



What Makes A Music Genre

Is it some distinguishable combination of loudness, tempo, keys, instruments, or lyrics?

Motivation + Problem Statement

Academics have argued that categorizing music by genre is inaccurate and outdated

Many songs fall in multiple genre buckets

Genre is very subjective

Some songs may not fall into any bucket

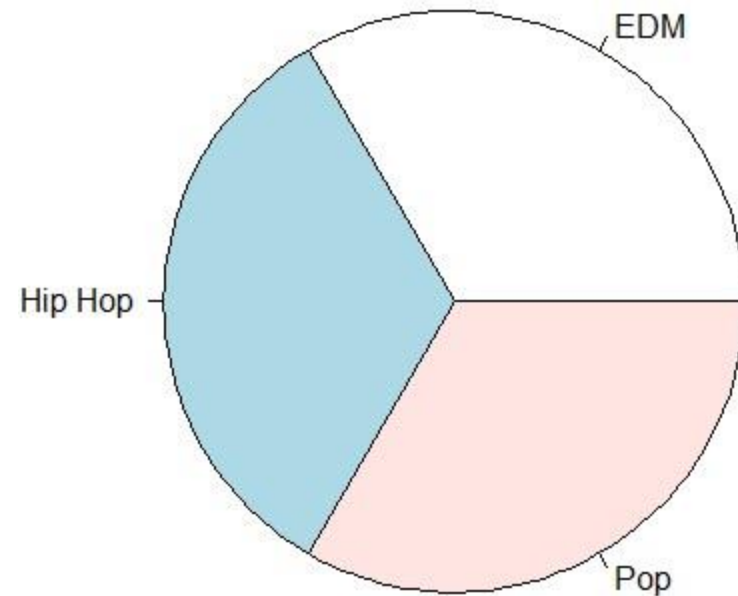
Songs can be falsely bucketed due to an artist's musical history

Can we use classification techniques to categorize songs utilizing quantitative measures?

About The Data

This dataset is derived from Spotify's Top 100 Most Popular Songs for 2017 and 2018.

harris kendrick
post malone
post maroon
dua ariana calvin
lamar grande drake
lipa the bandit
chainsmokers
sheeran clean
xxxtentacion



Songs were labeled by Genre (Not Included in Original Dataset).

Because the dataset predominantly composed of EDM, Hip Hop, and Pop songs, all other genres were deprecated due to the lack of data. 99 total songs.

There is a natural bias as a result of the dataset's song selection and genre association.

Types of Variables

This dataset contains 13 audio features (all numeric values) and target class, Genre:
EDM, Hip Hop, and Pop

Danceability

Based on a combination of musical elements... rhythm, beats, etc.

Energy

Represents a perceptual measure of intensity and activity.

Key

Mapped to pitches using standard Pitch Class notation.

Loudness

The overall loudness of a track in decibels (dB).

Mode

Indicates the modality (major or minor) of a track.

Speechiness

Detects the presence of spoken words.

Instrumentalness

Predicts whether a track contains no vocals.

Liveness

Detects the presence of an audience in the recording.

Valence

Describes the musical positiveness conveyed by a track.

Tempo

Estimated tempo of a track in beats per minute (BPM).

Duration and Time Signature

Duration in milliseconds and estimated overall time signature of a track.

