Frontend Development with React.js

Project Documentation for Rhythmic Tunes..

#. Introduction

- **Project Title**: Rhythmic Tunes

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#. 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.

#. 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:

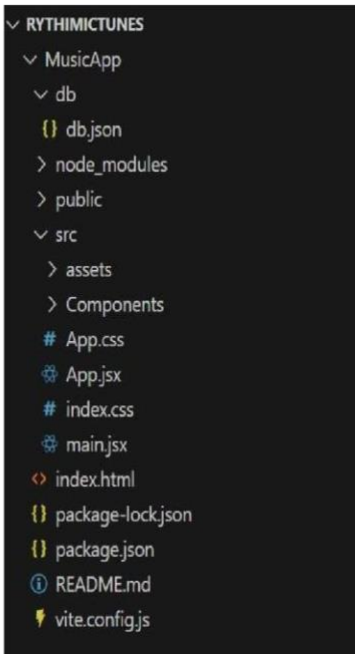
  User login page

#. Setup Instructions

- **Prerequisites**:
- Node.js (v16 or higher)
- npm (v8 or higher)
- **Installation**:

1. Git Hub Link : GIT HUB
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

#. Folder Structure



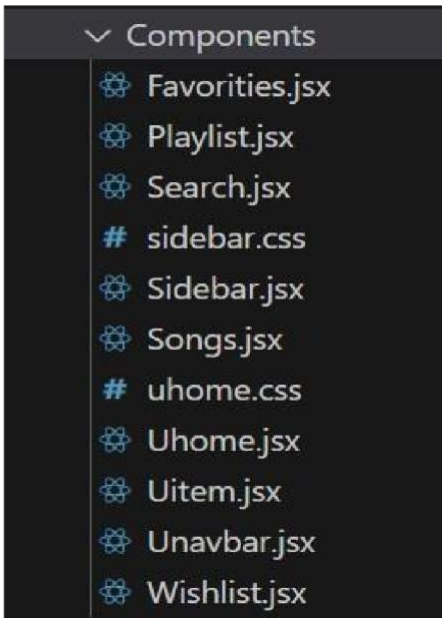
- **Client**:
  - **src/components:** # Reusable components (Header, Player, etc.)
  - **src/pages:** # Page components (HomePage, SearchPage, etc.)
  - **src/assets:** # Images, icons, and other static files
  - **src/redux:** # Redux store, actions, and reducers
  - **src/utils:** # Utility functions 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.

#. 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

#. 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.

