Abstract for “Digital Library” Web Application

Introduction:

The Digital Library is a sophisticated web application designed for individuals who wish to organize and manage their book collections in a personalized space. Developed using modern web technologies such as Vue.js, Node.js, and Express, the application is integrated with various libraries to enhance user experience and interaction. At its core, the Digital Library contains a well-organized repository of books, each with essential metadata, including genre, title, and author. Users can easily explore the collection through an intuitive interface. The application allows users to efficiently manage their books and provides a centralized platform for browsing and organizing them. Real-time updates ensure that the platform scales effectively as the collection grows.

Technological Stack:

- **Vue.js**: A progressive JavaScript framework used for building the frontend through its component-based architecture.
- **Node.js**: A JavaScript runtime used on the server-side.
- **Express.js**: A web application framework for Node.js that simplifies HTTP request routing and facilitates the development of a RESTful API for managing books.
- **Database Integration**: The PostgreSQL database is used to persist book records, user data, and other relevant information, ensuring efficient data storage and retrieval.

Key Features:

- **User Authentication**: Users can register, log in, and log out using secure session-based authentication.
- **Login and Registration Forms**: Conditional forms display based on user authentication state, handled by the User and Registration components.
- **Book Management**: Books are categorized by genre, a user can add, remove, and view them in their personal reading lists, completed lists, and favorites. When adding an already completed book to the reading list, it will be automatically removed from the completed list to prevent duplication within lists.
- **Database Integration**: SQL queries enable operations on books, genres, and user lists within the PostgreSQL database.
- **API Routes**: A set of RESTful endpoints supports operations such as fetching genres, adding/removing books, and checking user session status.

- **Responsive Design**: The layout is responsive, offering a tailored experience for both desktop and mobile devices.
- **Logout Feature**: When users log out, a confirmation message is displayed.

Development Process:

To bring the Digital Library to life, I began by familiarizing myself with the frontend framework, Vue.js, and the backend runtime environment, Node.js with Express. Vue.js was chosen for its reusable components and flexibility, while Node.js provided a platform-independent solution, ideal for real-time applications. I developed Vue components, created views, and integrated them using Vue Router for seamless navigation. Simultaneously, I built the backend API and performed CRUD operations with PostgreSQL. I focused on creating a simple and intuitive UI, including user login/registration icon, genre representations with images, and a responsive design using Bootstrap.
Books are accessed through an external service, and the frontend supports a mobile-friendly experience with a collapsible menu for small screens.

Lessons Learned:

- I gained practical experience connecting a PostgreSQL database (using a connection pool) to the backend.
- The importance of modular development became clear.
- I recognized the value of providing informative user feedback and clear interactions.
- I improved my skills in setting up a development environment for both frontend and backend, ensuring smooth integration.
- I learned the significance of secure password storage through bcrypt hashing and session management with cookies.

Conclusion:

The Digital Library is a robust, scalable web application built with Vue.js, Node.js, and Express. It provides an intuitive platform for managing digital book collections, offering features like user authentication, personalized book lists, and a responsive design for both desktop and mobile devices. The user-friendly interface, combined with a powerful backend, enables efficient organization, browsing, and management of books. With its seamless integration between the frontend and backend, the Digital Library offers a comprehensive solution for managing digital libraries online.