Frontend Development with React.js

Project Documentation

Introduction

Project Title: Rhythmic Tunes

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Project Overview

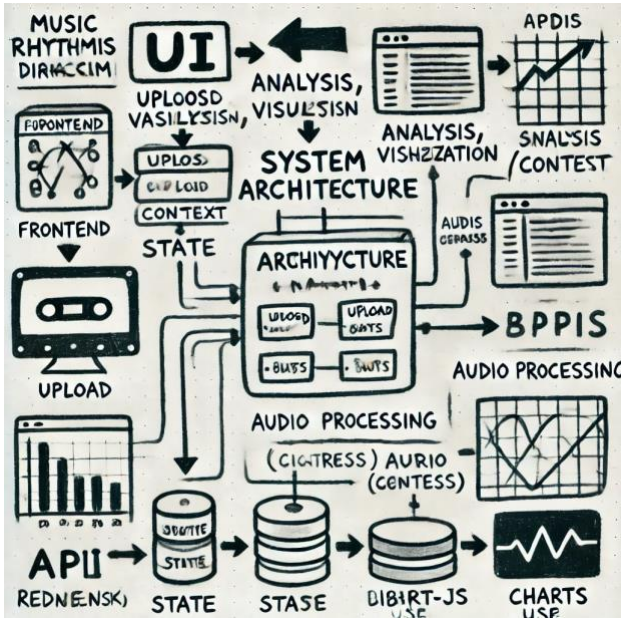
Purpose: The purpose of Rhythmic Tunes is to offer a unique and enhanced musical experience by focusing on the rhythmic elements of music tracks. The project aims to provide users with an interactive and engaging platform to explore and appreciate the intricacies of rhythm within their favourite songs. By utilizing advanced audio processing techniques, Rhythmic Tunes seeks to make rhythm analysis accessible and enjoyable for music enthusiasts, musicians, and anyone interested in understanding the underlying patterns of music

Features

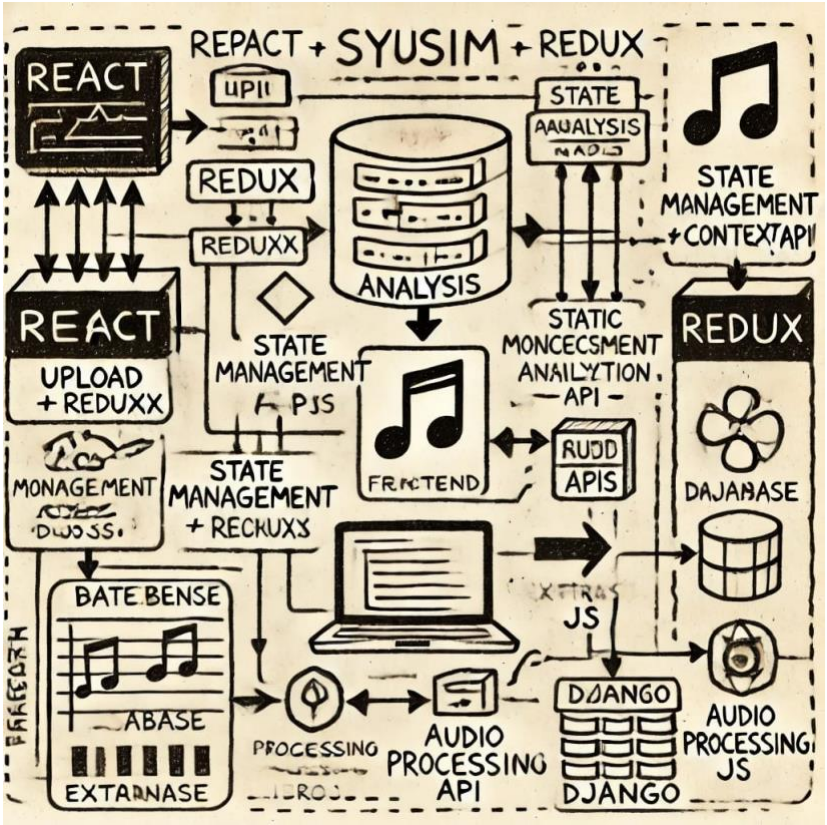
- Rhythm Detection: Detect onsets, beats, and tempo of music songs utilizing sophisticated audio processing libraries.
- Visual Representation: Provide visual representation of the rhythmic components for easier comprehension and enjoyment of users with respect to their music.
- Interactive Elements: Make the interactive aspects of rhythmic components, including tapping beats or changing the tempo, possible.
- User-Friendly Interface: Allow an easily comprehensible interface to ensure seamless use.