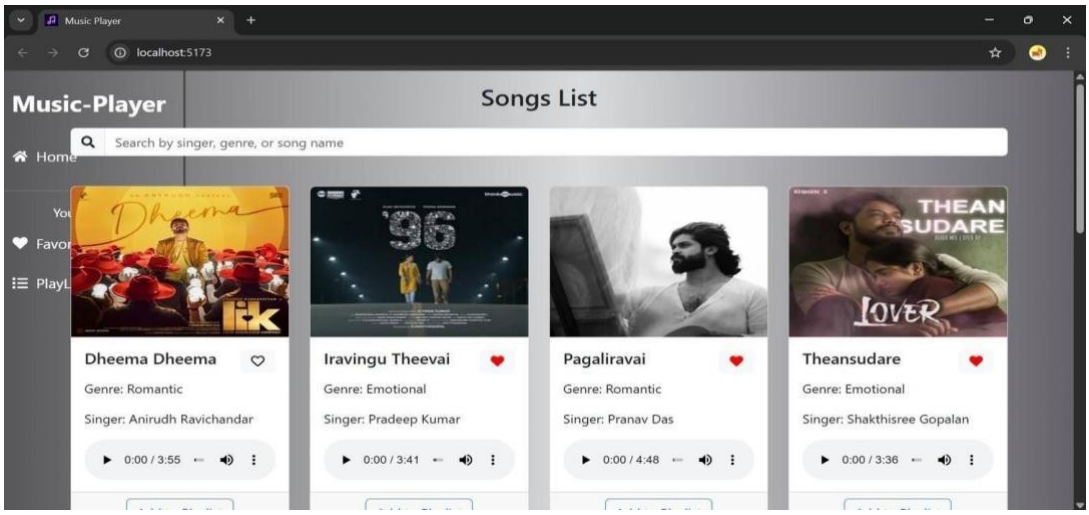
#. State Management

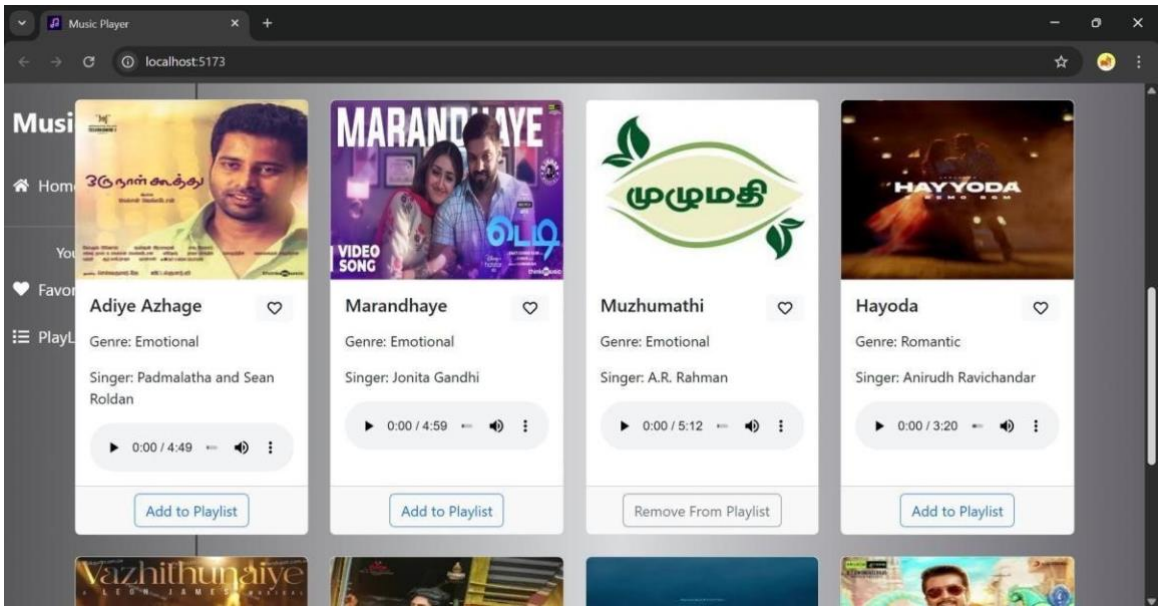
- **Global State**:
  The Redux store manages the following global states:
  - **user:** Current authenticated user.
  - **player:** Current playing track, playback status (playing/paused), and volume.
  - **playlists:** User-created playlists.
  - **searchResults:** Results from the search functionality.
- **Local State**:
  Local state is managed using React's useState hook within components. For example, the SearchPage component manages the search query input locally.

