Dharmsinh Desai University, Nadiad
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Department of Computer Engineering

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Project title: HarmonyHaven (Music App)

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Department of Computer Engineering

CERTIFICATE

This is to certify that the project entitled "**HarmonyHaven**" in the subject of "**Advanced Technologies**" is a bonafide report of the work carried out by

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ABSTRACT

"HarmonyHaven" is a dynamic music streaming app that blends a vast music library with tailored features to produce a seamless and engrossing musical experience. HarmonyHaven can help if you're a music lover looking for your favourite songs. HarmonyHaven offers listeners an extensive collection of songs, albums, and playlists arranged into various moods and genres for easy exploration and discovery of new music. Each song has detailed information, album cover, and an intuitive user interface that make it simple for fans to enjoy their favourite songs. In addition, HarmonyHaven offers high-quality audio streaming, delivering clean audio and a fully immersive audio experience. The way we listen to and experience music is revolutionized by HarmonyHaven. In addition to prioritizing high-quality audio streaming, it provides listeners with a trustworthy and user-friendly platform.

INTRODUCTION

Key Features of HarmonyHaven:

1. **Pull songs from a song database:**
   This function allows you to access the app's extensive song collection. According to user requests, search criteria, or playlist choices, the app should be able to retrieve tracks, ensuring that an extensive and varied library of music is easily accessible for streaming.

2. **Music streaming interface:**
   The app should provide a user-friendly interface specifically designed for music streaming. It should include controls such as play, pause, skip, and volume adjustment. The interface should display essential information such as the current track, album artwork, artist name, and progress bar, offering users an intuitive and visually appealing experience.

3. **Playlist selection and song search:**
   Users should have the option to select songs from their pre-existing playlists within the app. The app should provide easy navigation and organization of playlists, allowing users to access their favourite songs quickly. Furthermore, users should be able to search for specific songs, artists, or albums, facilitating quick and targeted music selection.

4. **Offline music streaming:**
   This feature allows users to download songs or playlists for offline playback. Users can save their favourite songs to their device, ensuring they can enjoy their music even when there is no internet connection available.

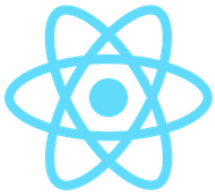
2.1 INTRODUCTION TO PLATFORM

Visual Studio Code:

Visual Studio Code is a lightweight source code editor with built-in support for various programming languages and a rich ecosystem of extensions. It offers extensions for popular frameworks like ReactJS and NodeJs.

2.2 TECHNOLOGIES USED

React Js:



ReactJS is a JavaScript library used for building interactive UIs in web applications, with a declarative approach for managing and reusing code. It follows a unidirectional data flow model and supports server-side rendering for improved performance and SEO.

Express:

Express, is a back end web application framework for building RESTful APIs with Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs.

NodeJs:

Node.js is a back-end JavaScript runtime environment, runs on the V8 JavaScript engine, and executes JavaScript code outside a web browser

MongoDB:

In this portal, we opted for MongoDB as the database due to its NoSQL structure, which stores data in flexible documents using a JSON-based query language. MongoDB comes with the Mongo shell, allowing easy manipulation of records using JavaScript. Unlike relational databases, MongoDB does not have a standard schema and allows for flexible structuring of data with varying content, sizes, and field numbers, making it suitable for handling evolving data.

SOFTWARE REQUIREMENT SPECIFICATIONS

1. Introduction:

1.1 Purpose

The primary purpose of this music streaming app is to play music available on database, customized playlist and like songs.

1.2 Document Conventions

1.3 Intended Audience

Intended audience for this app is everyone from music enthusiastic to casual listeners, music students to fitness and workout enthusiasts and commuters.

1.4 Product Scope

This music app has vast music library with songs ranging from
different genres to multiple languages for fulfilling user experience. This feature will allow users to listen to music according to their mood and choices.

1.5 References

https://spotify.com/

2. Overall Description:

2.1 Product Perspective

There are many similar software like this but the way this is different from those is that this provides a user friendly experience with the simple UI, quick and easy music search, and provides an option for personalized playlist so that they can curate their own music.

2.2 Product Functions

Functionality of the system

- Search

- Personalized playlist
- Like songs
- Upload your own Song
- Daily mix
- Artist based recommendations
- Playback functionality

2.3 User Classes and Characteristics

- Normal user: normal user is expected to invoke the functionalities such as login, play music, search, add to playlist, like songs, downloads.

2.4 Operating Environment

The system will be compatible with all popular web browsers, including Chrome, Firefox, Safari, Edge, and Internet Explorer. The machine should have sufficient ram and speed of internet connection.

2.5 Design and Implementation Constraints

MongoDB needs to be used as this would facilitate easy interfacing with other applications and for communication HTTPS should be used as it provides secure data transfer.

2.6 User Documentation

2.7 Assumptions and Dependencies

- Assumptions:

○ The system will assume that customers have access to the internet.
○ The system will assume that customers have a device that meets the minimum technical requirements, such as a modern web browser.

- Dependencies:

○ The system depends on the availability of a reliable and secure payment gateway for processing customer payments.
○ The system depends on the availability of a stable and secure hosting environment to host the system and store customer data.

3. External Interface Requirements:

3.1 User Interfaces

3.2 Hardware Interfaces

The system is compatible with a wide range of hardware, including
desktop computers, laptops, and mobile devices. The system will be able to run on popular operating systems such as Windows, MacOS, and Linux.
RAM: 4GB
Hard Drive Storage Needed: 2GB
Other Hardware Requirement: None

3.3 Software Interfaces

The database connection interface is the part of the music app that manages the communication and interaction between the system and the underlying database. This app uses MongoDB as its database;HTML,CSS,Javascript and React for frontend and NodeJS for backend development.

3.4 Communications Interfaces

This uses standard network protocols, such as HTTPS. The system will comply with industry standards for data encryption and secure communication to ensure that customer information is protected from unauthorized access or attack.

4. System Features:

R.1. Register new user

Description: The app will allow users to create an account and register with their personal information, such as name, email, and password.

- R.1.1 : Select signup option

Input : Selects signup option
Output : Redirected to signup page

- R.1.2 : Enter the details

Input : fill the details(first name, last name,email,password)
Output : Generated user Id

R.2 : Login user

Description : If a user wants to login into their account on the website, they will have to enter their email and password.

- R.2.1 : Select login option

Input : Selects login option

Output : Redirected to login page

- R.2.2 : Enter the login details

  Input : Enter email and password

  Output : Redirected to home page

R.3 :Personalized Playlists:

Description:The app will offer a feature for users to create and manage personalized playlists based on their preferences. Users will be able to add,remove, and rearrange songs in their playlists.

