System Design Document

Driven Developers

CSCC01 Project

Sprint 2

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Class Name: AddProject (from addproject.js)	
Parent Class: mongoose.Model Subclass: None	
Responsibilities ● Define and render the project addition form. ● Display input fields for project name, description, and link. ● Style the form and its elements using the defined styles object. ● Handle form submission. ● Collect and validate user input. ● Send a POST request to the API to create a new project. ● Navigate to the project list page upon successful submission. ● Handle form cancellation. ● Navigate to the project list page when the cancel button is clicked.	Collaborators: ● `React` (for managing component state and rendering) ● `useNavigate` (for navigation) ● `localStorage` (to get the token for authentication) ● `fetch` (for sending the POST request to the API) ● CSS-in-JS `styles` object (for styling the component)

Class Name: ProjectList(from projectList.js)	
Parent Class:None Subclass: None	
Responsibilities ● fetch and display a list of projects. ● Retrieve project data from the server using a GET request. ● Render each project with its details, including name, description, link, and profile picture. ● Handle user navigation.	Collaborators: ● `React` (for managing component state and rendering) ● `useNavigate` (for navigation) ● `localStorage` (to get the token for authentication) ● `fetch` (for sending GET and DELETE requests to the API) ● CSS-in-JS `styles` object (for styling

● Navigate to the 'Add Project' form when the "Add Project" button is clicked. ● Navigate back to the dashboard when the "Back to Dashboard" button is clicked. ● Handle project deletion. ● Send a DELETE request to the server to remove a project. ● Update the list of displayed projects upon successful deletion.	the component)

Class Name: App(from server.js)
Parent Class: Express.Application Subclass: None explicitly defined
Responsibilities ● Define the application's routing structure. ● Use BrowserRouter to handle routing within the app. ● Define Routes and corresponding Route elements for various components: ● / - Renders the Login component. ● /register - Renders the Register component. ● /dashboard - Renders the Dashboard component. ● /profile-view - Renders the ProfileView component. ● /profile-view/:id - Renders the ProfileView component in read-only mode. ● /edit-profile - Renders the EditProfileForm component. ● /project-list - Renders the ProjectList component. ● /add-project - Renders the AddProject component. ● /connect - Renders the SearchUser component. ● /notifications - Renders the Notifications component. ● /friend-list - Renders the FriendList component.
Collaborator: NextResponse from 'next/server' ● express: Web framework for creating the server and handling routing. ● mongoose: ODM (Object Data Modeling) library for MongoDB to define schemas and interact with the database. ● bcryptjs: Library for hashing passwords. ● jsonwebtoken: Library for creating and verifying JWT tokens. ● cors: Middleware to enable Cross-Origin Resource Sharing. ● multer: Middleware for handling file uploads. ● path: Node.js module for working with file and directory paths. ● User: Mongoose model representing users in the database. ● Project: Mongoose model representing projects in the database.

Class Name: User
Parent Class: mongoose.Model Subclass: None
Responsibilities ● Define the schema for a user. ● Specify fields and their types: email, password, fullName, programName, yearOfStudy, gpa, description, profilePicture, interests, courses, friendRequests, and friends. ● Set validation rules, such as making email and password required and email unique. ● Set default values for certain fields like fullName, programName, yearOfStudy, gpa, description, interests, and courses. ● Facilitate CRUD operations in MongoDB. ● Enable creation, reading, updating, and deletion of user documents in the MongoDB database. ● Ensure that user documents adhere to the defined schema.
Collaborator: NextResponse from 'next/server' ● mongoose.Schema (to define the structure of user documents) ● mongoose.model (to create the User model) ● User model (referenced by the friendRequests and friends fields to establish relationships between users)

Class Name: Projects(from Project.js)	
Parent Class: mongoose.Model Subclass: None	
Responsibilities ● Define the schema for a project. ● Specify fields and their types: projectName, description, link, and user. ● Set validation rules, such as making projectName and user required. ● Facilitate CRUD operations in MongoDB. ● Enable creation, reading, updating, and deletion of project documents in the MongoDB database. ● Ensure that project documents adhere to the defined schema.	Collaborators: ● mongoose.Schema (to define the structure of project documents) ● mongoose.model (to create the Project model) ● User model (referenced by the user field to establish a relationship between projects and users)