Architecture

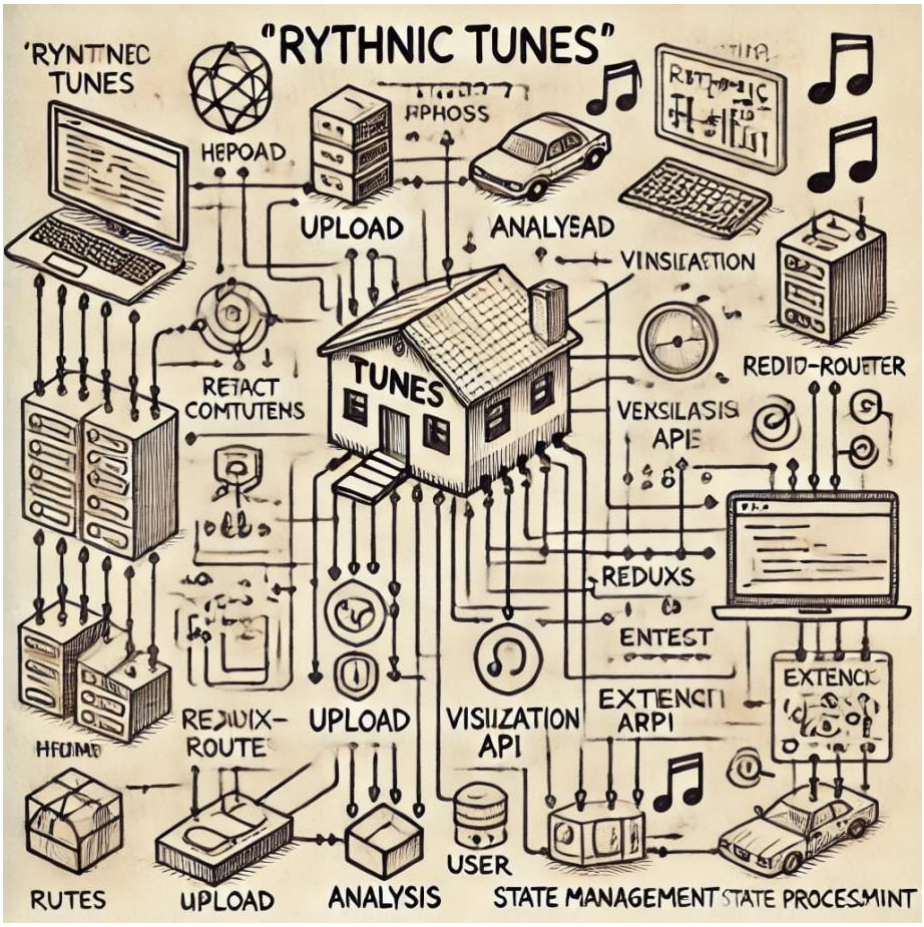
1. **Component Structure**:



2.State Management:



3.Routing:



Setup Instructions

Prerequisites:

Frontend:

1. Node.js
2. npm (Node Package Manager)
3. React.js
4. D3.js or Chart.js

Backend

5. Python.
6. Flask or Django
7. Librosa
8. SQLAlchemy or Django ORM

Database

9. MongoDB or MySQL
10. ORM Libraries

Development Tools

11. Git
12. Visual Studio Code
13. Postman

Installation:

1. **Python 3.6 or higher**: Download and install from the official Python website
2. **Node.js and npm (Node Package Manager**): Download and install from the official Node.js website.
3. **Git**: Download and install from the official Git website.

