

Music Classification and Recommendation System Avoiding Genre Selections

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Introduction/Goal

- Genres are too broad. Subgenres can also be nonspecific, which leads to unsatisfactory singular song recommendations.
- Collaborative systems aren't personalized. Users A and B both liking a single song does not necessarily mean A will like any of B's other songs.
- To recommend songs based on the analysis of other songs that a user likes.

Dataset

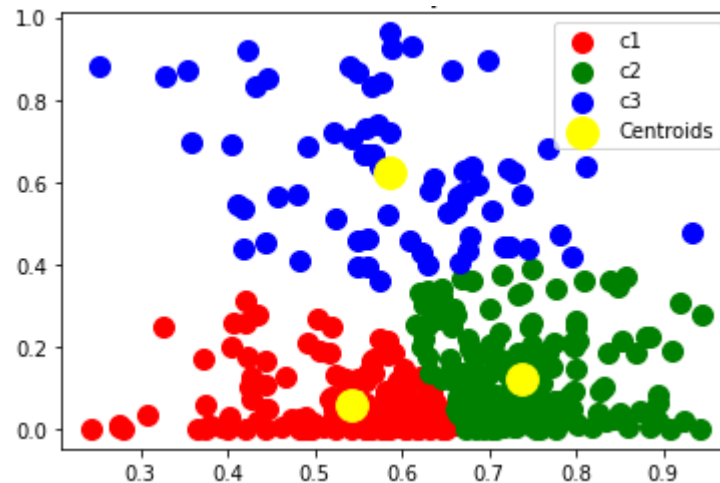
- The dataset used for initial testing was less than 200 songs from a small group of artists.
- Later tests of the system used a set of around 40,000 songs whose characteristics and identified genres spanned the spectrum.
- The available characteristics used for analysis were: danceability, energy, acousticness, instrumentalness, liveness, speechiness, and tempo.
- Values were standardized to fit on a scale from 0 to 1.

Clustering

- K-Means clustering used as the primary method for analyzing the data.
- Small, similar datasets have better cluster results than large, broad datasets.
- Clustering on a dataset with severely different characteristics has poor results.

System Implementation

- Determine the audio characteristics to analyze and compare across songs.
- Since large datasets have poor results, multiple, decreasingly sized iterations are performed to find most similar songs.
- Given a specific song, search for nearest neighbors in resultant clusters.



Cluster analysis of set of songs formed around energy, tempo, and danceability.

Results & Constraints

- The initial, smaller dataset had seemingly better results, likely because the songs were already semi-curved.
- As the dataset became larger, the recommendations became less precise, due to the much larger range of values for the characteristics used to cluster the data.
- Spotify's track audio analysis breaks down different sections of a song by pitch and timbre, which could be used to provide deeper insight into how a track actually sounds when played, then leveraged to further refine a selection of similar songs.