# melody MENTOR with AI


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B.Tech CSE DSAI-A

4th Sem/ 2nd yr

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The presentation takes you through the project Melody Mentor while explaining the problem statement, my solution to it and a brief description of the created project. Not only this but the end brings...

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Next: Music

# *introducing* THE PROBLEM

Singing is a universal expression of emotions and experiences. From entertainment to infotainment, it holds a deep existence.

However the traditional systems lack:

- Lack of Objective Feedback
- High Costs & Limited Access
- Time Constraints
- Performance Anxiety

**A Mic & A Song**

Express a lot

# UNDERSTAND *Music*

A Typical song involves some beautiful insights that heavily affect the impact.

## PITCH

& Ear Training

## TIMBER

& Relaxation

## BREATH

& Vocal Techniques

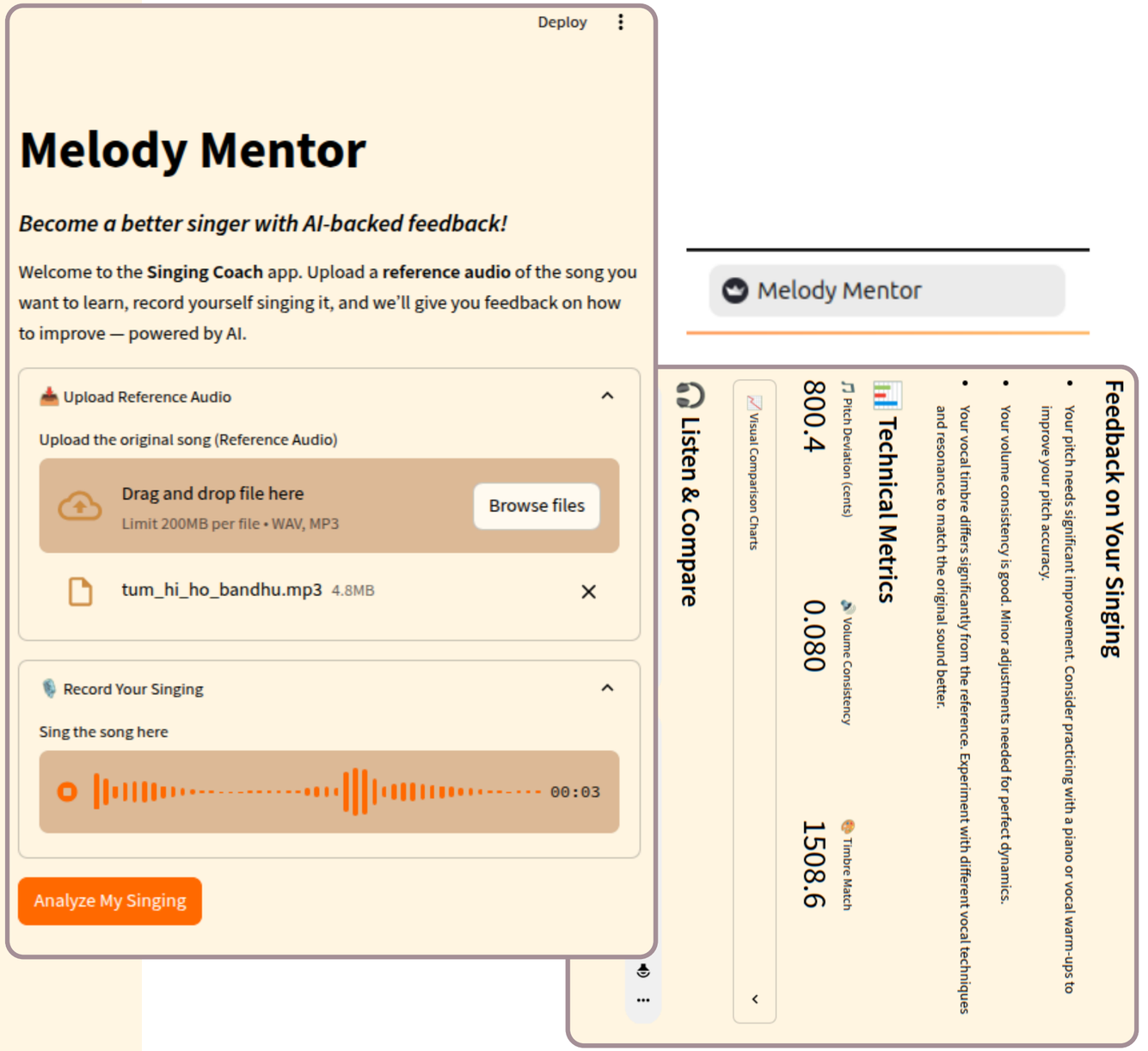
## RESONANCE

& Vocal Tract

