



Csharp basics

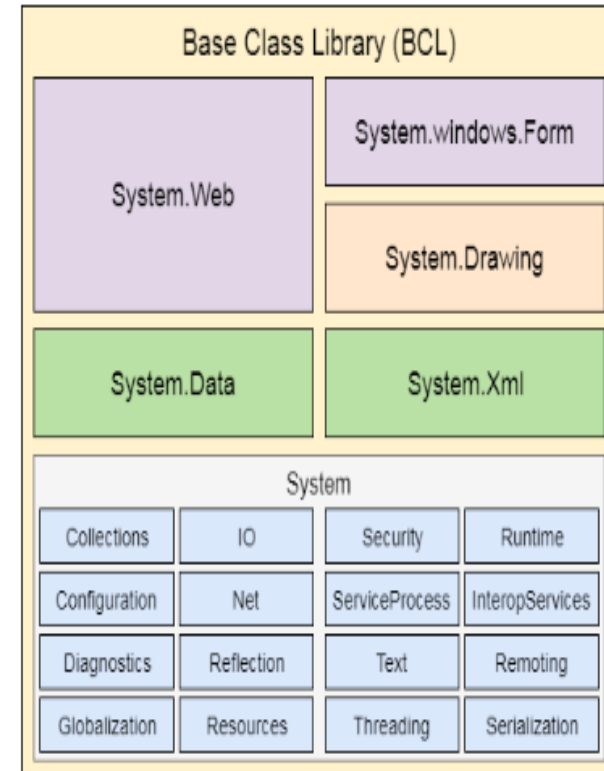
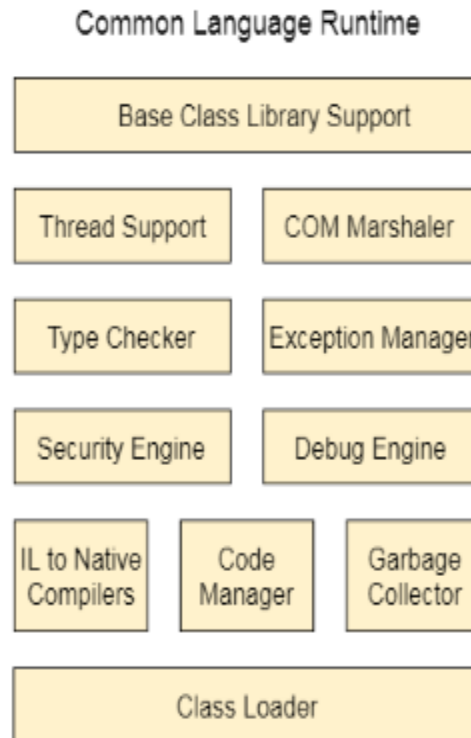
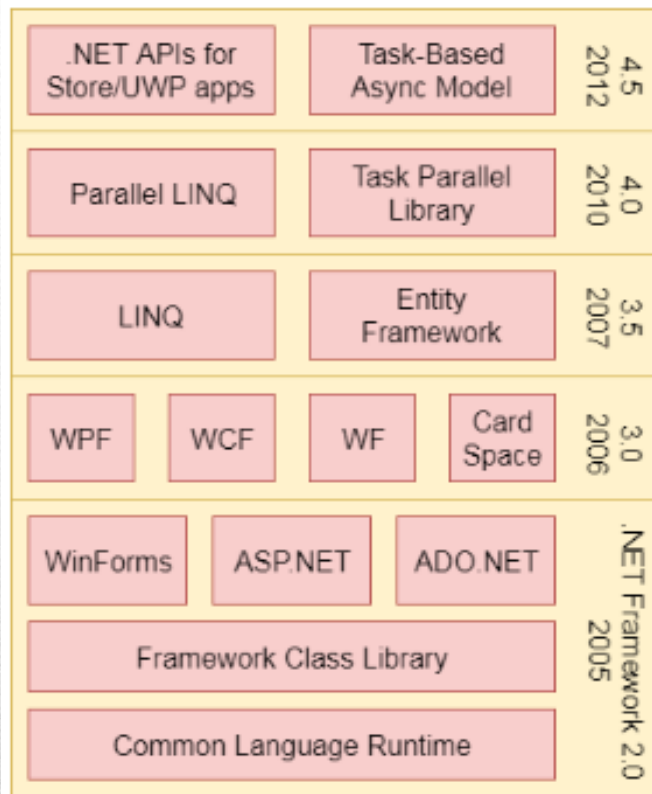
Theory/interview/mcq purpose

