

Hashim Aziz Muhammad

HA24010012783

Full Stack Web Development L3T01 - Backend Web Development

hashimazizm@gmail.com

+27832521214

Questions and Answer:

1. Difference between a Relational Database and a NoSQL Database:

- A **relational database** organizes data into tables with rows and columns, enforcing a predefined schema and relationships between tables. Examples include MySQL, PostgreSQL, and Oracle.
- A **NoSQL database** is non-relational and provides flexibility in data storage, allowing for unstructured or semi-structured data. It doesn't require a fixed schema and can scale horizontally. Examples include MongoDB, Cassandra, and Redis.

2. Purpose of Using Frameworks in Back-end Development:

- **Frameworks** like Django and Flask provide a structured way to build web applications, offering pre-built components and conventions to streamline development.
- They handle common tasks like routing, database interaction, and authentication, reducing development time and ensuring best practices are followed.

3. Security Considerations when Creating a Website/Application:

- Implementing **user authentication and authorization mechanisms** to control access to sensitive data and functionalities.
- **Input validation and sanitization** to prevent SQL injection, cross-site scripting (XSS), and other types of injection attacks.
- **Encryption of sensitive data**, both in transit (using HTTPS) and at rest (using encryption algorithms).
- Regular **security audits, code reviews, and updates** to patch vulnerabilities in dependencies and frameworks.

4. **Role of Web Server, Application Server, and Proxy Server:**

- **Web Server:** Handles HTTP requests from clients (e.g., browsers) and serves static content like HTML, CSS, and JavaScript files.
- **Application Server:** Executes application logic, generates dynamic content, and interacts with databases. It runs server-side code written in languages like Python, Ruby, or Java.
- **Proxy Server:** Acts as an intermediary between clients and servers, forwarding requests to the appropriate backend servers. It can enhance security, scalability, and performance by caching content, load balancing, and implementing security protocols.

5. **Steps Involved in Handling HTTP Requests in a Back-end Application:**

- Receive the **HTTP request** from the client.
- **Parse the request** to extract relevant information such as headers, parameters, and body.
- **Route the request** to the appropriate endpoint based on the request method (e.g., GET, POST) and URL.
- **Execute the corresponding logic** or controller function to process the request.
- **Interact with databases or external services** to fetch or manipulate data.

- Generate an **HTTP response** with the appropriate status code, headers, and body.
- Send the response back to the client.

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