# The SOLUTION

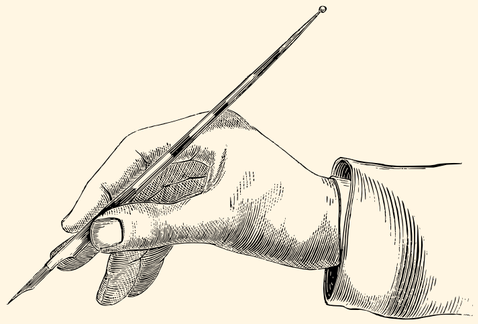
Melody Mentor is the AI Mentor to gain the desired perfection in singing. Yeah especially for bathroom singers.

LET'S DIVE DEEPER

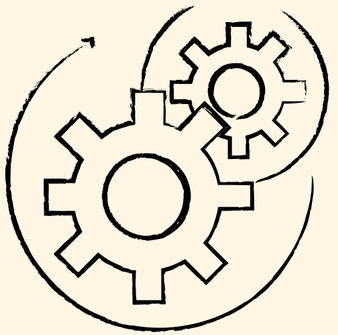


# Functional FEATURES

The software bridges the gap between a novice singer and the perfection achieved with decades of practicing. Here's how -



Personalized Feedback



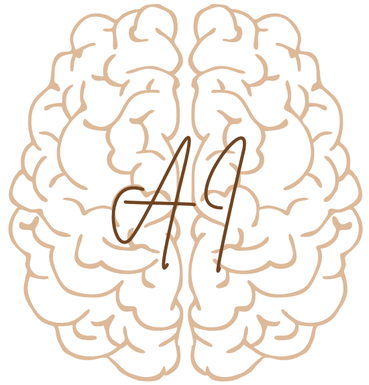
Automated & Instant

Affordable & Accessible

Listen to Yourself

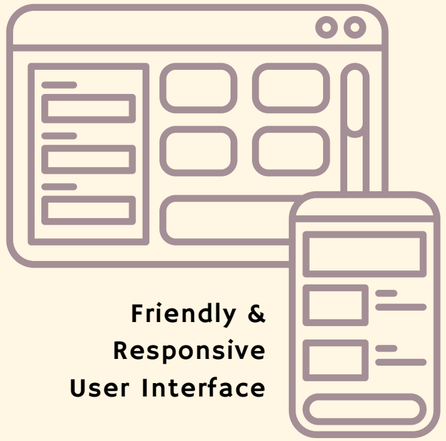
# Technical CAPABILITIES

Let's deeply explore what the software technically provides...




AI Powered Analysis

Feedback Generation



Friendly &
Responsive
User Interface

Focus Vocal Health

*How?*

# IT WORKS

The software works in three simple steps, basically providing a reference file, the user's audio recording, and finally analyzing the results and showing it.

## 01 Reference Song File

A file to be uploaded by the user, else a default reference is taken.