Class Name: EditProfileForm	
Parent Class: React.Component Subclass: None	
Responsibilities ● Render a form to allow users to edit their profile information. ● Handle form state using React hooks. ● Fetch the current profile data from the server and populate the form fields. ● Submit the updated profile data to the server. ● Navigate between different views based on user actions.	Collaborators: ● React: Library for building user interfaces and handling component state. ● useState and useEffect: React hooks for managing state and side effects. ● useNavigate: Hook from react-router-dom for navigating programmatically. ● fetch: Function for making HTTP requests to the server. ● localStorage: Web API for storing and retrieving authentication tokens.

Class Name: ProfileView
Parent Class: React.Component Subclass: None
Responsibilities: ● Render the user's profile information. ● Fetch the profile data from the server. ● Display the fetched profile data. ● Provide navigation options to edit the profile or return to the dashboard.
Collaborators: ● useState ● useRouter ● setIsRegister

Class Name: AddProject	
Parent Class: React.Component Subclass: None	

Responsibilities	Collaborators:
● Render the form for adding a new project. ● Manage form state and handle form submission. ● Send a POST request to add the new project. ● Navigate to the project list on successful submission. ● Provide a cancel button to navigate back to the project list without submitting.	● React: Library for building user interfaces and handling component state. ● useState: React hook for managing state. ● useNavigate: Hook from react-router-dom for navigating programmatically. ● fetch: Function for making HTTP requests to the server. ● localStorage: Web API for storing and retrieving authentication tokens.

Class Name: ProjectList	
Parent Class: React.Component Subclass: None	
Responsibilities	Collaborators:
● Fetch and display a list of projects from the server. ● Provide UI elements to navigate to add new projects and back to the dashboard. ● Display each project with its details and a delete button. ● Handle deletion of projects by sending a DELETE request to the server and updating the local state.	● React: Library for building user interfaces and handling component state. ● useState: React hook for managing state. ● useEffect: React hook for performing side effects in function components. ● useNavigate: Hook from react-router-dom for navigating programmatically. ● fetch: Function for making HTTP requests to the server. ● localStorage: Web API for storing and retrieving authentication tokens.ter

Class Name: Register	
Parent Class: React.Component Subclass: None	
Responsibilities	Collaborators:
● Fetch and display a list of projects from the server. (This is not explicitly implemented in the provided code but can be added separately) ● Provide UI elements to navigate to	● React: Library for building user interfaces and handling component state. ● useState: React hook for managing state.

add new projects and back to the dashboard. ● Display each project with its details and a delete button. (Not implemented in this code) ● Handle deletion of projects by sending a DELETE request to the server and updating the local state. (Not implemented in this code)	● useEffect: React hook for performing side effects in function components. ● useNavigate: Hook from react-router-dom for navigating programmatically. ● axios: Library for making HTTP requests to the server. ● localStorage: Web API for storing and retrieving authentication tokens.

Class Name: Dashboard	
Parent Class: N/A Subclass: N/A	
Responsibilities ● Render and manage the dashboard. ● Display user-specific information such as userName, projects, friendRequests, and recommendedConnections. ● Provide navigation options for different parts of the application (Profile, Connect, Projects, Notifications, Friends, Event Calendar, Discussions, GPA Calculator). ● Integrate FriendRequestsNotification component to show friend request notifications. ● Handle navigation and user actions. ● Navigate to different routes using useNavigate from react-router-dom. ● Fetch and display data related to user profile, projects, friend requests, and recommended connections from the backend. ● Handle actions such as sending friend requests and logging out.	Collaborators: ● useNavigate (from react-router-dom) for navigating between routes. ● useState (from react) for managing component state. ● useEffect (from react) for fetching initial data when the component mounts. ● fetch API for interacting with the backend to fetch and update data. ● FriendRequestsNotification component to display friend request notifications.

