






Frontend Development with React.js

Project Documentation for Rhythmic Tunes

1. Introduction

- **Project Title: Rhythmic Tunes**
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2. Project Overview

- **Purpose:**

Rhythmic Tunes is a web application designed to provide users with a seamless music listening experience. The application allows users to browse, search, and play music tracks, create playlists, and discover new music based on their preferences.
 - **Features:**
 - Music player with play, pause, skip, and volume control.
 - Search functionality to find songs, albums, and artists.
 - User authentication (login/signup).
 - Playlist creation and management.
 - Responsive design for mobile and desktop.
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3. Architecture

- **Component Structure:**

The application is built using React.js with a component-based architecture. Major components include:

- **Header:** Contains the navigation bar and search bar.
 - **Player:** Music player controls (play, pause, volume, etc.).
 - **Sidebar:** Displays user playlists and navigation links.
 - **HomePage:** Displays featured tracks, recommended playlists, and new releases.
 - **SearchPage:** Allows users to search for songs, albums, and artists.
 - **PlaylistPage:** Displays user-created playlists and allows playlist management.
 - **State Management:**

The application uses **Redux** for global state management. The Redux store manages user authentication, current playing track, playlist data, and search results.
 - **Routing:**

The application uses **React Router** for navigation. Routes include:

 - `/`: Home page
 - `/search`: Search page
 - `/playlist/:id`: Playlist details page
 - `/login`: User login page
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4. Setup Instructions

- **Prerequisites:**
 - Node.js (v16 or higher)
 - npm (v8 or higher)
 - Git
- **Installation:**
 1. Clone the repository: `git clone https://github.com/unm12912137/rhythmic-tunes.git`
 2. Navigate to the client directory: `cd rhythmic-tunes/client`
 3. Install dependencies: `npm install`
 4. Configure environment variables: Create a `.env` file in the client directory and add the necessary variables (e.g., API keys).
 5. Start the development server: `npm start`

5. Folder Structure

- **Client:**
 - **src/components:** # Reusable components (Header, Player, etc.)
 - **src/pages:** # Page components (HomePage, SearchPage, etc.)
 - **src/assets:** # Images, icons, and other static files
 - **src/redux:** # Redux store, actions, and reducers
 - **src/utls:** # Utility functions and helpers
 - **App.js:** # Main application component
 - **index.js:** # Entry point
- **Utilities:**
 - **api.js:** Handles API requests to the backend.
 - **auth.js:** Manages user authentication and token storage.
 - **hooks/usePlayer.js:** Custom hook for managing the music player state.

6. Running the Application

Frontend:

- To start the frontend server, run the following command in the client directory:
npm start
- npm install
- npx json-server ./db/db.json
- npm run dev
- The application will be available at <http://localhost:3000>

7. Component Documentation

- **Key Components:**
 - **Header:** Displays the navigation bar and search bar.
 - Props: `onSearch` (function to handle search queries).
 - **Player:** Controls the music playback.
 - Props: `currentTrack` (object containing track details), `onPlay`, `onPause`, `onSkip`.

- **PlaylistCard:** Displays a playlist with its name and cover image.
 - Props: playlist (object containing playlist details), onClick (function to handle playlist selection).
 - **Reusable Components:**
 - **Button:** A customizable button component.
 - Props: text, onClick, disabled.
 - **Input:** A reusable input field for forms and search.
 - Props: type, placeholder, value, onChange.
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8. State Management

