



# Speech Emotion Recognition

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CSE-7B





# Outline

- The Problem
- Ravedess dataset
- Audio Visualization
- Log Mel Spectrogram
- Model Architecture
- Hardware
- Circuit Diagram
- Arduino Program
- Hardware Model
- Django Framework

# The Problem

- Build an end-to-end hardware-software solution
- Extracts features such as pitch, loudness, spectrum, and cepstrum
- Recognize the emotions of the speaker through voice in real-time
- Provide a suitable response.

# Ravdess Dataset



Angry



Happy



Disgusted



Surprised



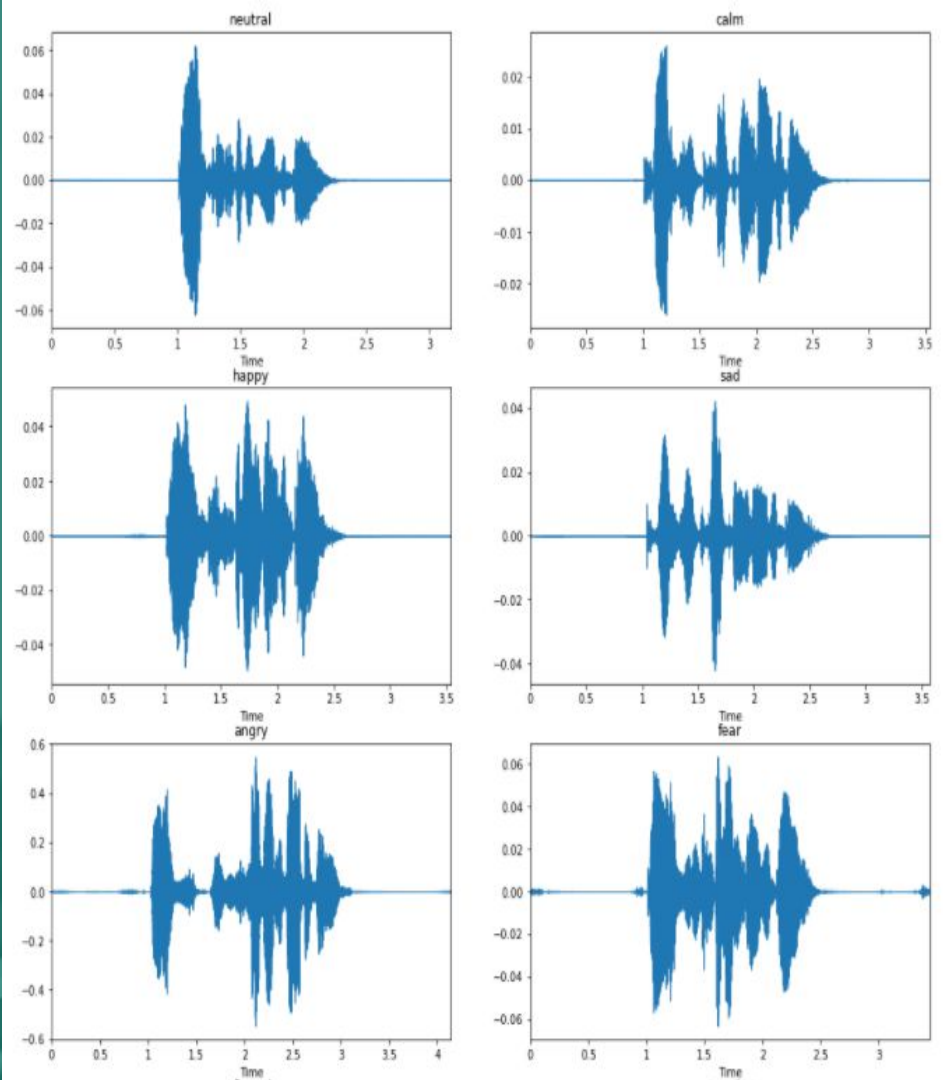
Calm



Fearful

	path	intensity	gender	emotion
0	/kaggle/input/ravdess-emotional-speech-audio/a...	1	male	happy
1	/kaggle/input/ravdess-emotional-speech-audio/a...	1	male	fear
2	/kaggle/input/ravdess-emotional-speech-audio/a...	1	male	sad
3	/kaggle/input/ravdess-emotional-speech-audio/a...	1	male	fear
4	/kaggle/input/ravdess-emotional-speech-audio/a...	2	male	surprise

