# What makes a song popular?

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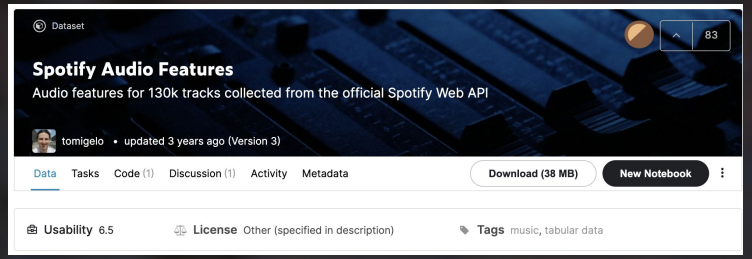
# Roadmap

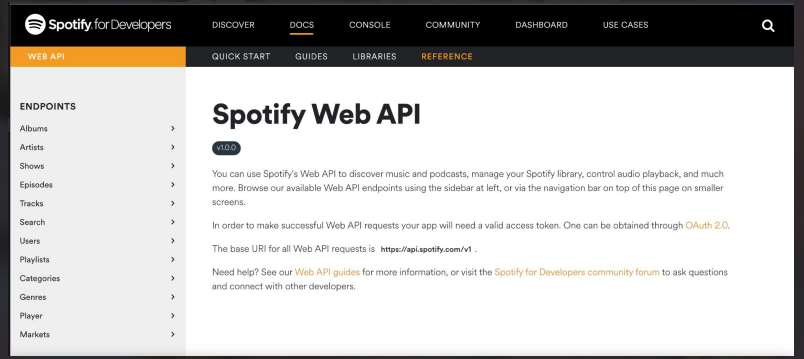
Dataset
Hypothesis
Challenges
Results
Future work

# Dataset of Spotify Audio Features

- Distinguishing aspects of a song were created by the Spotify Web API
  - Acousticnesss
  - Danceability
  - Duration_ms
  - Energy
  - Instrumentalness
  - Key
  - Liveness
  - Loudness
  - Mode
  - Speechiness
  - Tempo
  - Time_signature
  - Valence
- Spotify gave songs their own ‘popularity’ rating (from 0 - 100)
  - ➢ We updated the labels as 0 (unpopular) or 1 (popular)




- https://www.kaggle.com/tomigelo/spotify-audio-features




- https://developer.spotify.com/documentation/web-api/reference/#/

# Hypothesis

## Best Features

**Energy**

Fast-paced and energetic songs

**Danceability**

How “dance-able” song is using Spotify’s mysterious metric

## Worst Features

**Key**

Logically wouldn’t have a big effect on popularity

# Methods to Find the Best Feature

Entropy

Classification Accuracy

ROC Curves

Before applying methods need to: Discretize the data!

Splits method? ❌
KBinsDiscretizer ✅

# Challenges

## Discretizing the data

- Initial strategy: Splits method
  - Conclusion:
    - Wrong way to go
  - Rationale:
    - Too many splits (same as continuous)

# Limitations

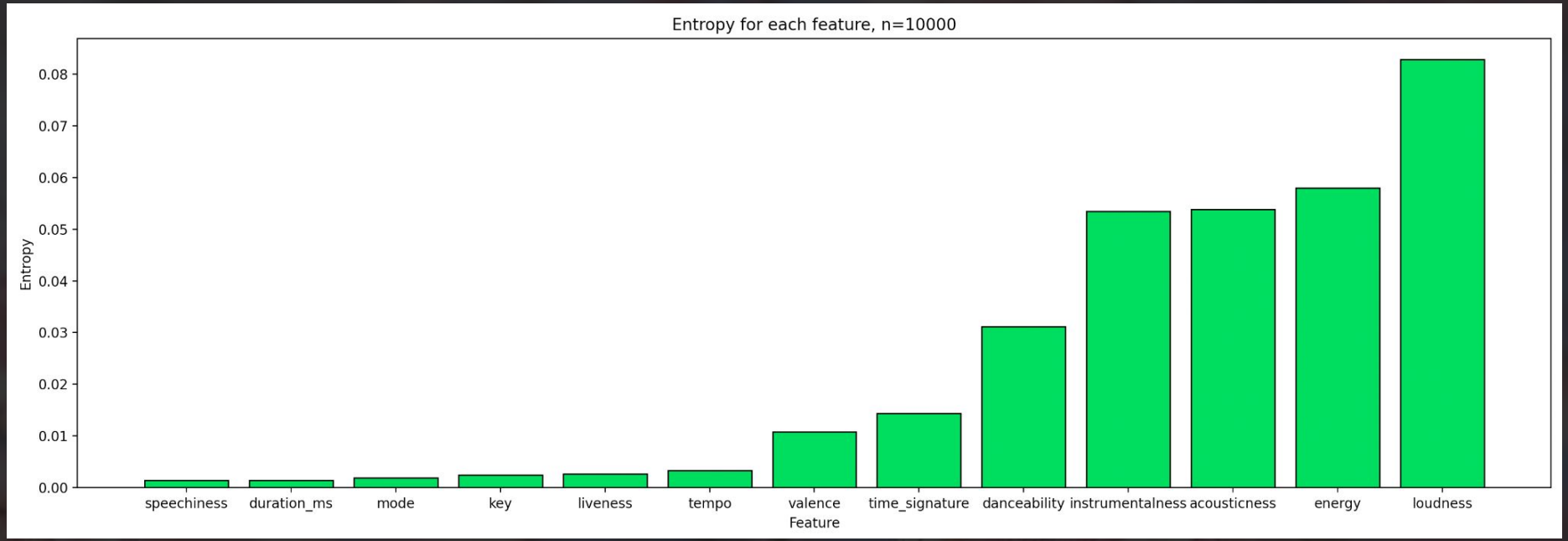
## Excluding features (ex. artist name)