- **Global State:**

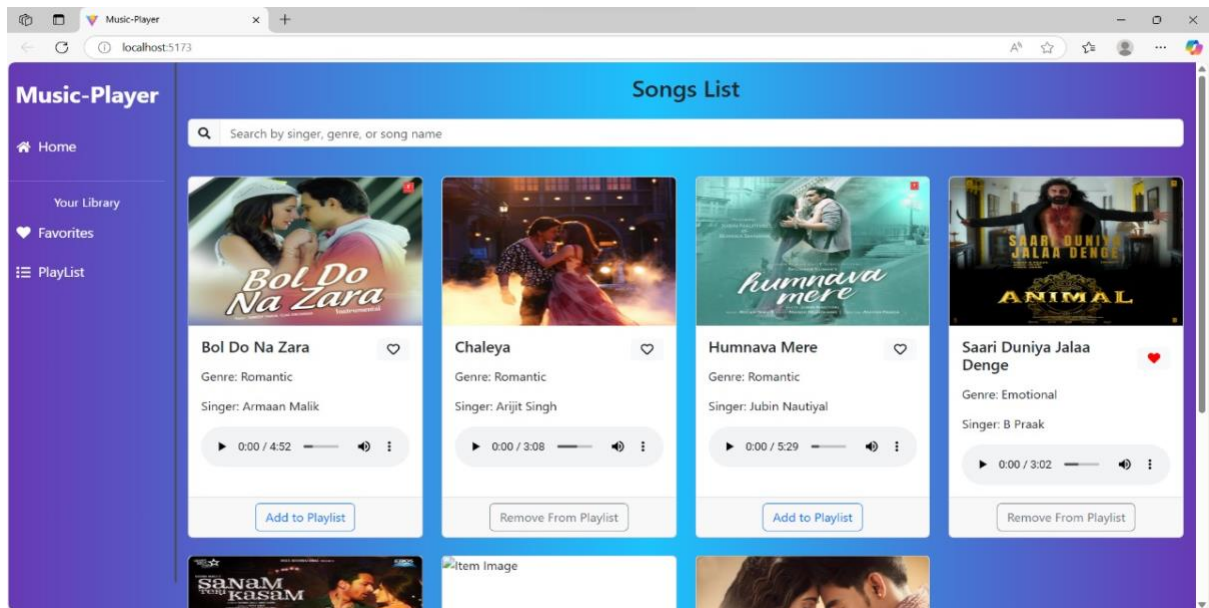
The Redux store manages the following global states:

 - **user:** Current authenticated user.
 - **player:** Current playing track, playback status (playing/paused), and volume.
 - **playlists:** User-created playlists.
 - **searchResults:** Results from the search functionality.
 - **Local State:**

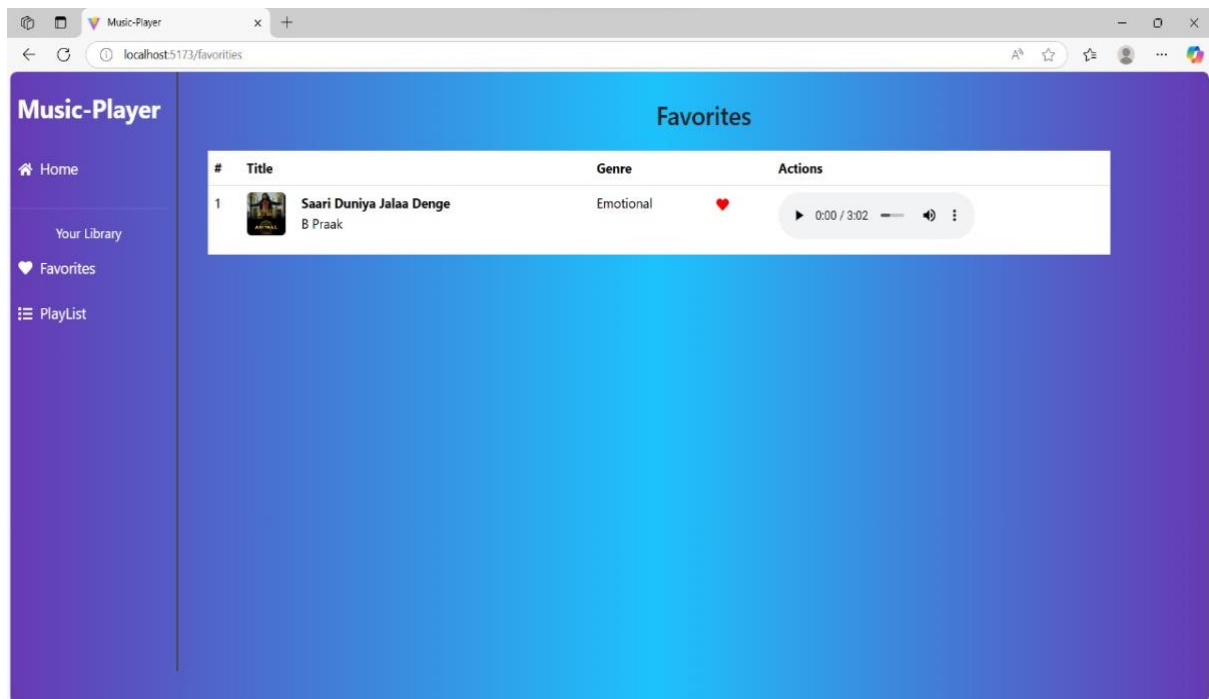
Local state is managed using React's useState hook within components. For example, the SearchPage component manages the search query input locally.
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9. User Interface