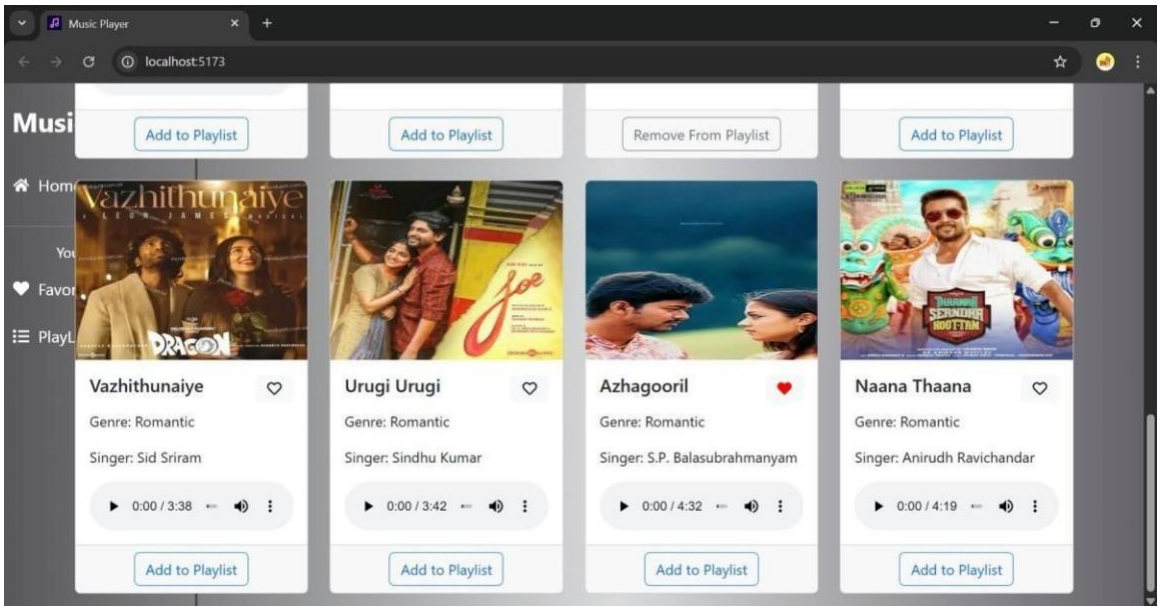
#. User Interface

- **Screenshots**

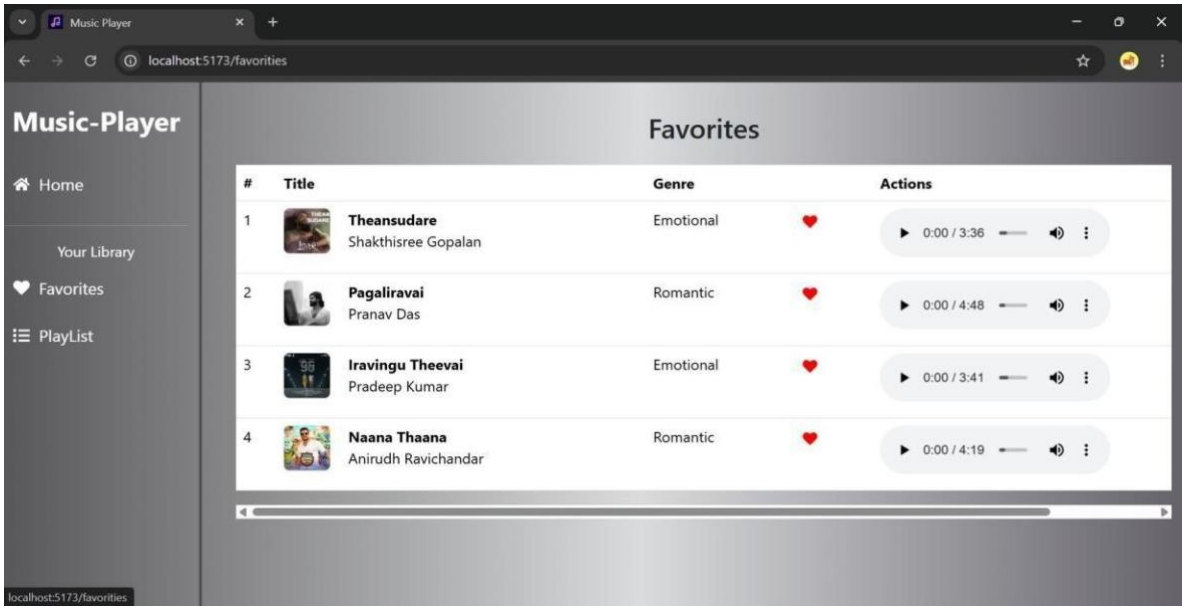
Home Page: Display featured tracks and recommended playlists.



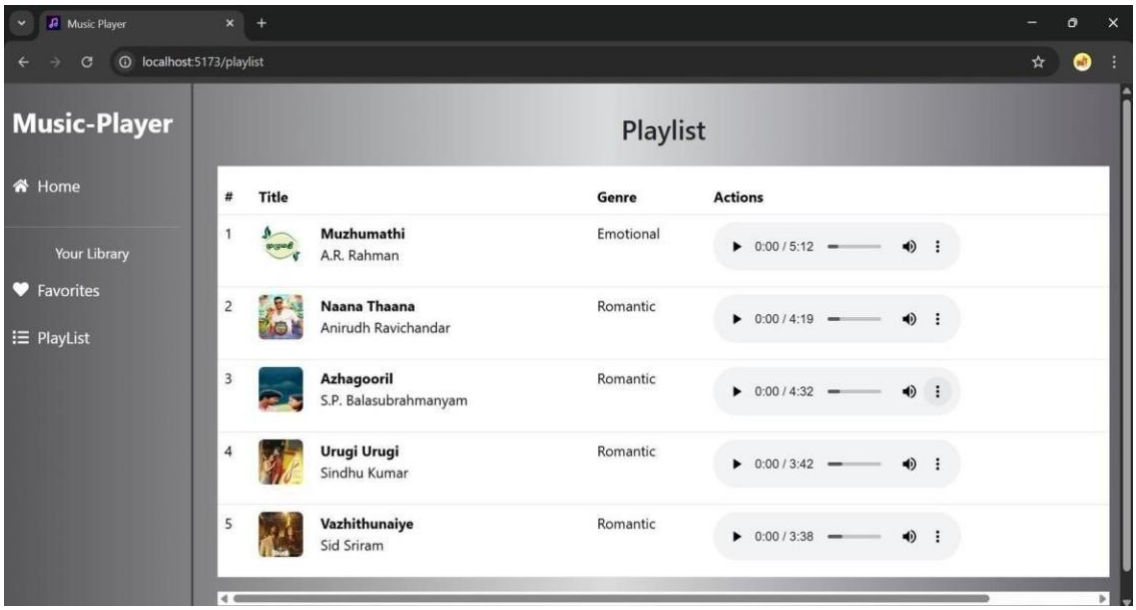




Favorites List : Songs, albums.



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



#. 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.

#. 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.

#. Screenshots or Demo

- **Demo Link:** Demo Video
- **Screenshots:** See Above for UI screenshots.

#. Known Issues

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

#. 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.

This documentation provides a comprehensive overview of the **Rhythmic Tunes** project, including its architecture, setup instructions, and future plans.

Thank You