2. **Folder Structure**

- **Client**:

Components:

- **HomePage.jsx**
- **UploadPage.jsx**.
- **AnalysisPage.jsx**
- **VisualizationPage.jsx**
- **NavigationBar.jsx**

State Management:

- **redux/actions**
- **redux/reducers**
- **redux/store.js**

Styles:

- **styles/**:

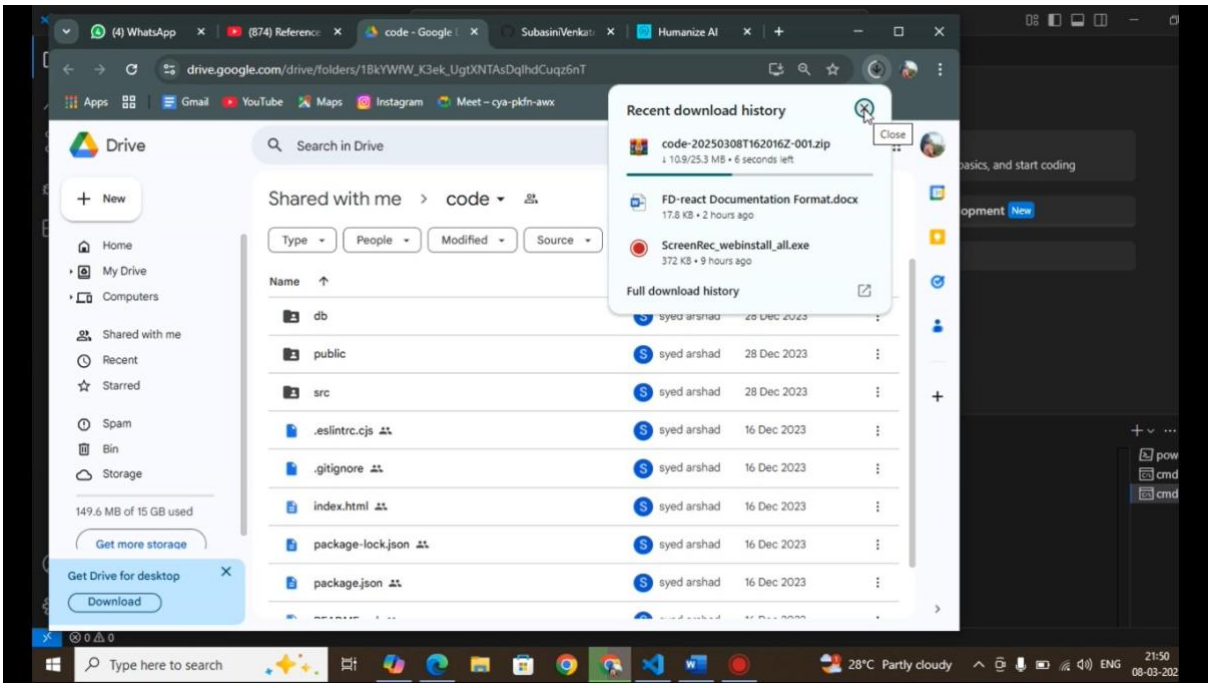
- **Utilities**

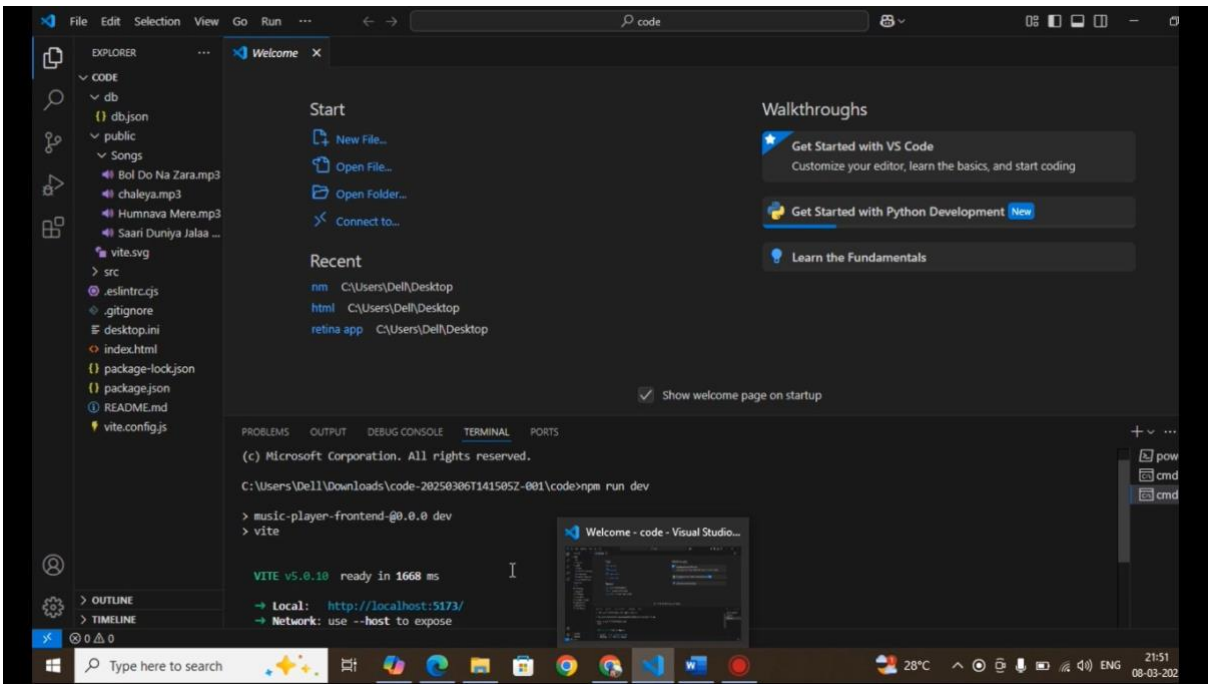
- audio_processing.py
- helpers.py:
- config.py