- R.3.1 Select create playlist option

  Input : “Playlist” option

  Output : system displays playlist

- R.3.2 Select create new list option

  Input : select “new list” option and enter name of the playlist

  Output : new list created

- R.3.3 Select add music option

  Input : select “Add Music” option

  Output : user prompted to enter keywords

- R.3.4 Search music

  Input : Key words.

  Output : List of music whose name matches any of the key words entered by the user. User will then select the add option to add songs in the list

- R.3.5 Display playlist
  Input : Select previously created playlist
  Output : List of songs from playlist

R.4: Liked Songs Playlist:
Description:The app will provide a way for users to save and access their liked songs in a dedicated playlist. Users will be able to easily add songs to their liked songs playlist and remove them if desired.

- R.4.1 Select like music option
  Input : Select “Like Music” option
  Output : Song added to the “Liked Song” playlist

R.5: Daily Mix:
Description:The app will generate personalized daily mixes for users based on their listening history, liked songs, and preferences. These mixes will include a curated selection of songs tailored to each user's taste.

- R.5.1 Select “Daily Mix” option
  Output : Display songs according to user preferences

R.6: Playback:
Description:The app will allow users to have playback functionality.

- R.6.1 Playback Option

Input: select various playback options like “Play”,“Pause”,“Skip”.
Output: Various playback actions will be performed according to the option selected

R.7: Search Functionality:
Description:The app will include a robust search feature that allows users to find songs, albums, artists, and playlists. It should provide filtering options, autocomplete suggestions, and relevant search results.

- R.7.1 Select search option

Input: select “Search” option
Output: User prompted to enter the key words

- R.7.2 Search and display

Input: Key words
Output: Details of all songs whose name matches
any of the key words entered by the user.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

○ The system should have a response time of less than 2 for all user Requests.

5.2 Safety Requirements

○ The system should clearly indicate to the user any potential risks associated with certain actions
○ The system should validate user input and prevent any data injection attacks.
○ The system should have a recovery process for handling errors and exceptions.

5.3 Security Requirements

○ The system should use encryption to protect sensitive data, such as user's password.
○ The system should have regular vulnerability assessments and penetration tests to identify and remediate any security weaknesses.

5.4 Software Quality Attributes

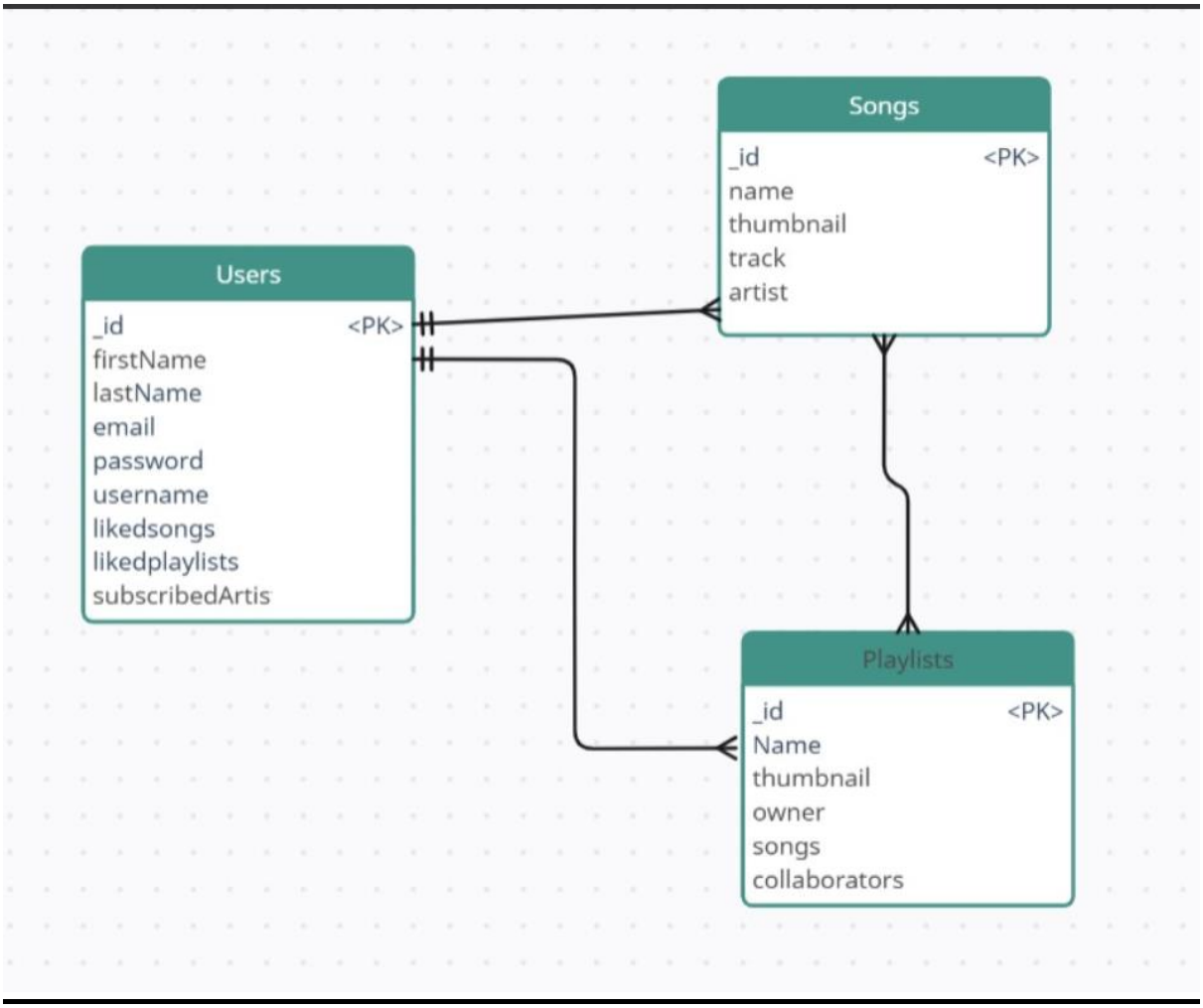
○ The system should be highly available, with an uptime of at 99.5%.
○ The system should be secure and protect against unauthorized access and data breaches.
○ The system should be scalable and able to handle an increase in traffic and data storage.

5.5 Design Requirements

○ The system should have a user-friendly interface that is easy to navigate and understand.