Acousticness

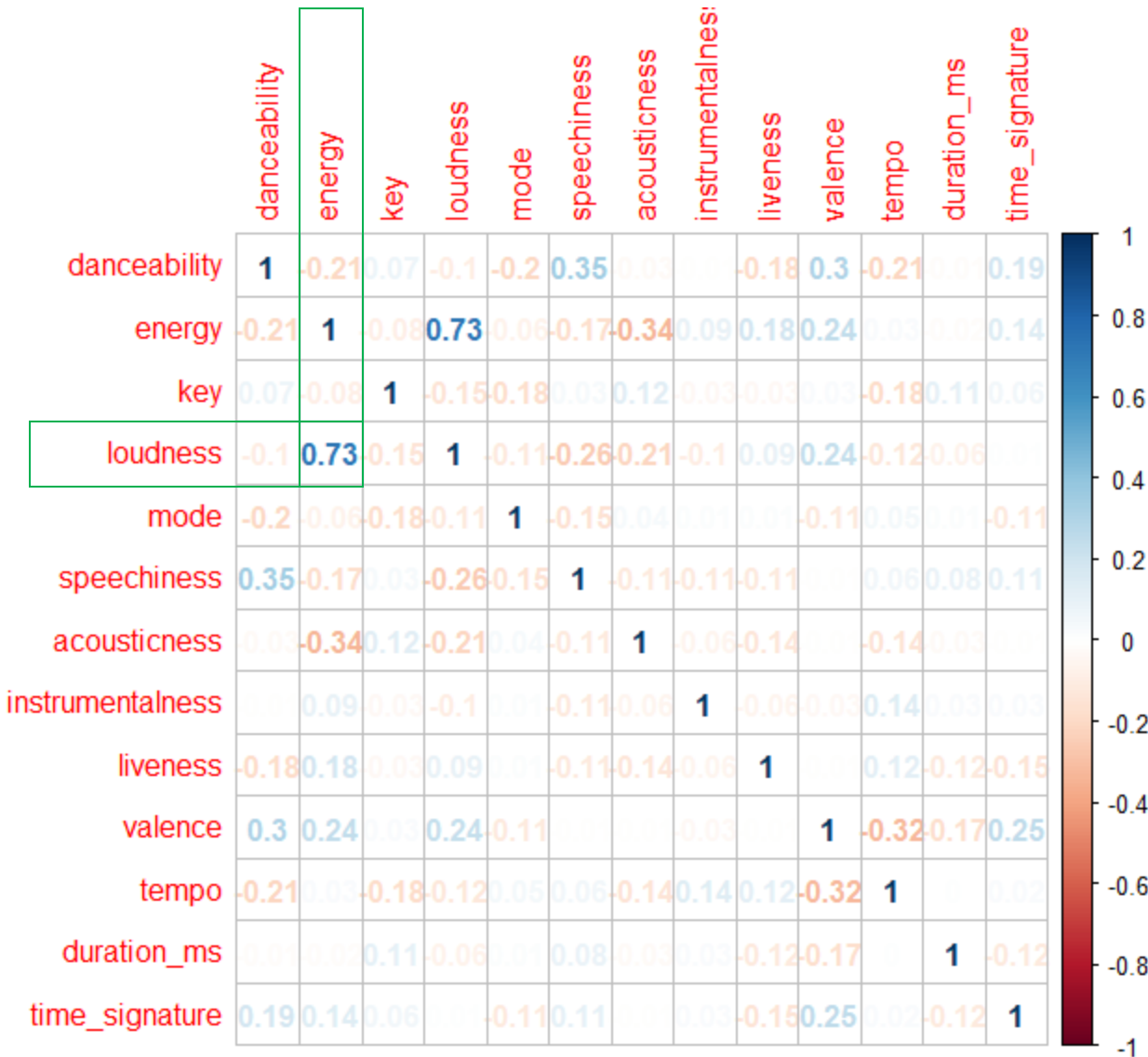
Represents high confidence the track is acoustic.

Multidimensional Audio Features

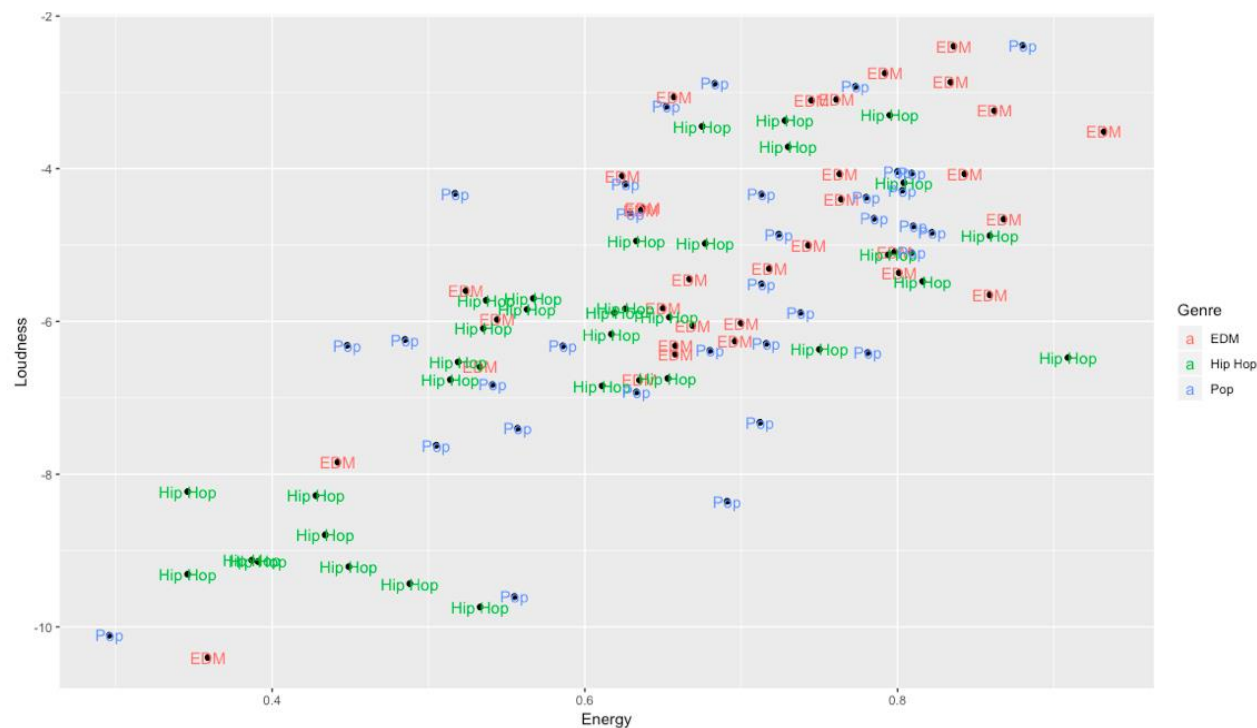
Although correlation shows a strong relationship between loudness and energy, there were no significant differences between audio features.

