Music Genre Classification

Shreya Srivastava

Carolene Priscilla Siga

18752 Project

Content

- Problem statement (1 slide)
- Data collection and pre-processing (up to 2 slides)
- Feature extraction (3 slides)
  - Including Data visualization (1 slide)
- Regression/classification/time series prediction (4 slides)
  - One of these methods should meet the performance specification
- Picture of the software code (up to 2 slides)
  - Explain each section of the code
- Slides explaining methods that are unfamiliar to the class (up to 4 slides)

- You can also include additional slides if they help explain the project better

Problem statement

We aim to classify the music audio files to their appropriate genres.

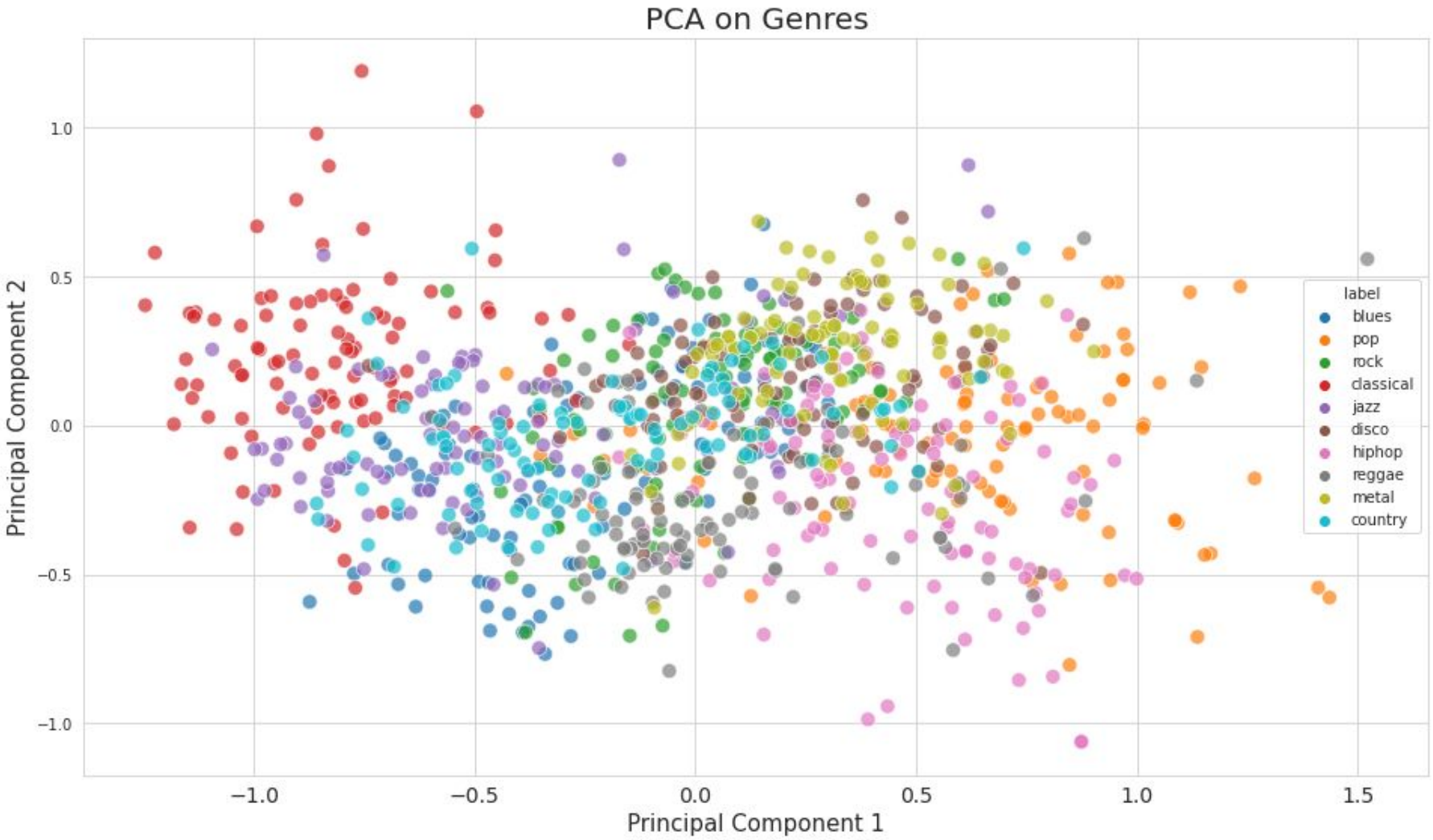
Classification results can support sociological and psychological research into how humans construct the notion of musical similarity and form harmonious groupings and how this compares to the objective truth.

