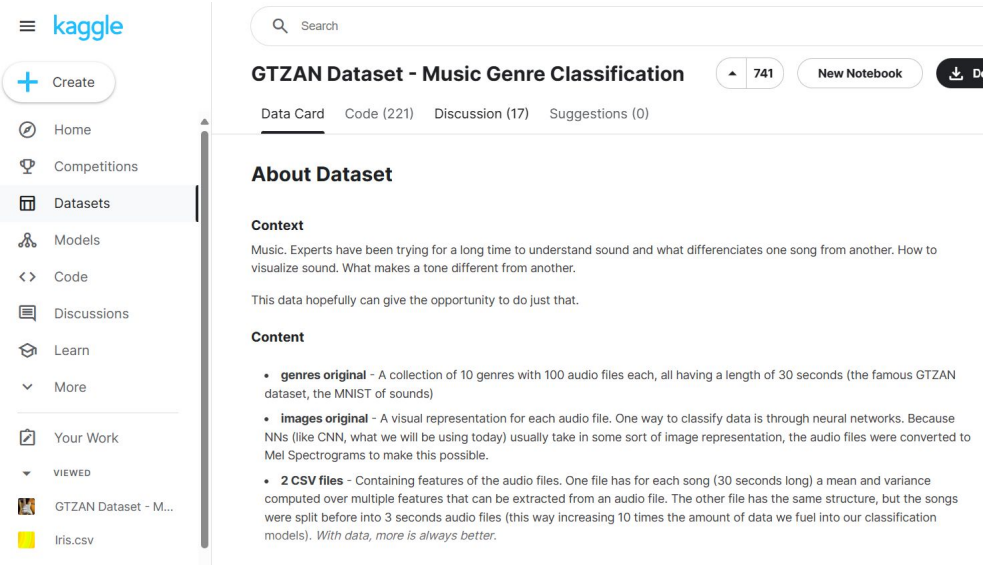
Music Genre Classification

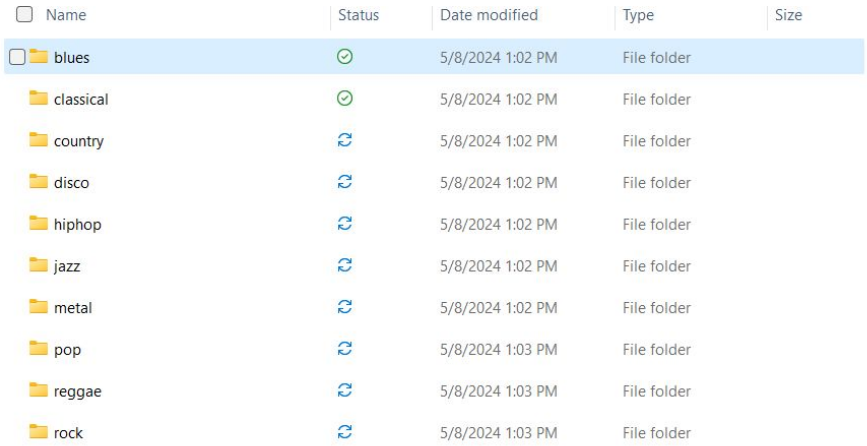
Phillip Wagner

Project Summary

- Goal: Classify Songs by genre
- Steps
  - Data preparation
  - Feature extraction
  - Model training
  - Evaluation/Improvement