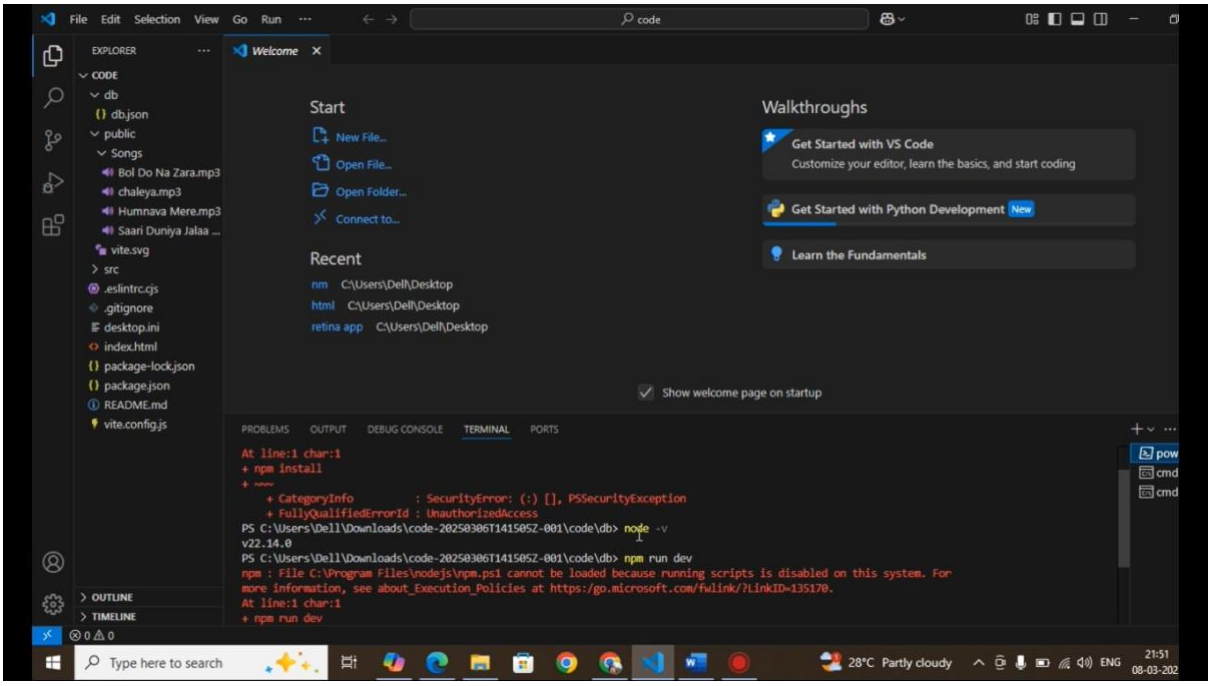
- audio_processing.py
- user_service.py

Screenshots or Demo

- https://github.com/SubasiniVenkatesan/Rythmic-tunes






File Edit Selection View Go Run
code
EXPLORER
CODE
db
db.json
public
Songs
Bol Do Na Zara.mp3
chaleya.mp3
Humnava Mere.mp3
Saari Duniya Jalaa ...
vite.svg
src
.eslintrc.cjs
.gitignore
desktop.ini
index.html
package-lock.json
package.json
README.md
vite.config.js
Welcome
Start
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Open File...
Open Folder...
Connect to...
Recent
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html C:\Users\Dell\Desktop
retina app C:\Users\Dell\Desktop
Walkthroughs
Get Started with VS Code
Customize your editor, learn the basics, and start coding
Get Started with Python Development New
Learn the Fundamentals
Show welcome page on startup
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+ npm install
+ ~~~