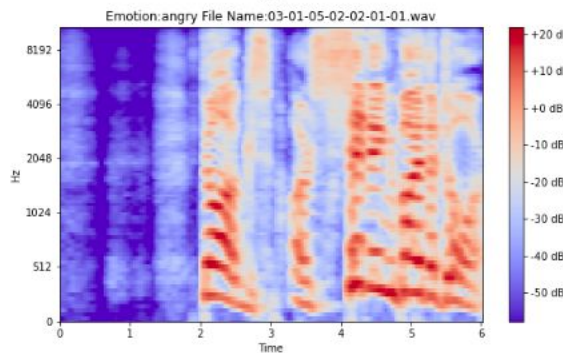
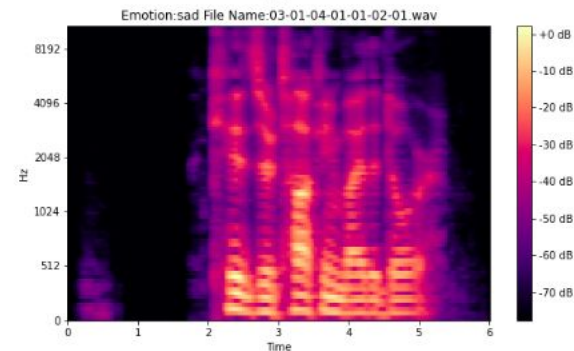
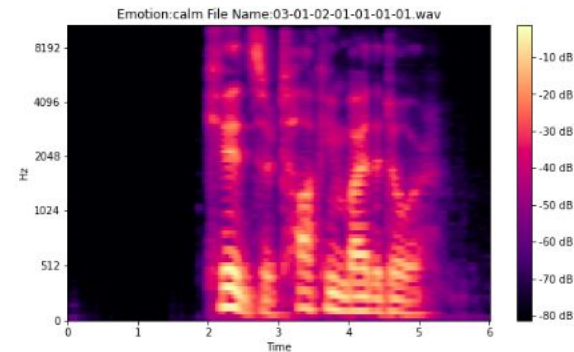
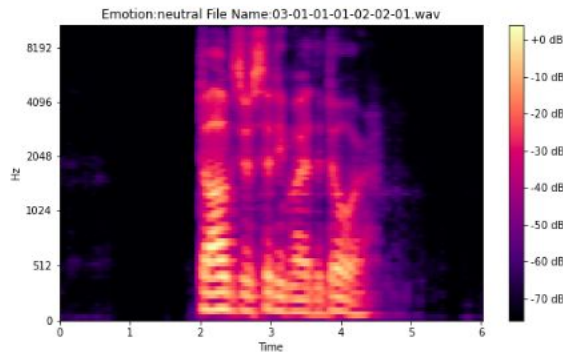
# Audio Visualization