DATABASE DESIGN

- ER Diagram:



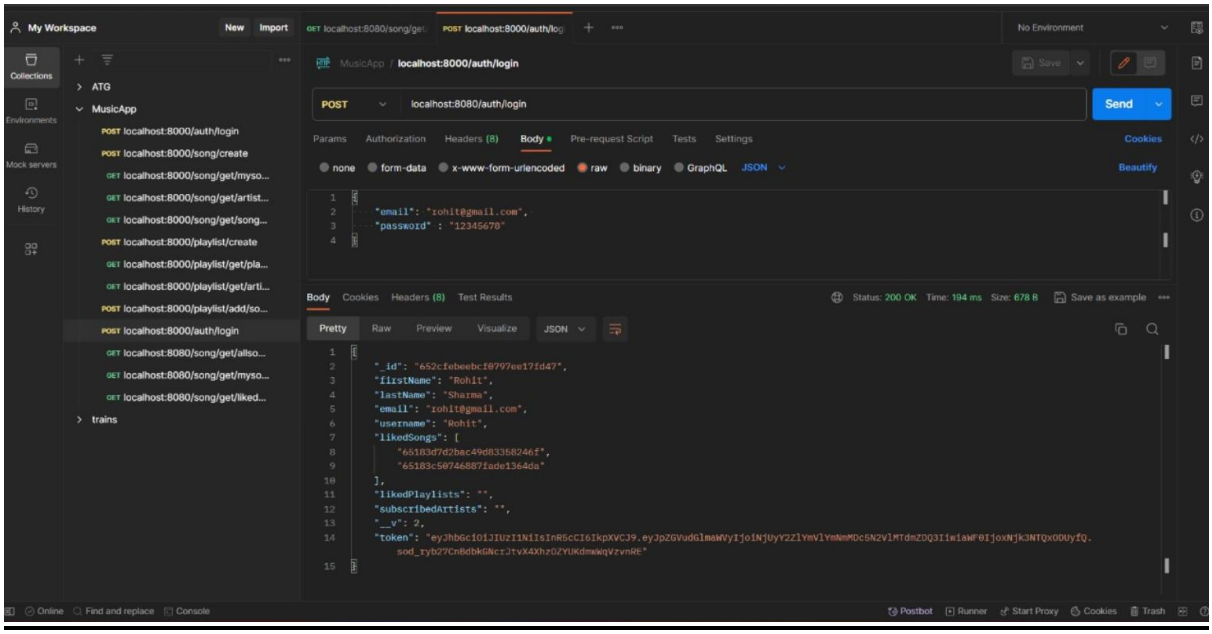
IMPLEMENTATION DETAILS

- Modules and description

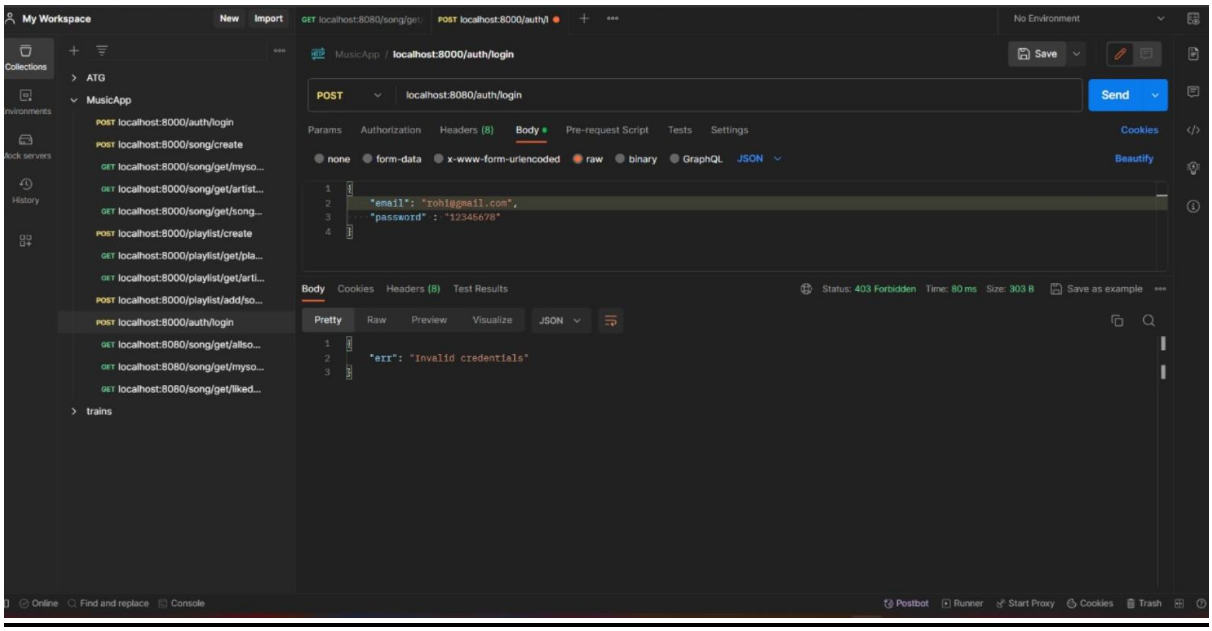
  - User Authentication and Management: -This module handles user registration, login, and account management. It includes user profile creation and management, as well as password reset functionalities.
  - Display Songs: This module helps display all the songs that user has uploaded to their account
  - Create Playlist: This module helps in creating playlist from the songs that user chose and wants them to be a part of particular group of songs.
  - Search: This module helps in search functionalities when user enters some words to search a song
  - Upload song: This module helps user to upload songs from their device to their account in the app.