+ CategoryInfo : SecurityError: (:) [], PSSecurityException
+ FullyQualifiedErrorId : UnauthorizedAccess
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v22.14.0
PS C:\Users\Dell\Downloads\code-20250306T141505Z-001\code\db> npm run dev
npm : File C:\Program Files\nodejs\npm.ps1 cannot be loaded because running scripts is disabled on this system. For more information, see about_Execution_Policies at https:/go.microsoft.com/fwlink/?LinkID=135170.
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+ npm run dev
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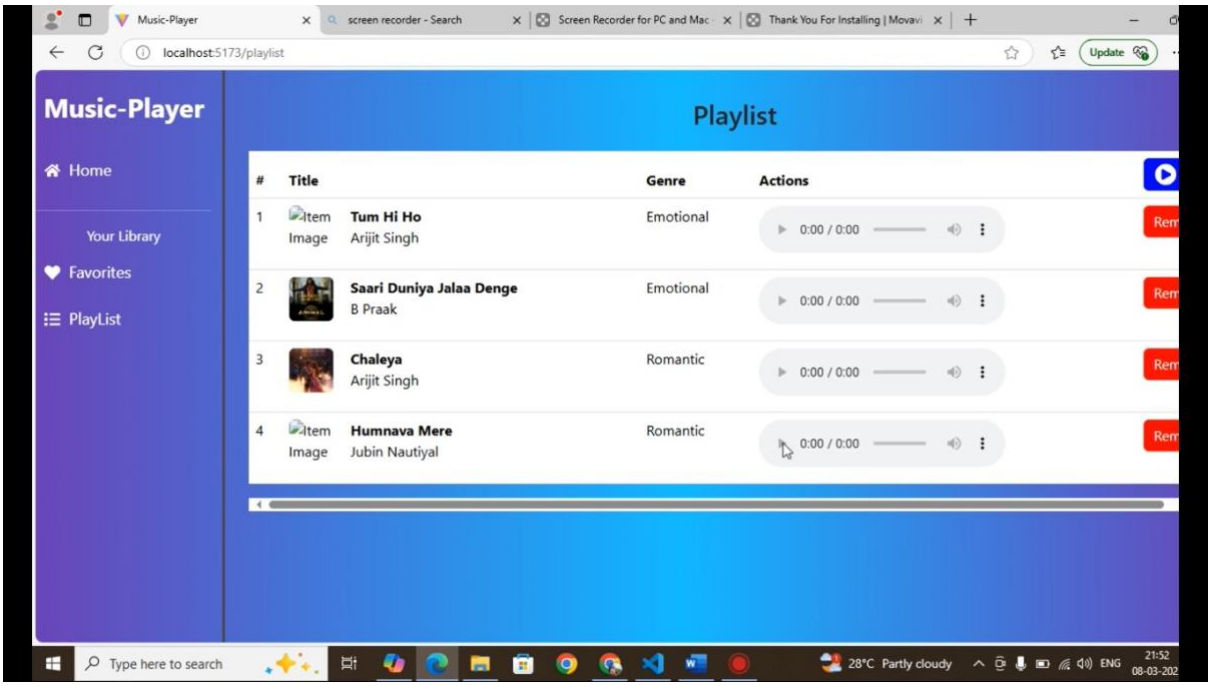
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screen recorder - Search
Screen Recorder for PC and Mac
Thank You For Installing | Movavi
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Update
Music-Player
Home
Your Library
Favorites
PlayList
Playlist
Title Genre Actions
1 Item Image Tum Hi Ho Arijit Singh Emotional 0:00 / 0:00
