.NET FRAMEWORK

.NET is a software framework that is designed and developed by Microsoft. The first version of the .Net framework was 1.0 which came in the year 2002. In simple words, It is also used to create a form based, console-based, mobile and web-based application or services that are available in Microsoft environments. Furthermore, the .NET framework
is a pure object oriented, that is similar to the Java language. But it is not a platform independent as Java. So, its application runs only to the windows platform.

The main objective of this framework is to develop an application that can run on the windows platform.

KEY TAKEAWAYS

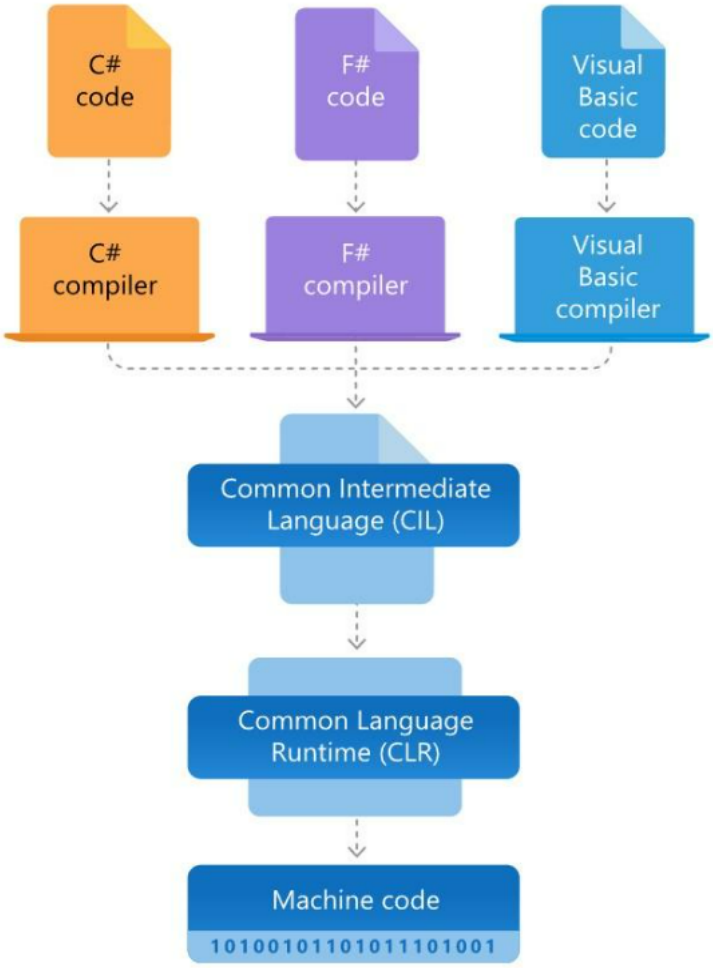
- The .NET Framework is an open-source platform for developing Windows-based applications
- The .NET Framework includes a variety of developer tools and class libraries
- The .NET Framework works with applications developed in C#, F#, Visual Basic, and other popular programming languages
- You can use the .NET Framework to develop both web-based and forms-based apps, as well as apps that integrate with major database platforms

UNDERSTANDING THE .NET FRAMEWORK ARCHITECTURE

The .NET Framework architecture provides an execution environment that integrates a variety of compatible programming languages. In essence, the architecture works like this:

- An application is written in one of a variety of compatible programming languages (the most popular being C#, F#, and Visual Basic)
- The application is compiled to the Common Intermediate Language (CIL)

- The Common Language Runtime (CLR) executes the application on the user's machine, converting the CIL to machine code



ESSENTIAL COMPONENTS OF THE .NET FRAMEWORK

There are several essential components of the .NET Framework, including the Framework Class Library, the Common Intermediate Language and the Common Language Runtime.

1). Framework Class Library

The Framework Class Library (FCL) provides a variety of APIs and types that provide common functionality across apps. There are APIs for:

- Reading files
- Writing files
- Connecting to databases

Types are provided for strings, numbers, dates, etc.

2). Common Intermediate Language

The Common Intermediate Language (CIL) stores code created by the source compilers. The compiled code is stored in files with .DLL or .EXE extensions.

3). Common Language Runtime

The Common Language Runtime (CLR) is the Framework's execution engine. It executes the CIL code by converting it into machine languages. In addition to running the applications, it includes a variety of useful services, including:

- Exception handling
- Garbage collection (removes unneeded resources)
- Thread management
- Type safety

4). FCL (Framework Class Library)

It provides the various system functionality in the .NET Framework, that includes classes, interfaces and data types, etc. to create multiple functions and different types of application such as desktop, web, mobile application, etc. In other words, it can be defined as, it provides a base on which various applications, controls and components are built in .NET Framework.

APP MODELS IN THE .NET FRAMEWORK

The .NET Framework supports a number of app models for building software applications. The most popular include:

- ADO.net, used to develop applications that interact directly with databases, such as Microsoft SQL Server
- ASP.Net, used to develop web-based applications that are served over the Internet and run inside users' web browsers
- WinForms, used to develop forms-based applications that run on users' computers

CHARACTERISTICS OF .NET FRAMEWORK

1. CLR (Common Language Runtime)
2. Namespace - Predefined class and function
3. Metadata and Assemblies
4. Application domains
5. It helps to configure and deploy the .net application
6. It provides form and web-based services
7. NET and ASP.NET AJAX
8. LINQ(Language Integrated Query, a uniform query syntax in c# or vb.net to retrieve data from different sources and formats)
9. Security and Portability
10. Interoperability (The ability of computer systems or softwares to exchange and make use of information)
11. It provides multiple environments for developing an application.