DAY 1(MVC)

1. what the httpcontext request and response message consist of?

    - HTTP context including the request and response, information about the connection, a collection of features that have been enabled on the server with middleware, and a User object for authentication and authorization.

    - HTTP request: is sent from a client to a server . consists of method, headers, query string parameters, the body of the request as a stream that you can read from, the content type and length, and cookies.
        - Method(Get ,Post ,Put ,Delete)

    - HTTP response: is sent from the server back to the client . consists of headers, the body of the response as a stream that you can write to, the content type and length, status code, and cookies.
        - Status code(200 Success , 404 NotFound, 500 Server error)

2. what's the diff btw https and http?

    - HTTP (Hypertext Transfer Protocol)>> port 80
    - HTTPS(Hypertext Transfer Protocol Secure) add security layer >>port 443
    - Both protocols allow data to be transferred over the network, allowing the user to access the website and other online sources.

3. what's the segments and fragments in URL with real URL Example?

    - Segments :refer to parts in path , separated by slashes (/)
        - ex:(/Products/ShowAll) >> Products & ShowAll >Segment
    - Fragments: comes after the (#)
        - Ex:(/Products/Details?id=1# reviews)

4. what's the difference btw Web Pages(Razor) and MVC and state two business cases and compare btw them?

    - ASP.NET Core Razor Pages is way to dynamically generate HTML for simple websites ,Combines HTML and server-side C#.
        - **Ex: Small Website.**

    - ASP.NET Core MVC cleanly separates the concerns of web developers between **the models**, which temporarily store the data; **the views**, which present the data using various formats in the UI; and **the controllers**, which fetch the model and pass it to a view. This separation enables improved reuse and unit testing.
        - **Ex: E-Commerce Platform.**

5. what's minification, web bundle, webPack and lazy loading of client side and what's its role in increasing performance through the network?

    - Minification: Reduces file size by removing unnecessary characters.
    - Web Bundling: Combines multiple files into fewer files to reduce HTTP requests.
    - WebPack**:** A tool for bundling, optimizing, and managing assets.
    - Lazy Loading: Loads resources only when needed.

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What Are Software Architecture Patterns?

An architecture pattern defines the fundamental structure of a software application, guiding how different components interact.

Common Architecture Patterns:

1. Layered Architecture
• Organizes the system into layers, each responsible for a specific function(Presentation ,Application, Business Logic, Data Access).
• used in frameworks like **ASP.NET**.

2. Client-Server Architecture
• Splits the system into two main parts:
o **Client**: Requests services.
o **Server**: Provides services.
• Found in web applications.

3. Microservices Architecture
• Decomposes an application into independent, loosely coupled services that communicate over **APIs**.
• Used in cloud-based systems like **Amazon**.

4. Pipe-and-Filter Architecture
• Data flows through a sequence of processing units (filters), each performing a transformation.
• Used in **compilers**.

5.Model-View-Controller (MVC)
• Separates concerns into three main components:
o **Model**: Manages the data and business logic.
o **View**: Present the data using various formats in the UI.
o **Controller**: Fetch the model and pass it to a view.
• This separation enables improved **reuse** and **unit testing**.
• Used in **web frameworks like ASP.NET MVC**.