# Songs Generator App

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# 01 Introduction

# Music has always been tied to technology.

Song = Music + Lyrics +Speech

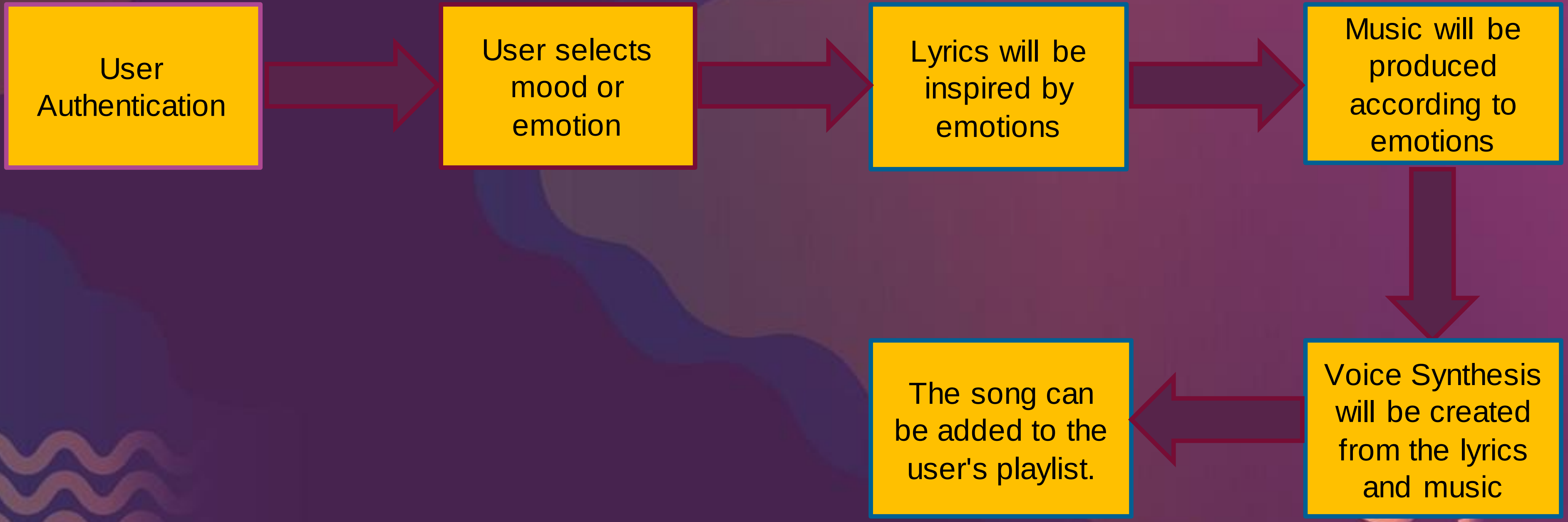
The creation of songs, music, and speech is a significant aspect of human creativity.
Can we teach machines to convey their emotions and ideas through AI songs

Soul Composer : is an app that generate lyrics and music according to the user's selected mood (happy, sad, etc.),then generate voice based on the lyrics and music that our app developed.

# Comparison

| | Boomy | My Lyrics Maker | Melobytes | Sound raw | Soul Composer |
|---|---|---|---|---|---|
| Lyrics Generator | X | From Topic | According To Your Lyrics | X | ✓ |
| Music Generator | ✓ | ✓ | ✓ | ✓ | ✓ |
| Voice Synthesis | Record Your Voice | X | ✓ | X | ✓ |
| Mood Choice | ✓ | X | X | ✓ | ✓ |
| Save As Play List | X | ✓ | X | ✓ | ✓ |

# Project Pipeline



User Authentication

User selects mood or emotion

Lyrics will be inspired by emotions

Music will be produced according to emotions

Voice Synthesis will be created from the lyrics and music

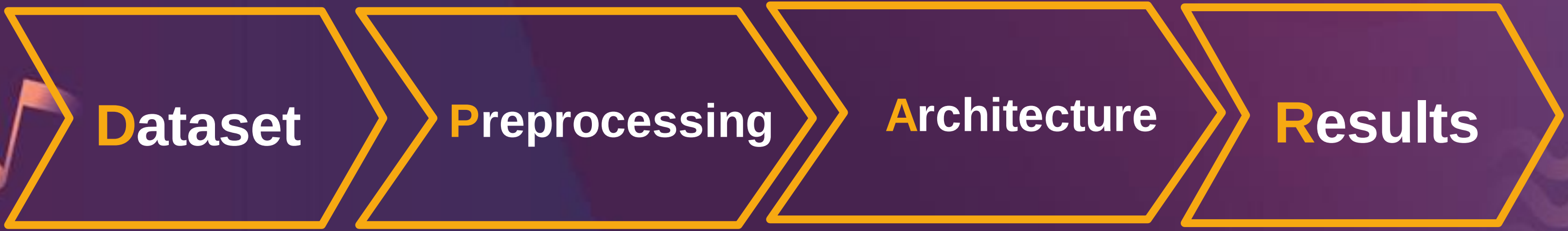
The song can be added to the user's playlist.

02

# Lyrics Generator

# Structure

Model Objective: generate lyrics based on emotion



Dataset

Preprocessing

Architecture

Results

# Data Set

- We have collected dataset manually
- Based on five emotions, five datasets
- has 200 songs, one for each emotion.