- Popularity of an artist impacting popularity of their songs

## Only using first 10,000 examples

- Computer limitation

# Results: Entropy



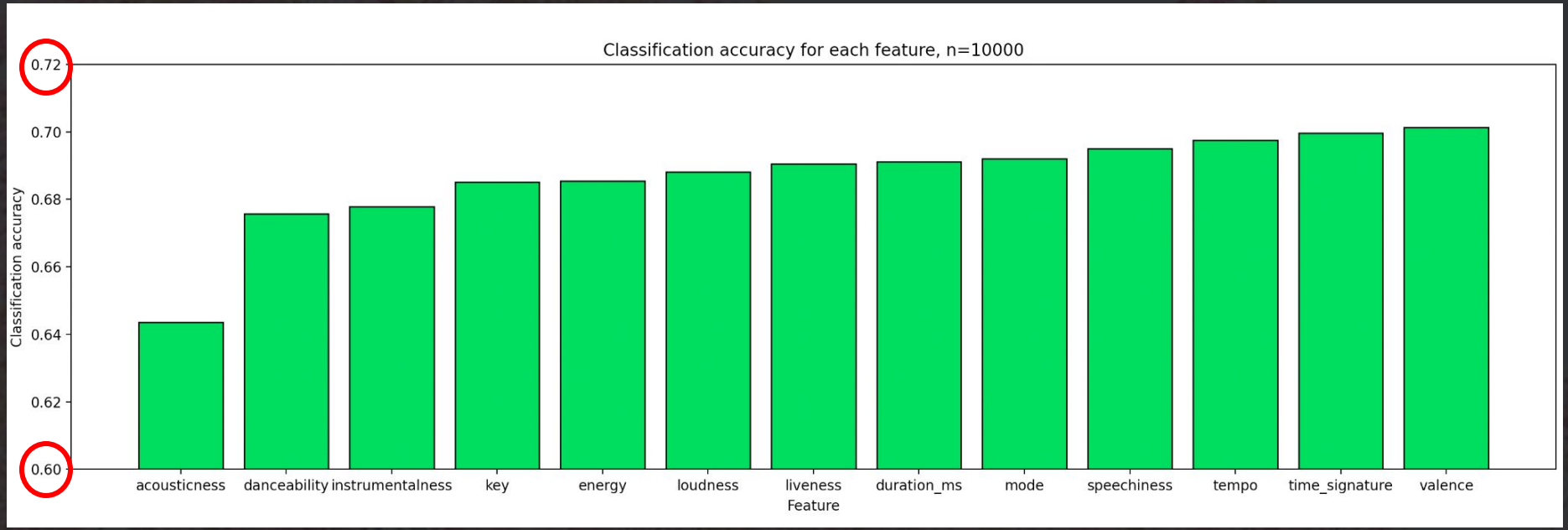

Best Features:

- Loudness
- Energy
- Acousticness

Worst Features:

