

Music Genre Classification Report

Problem

My task is classify given music into one of 10 genre (Blue, Classical, Country, Disco, Hiphop, Jazz, Metal, Pop, Reggae and Rock)

Dataset

I use GTZAN Dataset from [Kaggle](#) It contains first 3, 30 second of the song from 10 genre as mentioned 100 songs each

I use only 30 second one

Data preprocessing

I extracted the following features from the audio files:

- **MFCCs (Mel-Frequency Cepstral Coefficients):** Capture the timbral texture of the audio.
- **Spectral Centroid:** Indicates where the center of mass of the spectrum is located, related to the brightness of the sound.
- **Spectral Bandwidth:** Measures the width of the spectrum, indicating the range of frequencies present.
- **Spectral Rolloff:** The frequency below which a specified percentage of the total spectral energy is contained, indicating the skewness of the spectral distribution.
- **Zero Crossing Rate:** The rate at which the signal changes sign, related to the noisiness of the signal.

Selected Methods

First I try Random Forest with some hyper parameter tuning (Grid Search)

Then I try XGBoost with Grid Search the result is a bit better

The reason that I use Random Forest in the presentation because when training XGBoost I forgot about LabelEncoder line so the output is not genre but number

Tables of Metrics

Random Forest + Grid Search

Optimized Accuracy: 0.59

	precision	recall	f1-score	support
blues	0.81	0.77	0.79	22
classical	0.83	0.89	0.86	28
country	0.46	0.27	0.34	22
disco	0.30	0.29	0.29	21
hiphop	0.50	0.47	0.49	19
jazz	0.47	0.47	0.47	17
metal	0.67	1.00	0.80	12
pop	0.64	0.80	0.71	20
reggae	0.67	0.67	0.67	24
rock	0.29	0.27	0.28	15
accuracy			0.59	200
macro avg	0.56	0.59	0.57	200
weighted avg	0.58	0.59	0.58	200

XGBoost

Testing accuracy: 0.58

Testing:

	precision	recall	f1-score	support
0	0.81	0.77	0.79	22
1	0.86	0.89	0.88	28
2	0.50	0.36	0.42	22
3	0.47	0.38	0.42	21
4	0.33	0.42	0.37	19
5	0.44	0.47	0.46	17
6	0.71	1.00	0.83	12
7	0.70	0.80	0.74	20
8	0.55	0.50	0.52	24
9	0.15	0.13	0.14	15
accuracy			0.58	200
macro avg	0.55	0.57	0.56	200
weighted avg	0.57	0.58	0.57	200

XGBoost + Grid Search

Testing accuracy: 0.61

Testing:

	precision	recall	f1-score	support
0	0.83	0.91	0.87	22
1	0.87	0.93	0.90	28
2	0.41	0.41	0.41	22
3	0.37	0.33	0.35	21
4	0.47	0.47	0.47	19
5	0.44	0.41	0.42	17
6	0.67	1.00	0.80	12
7	0.74	0.70	0.72	20
8	0.61	0.58	0.60	24
9	0.40	0.27	0.32	15
accuracy			0.61	200
macro avg	0.58	0.60	0.59	200
weighted avg	0.60	0.61	0.60	200