# Log Mel Spectrogram

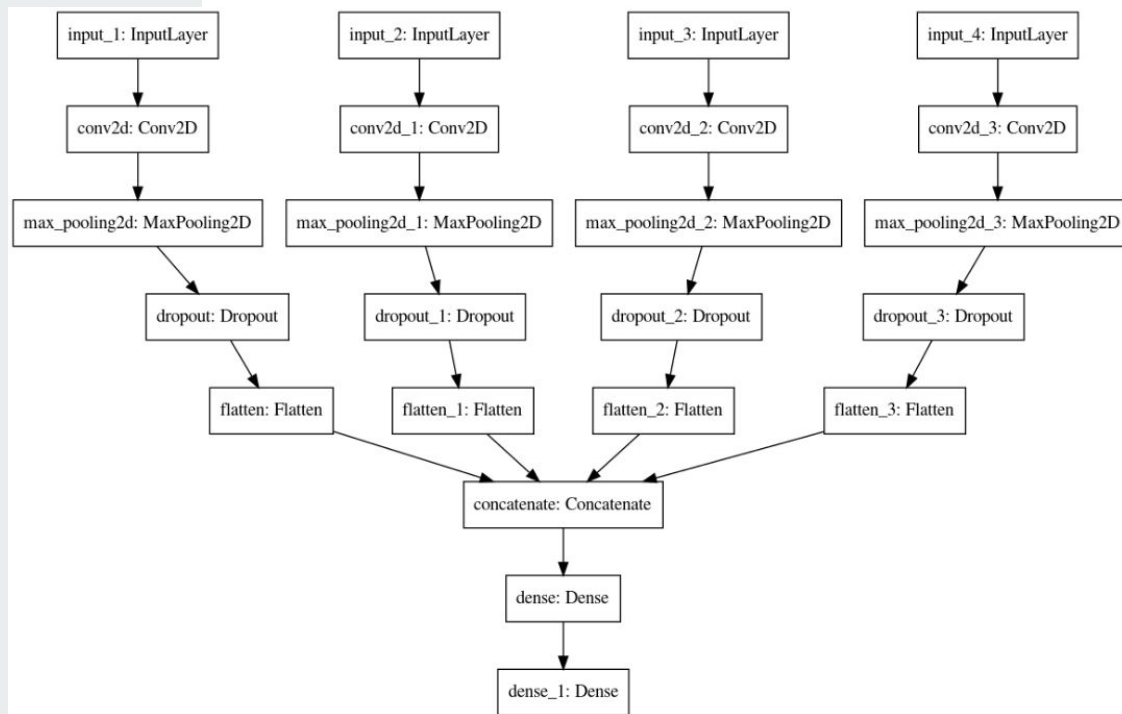


Log Mel Spectrogram visualizes the sound in both time and frequency domain simultaneously.



# Model Architecture

It uses 4-channel CNNs and then fully connected layer to predict the output.



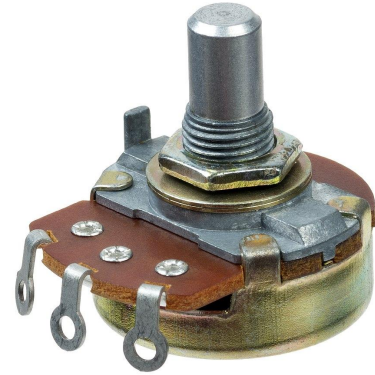
# Hardware



Arduino UNO

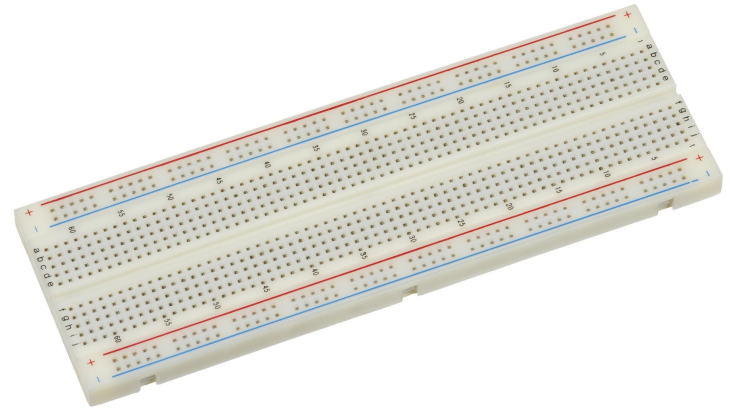
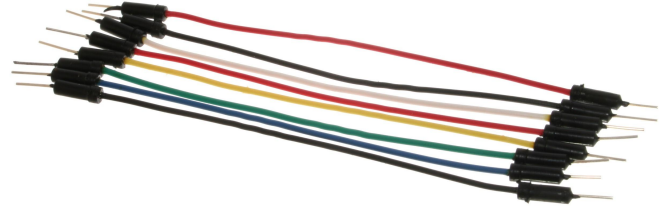