# Preprocessing Data

01

Tokenization

02

Lowercase Words

03

Remove Punctuation

04

Remove Tokens that are not Alphabetic

05

Sequences Of Token

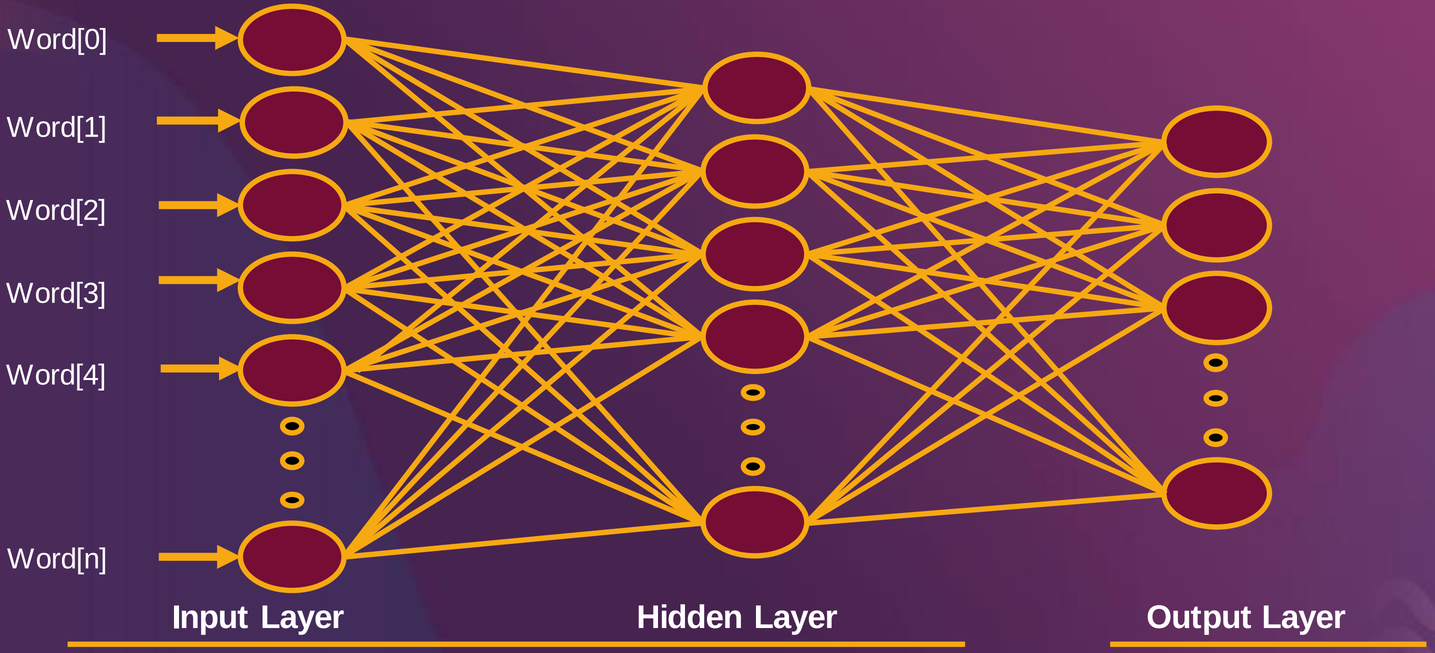
06

Sequence Of Integers

07

Separate The Sequence to input and output

# Architecture



One Embedding Layer + two LSTM layers +
One Dense layer with Relu

Dense layer
SoftMax

# HOW WILL THE MODEL DO IT?

4 **Upon adding hyper parameters, lyrics is obtained.**

3 The output of the LSTM was sent to two dense layers.

2 The output of the embedding layer is then taken by the two LSTM layers.

1 Vocabulary Size ,Output Size, and Input length are entered into Embedding layer.

# Results

**Hyperparameters :**

- **Activation** : Relu and softmax
- **Different epochs** : for each five models
- **Batch size :** 128
- **optimization** algorithm : Adam
- **loss function** : categorical crossentropy

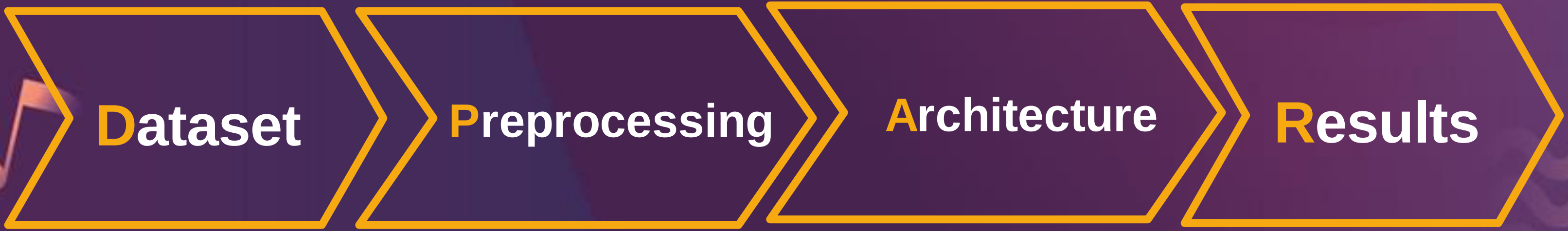
**After applying hyper parameters to our five models, we obtain varying degrees of accuracy (92–96%).**

03

# Music Generator

# Structure

Model Objective : generate music depending on emotion from midi files



Dataset

Preprocessing

Architecture

Results

# Data Set

- Our dataset POP909 includes piano tunes stored in the MIDI (Musical Instrument Digital Interface) format
- Using MuseScore3, we separate that dataset to five emotions.
- Each dataset contains between 50 to 85 midi file
- music21 (a toolkit for computer-aided musicology, MIT) These MIDI files data were extracted using a Python toolbox.

# Preprocessing Data

01 All dataset will be transformed into music21 objects.

02 Extract chords from objects scores

03 Obtain notes and their duration.

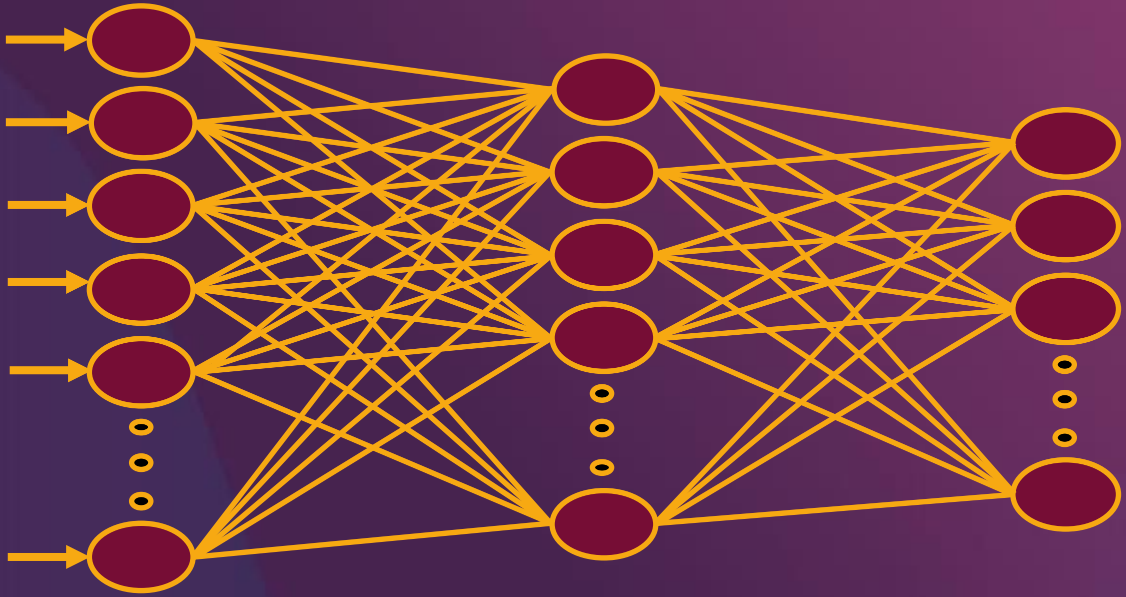
04 Choose the C major key

05 Mapping chords and durations to integers

06 Create Sequence Of Integers for chords and durations

07 *Construct train and target sequences for chords and durations*

# Architecture



Input Layer

Hidden Layer

Output Layer

Two Embedding Layer + two LSTM layers + one Dense layers with tanh Function

SoftMax Classification

# HOW WILL THE MODEL DO IT?

**Upon adding hyper parameters, notes and durations are obtained.**

Dense layer changing the output's dimension to 1

Then, the two LSTM layers take the concatenated versions of both inputs.

