Assignment 1 Introduction to Web Development

1.Explain the main components of client-server architecture and their functions

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- Client requests services or resources from the server.
- Server provides services or resources requested by clients.
- Client runs a user interface or application to interact with the server.
- Clients can be a web browser, mobile app, or desktop application.
- Server processes client requests and returns responses.
- Server can be a web server, database server, application server, etc.
- Network acts as the communication channel between clients and servers.
- Network uses protocols like HTTP, TCP/IP, or WebSocket for data transmission.

2.Discuss the various career paths available after completing a web development course

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Frontend Developer

- Specializes in designing and implementing the user interface (UI) and user experience (UX).
- Works with HTML, CSS, JavaScript, and frameworks like React, and Node.js.

Backend Developer

- Focuses on server-side logic, databases, and APIs.
- Works with programming languages like Node.js, Python, PHP, Java, or Ruby.

Full-Stack Developer

- Handles both frontend and backend development.
- Works with databases, servers,

E-commerce Developer

- Specializes in developing online stores using platforms like Shopify, Magento, or WooCommerce.
- Integrates payment gateways, shopping carts, and security features.

Mobile App Developer (Web-Based)

- Uses frameworks like React Native or Flutter to build mobile apps from web technologies.
- Works on cross-platform development.

Freelancer / Consultant

- Works independently, taking on web development projects from various clients.
- Requires knowledge of web development, business, and client management.

Technical SEO Specialist

- Optimizes websites for better search engine rankings.

- Works with HTML, JavaScript, and SEO tools like Google Analytics and Lighthouse.

Software Engineer (Web)

- Works on complex web applications, SaaS products, or enterprise solutions.
- Develops scalable and secure software systems.

3. Describe the role of a web browser's developer tools in web development

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- Real-Time HTML & CSS Inspection.
- JavaScript Debugging.
- Displays all network requests (e.g., API calls, resource loading) with details like status codes and load times.
- Aids in optimizing resource loading and troubleshooting issues related to data fetching.
- Offers profiling tools to assess page load times, memory usage, and CPU performance.
- Enables developers to pinpoint performance issues and optimize the web application's efficiency.
- Allows developers to test and refine the layout and functionality across various devices.
- Provides insights into cookies, local storage, and session storage used by the web application.
- Facilitates debugging issues related to user sessions and stored data.
- Serves as an interactive shell for executing JavaScript commands on the fly.

- Enables inspection of DOM events and element states (e.g., hover, active) for dynamic behavior debugging.

4.What are the advantages of using a Version Control System like Git in a development project

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- **Enhanced Collaboration:** Enables multiple developers to work concurrently, minimizing code conflicts.
- **Detailed Change History:** Tracks every code modification with timestamps and author details.
- **Efficient Branching:** Supports isolated development of features or fixes through branching.
- **Seamless Merging:** Facilitates the integration of changes from different branches back into the main codebase.
- **Distributed Workflow:** Provides each developer with a complete local repository, supporting offline work.
- **Easy Rollbacks:** Allows reverting to previous stable versions in case of bugs or errors.
- **Integrated Code Reviews:** Supports pull requests and code reviews to maintain code quality.
- **CI/CD Integration:** Works smoothly with continuous integration and deployment pipelines.
- **Improved Accountability:** Clearly logs who made each change, enhancing transparency.
- **Scalability and Flexibility:** Adapts to projects of any size, from small teams to large enterprises.

5.Compare and contrast a text editor and an IDE, highlighting their key features and uses.

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Functionality:

- Text Editors are primarily designed for basic code editing and text manipulation while
- IDEs: Combine code editing with integrated tools like debuggers, compilers, and build automation.

Performance:

- Text Editors: Lightweight and fast to load, ideal for quick edits.
- IDEs: Feature-rich and resource-intensive, which can slow down performance on lower-end machines.

Extensibility:

- Text Editors: Often extended with plugins and custom configurations to add features.
- IDEs: Typically come pre-configured with many built-in tools, reducing the need for extensive setup.

Use Cases:

- Text Editors: Best suited for small scripts, configuration files, or when a minimalistic interface is desired.
- IDEs: Geared towards large-scale projects that require integrated debugging, code navigation, and project management features.

User Experience:

- Text Editors: Offer a straightforward, distraction-free environment.
- IDEs: Provide a comprehensive workspace that can enhance productivity through integrated code suggestions, version control, and testing tools.