## 02 User's Singing

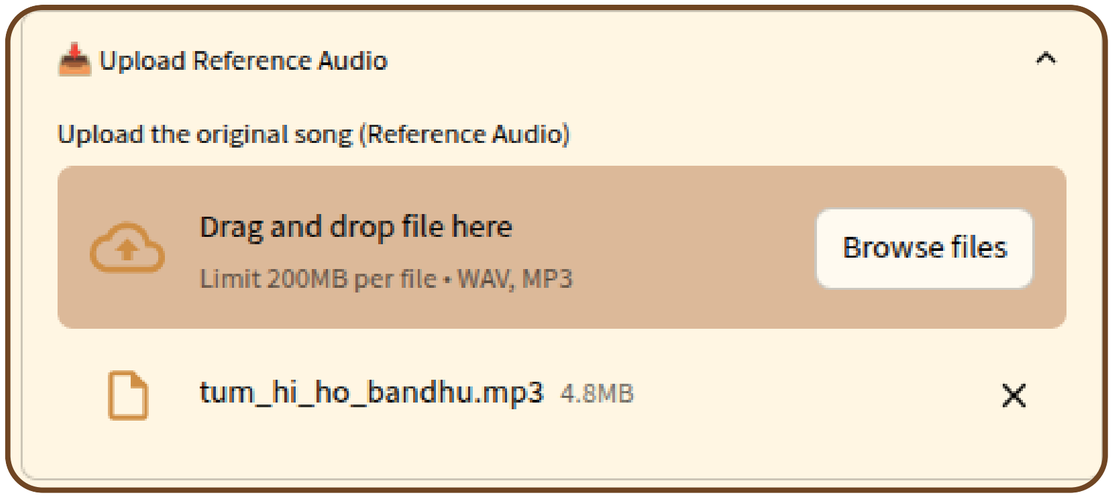
Microphone's recorded audio or a file uploaded by the user.

