The evolution of .NET Framework and C# has been a dynamic journey. Introduced by Microsoft in the early 2000s, they quickly became pillars of software development. With subsequent versions, the framework expanded its capabilities, introducing features like LINQ and async programming. The advent of .NET Core in 2016 brought cross-platform compatibility and an open-source approach. In 2020, .NET 5 consolidated the ecosystem, unifying .NET Core and Framework. This evolution reflects a commitment to modern development practices, performance enhancements, and broader community engagement, making .NET and C# formidable choices for contemporary software engineering challenges.NET and C# remain pivotal in contemporary software development.

No 2

- \*\*Mono:\*\* An open-source implementation of Microsoft's .NET framework, Mono enables cross-platform development by allowing .NET applications to run on various operating systems, including Linux, macOS, and Windows.

- \*\*Xamarin:\*\* A mobile app development framework that uses C# and the .NET framework. Xamarin allows developers to create cross-platform applications for iOS and Android using a single codebase, enhancing code reusability.

- \*\*COM (Component Object Model):\*\* A Microsoft technology that enables software components to communicate with each other in a networked environment. It facilitates the creation of reusable and modular

software components, promoting interoperability between different applications.

- \*\*.NET Core:\*\* An open-source, cross-platform framework for building modern, cloud-based, and scalable applications. It is the successor to the traditional .NET Framework, providing a lightweight and modular runtime.

- \*\*Unity (C#):\*\* Unity is a popular game development engine that uses C# as one of its scripting languages. C# is used to write code for game logic, AI, and other functionalities in Unity, making it a versatile language for game development.

- \*\*REST (Representational State Transfer):\*\* An architectural style for designing networked applications. REST is

based on a stateless client-server model, where communication is achieved through standard HTTP methods (GET, POST, PUT, DELETE). It is commonly used in web services to create scalable and interoperable APIs.

No 3.

Common Language Runtime (CLR) in .NET provides three crucial functions:

First, it manages memory, ensuring efficient allocation and deallocation;

Second, it enforces type safety, preventing errors related to data type misuse;

Third, it facilitates code execution, managing the just-in-time compilation and execution of .NET programs for platform independence.

CLR also offers automatic garbage collection, freeing up memory occupied by unused objects.