# ***Frontend Development with React.js***

# ***Project Documentation for Rhythmic Tunes***

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## 1. Introduction

- **Project Title**: Rhythmic Tunes
- **Team Members**: 4


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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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## 2. 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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**3. Setup Instructions**

- **Prerequisites**:
  - Node.js (v16 or higher) ○ npm (v8 or higher) ○ Git
- **Installation**:
  1. Clone the repository: git clone https://github.com/unm12912137/rhythmictunes.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

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**4. 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/utils:** # 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.

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**5. 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

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**6. 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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**7. 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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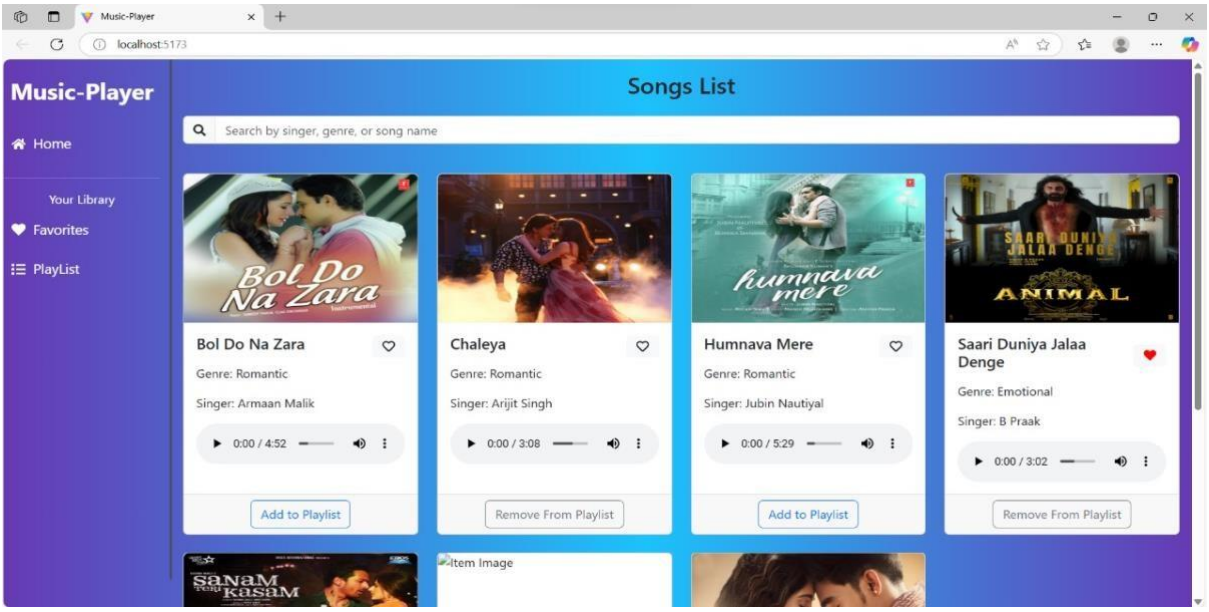
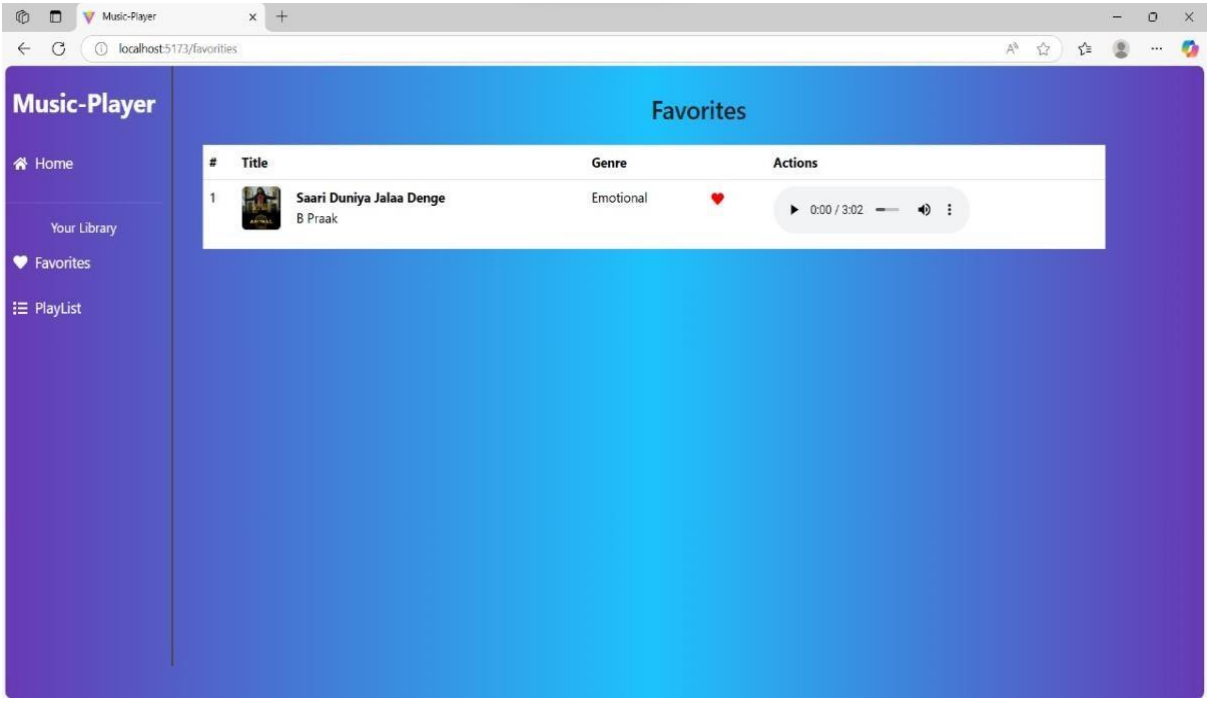
**8. User Interface**