Some variables are dependent on others: such as energy and danceability

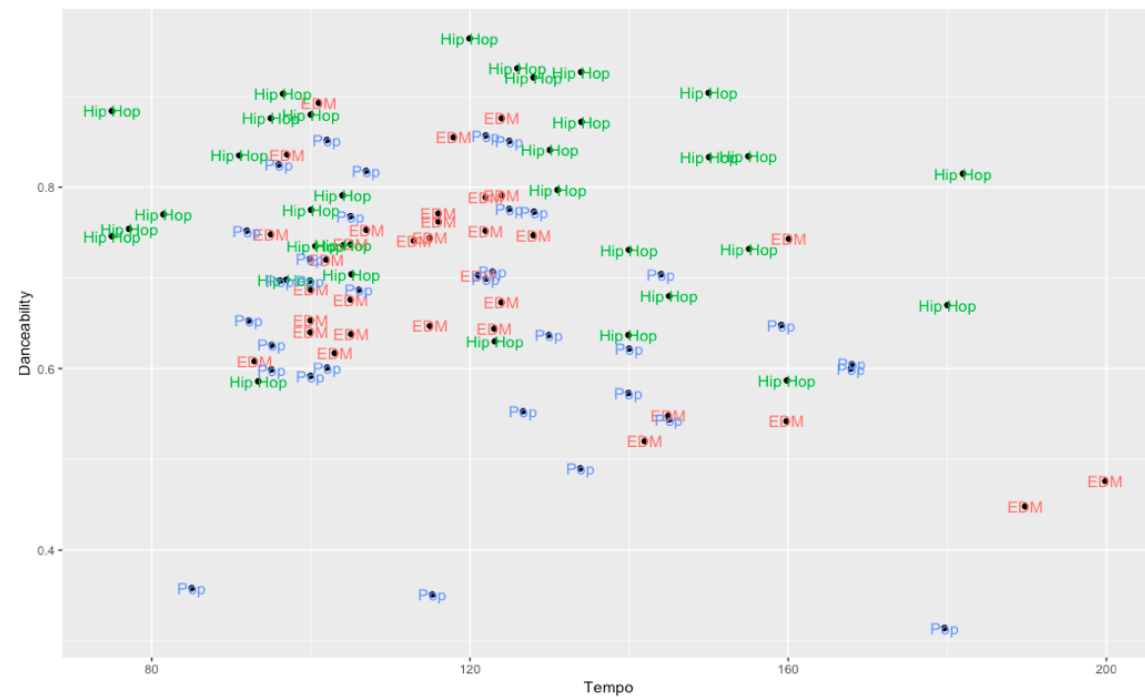
Energy: based on range, loudness, entropy
Danceability: based on rhythm, music, tempo