**Notes and durations are entered into two embedding layers.**

# Results

**Hyperparameters :**

- **Activation** : Tanh and softmax
- **Different epochs** : for each five models
- **Batch size :** 128
- **optimization** algorithm : RMSprop
- Learning rate :0.01
- **loss function** : sparse categorical crossentropy

**After applying hyper parameters to our five models, we obtain varying degrees of accuracy (94–96%).**

04

# Voice Synthesis

# Structure

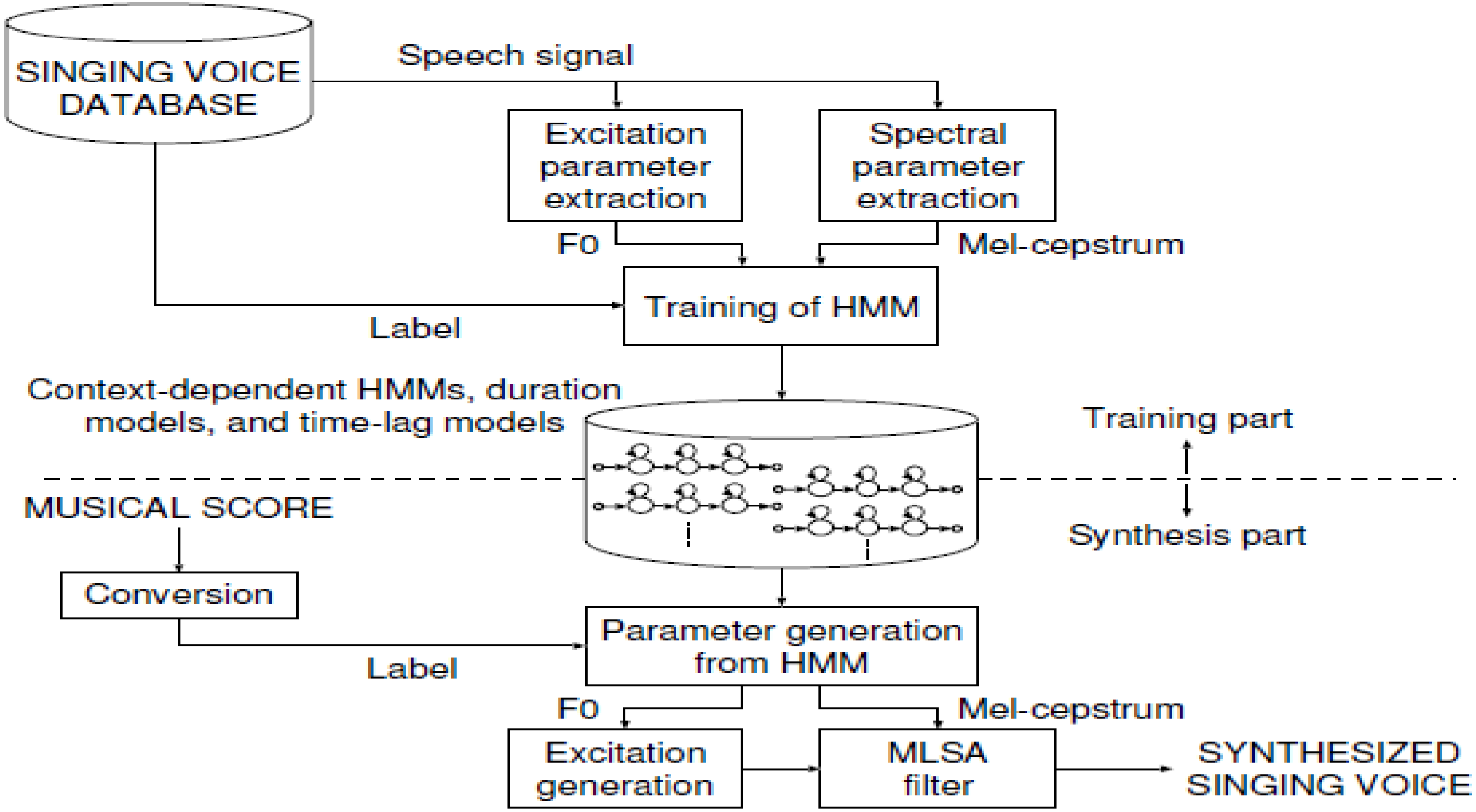
Model's objective : is to generate voice from midi files and lyrics.

Hidden Markov Models (HMMs) were used to create a singing voice synthesizer.

# Data Set

- Children's Song is the dataset we use.
- This collection includes 50 English songs.
- Each audio file is accompanied with lyrics and a MIDI transcription.
- Songs last a total of 72 minutes.

# Voice Synthesizer


SINGING VOICE DATABASE
Speech signal
Excitation parameter extraction
Spectral parameter extraction
F0
Mel-cepstrum
Training of HMM
Label
Context-dependent HMMs, duration models, and time-lag models
Training part
Synthesis part
MUSICAL SCORE
Conversion
Label
Parameter generation from HMM
F0
Mel-cepstrum
Excitation generation
MLSA filter
SYNTHESIZED SINGING VOICE

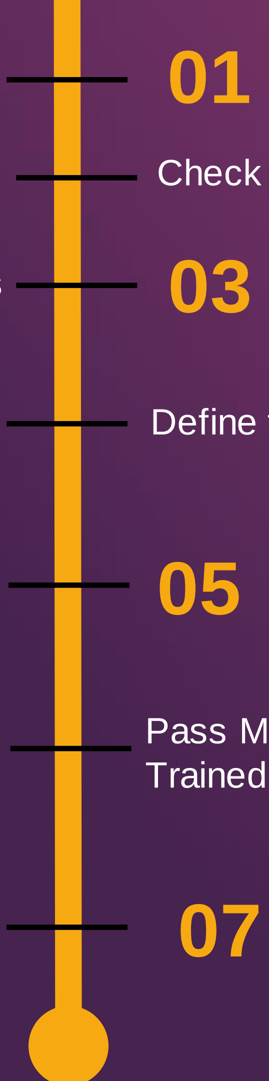
# Voice Synthesizer

- In the training part, first we extract spectral and excitation parameters
- Duration models and time-lag models are also estimated.
- In the synthesis part, first musical score to be synthesized is converted to a label sequence with lyrics.