TESTING

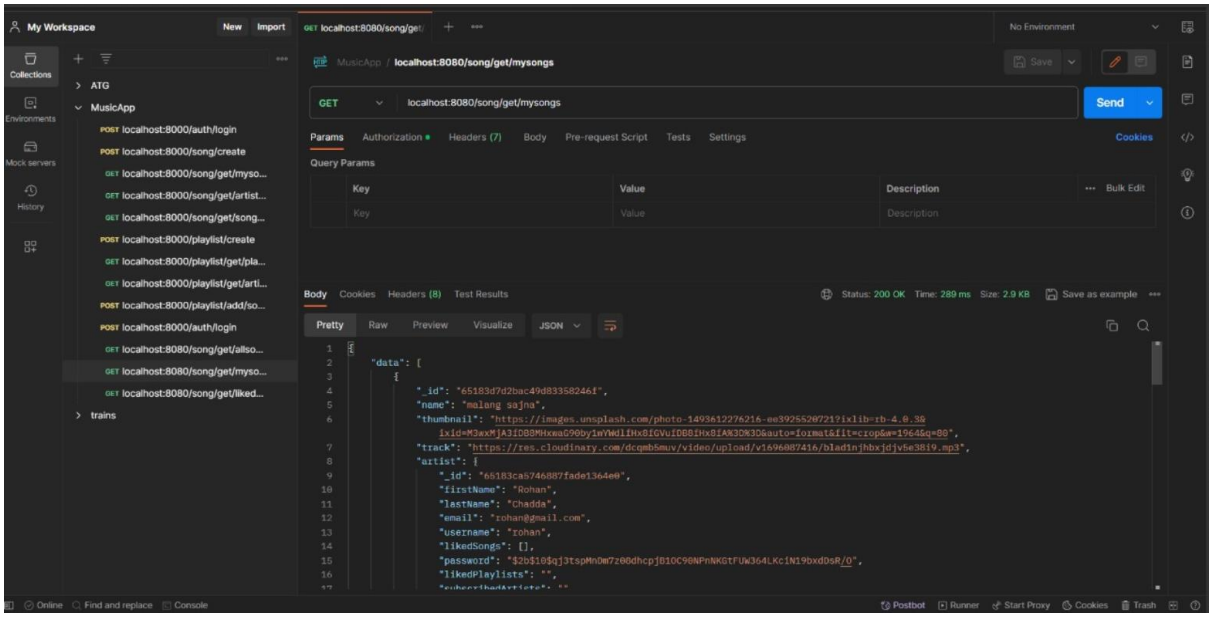
- If user exists



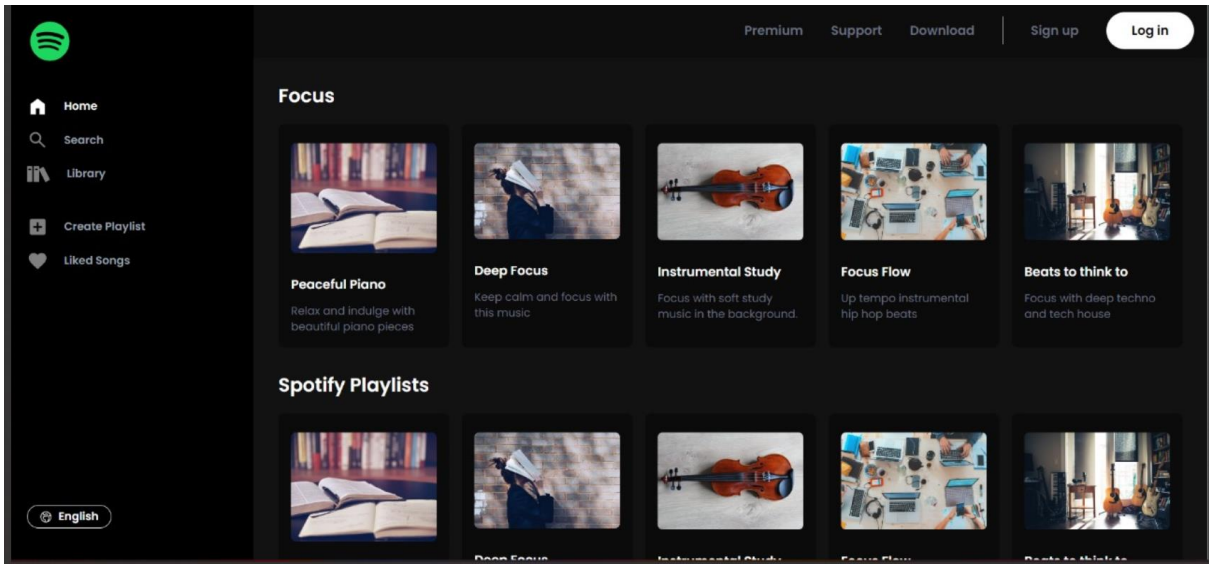
- Login failure

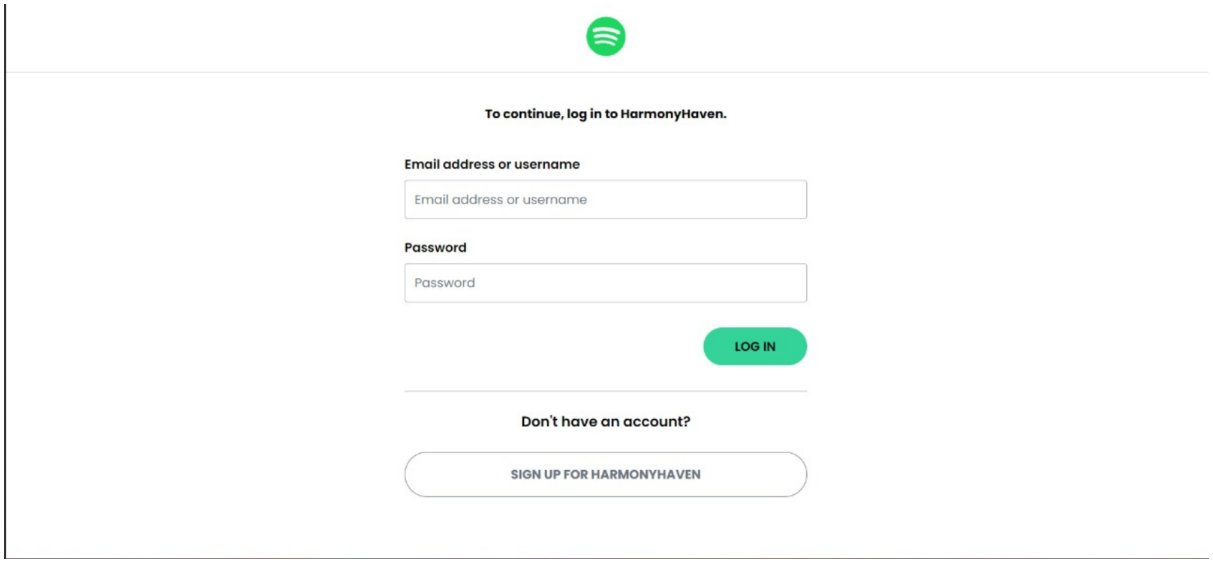


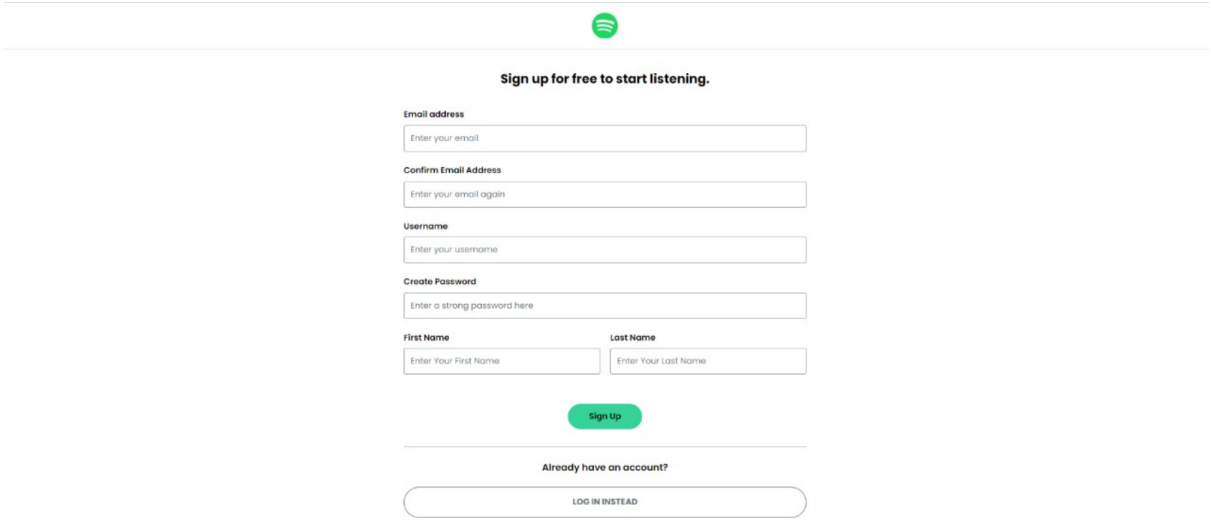
- To get my songs



SCREENSHOTS



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Enter your email
Confirm Email Address
Enter your email again
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Create Password
Enter a strong password here
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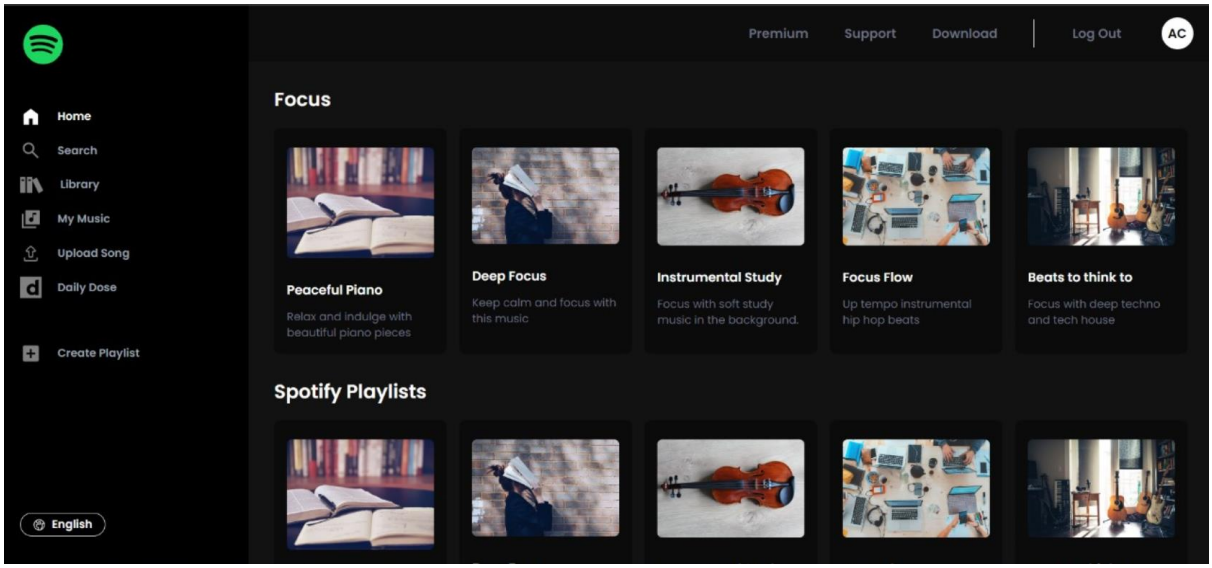
Already have an account?
LOG IN INSTEAD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Daily Dose