Correlated Variables



Energy is a function of Loudness

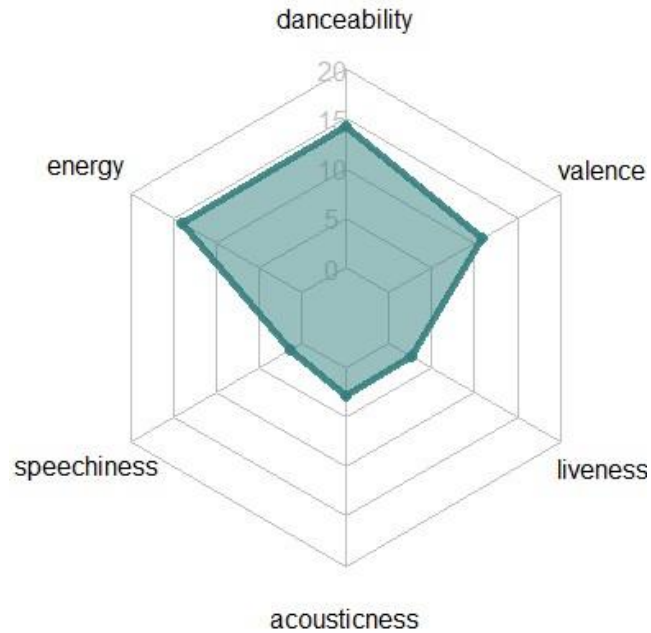


Danceability is a function of Tempo

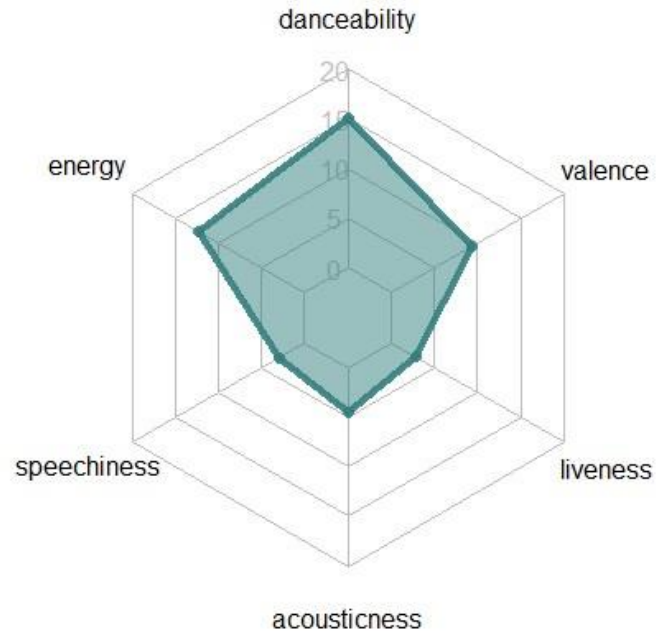
What's The Difference

Based on the calculated averages for audio features, the overall shape shows very little difference between EDM, Hip Hop, and Pop.

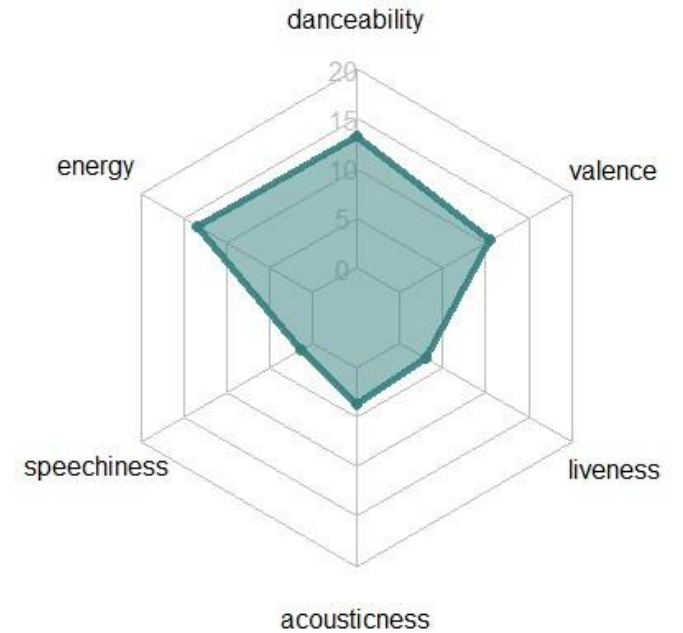
EDM



Hip Hop



Pop



Data Transformation

Discretized (Binning) all numeric values, and Deprecated ID, Song, Artist, Duration, and Song Signature from dataset.

Danceability.