# Voice Synthesizer

- according to the label sequence, spectral and excitation parameters are generated by HMM
- Finally, a speech waveform is synthesized directly from the generated spectral and excitation parameters

How We Do It ?



01 Preprocessing the midi and the lyrics

02 Check The Midi File if Contains one Channel

03 Verify that the wording matches the amount of notes

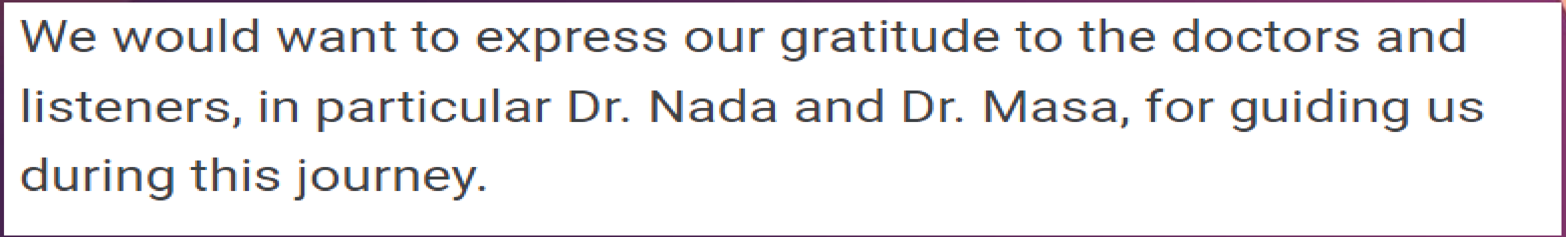
04 Define the Voice's Speak Rate

05 Define the voice's tempo

06 Pass Mid, Lyrics, Speak Rate, and Tempo to Trained Mid2Voice Models.

07 Call Voice Render in order to hear the voice

# Voice Synthesizer Example

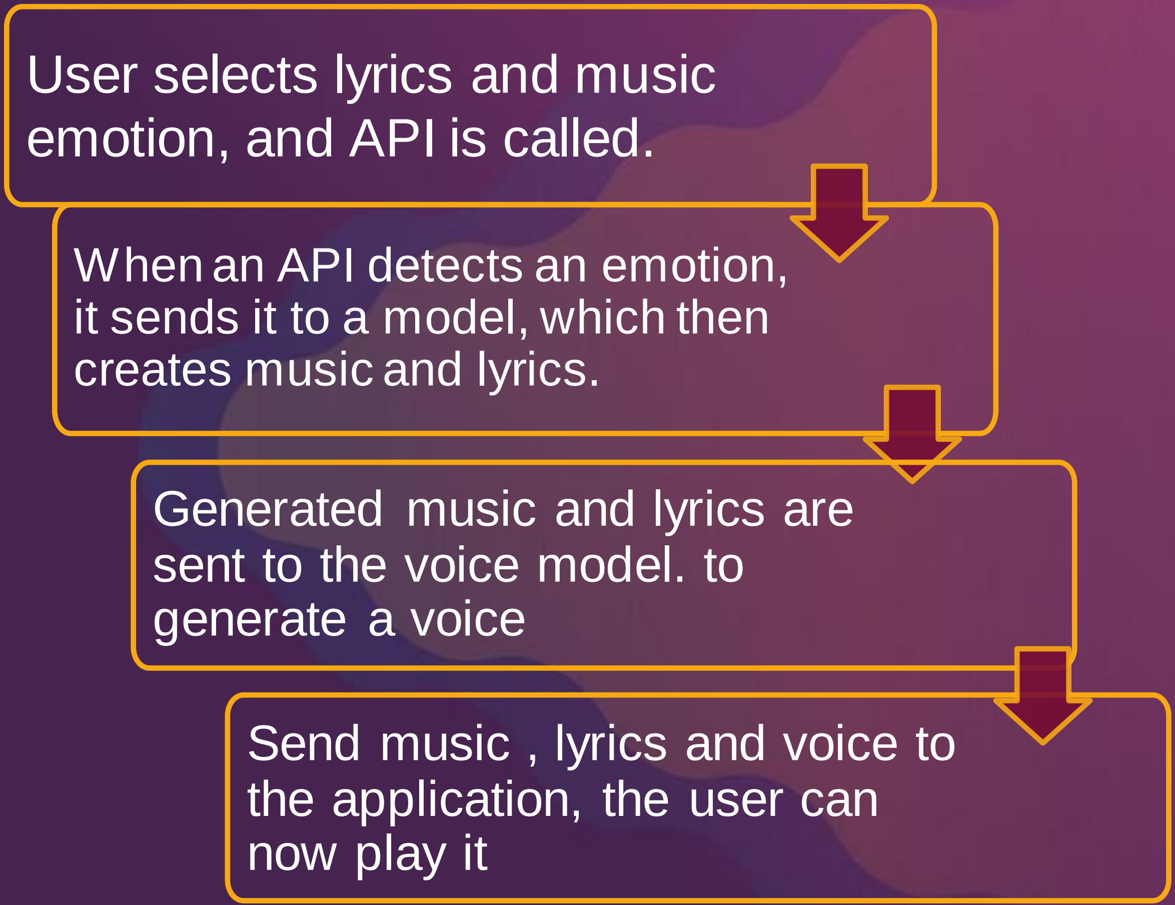


We would want to express our gratitude to the doctors and listeners, in particular Dr. Nada and Dr. Masa, for guiding us during this journey.

05

# Project Application

How We Do That ?



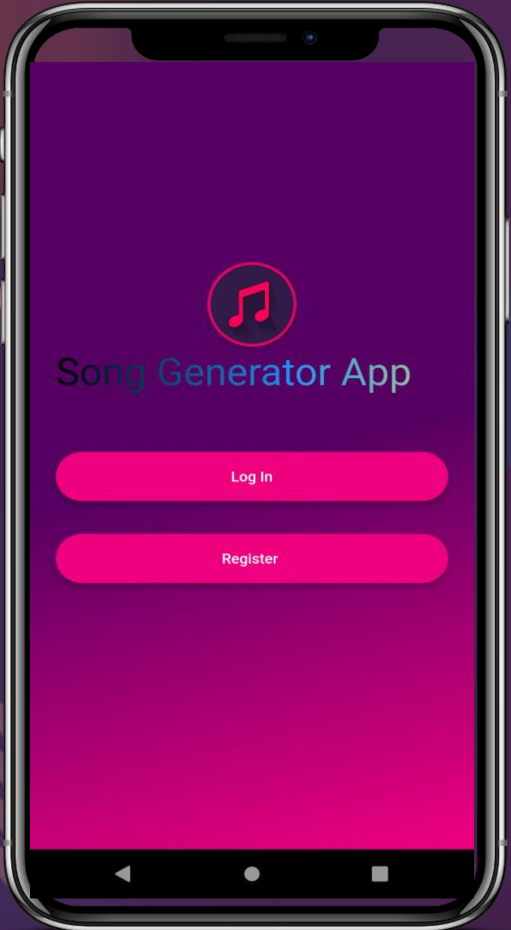
User selects lyrics and music emotion, and API is called.