We use GTZAN dataset which consists of 30-second segments of music from 10 different genres, each having 100 recordings (for a total of 1000).

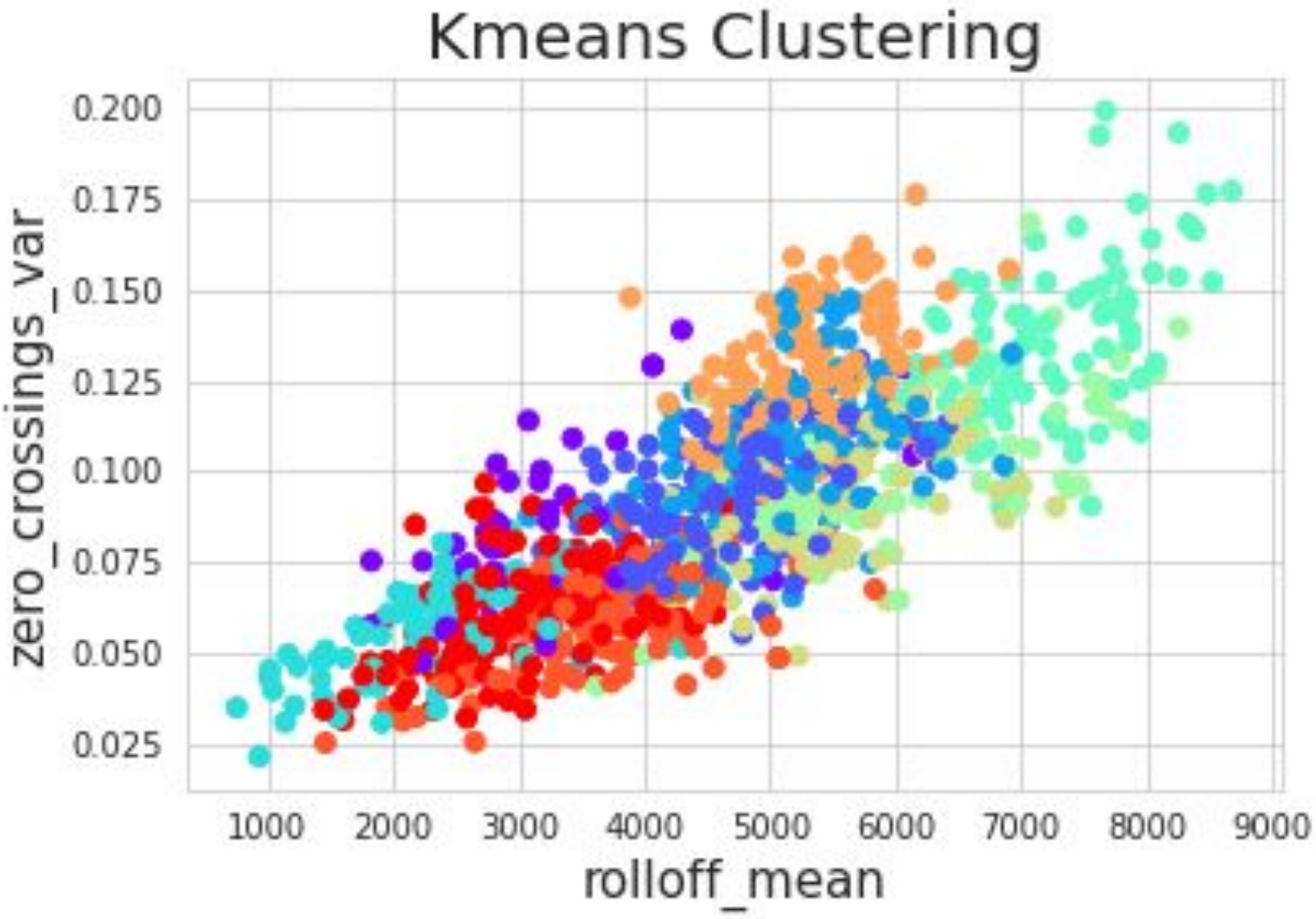
Feature extraction

- We extracted 47 features from the audio files of the GTZAN dataset.
- Extracted information includes- Mel spectrogram, zero crossings, tempo, MFCC, Chroma value, root-mean-square value for each frame, spectral centroid, spectral bandwidth, spectral roll-off, harmonic, and percussive elements.
- Conducted Principal Component Analysis and visualized the same in a 2-D plane. Used the learnt model and found rolloff_mean and zero_crossings_var to be influential features.
- We trained the K-means model with our extracted data and plotted the model with rolloff_mean and zero_crossings_var as the x and y axes.