Low
Moderate
High
Very High

Energy

Low
Moderate
High
Very High

Key

As Factor*

Loudness

Very Loud
Loud
Moderate
Low

Instrumentalness

Likely Vocal
Likely Instrumental

Mode

As Factor*

Speechiness

Non-Wordy
Somewhat Wordy
Wordy

Valence

Sad
Somewhat Sad
Somewhat Happy
Happy

Tempo

Low
Moderate
Somewhat High
High

Liveness

Not Live
Likely Live

Acousticness

Low
Moderate
High
Very High

Rules

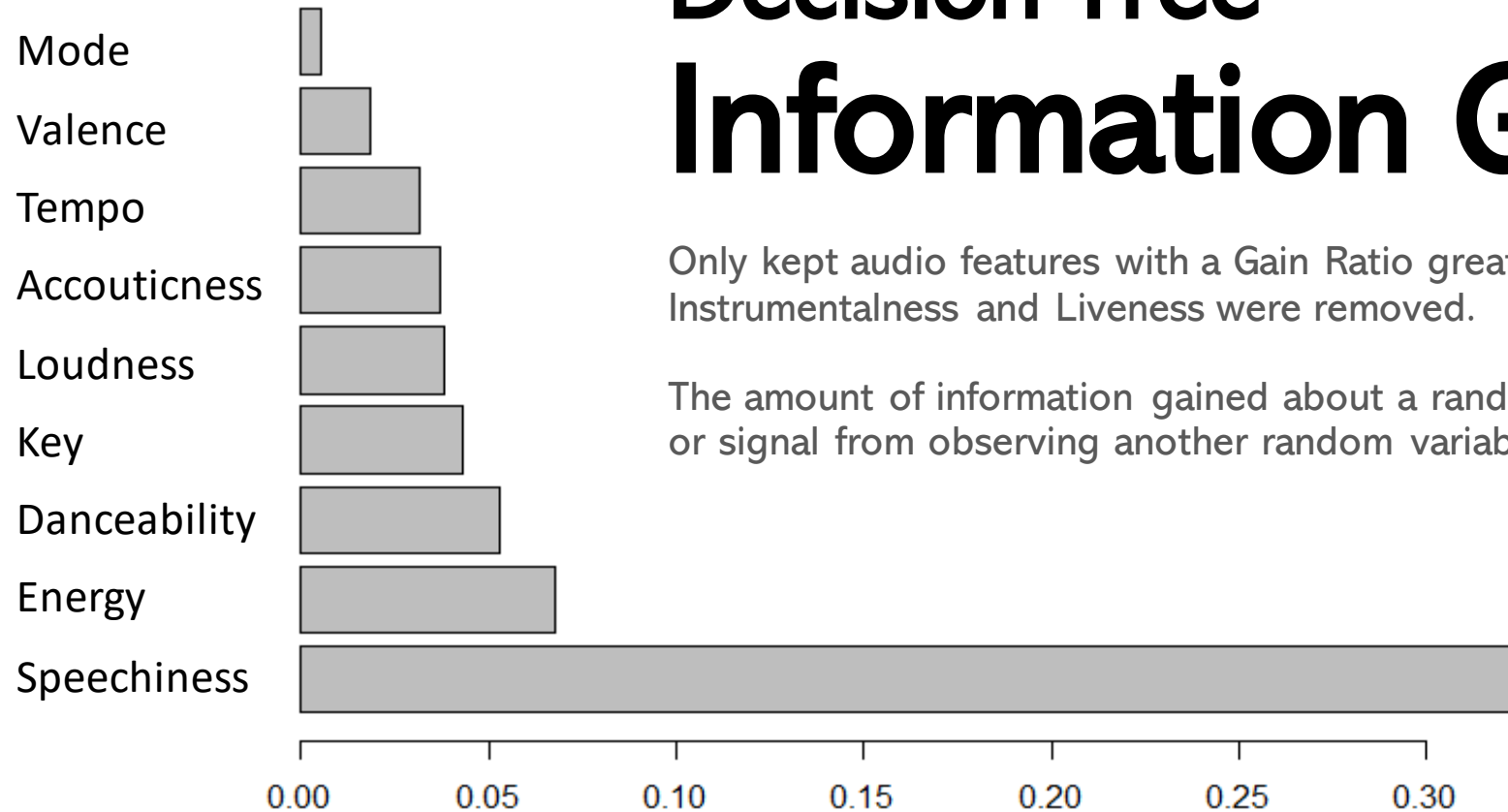
	EDM	Hip Hop	Pop
Energy	High	Moderate	Very high
Accousticness	Low	Low	Moderate
Loudness	Loud	Very Loud	Loud
Valence	Somewhat Sad	Somewhat Sad	Happy
Danceability	High	Very High	High
Key	11	1	8
Instrumental	Vocal	Vocal	Vocal
Tempo	Somewhat High	Moderate	Somewhat High
Speechiness	Non wordy	Somewhat wordy	Non wordy