# Potentiometer

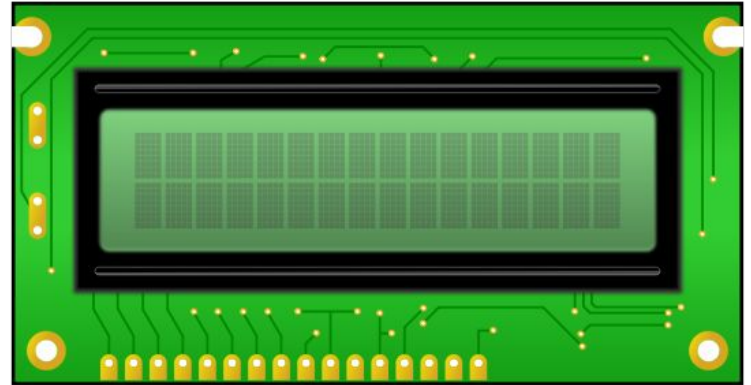




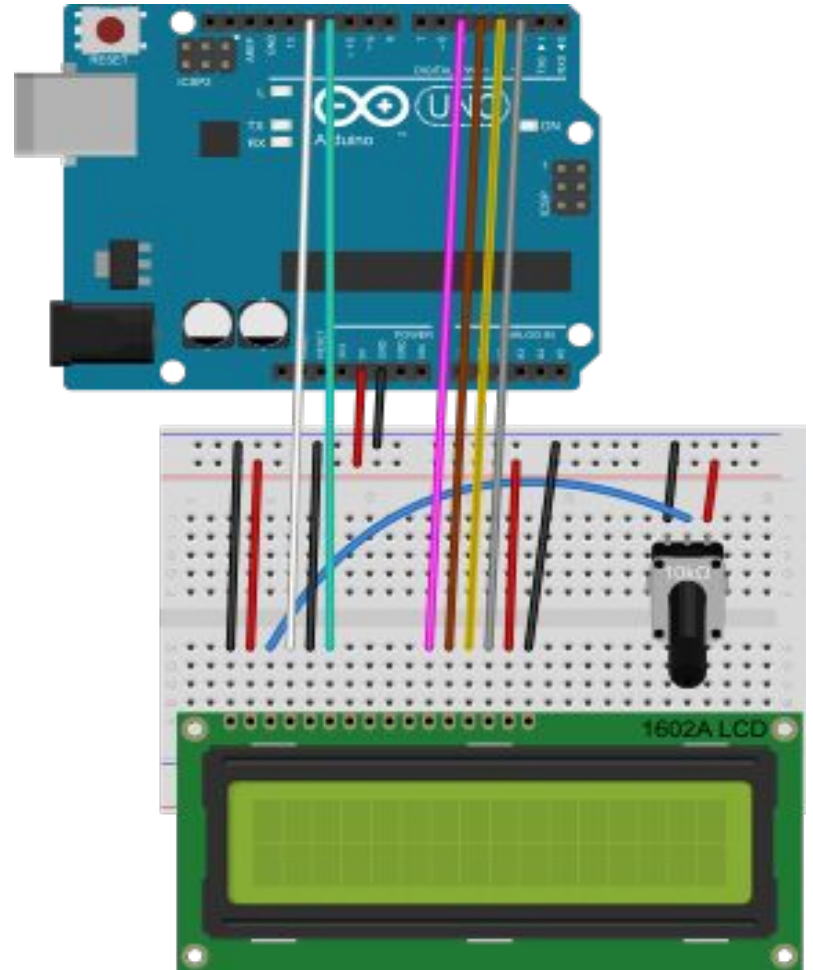
# Jumper Wire & Breadboard



# Hitachi HD44780 LCD Display



# Circuit Diagram



# Arduino Program

sketch\_nov02a | Arduino 1.8.13

File Edit Sketch Tools Help



sketch\_nov02a

```
#include<LiquidCrystal.h>

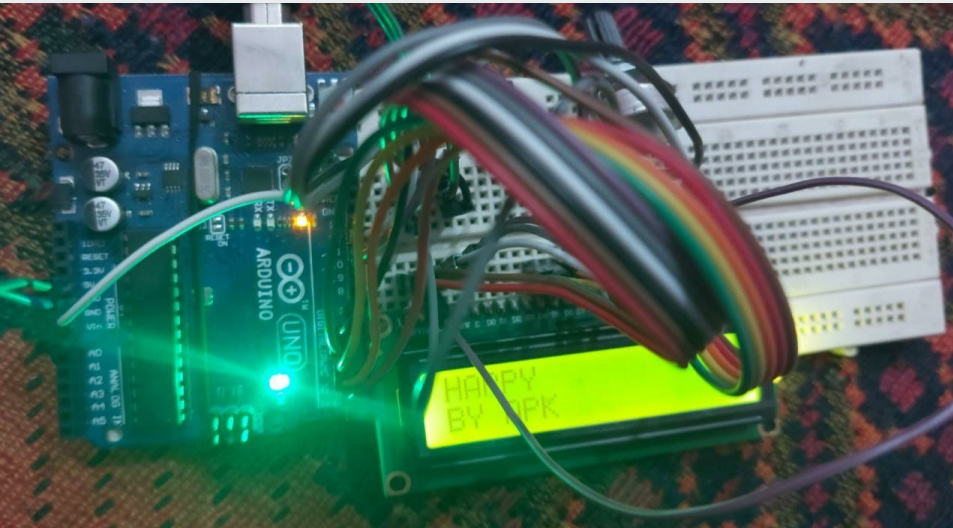
//#include <LiquidCrystal.h>
//int contrast=0;
//char serialdata;
LiquidCrystal lcd(12,11,5,4,3,2);
void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
  //analogWrite(6,0);
  lcd.begin(16,2);

  //delay(1000000);
}

void loop() {
  lcd.setCursor(0,0);
  lcd.print("HAPPY");
  //Serial.begin(74880);
  //delay(500000);
  lcd.setCursor(0,1);
  lcd.print("BY AFK");
  delay(50000);
  // put your main code here, to run repeatedly:
  // if(Serial.available())
  //{
  //  //delay(100);
  //  //lcd.clear();
  //  //while(Serial.available())>0)
```

