

Introduction to C#

What is C#?

C# (pronounced as 'C sharp') is a computer-programming language developed by Microsoft Corporation, USA. It is fully object-oriented language and is the first component – orient language. It is simple, efficient, and productive and type safe language derived from C and C++ family. C# is designed for developing robust, reliable & durable components to handle real-world applications.

Major highlights of c# are the following:

- It is a brand new language derived from c / c++ family.
- It simplifies & modernizes C++.
- It is a language designed for the .NET Framework.
- It combines the best features of many commonly used language: the productivity of visual basic, the power of c++ and elegance of java.
- Major parts of .NET framework is are actually coded in C#.

Why c#?

C & C++ have been the two most popular and most widely used language in the software industry for the past two decades. They provide programmers with a tremendous amount of power and control for developing scientific, commercial and business application. However these languages suffer from a number of shortcomings. Some are as follows:

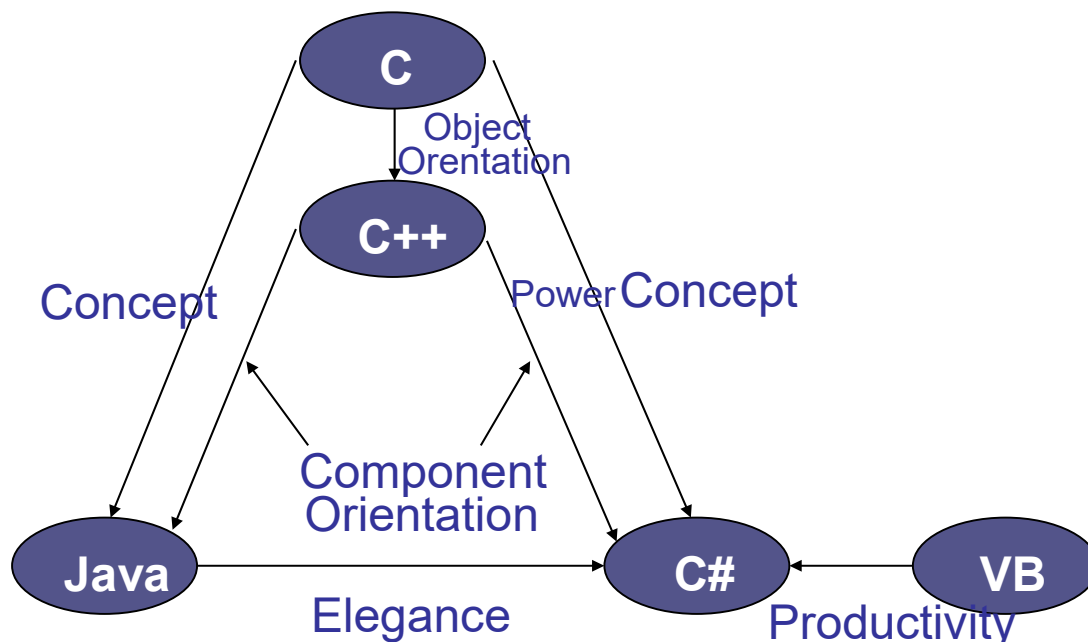
1. The high complexity of language
2. They are not truly object oriented
- 3 They are not suitable for working with new web technologies.
4. They do not support versioning
5. Their low productivity.

VB, a language promoted by Microsoft for overcoming these problems, is not truly object oriented and becomes increasingly difficult to use when systems become large. Java which is truly object oriented has not retained some powerful C++ features such as operator overloading. Java also lacks inter-operability with code developed in other languages. Microsoft therefore decided to design a new language.

The result is C#, a simple & modern language that directly addresses the needs of component-based software development.

Evolution of c#

C# is a descendant of C++ which in turn is a descendant of C as illustrated below. C is the mother of all the three modern language. C# modernizes C++ by enhancing some of its features and adding few new featuring so as to help developer do more with fewer lines of codes and fewer opportunities for error. C# borrows java's features such as grouping of classes, interface and implementation together in one file so that programmers can edit the code more easily. C# uses VB's approach to form design, namely, dragging controls from a tool box, dropping them onto forms, and writing event handlers for them.



Characteristics of C#

- **Simple**

- ✚ C# simplifies C++ by eliminating operators such as `->`, `::` and pointers.
- ✚ C# treats integers & Boolean data types as entirely different types.

- **Consistent**

C# supports an unified type system which eliminates the problem of varying ranges of integer. All types are treated as objects and developers can extend the type system simply and easily.

- **Modern**

C# is called modern language because it supports:

- ✚ Automatic garbage collection
- ✚ Rich model for error handling
- ✚ Decimal data types for financial applications
- ✚ Modern approach to debugging
- ✚ Robust security model

- **Object-Oriented**

C# is truly object-oriented. It supports all the three object oriented system

- ✚ Encapsulation
- ✚ Inheritance
- ✚ Polymorphism

- **Type-Safe**

C# incorporates number of type-safe measures:

- ✚ All dynamically allocated objects & arrays are initialized to zero
- ✚ Use of any uninitialized variables produces an error message by the compiler
- ✚ C# supports automatic garbage collection
- ✚ C# enforces overflow checking in arithmetic operation
- ✚ Access to arrays are range-checked and warned if it goes out-of-bounds.

- **Versionable**

Making new versions of software modules work with the existing applications is known as versioning. C# provides support for versioning with the help of new & override keywords.

- **Flexible**

C# does not directly support pointers, we may declare certain classes & methods as 'unsafe' and then use pointers to manipulate them.

- **Compatible**

C# enforces the .NET common language specifications and therefore allows inter-operation with other .NET languages. C# provides support for transparent access to standard COM and OLE automation.

- **Inter-operability**

C# provides support for using COM objects, no matter what languages was used to author them. C# also support a special feature that enables a program to call out any native API.

APPLICATION OF C#

C# is a new language developed exclusively to suit the features of .NET platform. It can be used for a variety of applications that are supported by .NET platform.

- Console application
- Windows application
- Web application
- Developing windows and web controls
- Mobile application
- Providing Web services
- Developing .NET component library
- A Simple C# Program