When an API detects an emotion, it sends it to a model, which then creates music and lyrics.

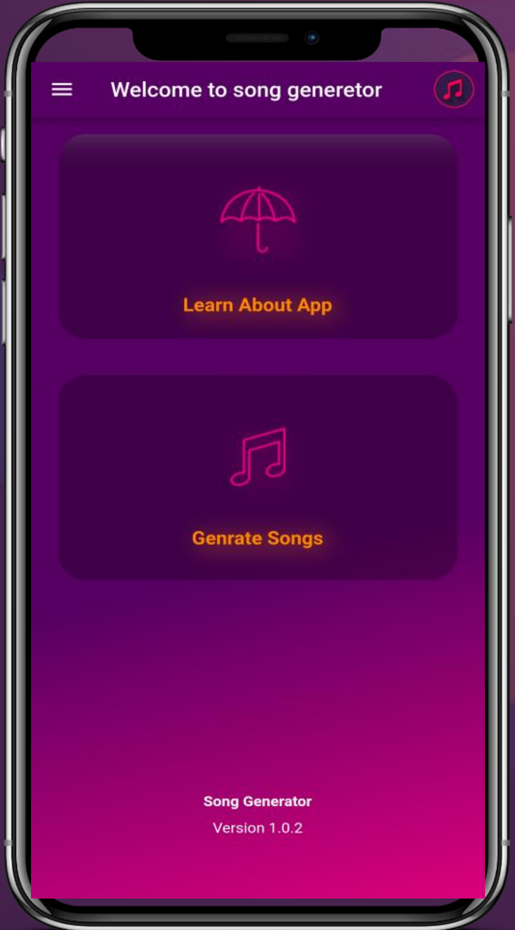
Generated music and lyrics are sent to the voice model. to generate a voice

Send music , lyrics and voice to the application, the user can now play it

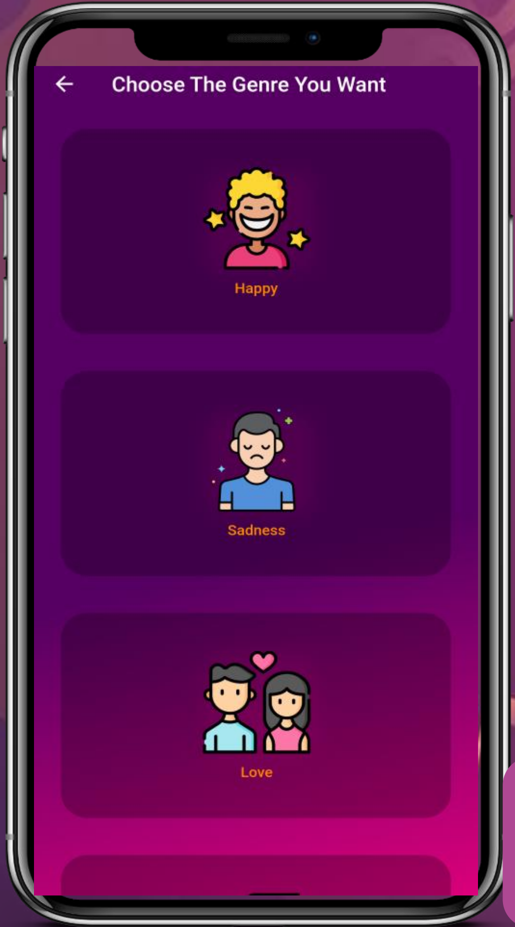
1


Song Generator App
Log In
Register

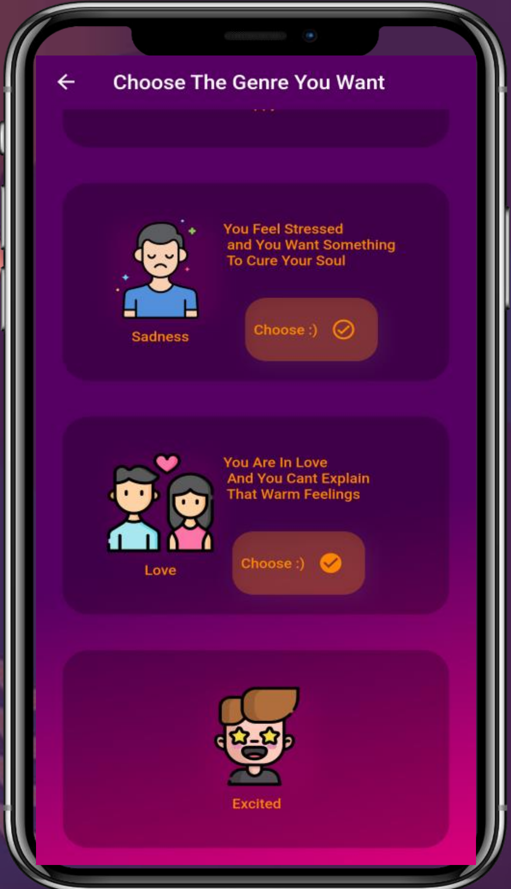
2


Welcome to song generetor
Learn About App
Genrate Songs
Song Generator
Version 1.0.2

3


Choose The Genre You Want
Happy
Sadness
Love

4



Choose The Genre You Want

You Feel Stressed and You Want Something To Cure Your Soul

Sadness

Choose :)

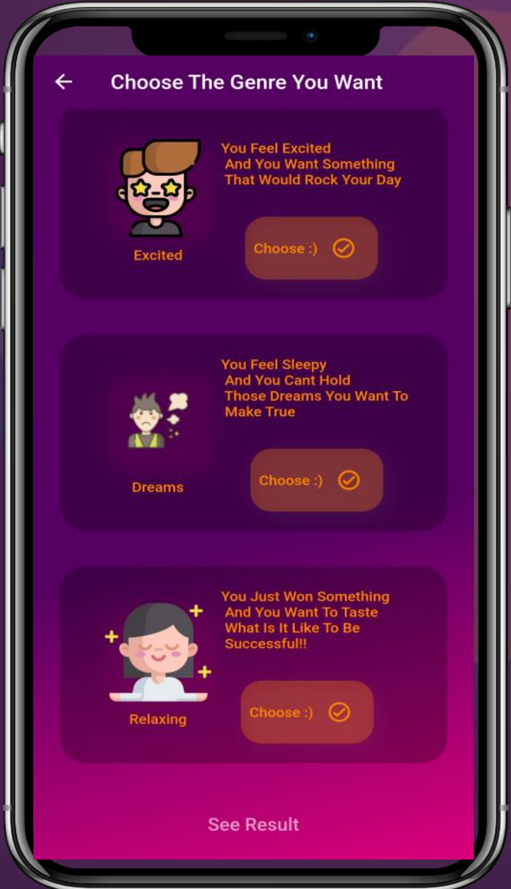
You Are In Love And You Cant Explain That Warm Feelings