- It is used to develop applications for web, Windows, phone. Moreover, it provides a broad range of functionalities and support.
- This framework contains a large number of class libraries known as Framework Class Library (FCL). The software programs written in .NET are executed in the execution environment, which is called CLR (Common Language Runtime). These are the core and essential parts of the .NET framework.
- This framework provides various services like memory management, networking, security, memory management, and type-safety.
- The .Net Framework supports more than 60 programming languages such as C#, F#, VB.NET, J#, VC++, JScript.NET, APL, COBOL, Perl, Oberon, ML, Pascal, Eiffel, Smalltalk, Python, Cobra, ADA, et

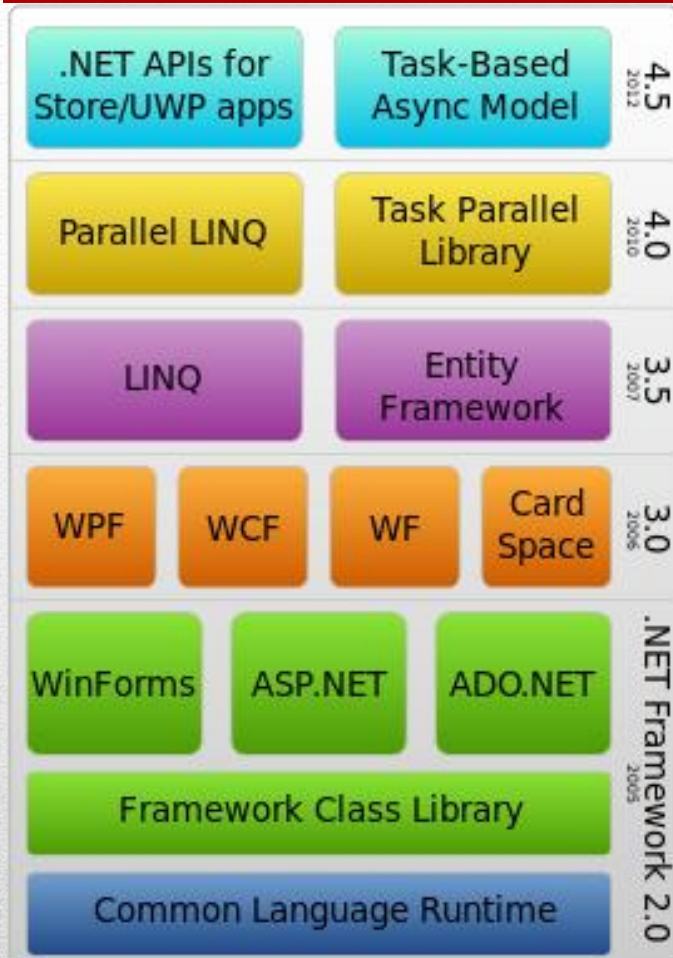
.NET FRAMEWORK

- Common Language Runtime (CLR)
- Framework Class Library (FCL),
- Core Languages (WinForms, ASP.NET, and ADO.NET), and
- Other Modules (WCF, WPF, WF, Card Space, LINQ, Entity Framework, Parallel LINQ, Task Parallel Library, etc.)

The .NET Framework (4 main components):



EVOLUTION



.NET FRAMEWORK

WinForms

- Windows Forms is a smart client technology for the .NET Framework, a set of managed libraries that simplify common application tasks such as reading and writing to the file system.

ASP.NET

- ASP.NET is a web framework designed and developed by Microsoft. It is used to develop websites, web applications, and web services. It provides a fantastic integration of HTML, CSS, and JavaScript. It was first released in January 2002.

ADO.NET

- ADO.NET is a module of .Net Framework, which is used to establish a connection between application and data sources. Data sources can be such as SQL Server and XML. ADO .NET consists of classes that can be used to connect, retrieve, insert, and delete data.

