# Spotify Song Recommender

Presented by: Veda Patel
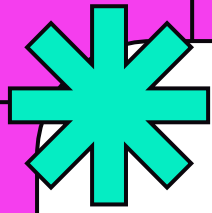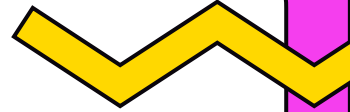
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# 01 Project Inspiration

# Project Inspiration

**Music Streaming**

**Spotify**

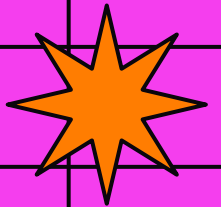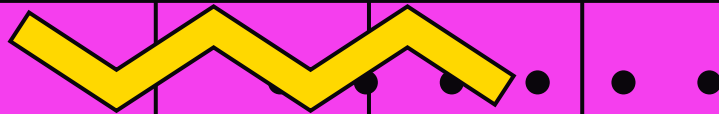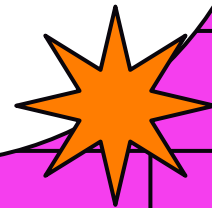**Playlists**

**Audio Features**

# Problem Statement

**02**

# Problem Statement

- Music Classification
- Song Recommender
- Playlist Curation

# 03
# Data Collection & Preprocessing

# Spotify API

Get song audio data

Playlist

Willis Orr • 5,827 likes • 10,000 songs, over 24 hr
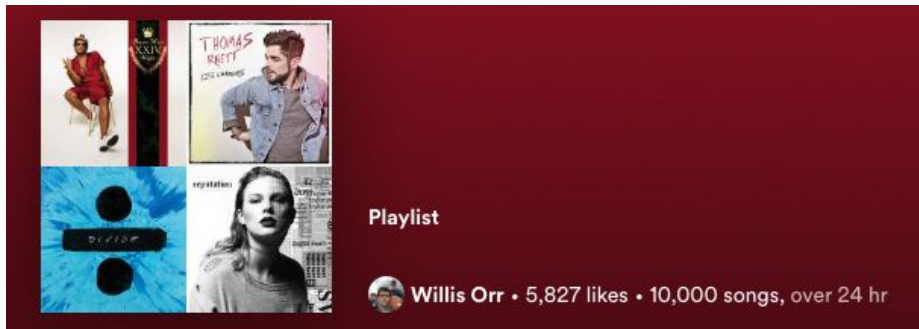
# 8,816 songs

After cleaning

# Some Audio Features

**Danceability**
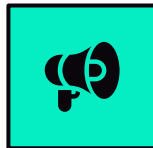
**Energy**

**Loudness**

**Acousticness**
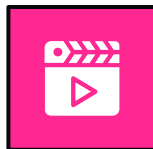
**Valence**

**Tempo**

# Clustering Songs

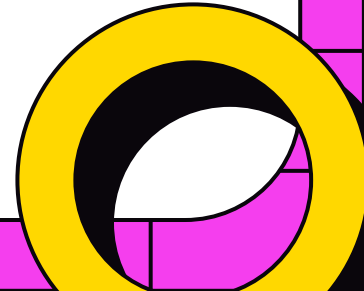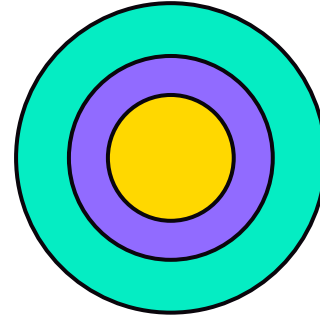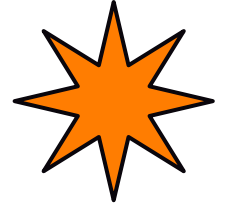**Principal Component Analysis**