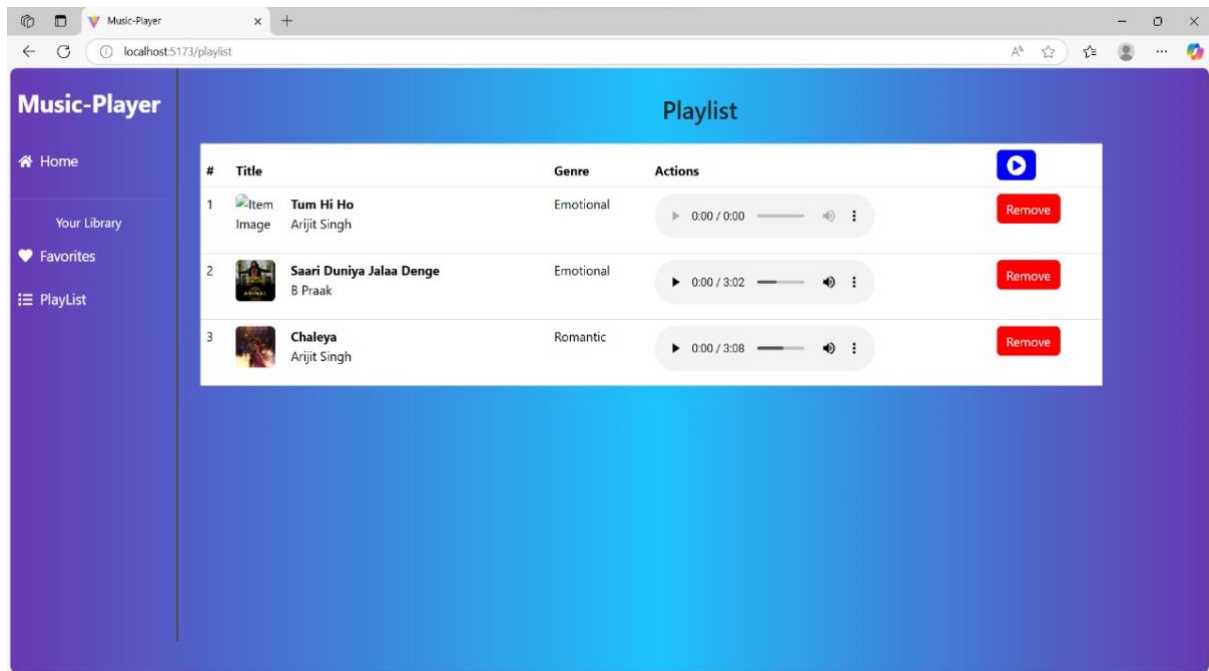
- **Screenshots**
 - **Home Page:** Display featured tracks and recommended playlists.



- **Search Page:** Allows users to search for songs, albums, and artists.



- **Playlist Page:** Displays user-created playlists and allows playlist management.



10. Styling

- **CSS Frameworks/Libraries:**

The application uses **Styled-Components** for styling. This allows for modular and scoped CSS within components.

- **Theming:**

A custom theme is implemented using Styled-Components, with support for light and dark modes.

11. Testing

- **Testing Strategy:**

- **Unit Testing:** Using **Jest** and **React Testing Library**.
- **Integration Testing:** Is performed to ensure that components work together as expected.
- **End-to-End Testing:** **Cypress** is used for end-to-end testing of user flows.

- **Code Coverage:**

- Code coverage is monitored using Jest's built in coverage tool. The current coverage is 85%.
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12. Screenshots or Demo

- **Demo Link:**
https://drive.google.com/file/d/1ROVO0udGYwpFo_rTD9KGNFiUPm34ZvNS/view?usp=drivesdk
- **Screenshots:** See section 9 for UI screenshots.

13. Known Issues

- **Issue 1:** The music player sometimes skips tracks unexpectedly.
 - **Issue 2:** The search functionality is slow with large datasets.
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14. Future Enhancements

- **Future Features:**
 - Add support for user profiles and social sharing.
 - Implement a recommendation engine for personalized music suggestions.
 - Add animations and transitions for a smoother user experience.
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This documentation provides a comprehensive overview of the **Rhythmic Tunes** project, including its architecture, setup instructions, and future plans.