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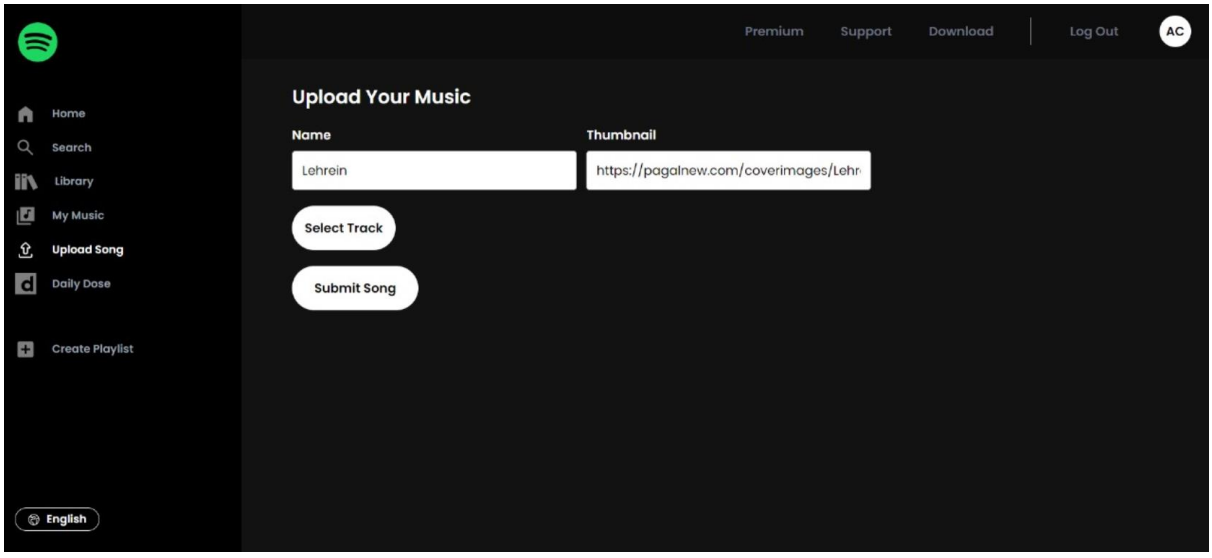
Focus
Peaceful Piano
Relax and indulge with beautiful piano pieces
Deep Focus
Keep calm and focus with this music
Instrumental Study
Focus with soft study music in the background.
Focus Flow
Up tempo instrumental hip hop beats
Beats to think to
Focus with deep techno and tech house
Spotify Playlists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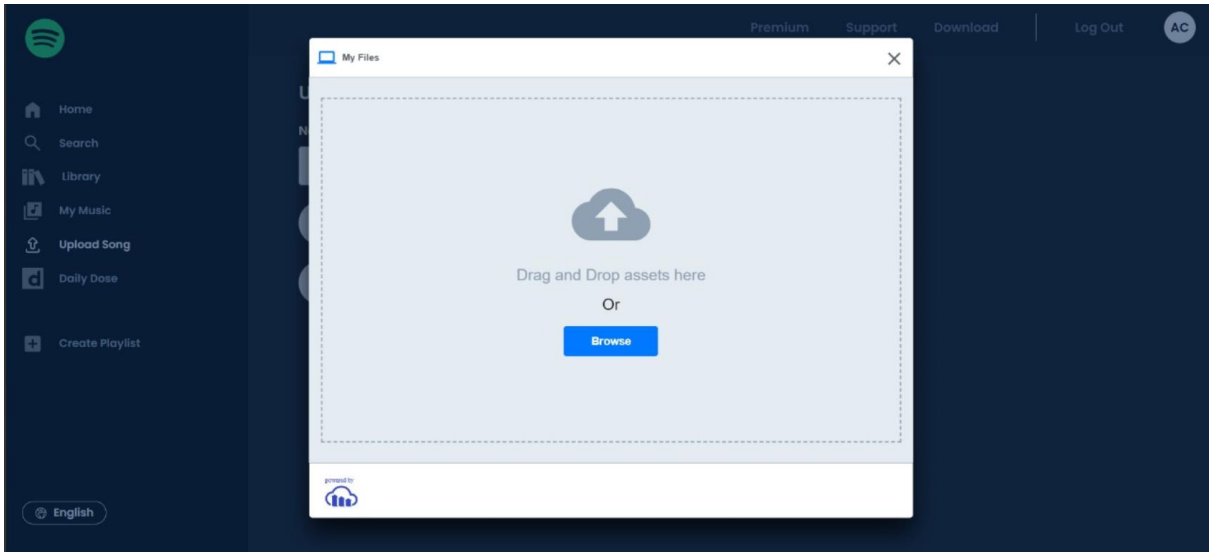
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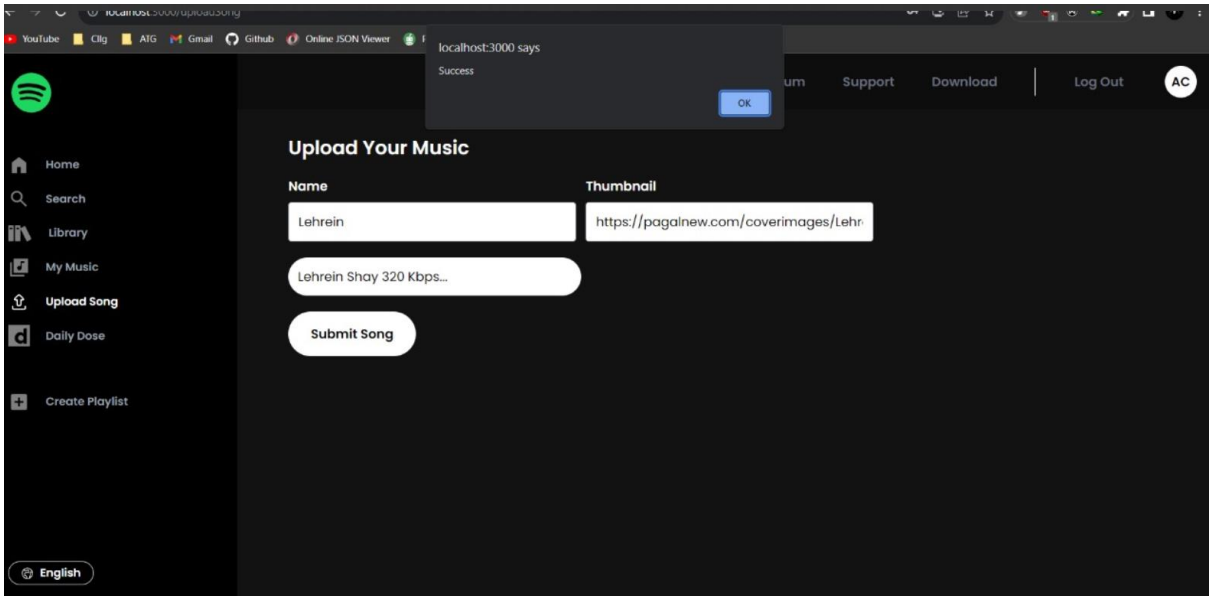
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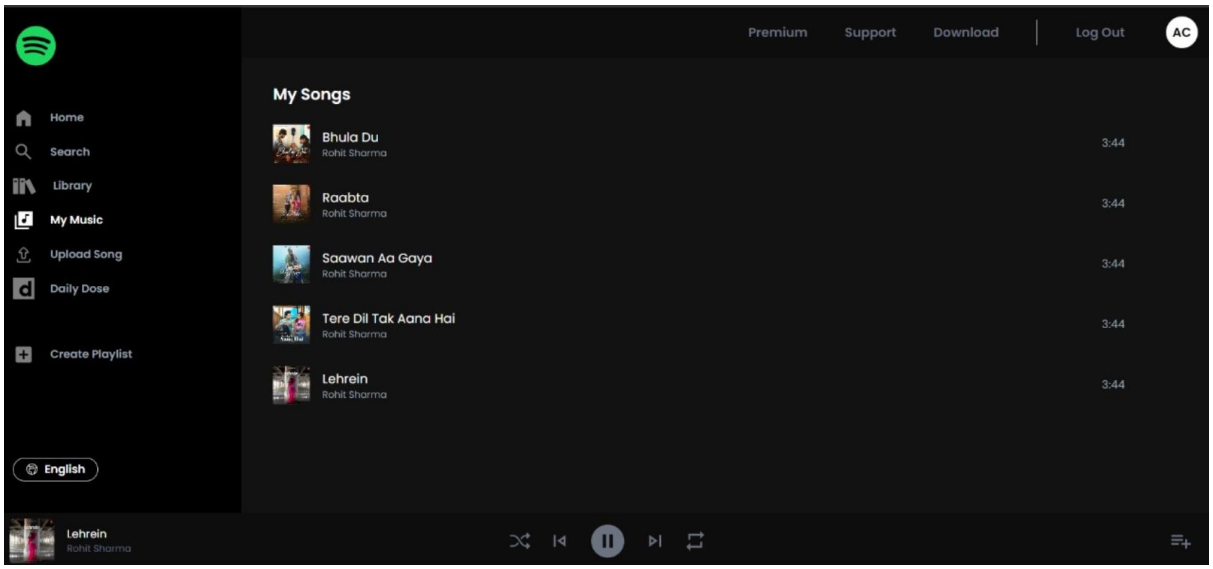
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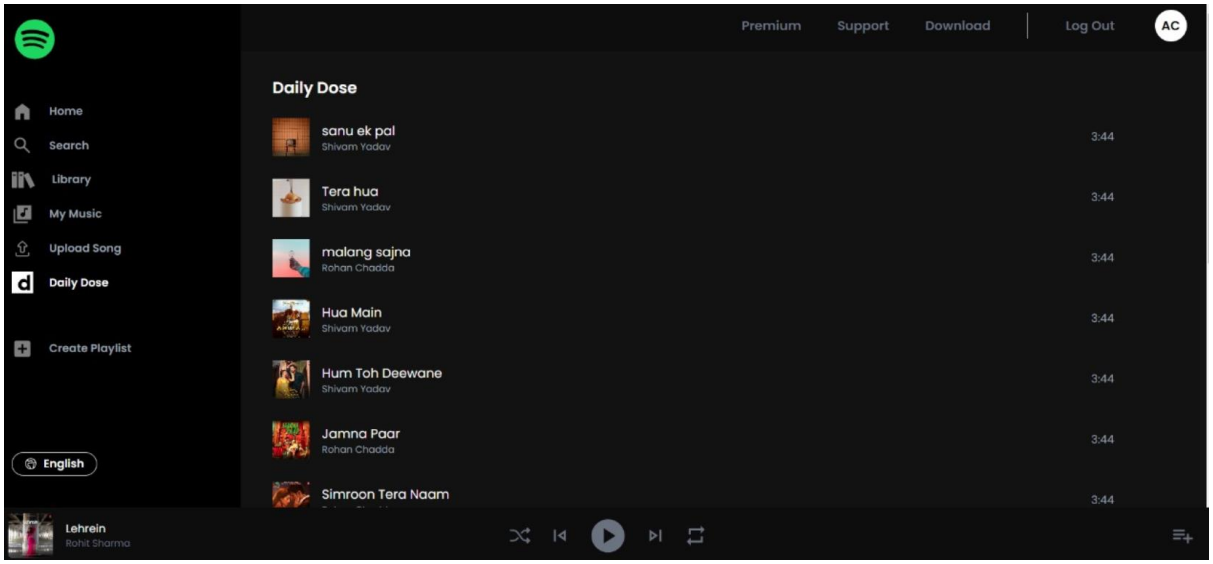