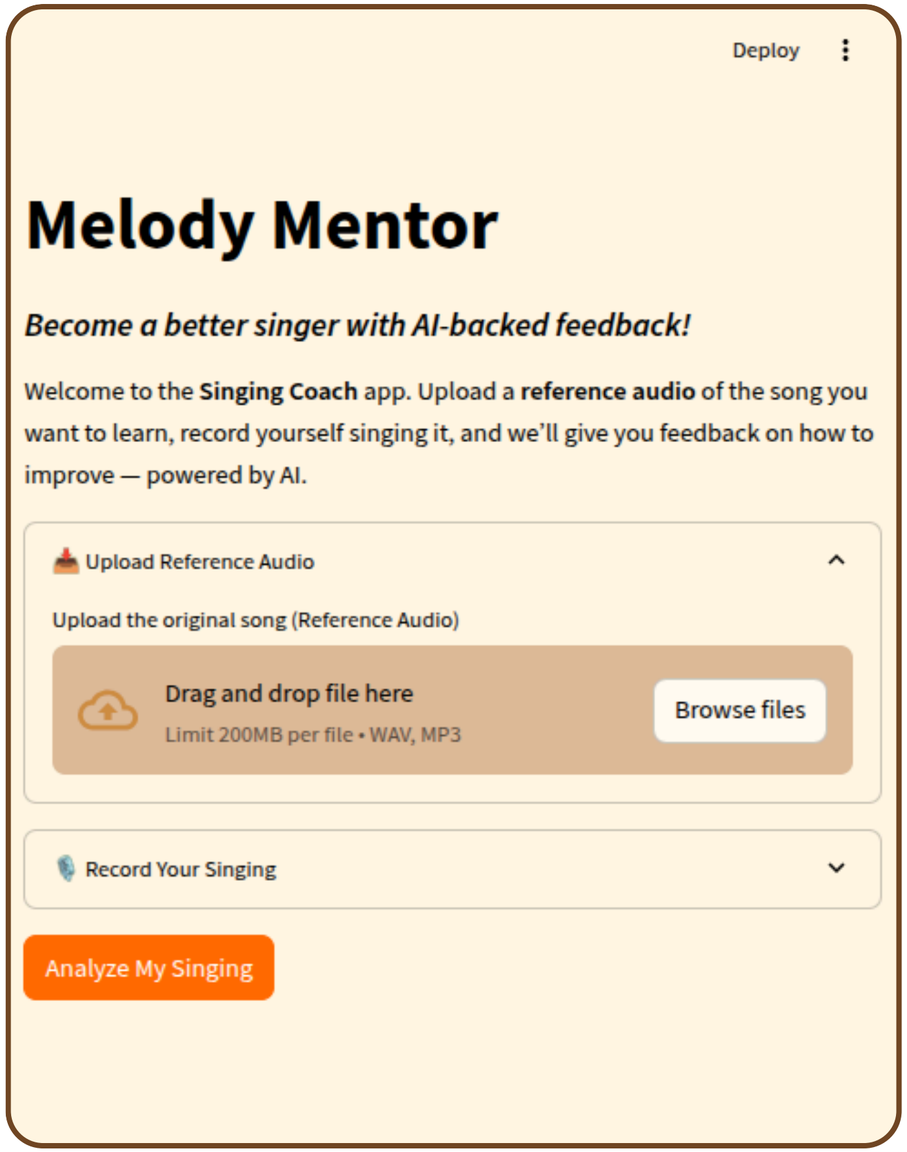
## 03 Analytical Results

Detailed plotting and Brief Advisory to the user.

# REFERENCE FILE

The user has to upload a reference song with which he wants to practice his singing. This file is later on used to compare with his singing and judge his singing wellness.