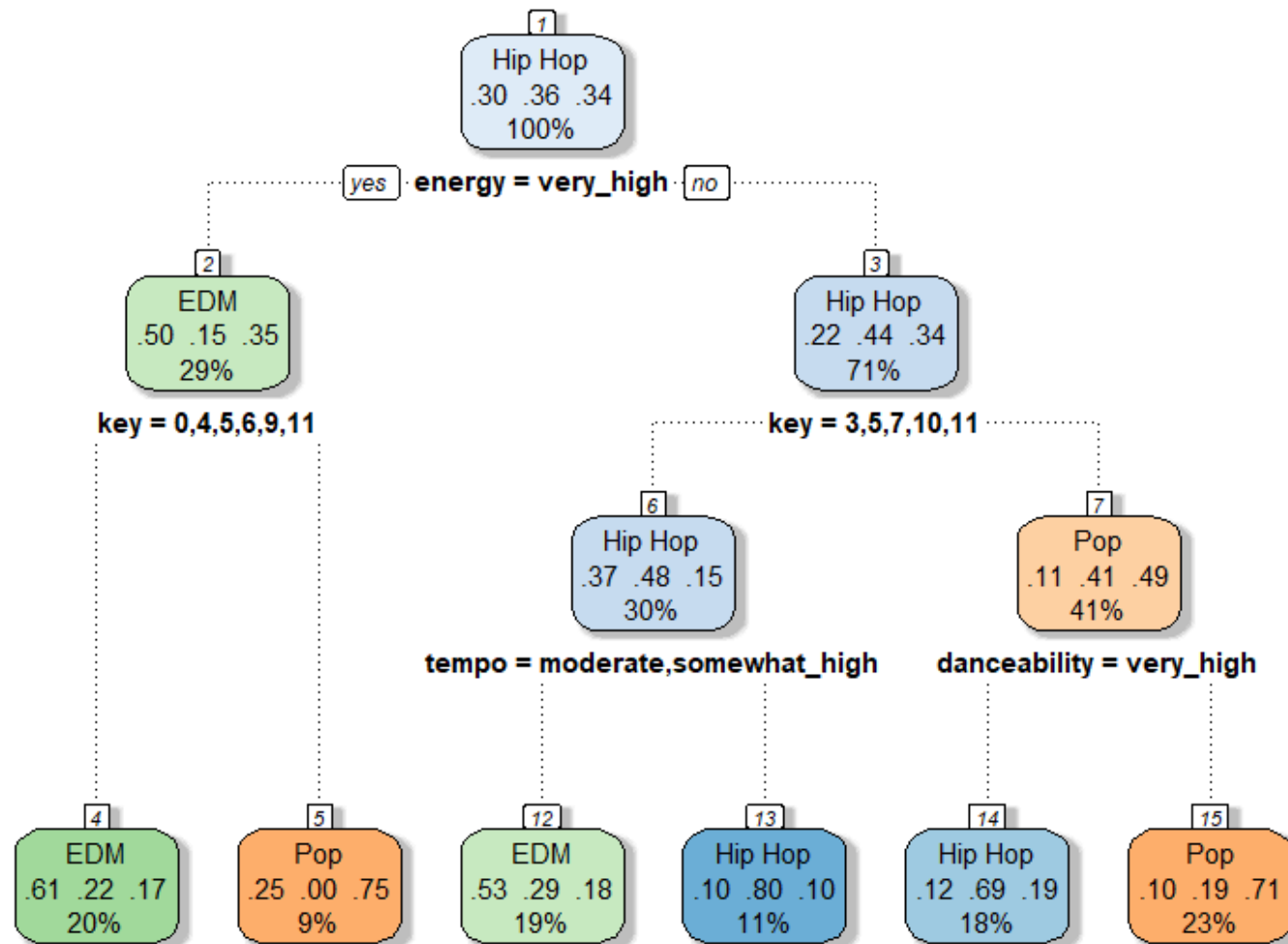
Decision Tree

Information Gain Ratio

Only kept audio features with a Gain Ratio greater than 0.
Instrumentalness and Liveness were removed.

The amount of information gained about a random variable
or signal from observing another random variable.





Decision Tree

Accuracy: 56%

Default parameters produced the greatest prediction rate.

Used a 10-fold Cross Validation to test the effectiveness of the model.