- Speechiness
- Duration
- Mode

# Results: Classification Accuracy

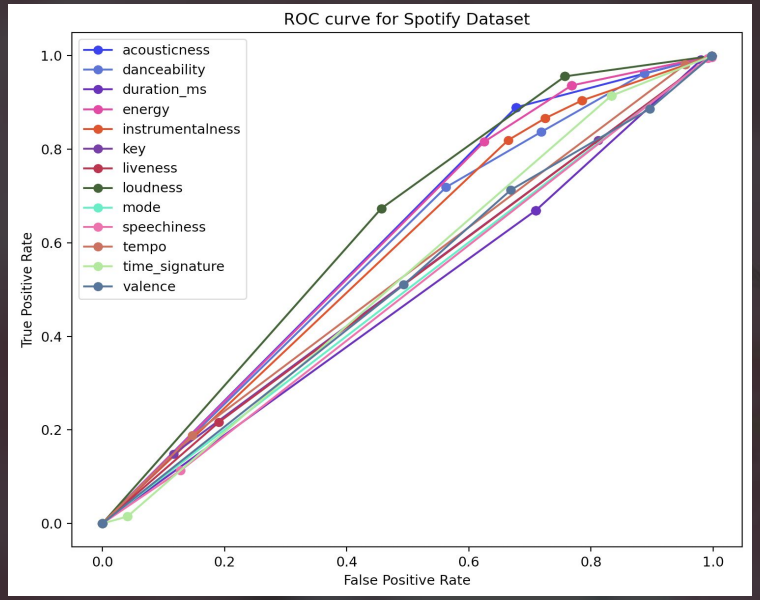


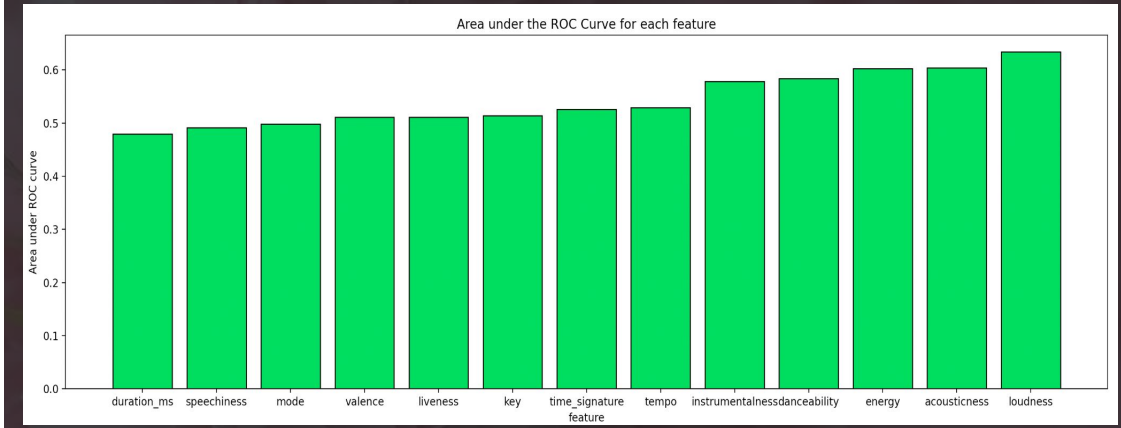

Best Features:
- Valence
- Time signature
- Tempo

Worst Features:
- Acousticness
- Danceability
- Instrumentalness

# Results for ROC

(80/20 split)




Best Features:

- Loudness
- Acousticness
- Energy

Worst Features:

- Duration
- Speechiness
- Mode

# Comparing results

**Entropy**

- Loudness
- Energy
- Acousticness

**Classification**

- Valence
- Time signature
- Tempo

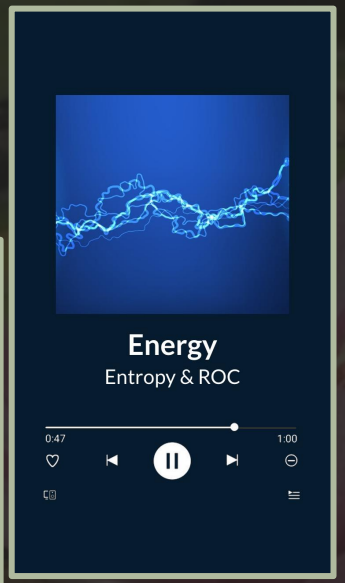
**ROC curve**

- Loudness
- Acousticness
- Energy

# Conclusion

# Future Work

**Best features for predicting popularity**




- How an artist's popularity affects a song popularity

# Sources [Images]

- https://www.kapwing.com/studio/editor
- https://www.pngegg.com/en/search?q=music+Bar
- https://www.funkidslive.com/wp-content/uploads/2016/08/ennandgee_0006_Layer-1.jpg
- https://www.kapwing.com/videos/61b0514b109edb003dccfd0b
- https://ecdn.teacherspayteachers.com/thumbitem/Musical-Instruments-Clipart-Vector-Set-2609367-1500873597/original-2609367-1.jpg
- https://videohive.img.customer.envatousercontent.com/files/250670897/Music%20Energy%20Waveform%203%20HD%20Inline.jpg?auto=compress%2Cformat&fit=crop&crop=top&max-h=8000&max-w=590&s=44ad46da8e4fc8fae061473dee758092