chrome

# Hardware Model



CROWDBOTICS

django



# DJANGO

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# Django framework

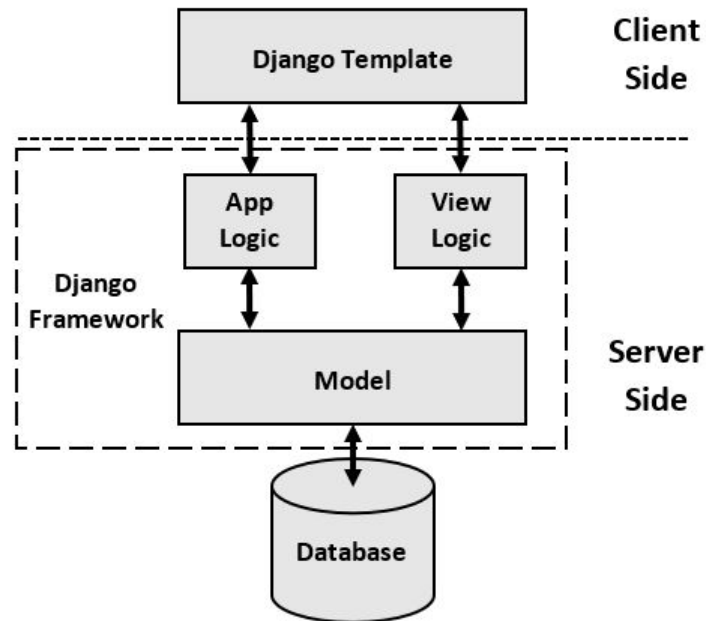
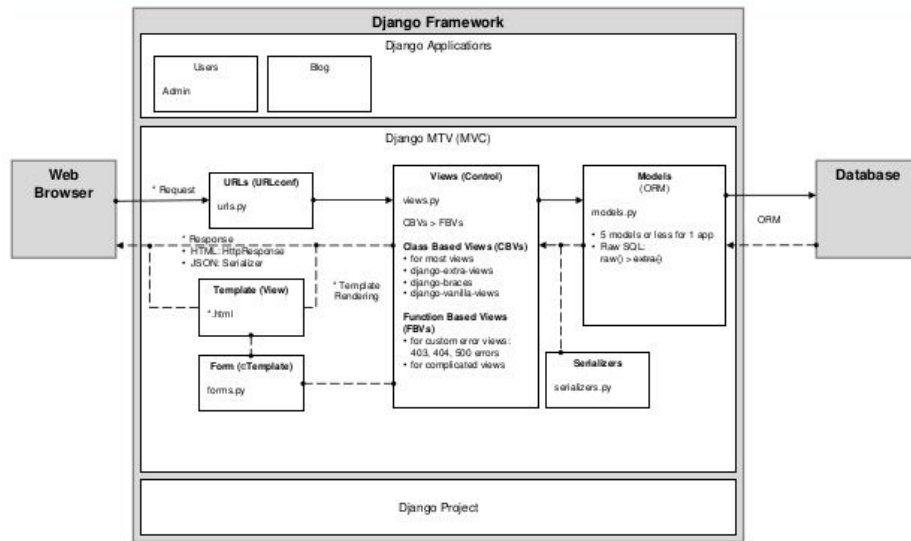
- **Django** is a Python-based free and open-source web framework that follows the model-template-views (MTV) architectural pattern. It is maintained by the Django Software Foundation (DSF), an American independent organization established as a 501 non-profit.
- Django's primary goal is to ease the creation of complex, database-driven websites. The framework emphasizes reusability and "pluggability" of components, less code, low coupling, rapid development, and the principle of don't repeat yourself.
- Python is used throughout, even for settings files and data models. Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models.