Class Name: FriendList (from FriendList.js)
Parent Class:None

Subclass: None	
Responsibilities ● Render and manage the friend list. ● ● Display the user's friends, including their profile picture and name. ● Provide options to view the profile of each friend and to remove friends from the list. ● Navigate back to the dashboard. ● Handle fetching and updating friends data. ● ● Fetch the list of friends from the backend when the component mounts. ● Handle removing a friend from the list by making a DELETE request to the backend.	Collaborators: ● `useNavigate (from react-router-dom) for navigating between routes.` ● `useState (from react) for managing component state.` ● `useEffect (from react) for fetching initial data when the component mounts.` ● `fetch API for interacting with the backend to fetch and update data.`

Class Name: FriendRequestsNotification.js	
Parent Class:None Subclass: None	
Responsibilities ● Render a notification for friend requests. ● Display a message indicating the number of friend requests the user has received. ● Only render the notification if there are one or more friend requests.	Collaborators: ● `React for creating the component.` ● `friendRequests (prop) passed from the parent component (Dashboard in this case) containing the list of friend requests.`

Class Name: Notification.js	
Parent Class:React.Component Subclass: None	
Responsibilities ● Render notifications for friend requests. ● Display a list of friend requests with options to accept or reject each	Collaborators: ● `React for creating the component.` ● `useState and useEffect hooks`

request. ● Fetch friend requests from the server using an API endpoint. ● Handle acceptance and rejection of friend requests via API calls and update the state accordingly. ● Display a message if no friend requests are available.	`from React for managing state and side effects.` ● `fetch API for making HTTP requests to the server.` ● `localStorage for storing and retrieving authentication tokens.`

Class Name: ConnectionsRouter (from connections.js)	
Parent Class: None Subclass: None	
Responsibilities: ● Handle routes related to recommended connections. ● Implement middleware (verifyToken) to authenticate and decode JWT tokens from request headers. ● Define a route (/recommended-connections) to fetch recommended connections for a user based on shared interests. ● Use JWT to verify and extract the user ID from the token payload. ● Fetch the current user's profile (User.findById(userId)) using ● Mongoose or a similar ORM. ● Retrieve other users (User.find(...)) who have similar interests as the current user but are not the same user (_id: { $ne: userId }). ● Return recommended connections as JSON response (res.json(recommendedConnections)) . ● Handle errors such as missing tokens, failed authentication, user not found, or server errors (res.status(...)).	Collaborators: ● express for creating and managing routes. ● jwt for token verification and decoding. ● User model (presumed to be from Mongoose or a similar ORM) for interacting with user data in the database. ● process.env.JWT_SECRET or default 'your-secret-key' for JWT token verification.

Class Name:SearchUsers (from SearchUsers.js)	
Parent Class:React.Component Subclass: None	
Responsibilities	Collaborators:

● Render a search interface for users based on filters. ● Display input fields for filtering users by name, academic interests, courses, program, and year. ● Allow users to search for other users based on specified filters. ● Display search results with user information including profile picture, name, academic interests, courses, program, and year of study. ● Enable sending friend requests to users displayed in the search results. ● Manage state for input fields (name, academicInterests, courses, program, year), search results (results), and friend requests (friendRequests). ● Fetch users based on search criteria using an API endpoint. ● Handle sending friend requests to selected users via API calls and update state accordingly. ● Display appropriate messages if no users match the search criteria or if there are no search results.	● `React for creating the component and managing state with useState hook.` ● `fetch API for making HTTP requests to the server.` ● `localStorage for storing and retrieving authentication tokens.`

Class Name: Index.js	
Parent Class: N/A Subclass: N/A	
Responsibilities ● Imports necessary modules and components (React, ReactDOM, App, reportWebVitals) ● Renders the main application component (<App />) within a React.StrictMode wrapper using ReactDOM.createRoot ● Includes a call to reportWebVitals() for measuring performance in the app	Collaborators: ● React (React, ReactDOM) ● './App' (Assuming this is the main application component) ● './reportWebVitals' (Used for performance measurement) ●

Class Name: GpaCalculator.js

Parent Class: N/A Subclass: N/A	
Responsibilities ● State Management: Maintain and update state for current courses, potential courses, GPAs, completed credits, error messages, and saved GPAs. ● UI Rendering: Render input forms for entering course details, buttons for adding/removing courses, and display calculated GPAs and saved GPAs. ● Event Handling: Handle various events such as adding/removing courses, changing course details, calculating GPAs, saving GPAs, and deleting saved GPAs. ● API Interaction: Fetch and save GPA data from/to the backend API. ● Validation: Validate form inputs before processing GPA calculations.	Collaborators: ● Backend API: Interacts with the backend to fetch and save GPA data.