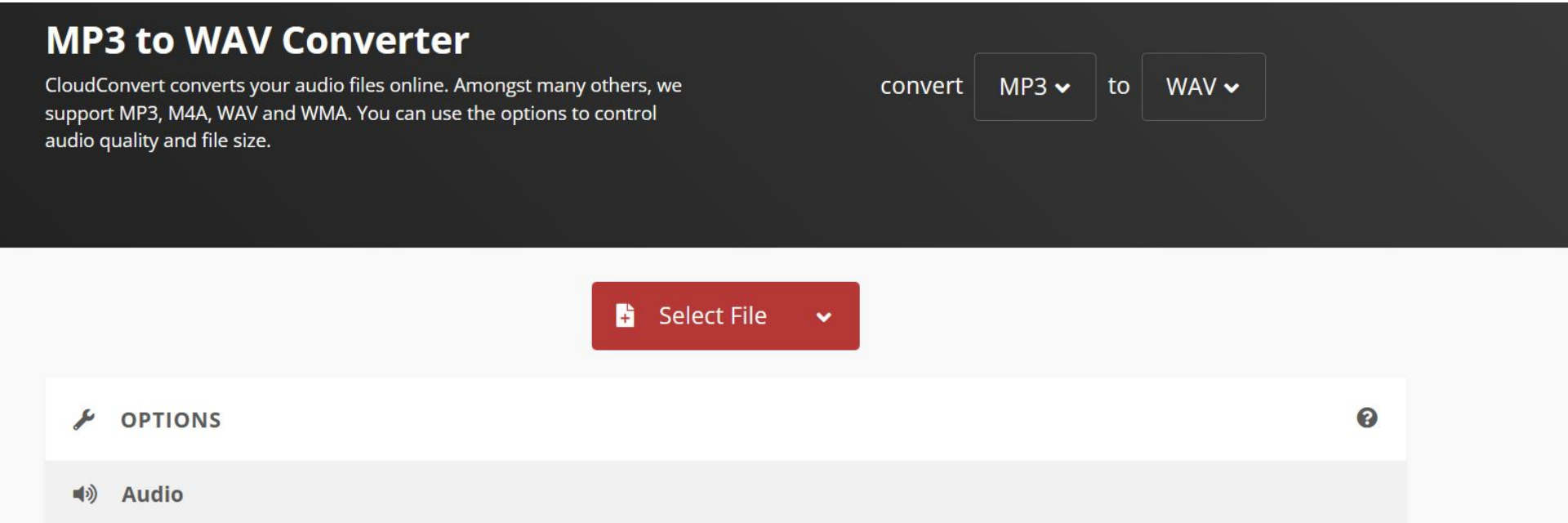
Importing dataset





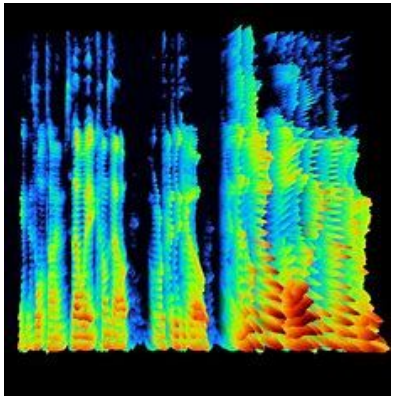
Converting data format

- Convert MP3 to WAV files, because they can be directly read by the scipy.io.wavfile package



Fast Fourier Transform Feature Extraction

- Different genres often have characteristic frequency patterns,FFT serves as a critical tool for feature extraction.
- FFT is applied using scipy.fft.fft, function computes the spectrum of the signal, capturing the amplitude of each frequency component
- Reduces complexity to focus on most significant frequencies
- spectrogram is a visual representation of the frequencies that occur in a song
    - Shows intensity to use for classification



Model Breakdown

- Logistic Regression Classifier -multiclass classification
- spectrogram is a visual representation of the frequencies that occur in a song
  - Shows intensity to use for classification
- model makes its genre prediction based on which genre has highest predicted probability for a given song, derived from the logistic function applied to the linear combination of FFT features.
- See accuracy with confusion matrix

```
[[26  1  2  0  0  2]
 [ 4  7  5  0  5  3]
 [ 1  2 14  2  8  3]
 [ 5  4  7  3  7  5]
 [ 0  0 10  2 10 12]
 [ 1  0  4  0 13 12]]
```