

**1. Explain full request-response cycle including network, HTTP headers.**

When a user takes an action like entering a URL or clicking a link, the browser creates an HTTP request. This request includes a method (such as GET or POST), the target URL, headers carrying metadata (like User-Agent, Accept, or Authorization), and sometimes a body with data. The request is sent over the network, starting with a DNS lookup to resolve the domain name to an IP address, and then establishing a TCP connection via a 3-way handshake.

Once connected, the HTTP request travels to the server's socket listening on a specific port. The server processes the request—checking headers, authenticating users if needed, and fetching or modifying the requested resource.

The server then sends back an HTTP response. The response has a status line, response headers, and optionally a body containing the requested data. The browser receives this response and renders the data or reacts accordingly.

**2. What do you need to consider for security (e.g. input validation, sanitization, auth) even if simple app.**

Security is essential even in simple applications. I consider:

- a. **Input validation**: Check incoming data strictly to prevent injection attacks or invalid data.
- b. **Sanitization**: Clean inputs to remove harmful code, e.g., preventing XSS (Cross-Site Scripting).
- c. **Authentication and Authorization**: Ensuring users are who they say they are, and can only access allowed resources.
- d. **HTTPS usage**: Encrypt data in transit to avoid eavesdropping.
- e. **Error handling**: Avoid leaking sensitive info via error messages.

**3. How would you monitor errors in production?**

- Use logging frameworks to capture errors with context, like timestamps and user data.
- Integrate error tracking tools (e.g., Sentry or LogRocket) for real-time alerting.
- Monitor server health and performance metrics.
- Set up alerts to notify the team immediately when critical errors appear.
- Regularly review logs and error reports to identify patterns and fix root causes.

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