**Developing a Dynamic Single-Page Website**

**(WEB 224 Web Programming)**

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**OBJECTIVES**

The project's primary goal is to develop a corporate website designed to facilitate real-time communication and collaboration among employees from different countries. The website features customizable rooms dedicated to individual teams or projects, with deadlines automatically adjusted to match the time zones of the team members. The website utilizes Web Socket technology for real-time communication and public APIs for retrieval of data such as time zones and holiday schedules.

**FEATURES**

**Login Functionality**

Users can enter their name, employee ID, select a continent, and input their country and capital to log in. Upon login, the user's information is stored and displayed in the profile section.

**Navigation Menu**

Users' profile information, including name, ID, and timezone, is displayed in the top for quick reference. The navigation menu allows users to seamlessly switch between different features of the application, including home, time conversion, room creation, joining rooms, and holiday information.

**Home Page**

Upon successful login, users are directed to the home page. The home page serves as an introduction to the website's features, guiding users on their navigation through the website.

**Time Conversion**

Users can input a continent and a capital to fetch and display the current time of the specified location. The time data is retrieved from the World Time API via asynchronous HTTP requests. Timezones are dynamically added to the interface with the ability to toggle between 12-hour and 24-hour formats.

**Room Creation and Joining**

Users can create and join chat rooms which involves specifying a room name, category, and deadline, with real-time updates of active rooms. Joining a room updates the room members list and displays relevant information about the room.

**Holiday Information**

Upon entering a country name, the website retrieves and displays a list of holidays for the selected country and year.

**Task Management**

Upon entering a room, users can create tasks that are specifically for that room and set their deadlines accordingly. The deadlines will then adjust depending on each user’s time zone, creating an accurate time and date indicator.

**PROGRAM STRUCTURE**

**Architecture**

The application follows a client-server architecture with WebSocket communication between the front-end and back-end.

**Modules**

* **index.html**: The main HTML file containing the structure and layout of the web application.
* **script.js**: JavaScript file handling client-side logic and WebSocket communication.
* **websocket.js**: Node.js file setting up the WebSocket server and handling different user actions.

**Data Flow**

* User interacts with the client.
* Front-end sends a WebSocket message to the server.
* Server processes the message and performs necessary actions.
* Server sends a response back to the client/s via WebSocket.
* Client/s updates the UI based on the server response.

**Dependencies**

Front-End:

* HTML, CSS, JavaScript
* WebSocket

Back-End:

* Node.js
* ws library for WebSocket
* express for setting up the HTTP server
* http module

APIs:

* WebSocket API: Used for real-time communication between the client and server.
* World Time API: Used to fetch time data.
* Public Holiday API: Used to fetch public holidays for a country.