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Dept: Computer science

Course Code: COM 316

Course Title: Computer programming using C++

Assignment

1. Write a short note on the evolution of .Net Framework and C#(100 words)

2. Explain the following terms ;

Mono, Xamarin, COM, .Net Core, Unity C#,REST

3. Critically, explain ANY three key functions of CLR(50 words)

Solution

1. The evolution of .NET Framework began in 2002 with its introduction by Microsoft, alongside C# as the primary programming language, revolutionizing software development with managed code and language flexibility. As versions progressed, .NET introduced key features such as generics, language enhancements, and cross-platform capability in .NET Core. This evolution culminated in .NET 5, unifying the framework and emphasizing high performance, open-source collaboration, and cloud-native development. Subsequent releases of .NET 6 and C# 10 further solidified their roles in modern application development, nurturing a vibrant ecosystem. Today, .NET and C# stand as a testament to adaptability, community engagement, and empowering developers with a versatile, feature-rich platform.

2(a). Mono is an open-source and cross-platform implementation of Microsoft's .NET Framework. It enables developers to build and run applications on various operating systems, including Linux, macOS, and Windows. Originally developed by Xamarin, Mono provides a versatile and robust environment for creating applications using C# and other .NET languages outside of the Windows ecosystem.

b). Xamarin is a popular and powerful platform for building cross-platform mobile applications using C# and the .NET Framework. It allows developers to use a single code base to create applications for iOS, Android, and Windows. It also provides a set of tools that enable the development of native mobile apps with shared business logic, reducing the need for separate development efforts for each platform.

c). COM, also known as Component Object Model, is a Microsoft technology that enables software components to communicate and interact with one another. It is a platform-independent, distributed system that allows different software components to work together, regardless of the language in which they were created or the location in which they are running. COM was introduced by Microsoft in the early 1990s and has been a fundamental technology for building Windows-based applications.

d). .NET Core is an open-source, cross-platform framework that serves as a modern, modular, and high-performance successor to the traditional .NET Framework. It was initially introduced by Microsoft in 2016 and has since become a central component of the .NET ecosystem. .NET Core was designed to address the needs of modern application development by offering improved performance, greater scalability, and expanded platform support.

e). Unity C#: Unity C# is a real-time 3D development platform for building 2D and 3D application, like games and simulations, using NET and the C# programming language.

3a). Garbage Collection: this allows CLR to automatically manages memory by reclaiming unused objects, preventing memory leaks, and ensuring enough memory usage.

b. Managed Code Execution: It compiles CIL into native machine code during execution, optimizing performance and enabling cross-platform compatibility.

c. Exception Handling: The CLR simplifies robust error management through structured exception handling, ensuring consistent and reliable error resolution.