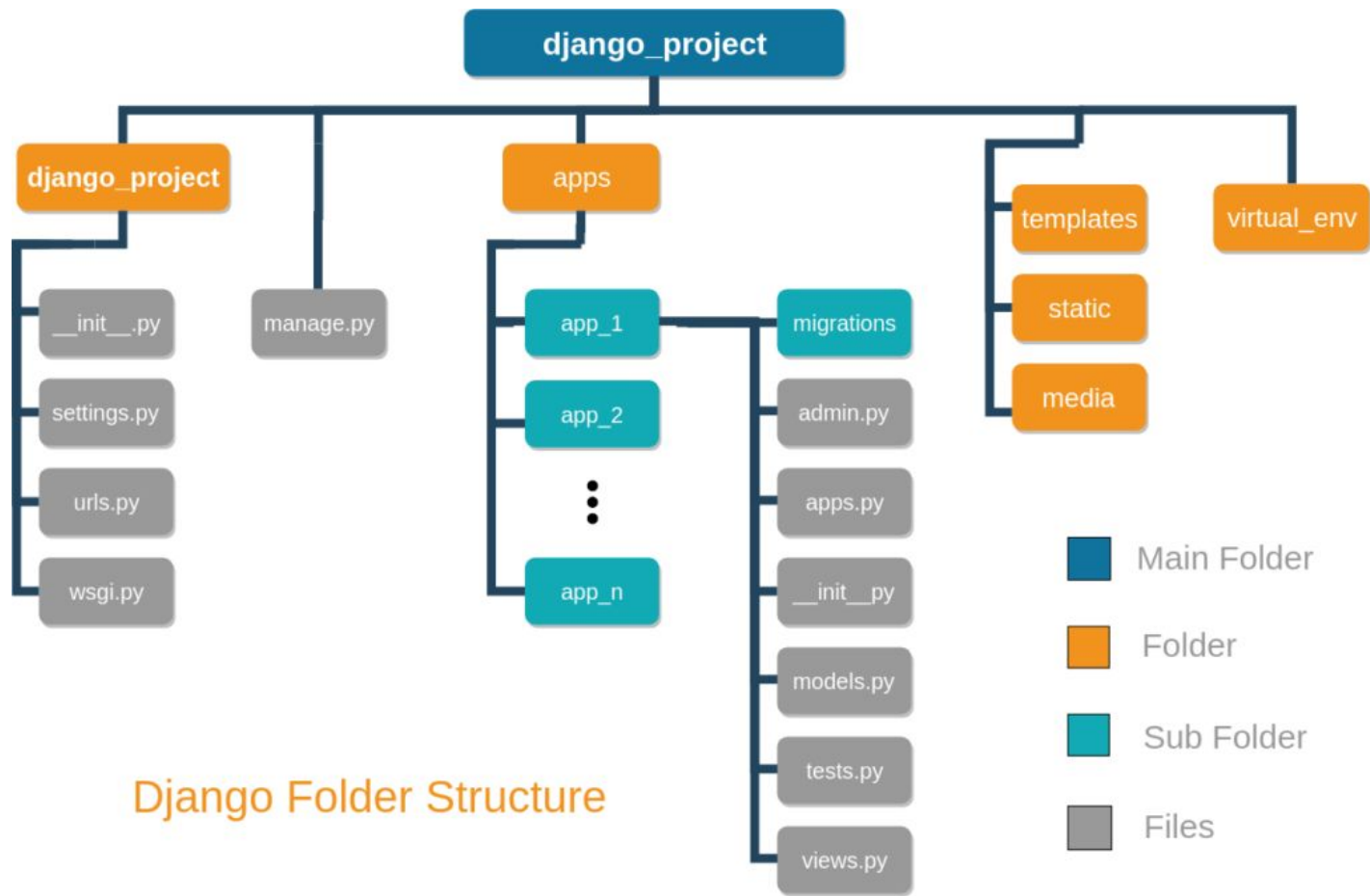


# Django Workflow

## Django Framework and Application Structure

Application Dependencies  
Framework





# Speech Emotion Recognition

By A.P.K

Record Audio

CHOOSE AUDIO FILE

03-01-05-02-02-01-02.wav

RECOGNIZE EMOTION

Audio Visualize

▶ 0:00 / 0:00



▶ 0:00 / 0:00



Recognized Emotion



Angry

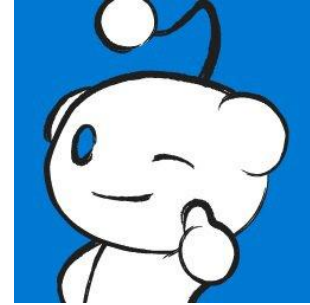
chrome

Thank  
You



# APK

## O1



**Abhishek**

Data Science Expert



# APK

## 02



**Kanishk Gupta**  
Full Stack Expert, Developer

# APK

## 03



**Parth**  
Hardware design