Audify - A cutting-edge music streaming service

IITM Project (AppDev-1) by Kabir Maniar - 22F3002401

The Audify music streaming application merges modern web technologies and robust back-end architecture to create an intuitive music streaming experience. This report outlines the project's key objectives, technical framework, and features. Developed with Flask and supported by HTML, CSS, and an SQLite database, Audify aims to offer a comprehensive and accessible music platform for users to discover and enjoy a diverse range of music.

Video Demo - https://www.youtube.com/watch?v=JKZO21XS9lU

Database Design

The application's data management is anchored in an SQLite database, consisting of the following tables, each serving a distinct purpose:

Table Name	Purpose
Albums	Stores basic album information
AlbumItems	Maps tracks to albums
Alembic_version	Manages database migration history
Channel	Stores information about channels
Genre	Contains genre information
Members	Maps users to channels
Playlist	Stores basic playlist information
PlaylistItem	Maps songs to playlists
Rating	Stores likes/dislikes of tracks
Recent	Stores recently viewed tracks by users
Track	Contains information of each track
User	Stores user information
View	Stores views of tracks by users
Fulltext search v-tables	Enables full-text search for albums, channels, playlists and tracks

Back-end Architecture

Audify's back-end architecture is designed with a focus on loose coupling and modularity.

- **Modular Structure:** Audify employs a modular architecture, separating functions like membership management, music, and admin. This approach allows for independent development and maintenance of each module, enhancing the efficiency and flexibility of the application.
- **Services, APIs, and Models:** The application distinctly categorizes services, APIs, and data models. This separation facilitates scalability and eases maintenance, crucial for projects like this.
- **Music Streaming and Network Testing:** The music streaming feature in Audify has been extensively tested under various network conditions. Using network simulation tools, the app has been optimized to ensure consistent streaming quality across different bandwidth scenarios.
- **CLI Commands for Development & Testing:** The project includes several CLI commands, such as `create_superuser`, `get_track_list`, `etc` These commands are integral to daily development and testing tasks.

Client-Side Design

Audify's client-side design is custom-developed with a focus on simplicity and functionality:

- **Minimal Use of JavaScript:** The application uses only bare essential self-developed JavaScript, ensuring lightweight and focused functionality, particularly in the music player.
  Use of Grid and Flex Layout: Currently, the design employs Grid and Flexbox layouts but is not fully responsive, with plans for future enhancements.
- **Advanced CSS Features:** The interface utilizes advanced CSS for animations and background blurs, contributing to a unique visual experience.
- **Custom Design Elements:** Features include custom, JavaScript-less drop-down menus, aligning with the minimalist design ethos of the platform.

Application Features

Audify comes with a suite of features designed to enhance the user experience:

- **User Roles and Authentication:** Distinct roles for users, creators, and administrators with a secure authentication system.
- **Music Streaming and Playback:** A custom-built music player offering features like autoplay, playlist management, and seamless streaming.
- **User Engagement:** Features like comments, ratings, and a robust full-text search mechanism.
- **Admin and Channel Dashboards:** Specialized interfaces for channel management and administrative tasks.
- **Playlist and Album Management:** Intuitive tools for users and creators to manage their playlists and albums.

Conclusion

Audify stands as a testament to innovative software engineering in the realm of digital music streaming. Skillfully blending technology with user-centric design, it successfully achieves its goal of providing a comprehensive music experience as expected by IITM project requirements.