2 Saari Duniya Jalaa Denge B Praak Emotional 0:00 / 0:00
3 Chaleya Arijit Singh Romantic 0:00 / 0:00
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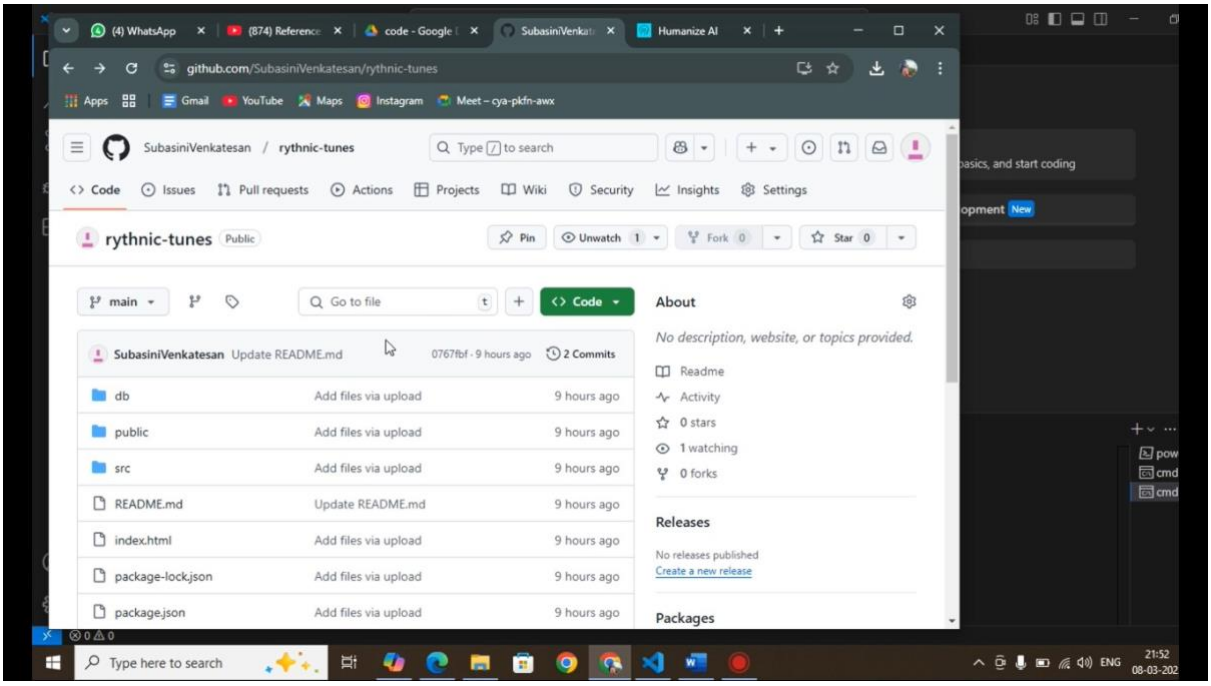

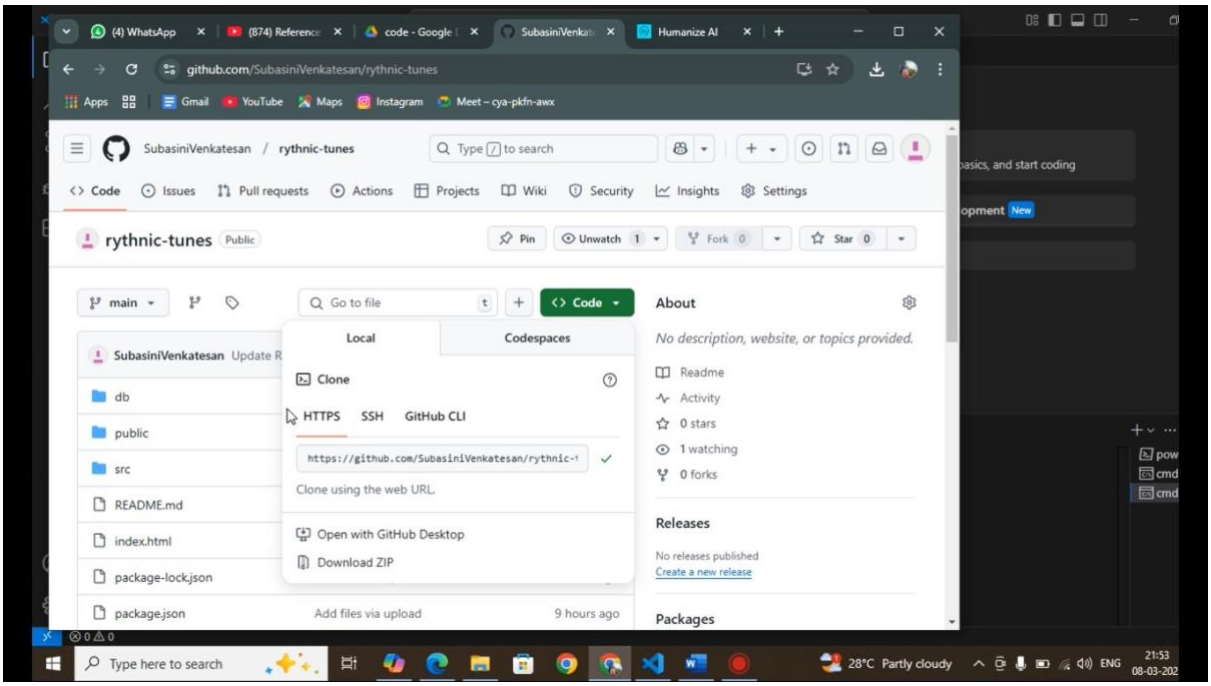

Future Enhancements

Looking ahead, the "Rhythmic Tunes" project has the potential for several exciting enhancements that could significantly improve the user experience and broaden its functionality. One key enhancement could be the implementation of real-time rhythm analysis, allowing users to see rhythmic elements in live music or streamed tracks as they

play or perform. Integrating with more music services, such as YouTube Music or Amazon Music, would also enable a wider range of track imports. Advanced visualization techniques, including 3D and augmented reality (AR) elements, could offer users a more immersive and interactive experience.

Additionally, user customization options for visual representations, rhythm-based track recommendations powered by AI, and collaborative features for sharing and creating playlists could further enrich the platform. Educational tools and resources on rhythm, music theory, and composition would benefit users looking to deepen their understanding of music. Developing a mobile application for iOS and Android platforms would allow users to analyse and interact with music on the go.

Enhanced audio processing techniques, such as using deep learning models, could improve the accuracy and detail of rhythm analysis. User feedback mechanisms and community features, like forums and discussion boards, would foster a sense of community and continuous improvement. An offline mode would enable users to analyse and visualize music tracks without an internet connection, and multilingual support would make the application accessible to a global audience.