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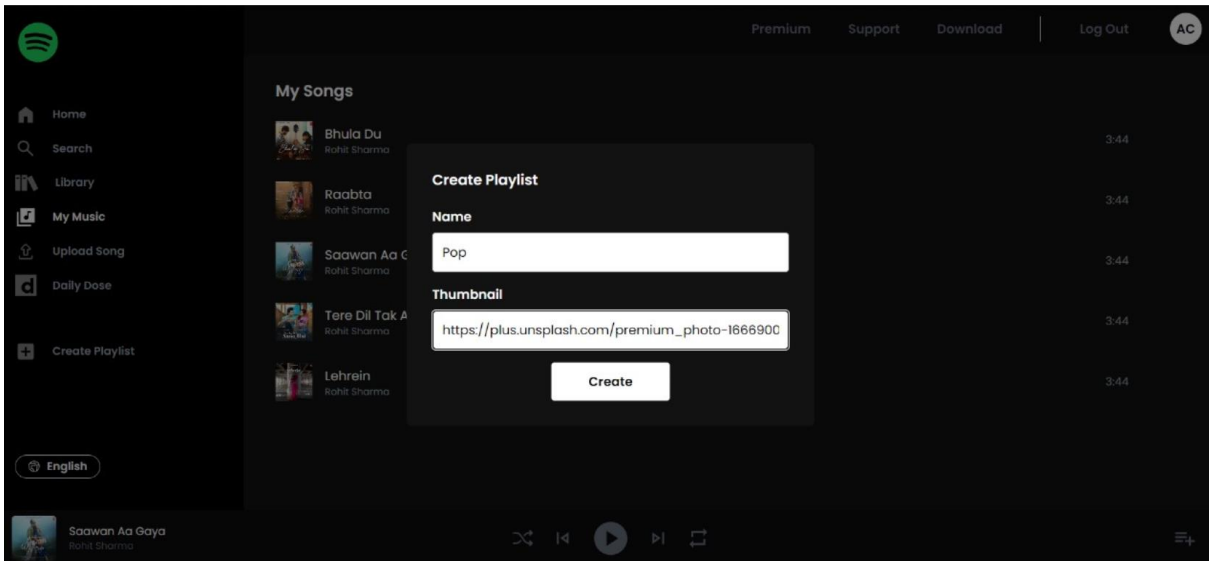
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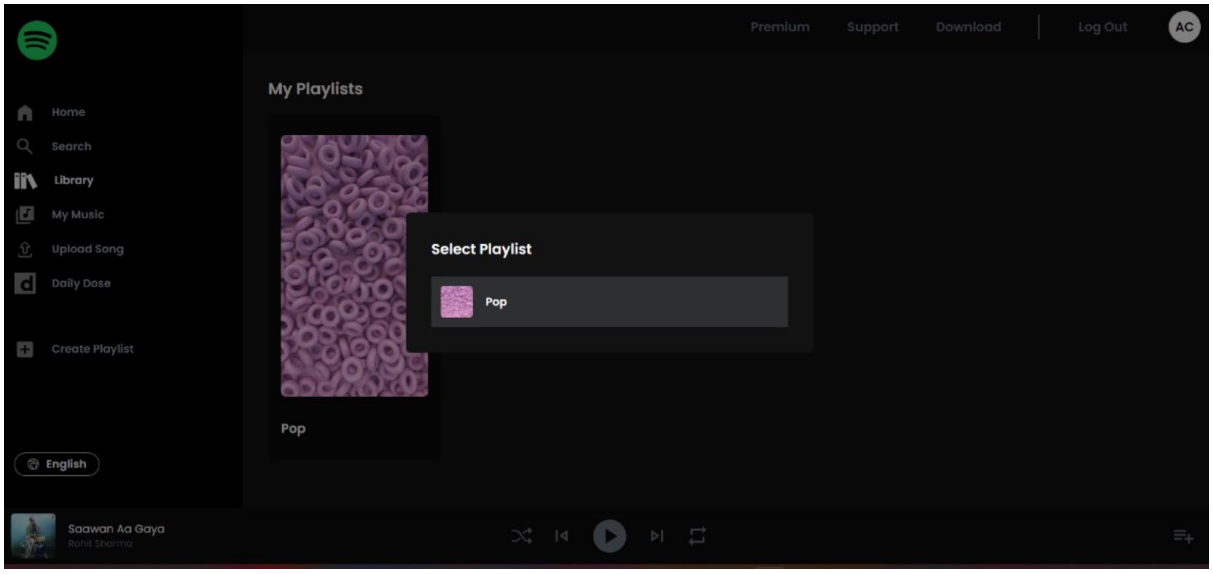
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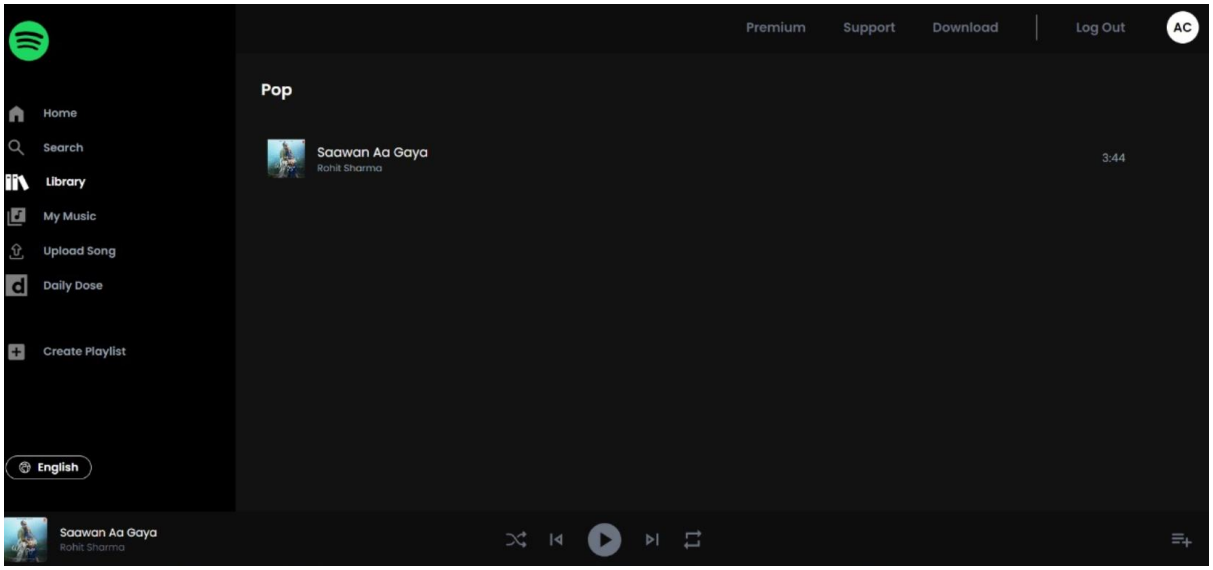
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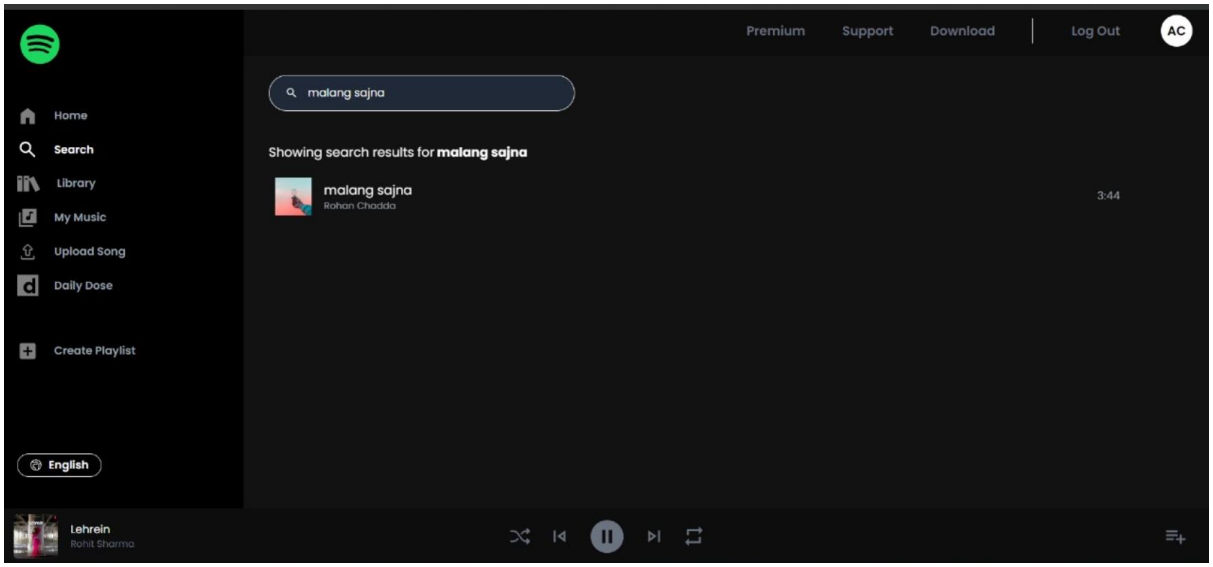
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CONCLUSION

- Functionalities Implemented:

  - Login/Signup and user authentication: A new user can sign up and already existing user can login with their credentials and if credentials are not correct, error message will be displayed.
  - Upload your own music: A logged in user can upload their own music saved on their device and that music will be saved on cloudinary.
  - My Songs playlist: As user uploads their own music, that songs will be added to my songs playlist.
  - Create your own playlist: A user can create their own playlist from their uploaded songs based on genre or mood.
  - Search: A user can search for songs by giving initial letters of the song.
  - Play Song: if user clicks on the play icon of the page, selected song will start playing.

LIMITATION AND FUTURE EXTENSION

- Functionalities not implemented:
  - Shuffle: User can not shuffle in between songs.
  - Playback: User can not go back to previous song or skip the current song.
  - Artist based recommendations

- Future Extension:
  - AI-Driven Music Recommendations**:** Music apps can leverage artificial intelligence and machine learning algorithms to provide highly personalized music recommendations based on a user's listening history, preferences, and context. This could include recommending songs, artists, and playlists.
  - Lyrics and Karaoke Integration**:** Adding real-time lyrics display and karaoke features to songs can enhance the user experience, making it more engaging and interactive.

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https://www.mongodb.com/
https://cloudinary.com/

~Thank You~