features
C# 2.0	2005	2.0	Visual Studio 2005	• Generics • Partial types • Anonymous methods • Nullable types • Iterators • Covariance and contravariance

Version	Year	.NET Framework	Visual Studio	Features
C# 3.0	2007	3.0 / 3.5	Visual Studio 2008	• Auto implemented properties • Anonymous types • Query expressions • Lambda expression • Expression trees • Extension methods
C# 4.0	2010	4.0	Visual Studio 2010	• Dynamic binding • Named/optional arguments • Generic covariant and contravariant • Embedded interop types
C# 5.0	2012	4.5	Visual Studio 2012 / 13	• Asynchronous members • Caller info attributes
C# 6.0	2015	4.6	Visual Studio 2015	• Static imports • Exception filters • Property initializers • Expression bodied members • Null propagator • String interpolation • nameof operator • Dictionary initializer
C# 7.0	2017	.NET Core	Visual Studio 2017	• Out variables • Tuples and deconstruction • Pattern matching • Local functions • Expanded expression bodied members • Ref locals and returns

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