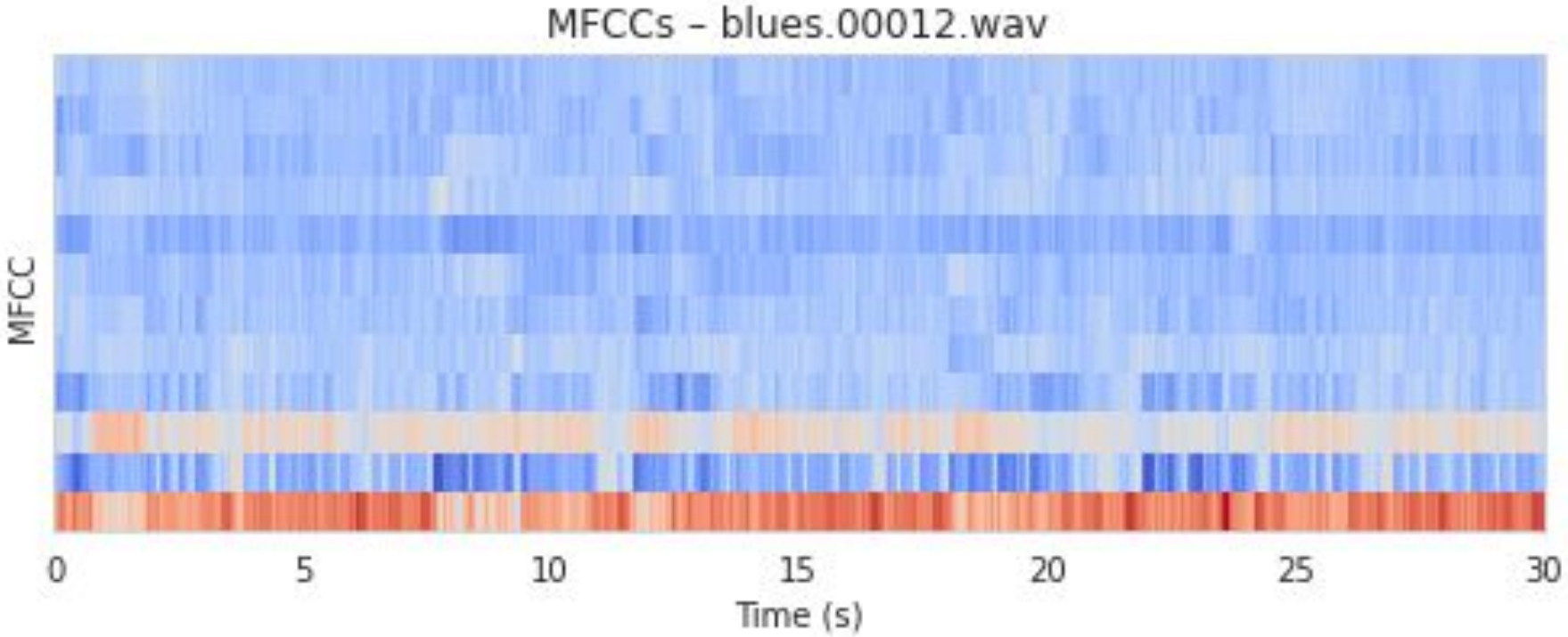
Feature extraction



Feature extraction



