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LEVEL: HND 1

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**C# ASSIGNMENT**

1. Write a short note on the evolution of .NETframework and C# (100 words)
2. Explain the following terms;
   1. MONO
   2. XAMARIN
   3. COM
   4. .NET CORE
   5. UNITY C#
   6. REST
3. Critically explain any three key Function of CLR(50 words)

**Solutions**

1. The .NET Framework is a proprietary software framework developed by Microsoft that runs primarily on Microsoft Windows. .NET Framework, introduced in 2002, has evolved to become a versatile platform for building various types of applications. C#, its primary language, has advanced with features like async/await, LINQ, and pattern matching. It includes a common language Runtime(CLR) which manages the execution of code and a Base class library (BCL), which provides a rich library of classes .C# has gained modern constructs such as records and top-level statements .NET and C# continue to adapt to industry needs, enabling robust and efficient application development across diverse environments.
2. Explain the following terms ;
   1. MONO: Mono is an open-source implementation of the .NET Framework, allowing developers to build and run cross-platform applications. It provides a runtime, a set of class libraries, and development tools, enabling the creation of .NET applications for various operating systems, including Linux, macOS, and Windows.
   2. XAMARIN: Xamarin is a platform for building native mobile applications using C# and .NET. It allows developers to share code across multiple platforms, such as iOS, Android, and Windows, while still providing a fully native user experience. Xamarin.Forms, a part of Xamarin, enables the creation of cross-platform UIs using a single, shared codebase.
   3. COM: COM (Component Object Model) is a binary-interface standard for software components introduced by Microsoft. It enables interprocess communication and dynamic object creation in a language-independent manner. COM components can be used in various programming languages and are a fundamental technology for building Windows-based software.
   4. .NET Core: .NET Core is an open-source, cross-platform version of the .NET framework. It is optimized for building modern, cloud-based, and containerized applications. .NET Core supports multiple operating systems and architectures and provides a modular and lightweight runtime, making it suitable for a wide range of development scenarios.
   5. UNITY C#: Unity is a popular game development platform that uses C# as its primary scripting language. C# is used to create gameplay mechanics, implement game logic, and interact with the Unity API to build interactive and immersive gaming experiences.
   6. REST: REST (Representational State Transfer) is an architectural style for designing networked applications. It relies on a stateless, client-server communication model, and leverages HTTP to access and manipulate resources. RESTful APIs use standard HTTP methods (GET, POST, PUT, DELETE) to perform operations on resources, providing a scalable and interoperable approach for building web services and APIs.

1. Critically ,explain ANY three key functions of CLR

* + 1. MEMORY MANAGEMENT : This frees developers from manual memory allocation and deallocation, reducing the risk of memory leaks and dangling pointers while improving stability of the applications.
    2. EXCEPTION HANDLING: CLR offers robust support for exception handling, allowing developers to write reliable and maintainable code by providing a structured approach to handling runtime errors. .
    3. SECURITY : CLR enforces various security measures such as code access security, role-based security, and cryptographic services, ensuring that applications running within the CLR environment are protected from unauthorized access, malicious code, and potentially harmful actions.