Love

Choose :)

Excited

5



Choose The Genre You Want

You Feel Excited And You Want Something That Would Rock Your Day

Excited

Choose :)

You Feel Sleepy And You Cant Hold Those Dreams You Want To Make True

Dreams

Choose :)

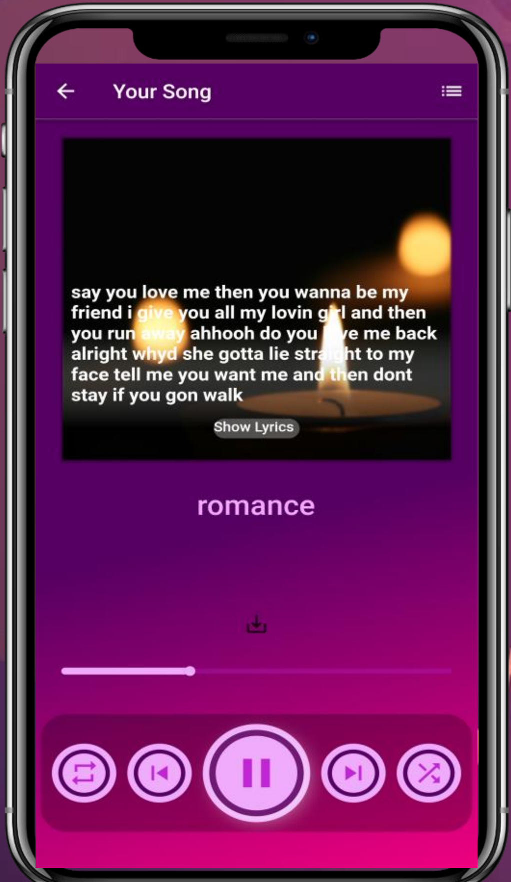
You Just Won Something And You Want To Taste What Is It Like To Be Successful!!

Relaxing

Choose :)

See Result

6



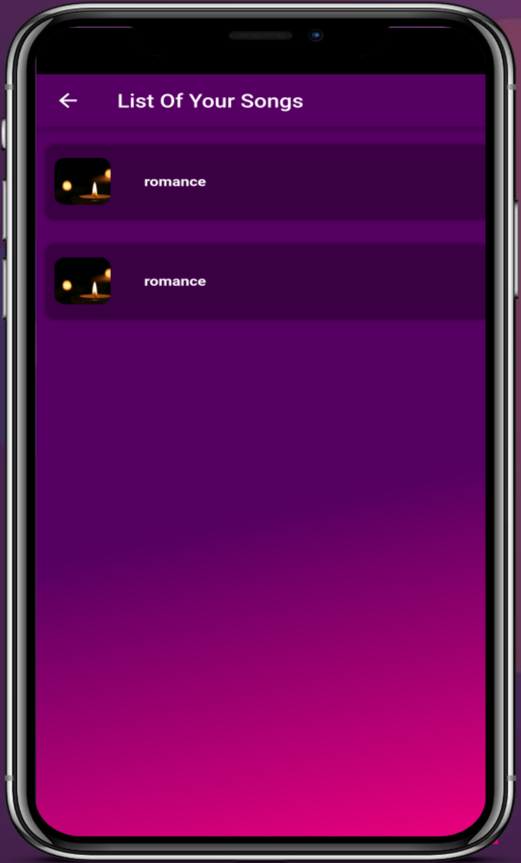
Your Song

say you love me then you wanna be my friend i give you all my lovin girl and then you run away ahhooh do you love me back alright whyd she gotta lie straight to my face tell me you want me and then dont stay if you gon walk