WPF (Windows Presentation Foundation)

- Windows Presentation Foundation (WPF) is a graphical subsystem by Microsoft for rendering user interfaces in Windows-based applications. WPF, previously known as "Avalon", was initially released as part of .NET Framework 3.0 in 2006. WPF uses DirectX.
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WCF (Windows Communication Foundation)

- It is a framework for building service-oriented applications. Using WCF, you can send data as asynchronous messages from one service endpoint to another.WF (Workflow Foundation)
- Windows Workflow Foundation (WF) is a Microsoft technology that provides an API, an in-process workflow engine, and a rehostable designer to implement long-running processes as workflows within .NET applications.

LINQ (Language Integrated Query)

- It is a query language, introduced in .NET 3.5 framework. It is used to make the query for data sources with C# or Visual Basics programming languages.

Entity Framework

- It is an ORM based open source framework which is used to work with a database using .NET objects. It eliminates a lot of developers effort to handle the database. It is Microsoft's recommended technology to deal with the database.

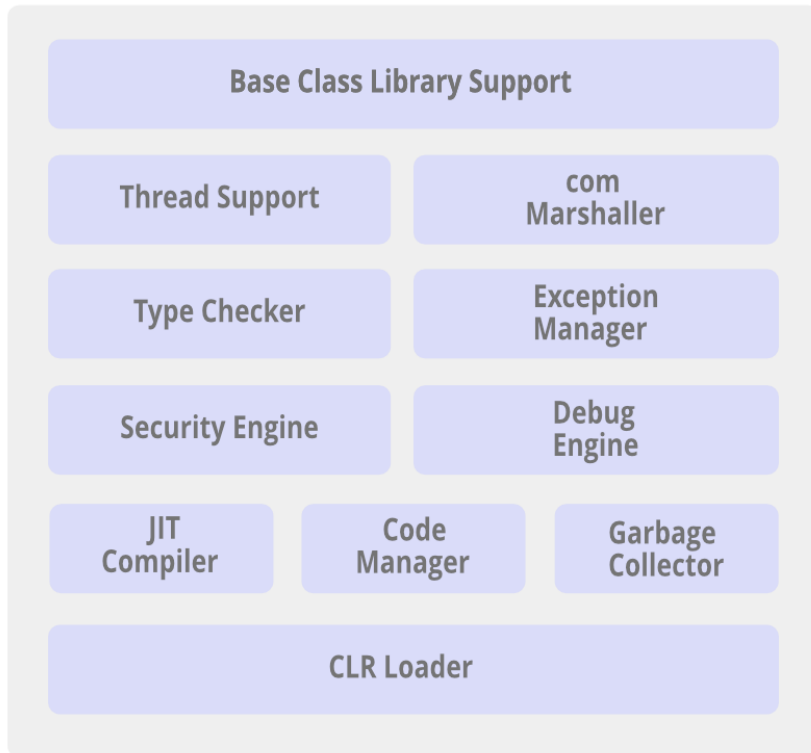
Parallel LINQ

- Parallel LINQ or PLINQ is a parallel implementation of LINQ to objects. It combines the simplicity and readability of LINQ and provides the power of parallel programming.
 - It can improve and provide fast speed to execute the LINQ query by using all available computer capabilities.
 - Apart from the above features and libraries, .NET includes other APIs and Model to improve and enhance the .NET framework.
 - In 2015, Task parallel and Task parallel libraries were added. In .NET 4.5, a task-based asynchronous model was added.
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- It converts the program into native code.
- Handles Exceptions
- Provides type-safety
- Memory management
- Provides security
- Improved performance
- Language independent
- Platform independent
- Garbage collection
- Provides language features such as inheritance, interfaces, and overloading for object-oriented programming.

NET Common Language Runtime (CLR)

Architecture of Common Language Runtime



It is a program execution engine that loads and executes the program. It converts the program into native code. It acts as an interface between the framework and operating system. It does exception handling, memory management, and garbage collection. Moreover, it provides security, type-safety, interoperability, and portability. A list of CLR components are given below:

CLR

Base Class Library Support

- SQL CREATE TABLE
- It is a class library that provides support of classes to the .NET application.

Thread Support

- It manages the parallel execution of the multi-threaded application.

COM Marshaler

- It provides communication between the COM objects and the application.

Type Checker

- It checks types used in the application and verifies that they match to the standards provided by the CLR.

Code Manager

- It manages code at execution run-time.