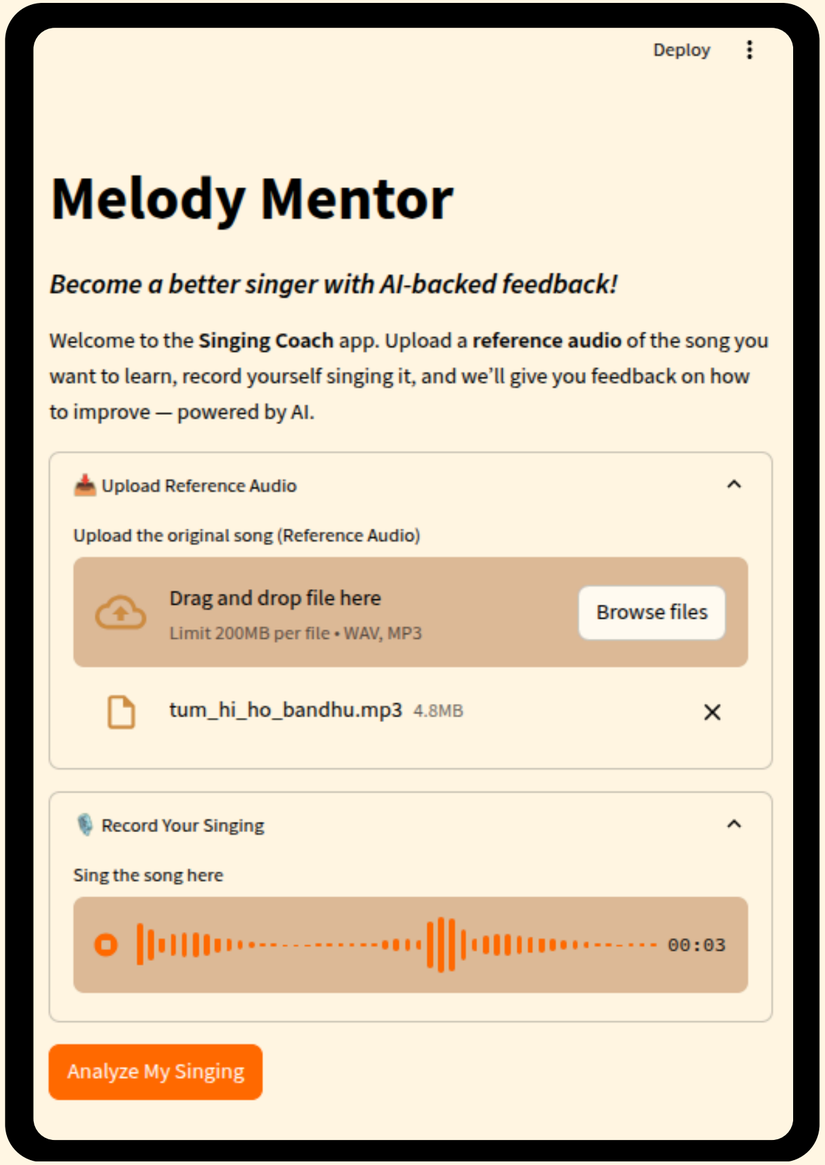
# USER SINGING

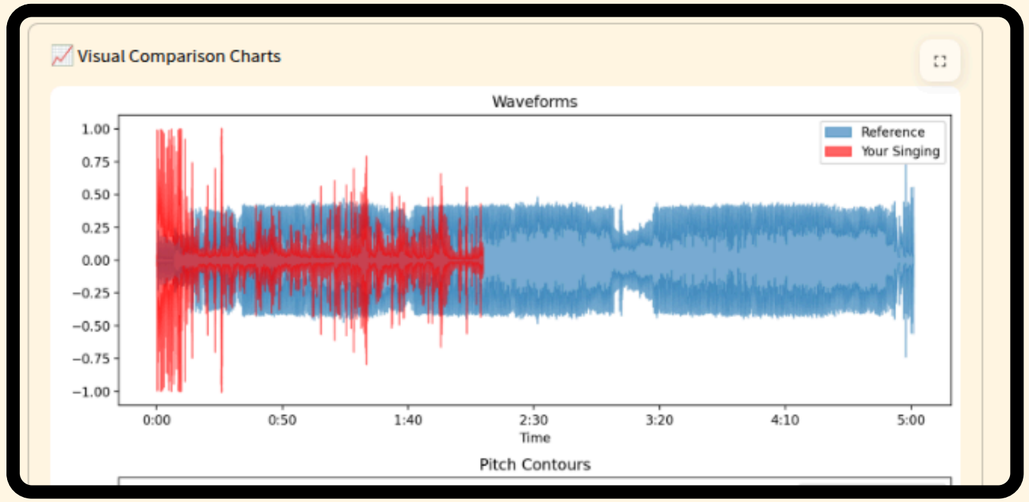
The second widget lies responsible to input user's singing using his microphone with standard WAV audio buffer that will later be processed with respect to the reference file.

**TO IMPLEMENT**

## SINGING FILE UPLOAD

For the case when the user can't directly record in the application, the software will offer uploading another file for their singing.






# Shown OUTPUTS

Advices Framed in Natural Language

Technical Metrics

Wave / Time: Graphs & Charts

## Feedback on Your Singing

- Your pitch needs significant improvement. Consider practicing with a piano or vocal warm-ups to improve your pitch accuracy.
- Your volume consistency is good. Minor adjustments needed for perfect dynamics.
- Your vocal timbre differs significantly from the reference. Experiment with different vocal techniques and resonance to match the original sound better.

## 📊 Technical Metrics

| 🎵 Pitch Deviation (cents) | 🔊 Volume Consistency | 🎨 Timbre Match |
|---|---|---|
| 800.4 | 0.080 | 1508.6 |

📈 Visual Comparison Charts

## 🎧 Listen & Compare

0:00 / 5:01

0:00 / 2:09

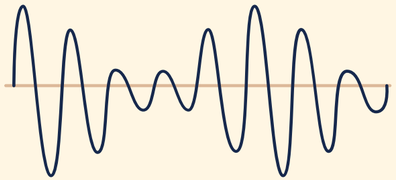
🎼 Reference Audio

🎤 Your Singing

# *Used* ALGORITHMS

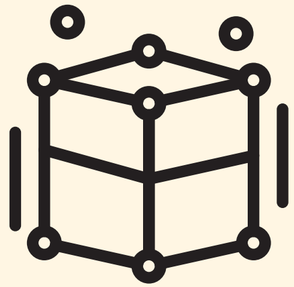
Post-analysis, the following results are shown to the user interface for the user to study his singing wellness.

Respective algorithm is written with them.