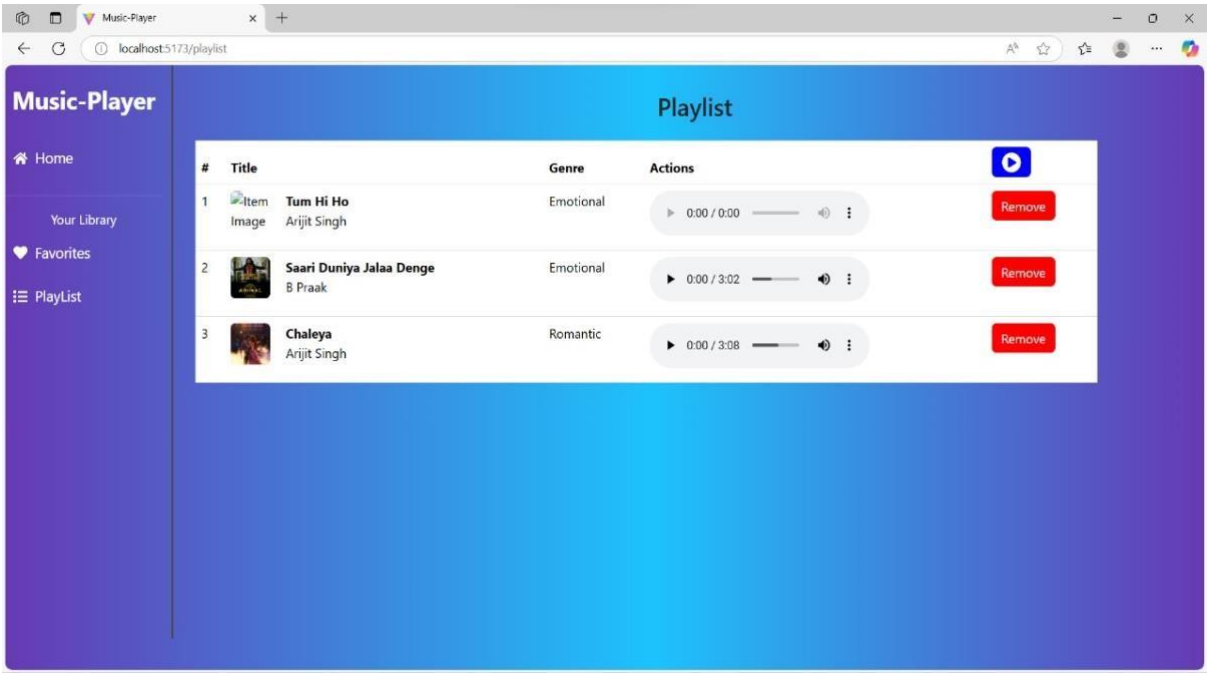
- **Screenshots** **Home Page:** Display featured tracks and recommended playlists.




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




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

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## 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.

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## 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.