Show Lyrics

romance

7



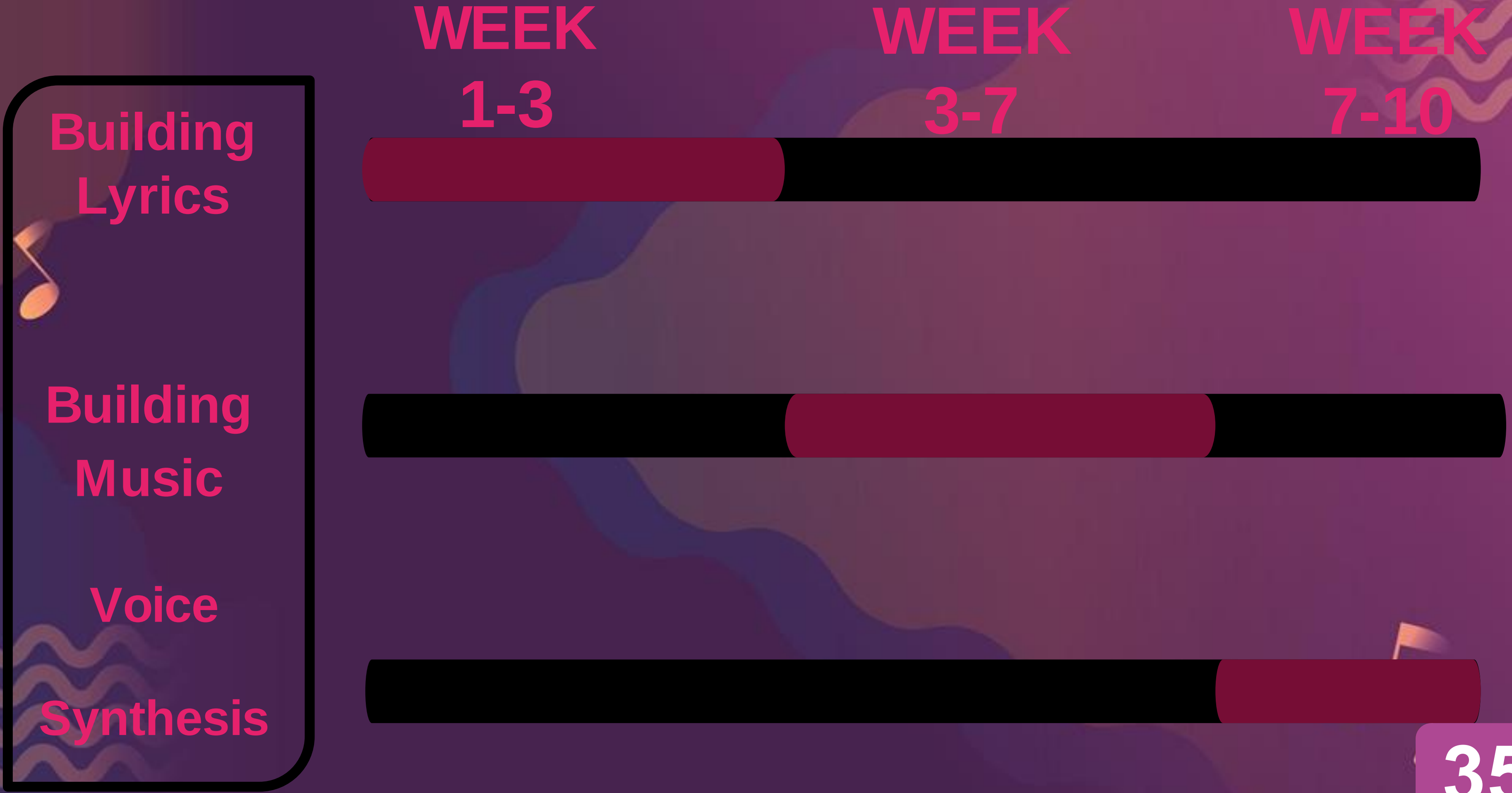
List Of Your Songs

romance

romance

06

# Project Timeline



WEEK 1-3

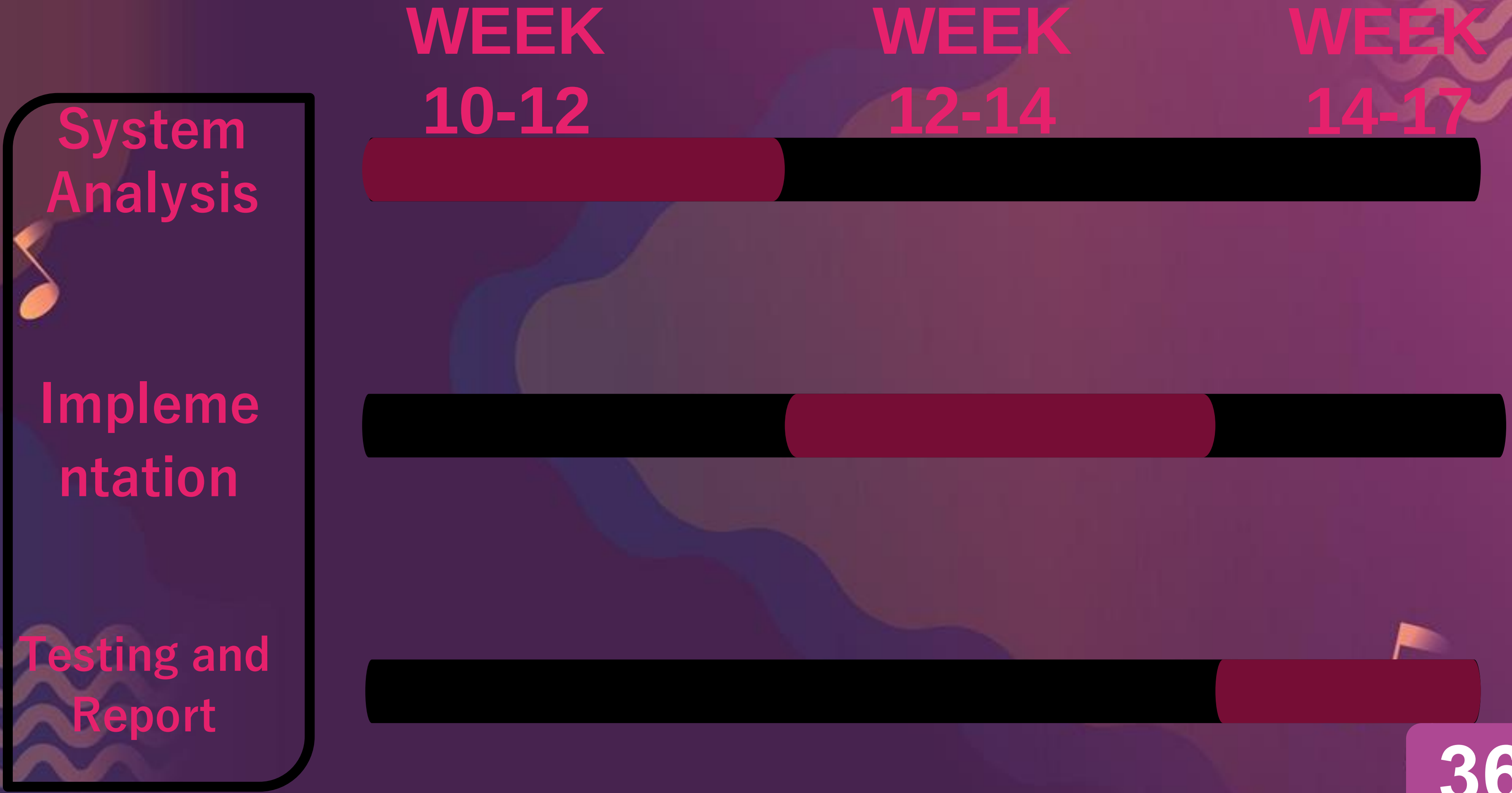
WEEK 3-7

WEEK 7-10

Building Lyrics

Building Music

Voice Synthesis



WEEK 10-12

WEEK 12-14

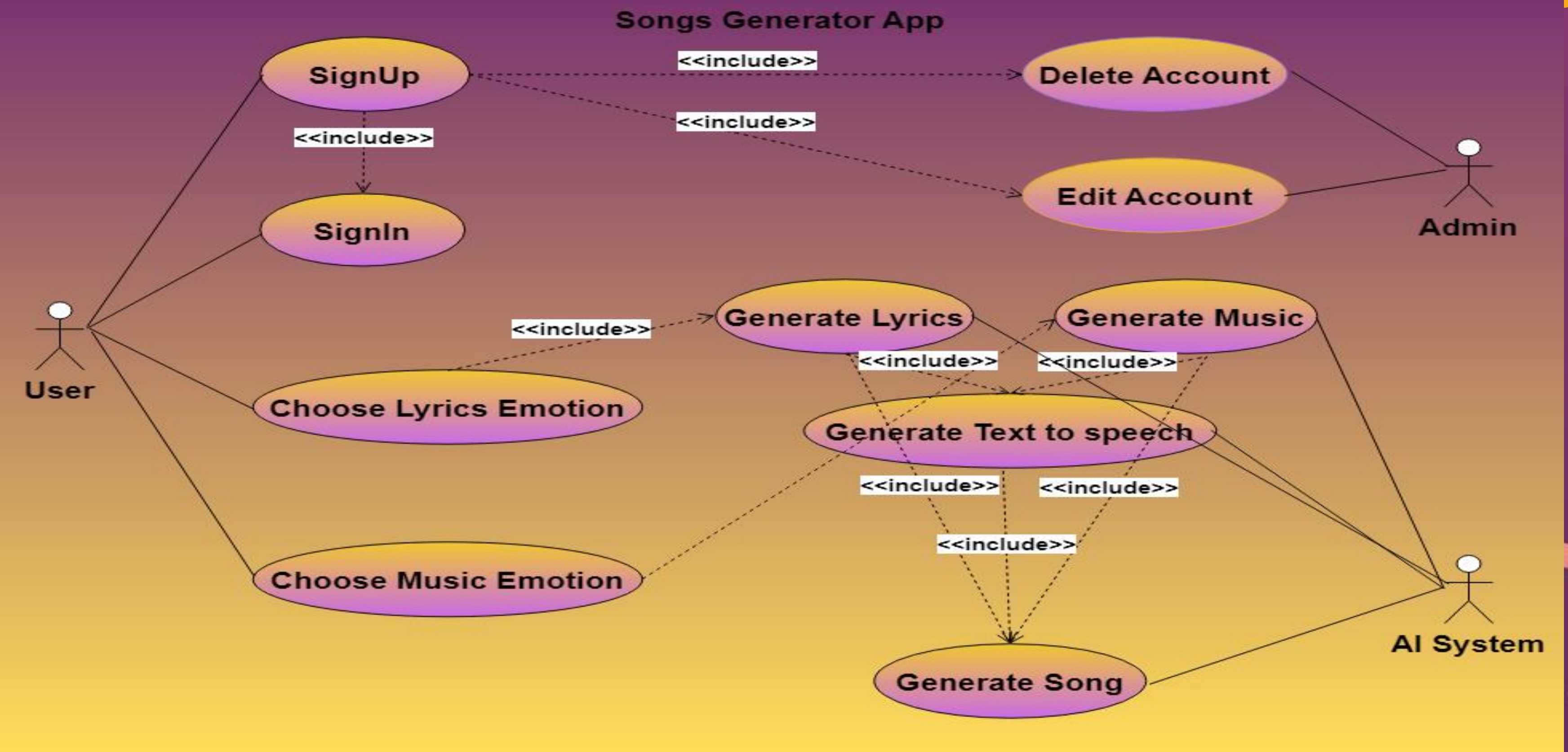
WEEK 14-17

System Analysis

Implementation

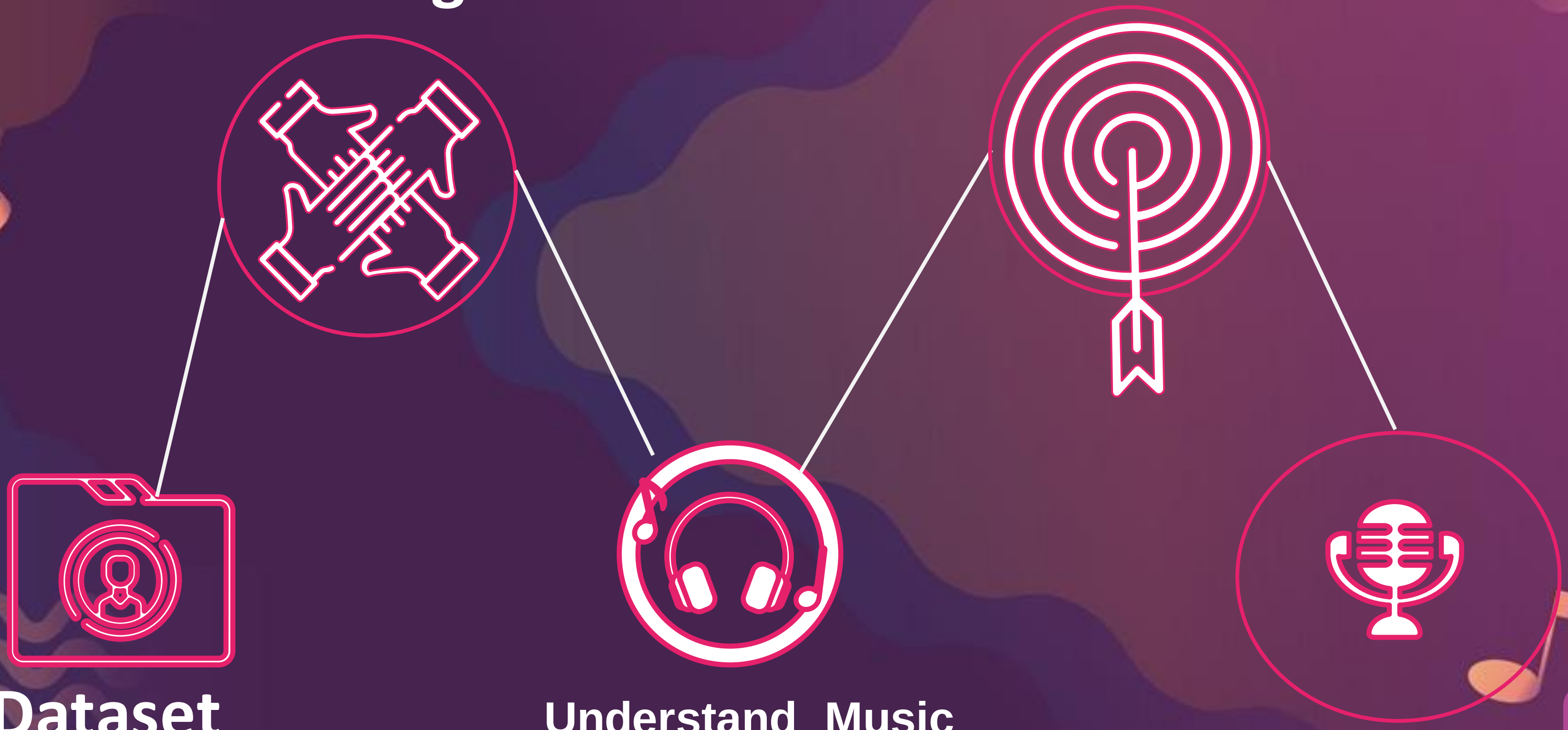
Testing and Report

# Use case Diagram



07

# DIFFICULTIES & Used Technologies



Dataset

Linking

Understand Music

Training

Music Sync

Flutter POSTMAN Flask

Application Building

python™ Keras TensorFlow

Model Developing

09

# FUTURE VISION

Song in another language

Voicing for particular artists

lyric video for the song

Various instrument music

# THANKS!

For your
time, attention, everything!