Class Name: Discussion.js	
Parent Class: N/A Subclass: N/A	
Responsibilities ● Data Representation: Define and structure the data for a discussion post. ● Schema Definition: Set up the schema with required fields and data types using Mongoose. ● Database Interaction: Facilitate creation, reading, updating, and deletion of discussion documents in the MongoDB database.	Collaborators: ● Mongoose: Utilized for schema definition and model creation. ● User Model: References the User model to link discussions to user accounts.

Class Name: DiscussionDetail.js
Parent Class: N/A Subclass: N/A

Responsibilities	Collaborators:
• Fetch and Display Discussion Details: Retrieve and display detailed information about a specific discussion post. • Fetch and Display Comments: Retrieve and display comments associated with the discussion post. • Handle New Comments: Allow users to submit new comments to the discussion post. • User Interface: Manage the layout and styling of the discussion detail view and comments section..	• React: Utilized for building the component and managing state and lifecycle. • React Router (useParams): Used to access the discussionId from the URL. • Axios: Used for making HTTP requests to the backend API. • LocalStorage: Used for retrieving the user's authentication token

Class Name: NewDiscussion.js	
Parent Class: N/A Subclass: N/A	
Responsibilities	Collaborators:
• Form Management: Manage the input form for creating a new discussion. • Image Handling: Handle the selection and management of multiple images for the discussion. • Form Submission: Submit the form data, including the images, to the backend API to create a new discussion. • Navigation: Navigate to the discussions list view upon successful creation of a new discussion	• React: Utilized for building the component and managing state. • React Router (useNavigate): Used for navigating to the discussions list view after successfully creating a new discussion. • Fetch API: Used for making HTTP requests to the backend API. • LocalStorage: Used for retrieving the user's authentication token.

Class Name: reportWebVitals.js
Parent Class: N/A Subclass: N/A

Responsibilities	Collaborators:
● Defines a function reportWebVitals that takes onPerfEntry as a parameter ● Checks if onPerfEntry is a function and then imports the 'web-vitals' module asynchronously ● Once the 'web-vitals' module is loaded, it invokes functions (getCLS, getFID, getFCP, getLCP, getTTFB) provided by the module and passes onPerfEntry to each of them	● 'web-vitals' (module imported dynamically) ● onPerfEntry (a function passed as a parameter to reportWebVitals)

Class Name: setupTests.js	
Parent Class: N/A Subclass: N/A	
Responsibilities ● Comments explaining the purpose of the import and its usage. ● Imports '@testing-library/jest-dom' which adds custom Jest matchers for asserting on DOM nodes. ● Enhances Jest's capabilities to assert on DOM elements using methods like toHaveTextContent provided by '@testing-library/jest-dom'.	Collaborators: ● '@testing-library/jest-dom' (library providing custom Jest matchers for DOM assertions)

Class Name: EventCalendar	
Parent Class: React.Component Subclass: None	
Responsibilities ● State Management: ● Manage state for events, modalOpen, selectedEvent, eventTitle, eventLocation, friends, invitedFriends, startDate, endDate, currentMonthYear, eventInvites, and currentUser. ● Data Fetching: ● Fetch current user data (fetchCurrentUser) and store it in	Collaborators: ● React: For component creation, state management, and lifecycle methods (useState, useEffect). ● FullCalendar: For calendar rendering and interaction (@fullcalendar/react, dayGridPlugin, interactionPlugin). ● LocalStorage: For retrieving the JWT token. ● Fetch API: For making HTTP requests

