

## **.NET ASSIGNMENT-1:**

Ques.1) What is the main component in the .Net Framework?

Ans.1) .Net is a software framework which is designed and developed by Microsoft. The first version of the .Net framework was 1.0 which came in the year 2002. In easy words, it is a virtual machine for compiling and executing programs written in different languages like C#, VB.Net etc.

.NET Framework supports more than 60 programming languages in which 11 programming languages are designed and developed by Microsoft. The remaining Non-Microsoft languages which are supported by .NET Framework but not designed and developed by Microsoft.

### **Main components of .Net Framework are:**

1. .NET Class Library
2. Common Language runtime
3. Dynamic Language runtime
4. Application domains
5. .Net Framework Security
6. Cross Language interoperability
7. Side by side execution
8. Common Type System

#### **1) .NET Class Library**

.NET framework contains multiple classes that are readily available for developers. The classes in the FCL (framework class library) are grouped under multiple namespaces.

2) Common Language Runtime: CLR provides interoperability between different language, like C# , VB, Visual C++, by providing a common environment for the execution of code written in of these languages.

### 3) Dynamic Language runtime

DLR provides to execute dynamic languages on .NET Framework by adding some special services to the CLR.

### 4) Application domains

It is used to isolate the process of different applications and can be defined by .NET framework.

### 5) .NET Framework Security

.NET framework provides multiple tools that can be used by developers to protect the resources and code from unauthorized users.

### 6) Cross Language interoperability

Object or compiled code of one language can be used in other .NET compatible language.

### 7) Side by side execution

In the same application we can use multiple versions of CLR simultaneously.

### 8) Common Type System

CTS is used to maintain data integrity across the code written in different .NET compliant languages. CTS also used to prevent data loss when a type in one language transfers data to its equivalent type in other language.

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Ques2.) Current .Net Standard framework and Current core framework?

Ans.2) **.Net Standard Framework: 4.8**

**.Net Core Framework: 3.1**

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Ques.3) Difference between Managed and Unmanaged code?

Ans.3)

MANAGED CODE	UNMANAGED CODE
It is executed by managed runtime environment or managed by the CLR.	It is executed directly by the operating system.
It provides security to the application written in .NET Framework.	It does not provide any security to the application.
Memory buffer overflow does not occur.	Memory buffer overflow may occur.

It provide runtime services like Garbage Collection, exception handling, etc.	It does not provide runtime services like Garbage Collection, exception handling, etc.
The source code is compiled in the intermediate language known as <i>IL</i> or <i>MSIL</i> or <i>CIL</i> .	The source code directly compiled into native language.
<b>It does not provide low-level access to the programmer.</b>	<b>It provide low-level access to the programmer.</b>

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Ques.4) What do you mean by MSIL Code?

Ans.4) MSIL stands for Microsoft Intermediate Language. We can call it as Intermediate Language (IL) or Common Intermediate Language (CIL). During the compile time , the compiler convert the source code into Microsoft Intermediate Language (MSIL) .Microsoft Intermediate Language (MSIL) is a CPU-independent set of instructions that can be efficiently converted to the native code.

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Ques.5) What is the difference between .Net and .Net Core Frameworks?

Ans.5) The .NET Framework:

.NET framework is a software framework developed by Microsoft which includes a runtime environment for creating Windows apps and web services. It covers a large class library called .NET framework class Library; which is combinations of classes, interfaces, and value types that provide access to system functionality.

## The .NET Core:

The .NET core is free and fully open-source cross-platform software framework for the Microsoft Windows, Apple macOS, and Linux operating systems that uses MIT and Apache 2 license. .NET Core simply a combination of the ASP.NET MVC and ASP.NET Web API . You can also use Visual Studio 2017 for your .NET Core development.

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Ques.6) Explain the execution process of managed code in .Net?

Ans.6)

## Choosing the right compiler:

.Net Framework is a multilanguage execution environment, the runtime supports a wide variety of data types and language features. In order to obtain the full benefits provided by the common language runtime , you should use one or more language (VB.Net, C# etc.) compilers that target the runtime.

### Compiling the code to MSIL:

Unlike the execution style of compiling source code into machine level code, .Net language compilers translates the source code into Microsoft Intermediate Language. This ensures language interoperability because no matter which language has been used to develop the application, it always gets translated to Microsoft Intermediate Language. During the compile time the compiler produces metadata, that contains description of the program like dependencies, versions etc.

### Compiling MSIL to native code:

Before the program execution , Jist In Time compiler (JIT) compiles the MSIL into native code and stores it in a memory buffer. During JIT compilation, the code is also checked for type safety. Type safety ensures that objects are always accessed in a compatible way. The compiled native code is in memory and is not persisted. So every time we run our application this whole thing has to happen again.

### Execution of Code:

After translating the IL into native code, it is sent to .Net runtime manager. The .Net runtime manager executes the code. During execution, managed code receives

services such as garbage collection, security, interoperability with unmanaged code, cross-language debugging support, and enhanced deployment and versioning support.

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