**PYIN Algo : Pitch**

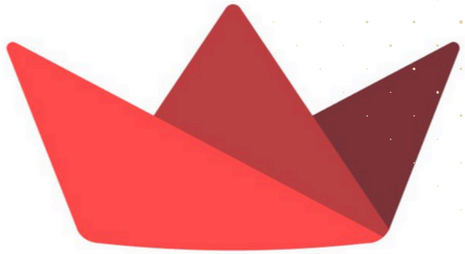
**RMS Energy : Volume**



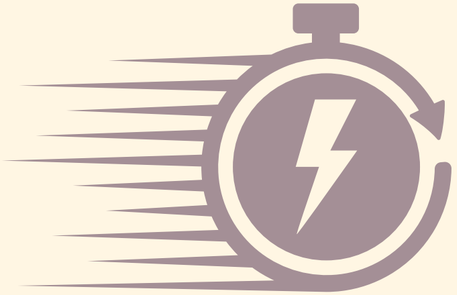
**Spectral Centroid: Timbre**

**Derived from Timbre: Resonance**

# Why STREAMLIT



Let's explore the reason behind choosing streamlit as the frontend driver



Fast & Ready to use

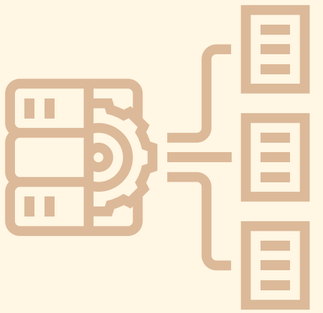
Targets Client Side

Scripted in Python

# Why FIREBASE

Firebase by Google is a cloud based database and various processing service provider. It has 99.9% uptime and 200ms latency provided that the internet connection is stable and good enough.

99% Uptime



NoSQL Database

Realtime Service

Maintains Good API

# Testing RESULTS

The Feedback aligns with expert vocal coaches

Accuracy

92% Pitch

95% RMS Energy

85% Spectral Centroid

90% Feedback

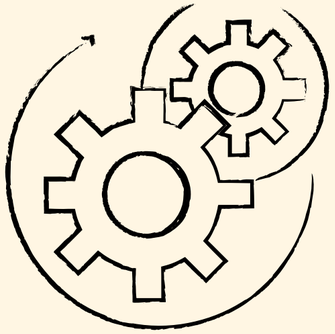
Intuitive

80% UI

# Future DIRECTION

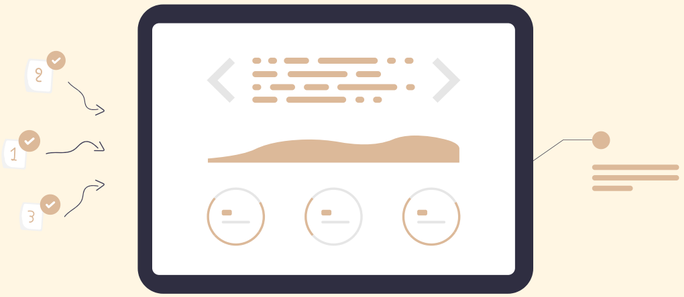
I envision the software to be a leading and emerging singing mentor app that is trusted by the users and proves to show noticeable change in the vocals.

Voice recognition

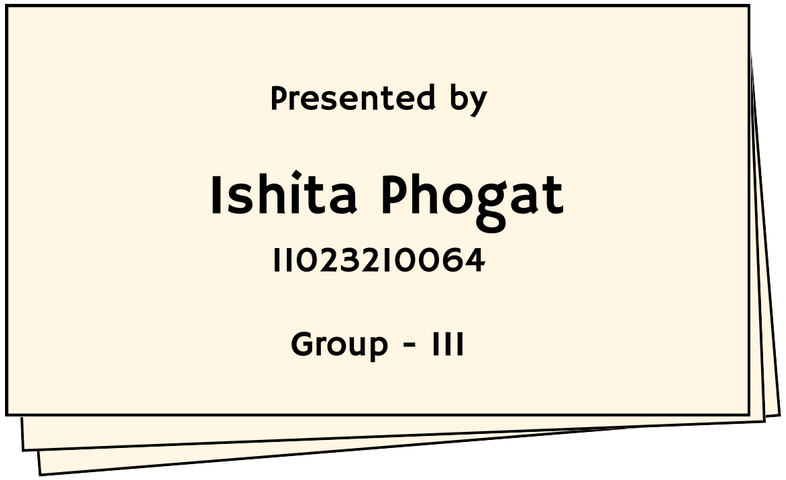


Expanded Feature Set

Vocal extraction



User Experience Enhancement

# THANKS FOR YOUR PATIENCE

Any questions in your mind are welcomed!