state. ● Fetch friends data (fetchFriends) and store it in state. ● Fetch events data (fetchEvents) and store it in state. ● Fetch event invites data (fetchEventInvites) and store it in state. ● Event Handling: ● Handle calendar date selection (handleSelect) to open a modal for creating a new event. ● Handle event creation (handleCreateEvent) by sending a POST request to the server and updating the state with the new event. ● Handle event click (handleEventClick) to display event details in a modal. ● Handle event deletion (handleDeleteEvent) by sending a DELETE request to the server and updating the state. ● Handle attendee removal (handleRemoveAttendee) by sending a POST request to the server and updating the state. ● Handle invite acceptance (handleAcceptInvite) and rejection (handleRejectInvite) by sending POST requests to the server and updating the state. ● Form Handling: ● Reset form fields (resetForm) after event creation or cancellation. ● Handle form cancellation (handleCancel) by closing the modal and resetting form fields. ● Handle inviting friends (handleInviteFriend) by updating the state with selected friends. ● Calendar Configuration: ● Configure FullCalendar with plugins, initial view, selectable dates, events data, and custom handlers for selection, date setting, and event clicks. ● Display the current month and year in the calendar header (handleDatesSet).	to the server to fetch and manipulate event and user data.

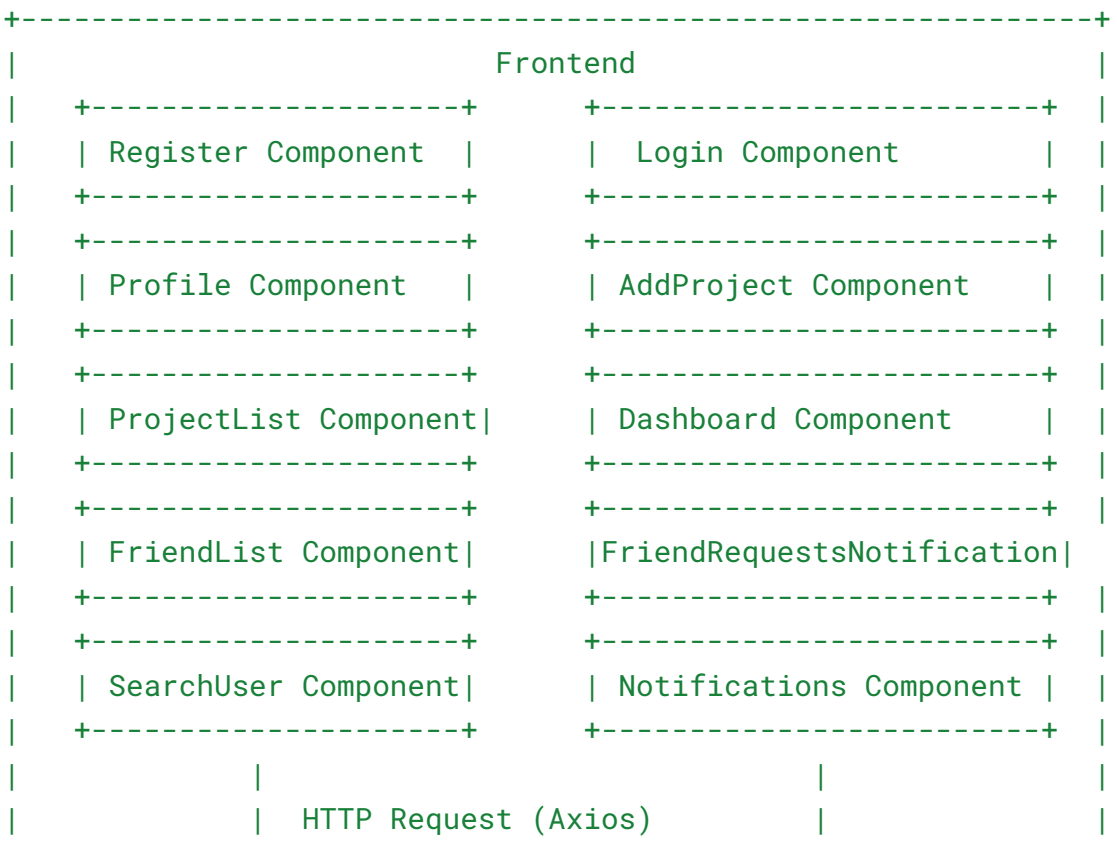
Description of System Interaction with the Environment