Data visualization



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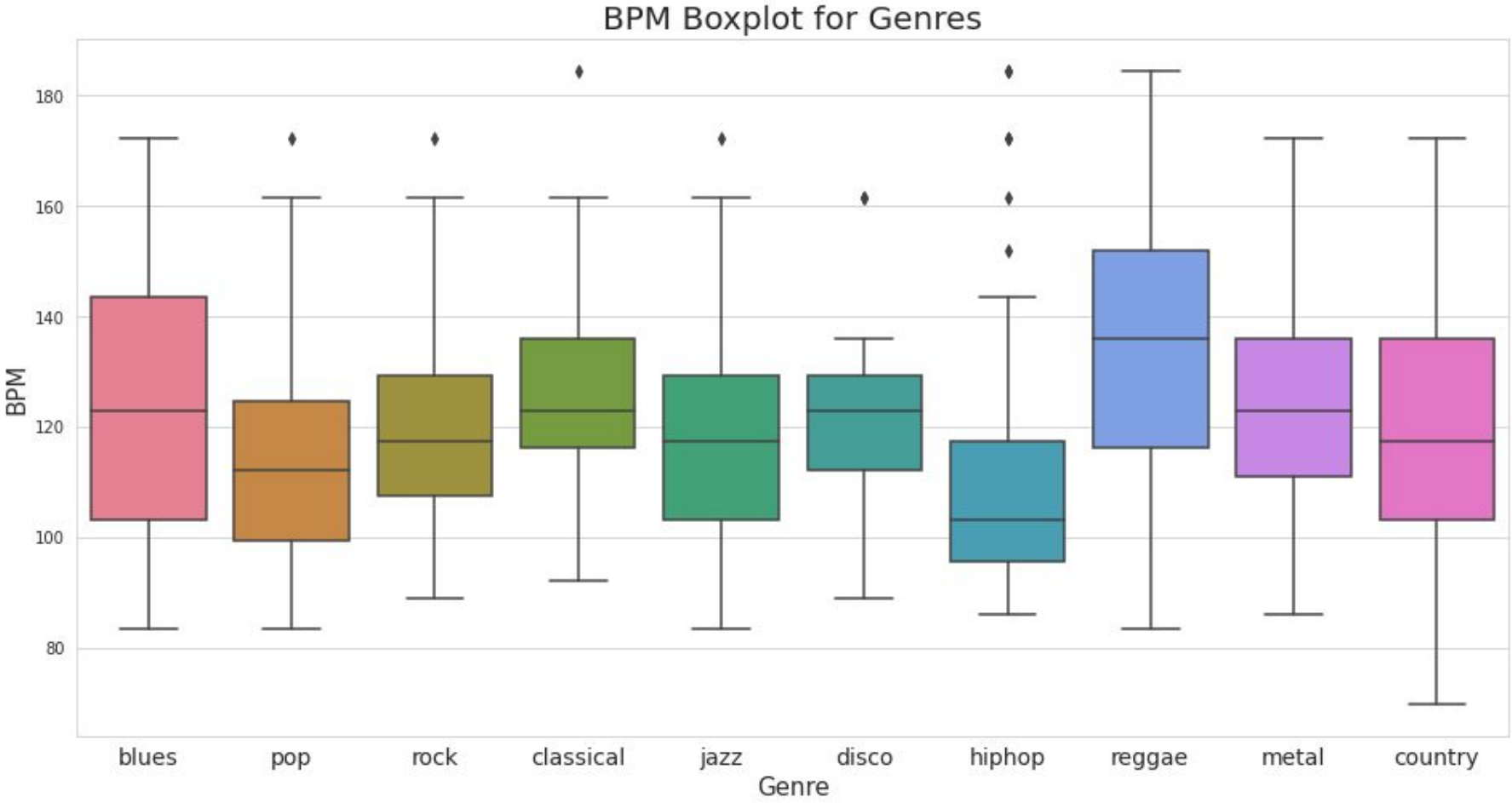
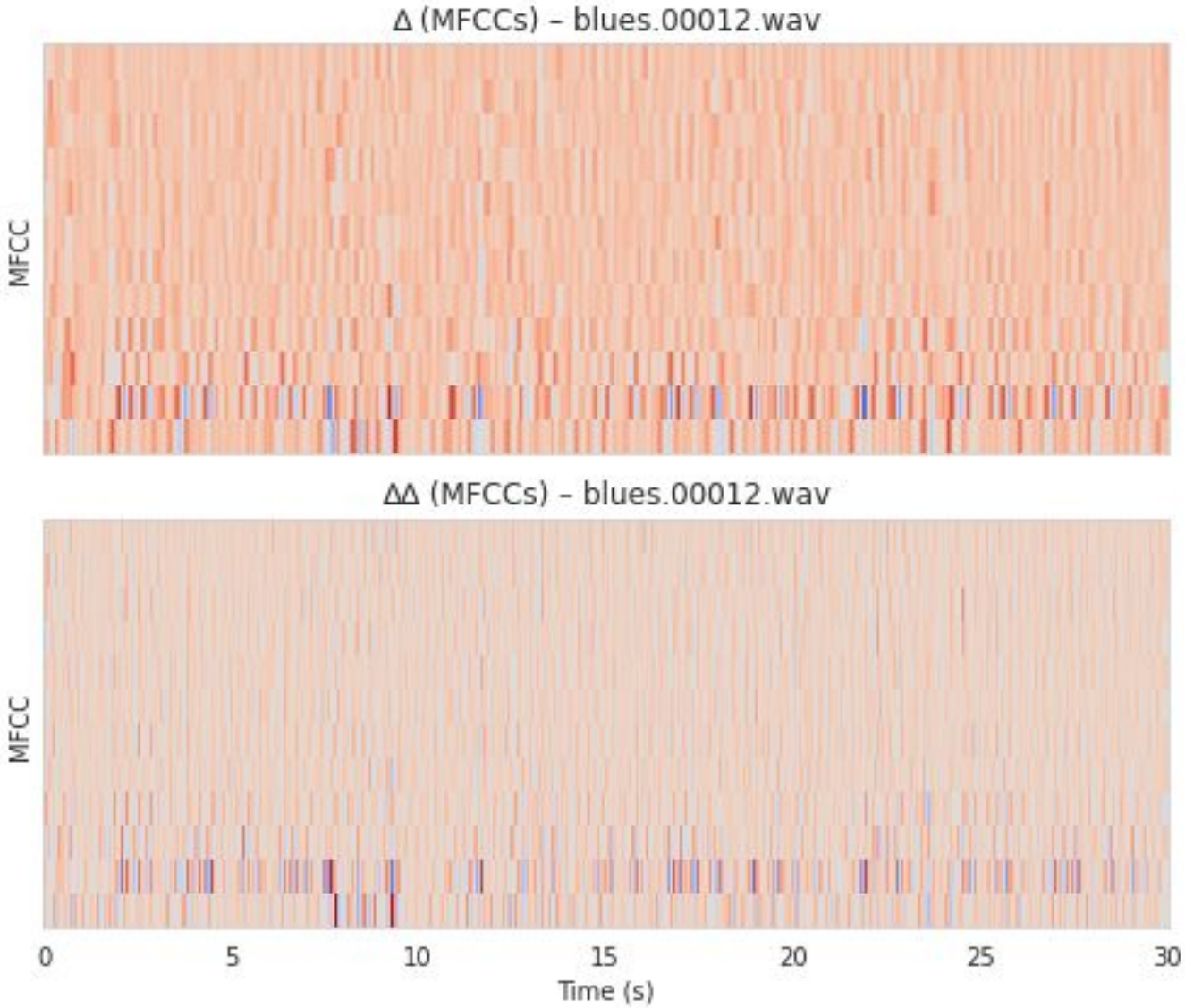


