

Assignment 1: Web Development Fundamentals

1. Explain the difference between frontend, backend, and full-stack development with suitable real-world examples.

Ans. Frontend development deals with the visual part of a website — what users see and interact with. Technologies include HTML, CSS, and JavaScript. Example: Designing the layout of a shopping website like Amazon.

Backend development handles the server, database, and logic that power the frontend. Technologies include Node.js, Java, Python, PHP, and databases like MySQL. Example: Managing user authentication and order history on Amazon.

Full-stack development combines both frontend and backend roles. A full-stack developer builds the complete web application. Example: A developer who builds both the UI and server logic for a food delivery app.

2. Create a simple diagram showing how the client-server model works in web architecture.

Ans. Client (Browser) → Internet → Web Server → Database → Response sent back to Client

3. Describe how a browser requests and displays a web page from a web server.

Ans. When a user enters a URL, the browser sends an HTTP request to the web server. The server processes the request, fetches the required HTML, CSS, and JavaScript files, and sends them back. The browser then renders these files to display the webpage visually.

4. Identify and list the tools required to set up a web development environment. Explain the purpose of each.

Ans. 1. VS Code – Code editor for writing HTML, CSS, and JavaScript.
2. Web Browser (Chrome, Edge, etc.) – For testing and debugging websites.
3. Node.js – For running JavaScript on the backend and managing packages.
4. Git & GitHub – Version control and collaboration.
5. Live Server Extension – For real-time preview of code changes in the browser.

5. Explain what a web server is and give examples of commonly used servers.

Ans. A web server is software that delivers web pages to clients upon request. It handles HTTP requests and responses.

Examples:

- Apache HTTP Server
- Nginx
- Microsoft IIS
- Node.js (Express.js framework)
- LiteSpeed

6. Define the roles of a frontend developer, backend developer, and database administrator in a project.

Ans. Frontend Developer: Designs and develops the visual interface and ensures responsiveness and interactivity.

- Backend Developer: Manages server-side logic, APIs, and integrates databases with the frontend.
- Database Administrator (DBA): Handles database management, security, backup, and performance optimization.

7. Explain the difference between static and dynamic websites. Provide an example of each.

Ans. Static Website: Displays fixed content to every visitor; no server-side processing.

Example: A portfolio or company info page.

- Dynamic Website: Content changes based on user input or server logic. Example: Facebook, where each user sees personalized content.

8. Research and list five web browsers. Explain how rendering engines differ between them.

Ans. Five popular web browsers:

1. Google Chrome – Uses Blink engine
2. Mozilla Firefox – Uses Gecko engine
3. Microsoft Edge – Uses Blink engine
4. Apple Safari – Uses WebKit engine
5. Opera – Uses Blink engine

Rendering engines interpret HTML, CSS, and JavaScript to display web pages. Different engines have variations in performance, standards compliance, and rendering accuracy.

9. Draw a labeled diagram showing the basic web architecture flow — client, server, database, and APIs.

Ans. Client (Browser) → API Request → Server → Database → Response → Back to Client

Example:

User → Frontend → Backend API → Database (fetch user data) → API Response → Display on UI