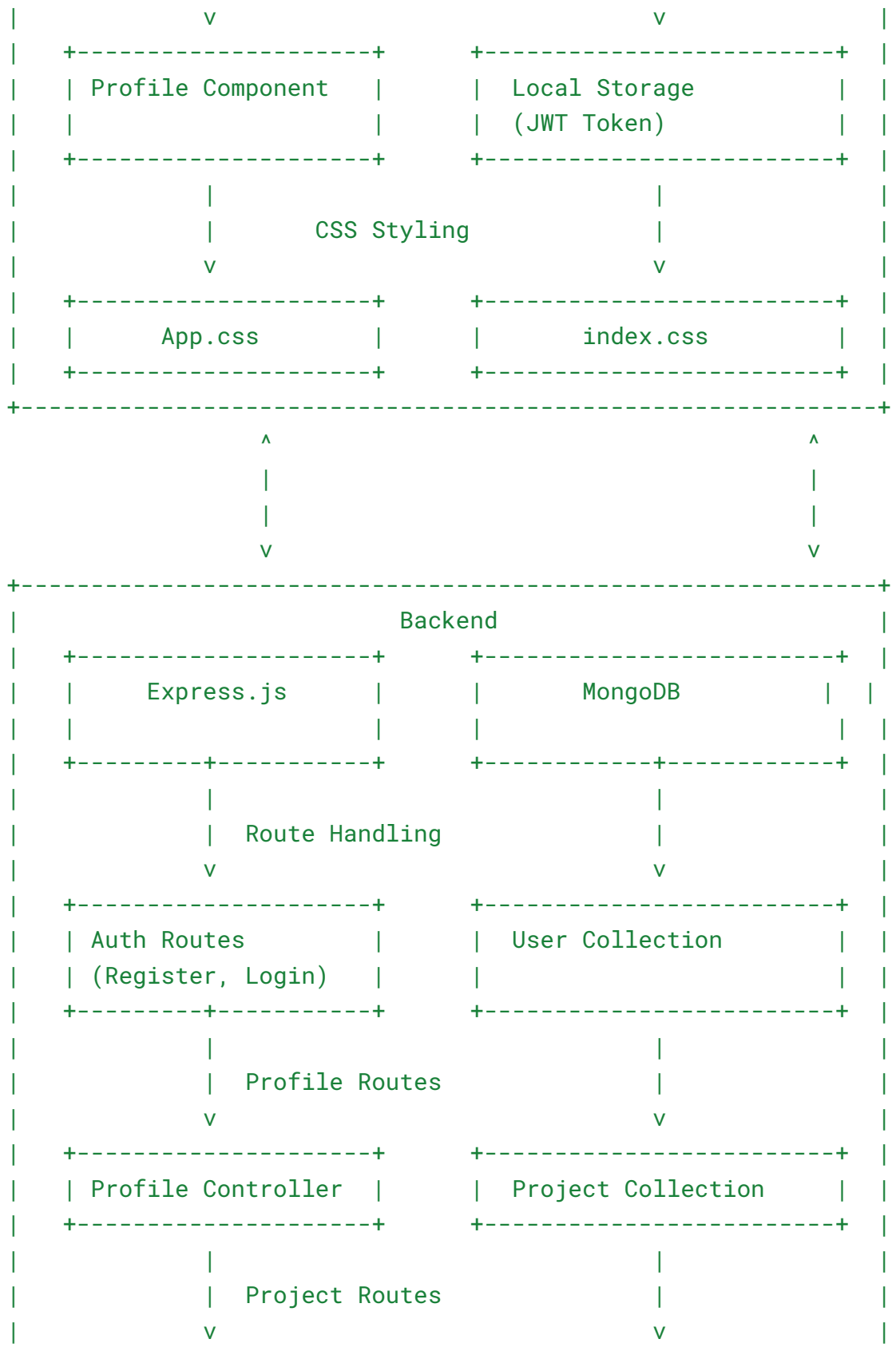
Dependencies and Assumptions:

