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Full Stack Web Development L1T01- INTRODUCTION TO WEB DEV

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1. What is the world wide web?

The global information system is comprised of interconnected web pages, utilizing hyperlinks to facilitate navigation between pages within a website and across different websites worldwide. These hyperlinks form an expansive web of information, providing a seamless experience for users as they explore various online content daily.

Reference:

Introduction to Web Development. (2024) HyperionDev Full Stack Web Development Online Notes, 06-032 (2024). Accessed: 02 February 2024

2. Explain the functional differences between a web application's front-end and back-end.

The front-end of a web application is responsible for the following:

- **Designing the user interface**: This includes designing the layout, color scheme, and typography of the application.
- **Creating the user experience**: This includes creating interactive elements such as buttons, forms, and menus.
- **Optimizing the application for speed and performance**: This includes optimizing images, reducing the number of HTTP requests, and minimizing the size of files.

The back end of a web application is responsible for the following:

- **Managing data**: This includes storing, retrieving, and updating data in a database.
- **Handling logic from the Server**: This includes processing user input, handling authentication and authorization, and performing calculations.
- **Optimizing the application for speed and performance**: This includes optimizing database queries, caching data, and minimizing the number of requests to external services.

Full-stack developers are responsible for both the front-end and back-end of a web application. They have a broad range of skills and are able to handle all aspects of the application development process.

References:

Front end vs back end - difference between application development ... Available at: https://aws.amazon.com/compare/the-difference-between-frontend-and-backend/ (Accessed: 06 February 2024).

The difference between front-end vs. back-end (2023) *ComputerScience.org*. Available at: https://www.computerscience.org/bootcamps/resources/frontend-vs-backend/ (Accessed: 05 February 2024).

Front-end vs. back-end developer: Understanding the differences Coursera. Available at: https://www.coursera.org/articles/front-end-vs-back-end (Accessed: 05 February 2024).

3. Describe what occurs on the back end during a web interaction using the "Google query example" from the article or create your own example.

In the "Google query example," given in the provided notes the back end handles various tasks after a user enters a query, it can be broken down into points as follows:

- Query Parsing: Understands user intent and extracts keywords.
- Location-Based Relevance: Considers the user's location for context-aware results.
- Predictive Typing: Anticipates and suggests likely query completions.
- Execution of the Search Algorithm: Runs complex algorithms to fetch and rank relevant results.
- Concurrent Request Handling: Manages multiple requests efficiently for consistent performance.
- Database Interaction: Communicates with databases to retrieve the indexed information.
- Ranking and Sorting: Determines result order based on relevance and other factors.
- Response Generation: Creates a response with search results and metadata.
- Front-End Display: Sends the response to the front-end for user-friendly presentation, completing the interaction with a high level of efficiency and seamlessness.

References:

Introduction to Web Development. HyperionDev Full Stack Web Development Online Notes, 06-032 (2024). Accessed: 02 February 2024

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Front-end vs. back-end developer: Understanding the differences (no date) *Coursera*. Available at: https://www.coursera.org/articles/front-end-vs-back-end (Accessed: 05 February 2024).

HyperionDev (2020) *Front-end vs back-end web development: What's the difference? HyperionDev Blog*. Available at: https://blog.hyperiondev.com/index.php/2017/10/10/front-end-vs-back-end-web/ (Accessed: 06 February 2024).

4. MERN stack is a JavaScript/JSON-based three-tier architecture that replaces Angular.js with React.js and connects MongoDB, Express.js, and Node.js. MERN is an acronym for the four technologies that form the stack:

    - MongoDB: A document-oriented database that stores data in JSON-like format.
    - Express.js: A web framework that handles routing, middleware, and server-side logic.
    - React.js: A library that creates user interfaces using components and state management.
    - Node.js: A runtime environment that executes JavaScript code outside the browser.

    The MERN stack is popular because it allows one to use the same language such as JavaScript for both the front-end and back-end of a web application. It also offers benefits such as scalability, performance, and flexibility.

References:

How to use mern stack: A complete guide MongoDB. Available at: https://www.mongodb.com/languages/mern-stack-tutorial (Accessed: 06 February 2024).

HyperionDev (2019) *Everything you need to know about the mern stack*, *HyperionDev Blog*. Available at: https://blog.hyperiondev.com/index.php/2018/09/10/everything-need-know-mern-stack/ (Accessed: 06 February 2024).

What is The mern stack? What is the MERN Stack? Guide & Examples | Oracle South Africa. Available at: https://www.oracle.com/za/database/mern-stack/ (Accessed: 06 February 2024).

What is The mern stack? introduction & examples MongoDB. Available at: https://www.mongodb.com/mern-stack (Accessed: 06 February 2024).