Data visualization



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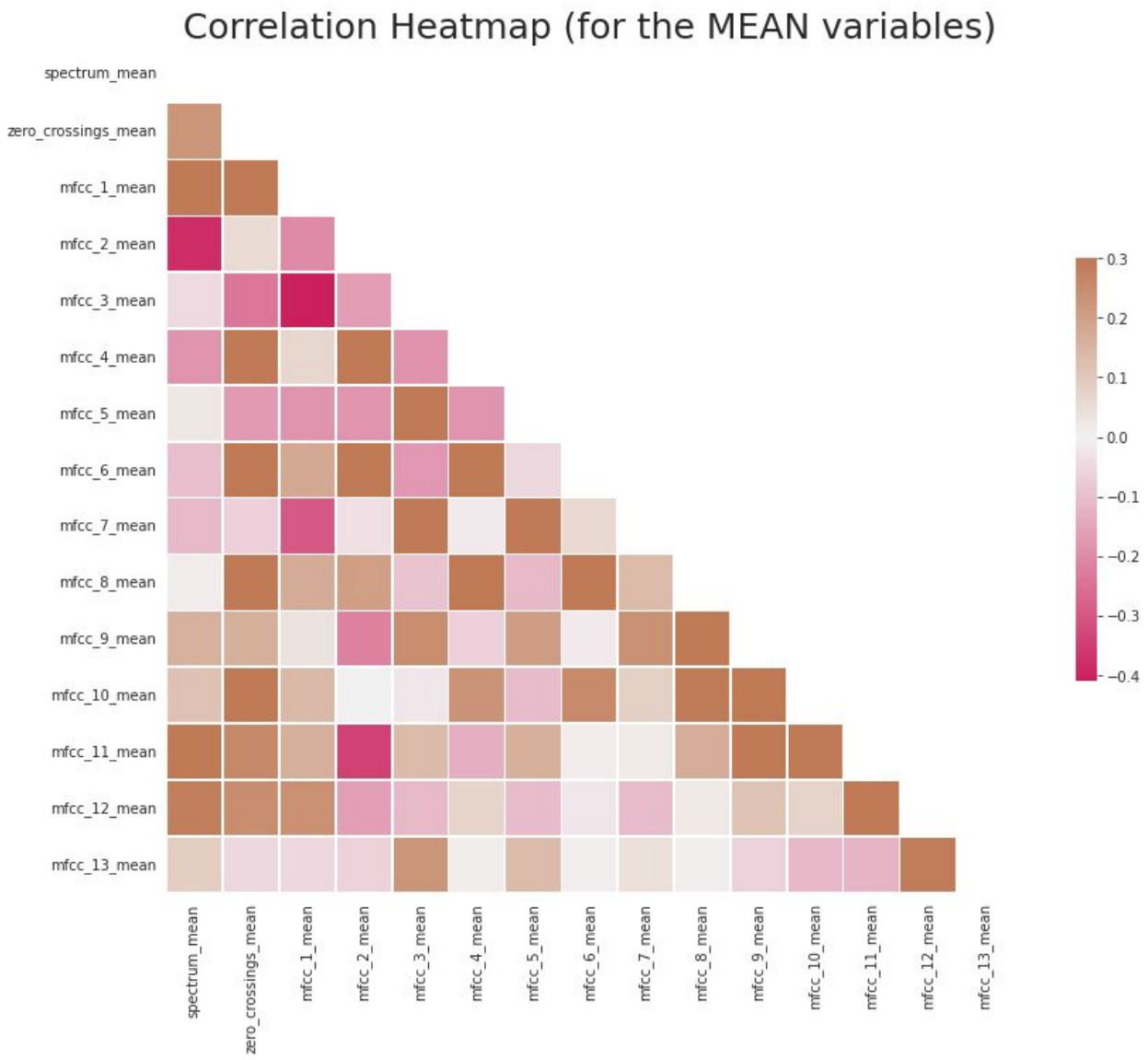

Classification Results

Model Name	Test Accuracy
Logistic Regression	69.0%
KNN Classifier	62.5%
MLP Classifier	69.5%
Support Vector Classifier	71.5%
Random Forest Classifier	73.0%
Bagging Classifier	63.5%
Gradient Boosting Classifier	71.0%
AdaBoost Classifier	29.0%
XGB Classifier	71.5%
CatBoost Classifier	76.5%