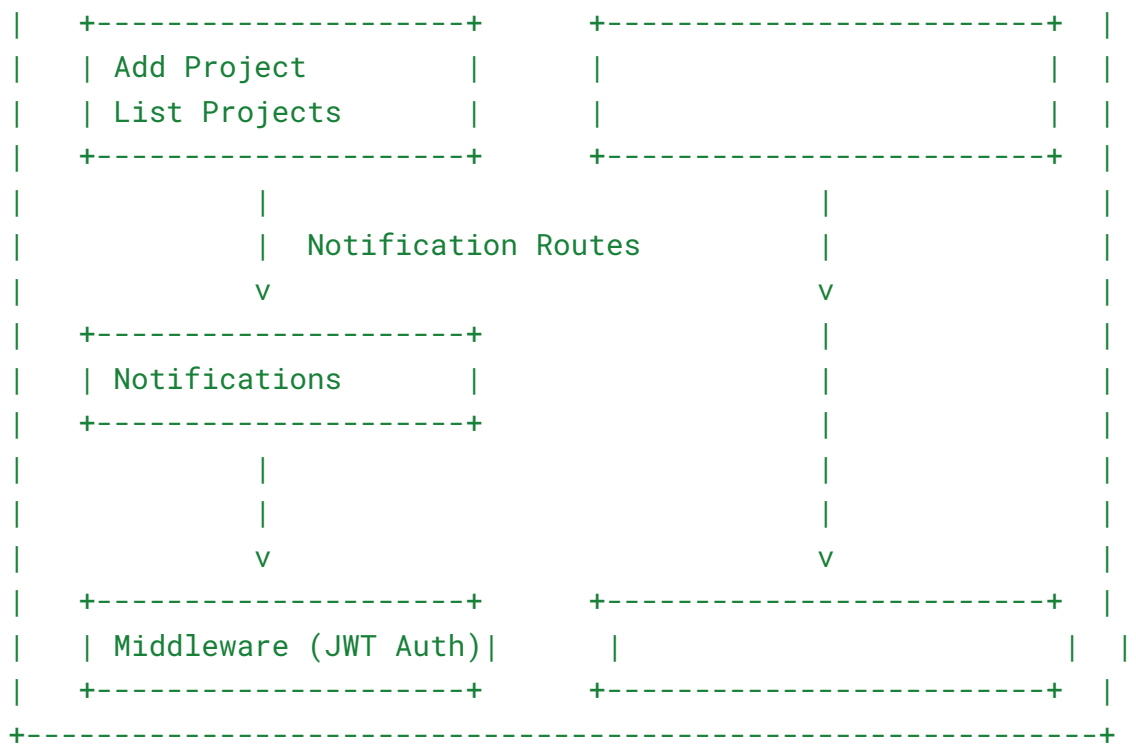
1. **Operating System**:
    - The system is designed to be OS-independent, meaning it can run on Windows, macOS, and Linux. However, development and testing are typically done on a Unix-like environment (Linux or macOS).
2. **Programming Languages**:
    - **JavaScript**: For both client-side (React.js) and server-side (Node.js) development.
    - **HTML/CSS**: For client-side rendering and styling.
3. **Frameworks and Libraries**:
    - **Frontend**:
        - **React.js**: For building the user interface.
        - **React Router**: For handling routing in the single-page application.
        - **Axios**: For making HTTP requests from the client to the server.
    - **Backend**:
        - **Express.js**: For building the server-side RESTful APIs.
        - **Mongoose**: For interacting with MongoDB.
        - **Bcrypt.js**: For password hashing.
        - **Jsonwebtoken**: For user authentication.
        - **Cors**: For enabling Cross-Origin Resource Sharing.
    - **Development Tools**:
        - **Nodemon**: For automatic server restarts during development.

        - **Concurrently**: For running both the client and server concurrently during development.
4. **Database**:
    - **MongoDB**: Used to store user data, including emails, hashed passwords, and profile information.
5. **Network Configuration**:
    - The system requires a stable internet connection for accessing the MongoDB Atlas database.
    - Proper network configurations and permissions are needed, including IP whitelisting for MongoDB Atlas.

Architecture Diagram




Profile Component
Local Storage
(JWT Token)
CSS Styling
App.css
index.css
Backend
Express.js
MongoDB
Route Handling
Auth Routes
(Register, Login)
User Collection
Profile Routes
Profile Controller
Project Collection
Project Routes


Add Project
List Projects
Notification Routes
Notifications
Middleware (JWT Auth)