Garbage Collector

- It releases the unused memory and allocates it to a new application.

Exception Handler

- It handles the exception at runtime to avoid application failure.

ClassLoader

- It is used to load all classes at run time.
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- .NET Framework Class Library is the collection of classes, namespaces, interfaces and value types that are used for .NET applications.
- It contains thousands of classes that supports the following functions.
- Base and user-defined data types
- Support for exceptions handling
- input/output and stream operations
- Communications with the underlying system
- Access to data
- Ability to create Windows-based GUI applications
- Ability to create web-client and server applications
- Support for creating web services

.NET Framework Class Library

Namespaces	Description
System	It includes all common datatypes, string values, arrays and methods for data conversion.
System.Data, System.Data.Common, System.Data.OleDb, System.Data.SqlClient, System.Data.SqlTypes	These are used to access a database, perform commands on a database and retrieve database.
System.IO, System.DirectoryServices, System.IO.IsolatedStorage	These are used to access, read and write files.
System.Diagnostics	It is used to debug and trace the execution of an application.
System.Net, System.Net.Sockets	These are used to communicate over the Internet when creating peer-to-peer applications.
System.Windows.Forms, System.Windows.Forms.Design	These namespaces are used to create Windows-based applications using Windows user interface components.

.NET Framework Class Library Namespaces

System.Web, System.Web.Caching, System.Web.UI, System.Web.UI.Design, System.Web.UI.WebControls, System.Web.UI.HtmlControls, System.Web.Configuration, System.Web.Hosting, System.Web.Mail, System.Web.SessionState	These are used to create ASP. NET Web applications that run over the web.
System.Web.Services, System.Web.Services.Description, System.Web.Services.Configuration, System.Web.Services.Discovery, System.Web.Services.Protocols	These are used to create XML Web services and components that can be published over the web.
System.Security, System.Security.Permissions, System.Security.Policy, System.WebSecurity, System.Security.Cryptography	These are used for authentication, authorization, and encryption purpose.
System.Xml, System.Xml.Schema, System.Xml.Serialization, System.Xml.XPath, System.Xml.Xsl	These namespaces are used to create and access XML files.

.NET Framework Class Library Namespaces

- Window applications
- Web applications
- Distributed applications
- Web service applications
- Database applications etc.

C#

No.	Java	C#
1)	Java is a high level, robust, secured and object-oriented programming language developed by Oracle.	C# is an object-oriented programming language developed by Microsoft that runs on .Net Framework.
2)	Java programming language is designed to be run on a Java platform, by the help of Java Runtime Environment (JRE) .	C# programming language is designed to be run on the Common Language Runtime (CLR) .
3)	Java type safety is safe.	C# type safety is unsafe.
4)	In java, built-in data types that are passed by value are called primitive types .	In C#, built-in data types that are passed by value are called simple types .
5)	Arrays in Java are direct specialization of Object .	Arrays in C# are specialization of System .
6)	Java does not support conditional compilation .	C# supports conditional compilation using preprocessor directives.
7)	Java doesn't support goto statement.	C# supports goto statement.
8)	Java doesn't support structures and unions .	C# supports structures and unions.
9)	Java supports checked exception and unchecked exception.	C# supports unchecked exception.

JAVA VS CSHARP

1) Simple

C# is a simple language in the sense that it provides structured approach (to break the problem into parts), rich set of library functions, data types etc.

2) Modern Programming Language

C# programming is based upon the current trend and it is very powerful and simple for building scalable, interoperable and robust applications.

3) 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 if code grows as project size grow.

4) Type Safe

C# type safe code can only access the memory location that it has permission to execute. Therefore it improves a security of the program.

5) Interoperability

Interoperability process enables the C# programs to do almost anything that a native C++ application can do.

Hello Java Program for Beginners

6) Scalable and Updateable

C# is automatic scalable and updateable programming language. For updating our application we delete the old files and update them with new ones.

7) Component Oriented

C# is component oriented programming language. It is the predominant software development methodology used to develop more robust and highly scalable applications.

8) Structured Programming Language

C# is a structured programming language in the sense that we can break the program into parts using functions. So, it is easy to understand and modify.

9) Rich Library

C# provides a lot of inbuilt functions that makes the development fast.

10) Fast Speed

The compilation and execution time of C# language is fast.

C# Features