**2 Clustering Techniques**

**9 Clusters**

# 04

# Exploratory Data Analysis
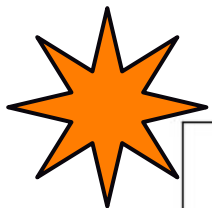
# Release Date Distribution
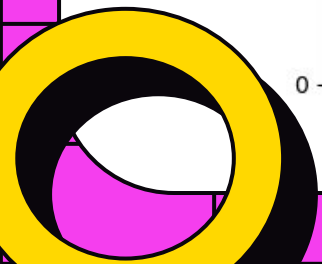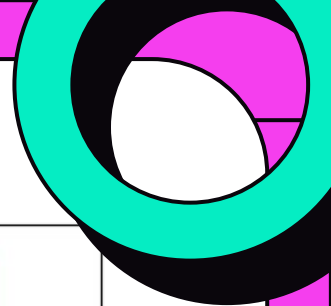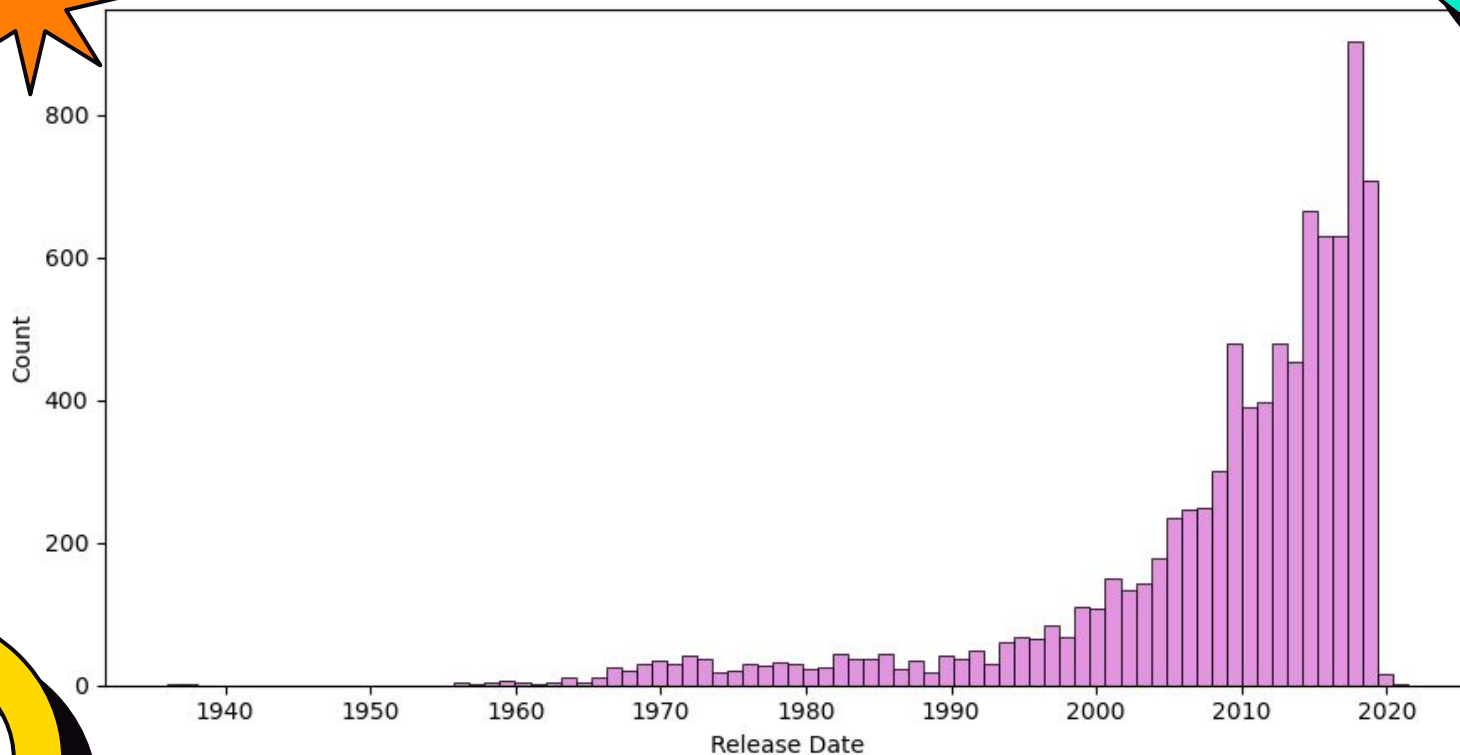
# Top Artists Occurrences in Playlist



Top 10 Arists with Most Occurances

# Correlated Audio Features



Loudness vs. Energy (Positive Correlation)

Danceability vs. Valence (Positive Correlation)

# Correlated Audio Features



Acousticness vs. Loudness (Negative Correlation)

Acousticness vs. Energy (Negative Correlation)
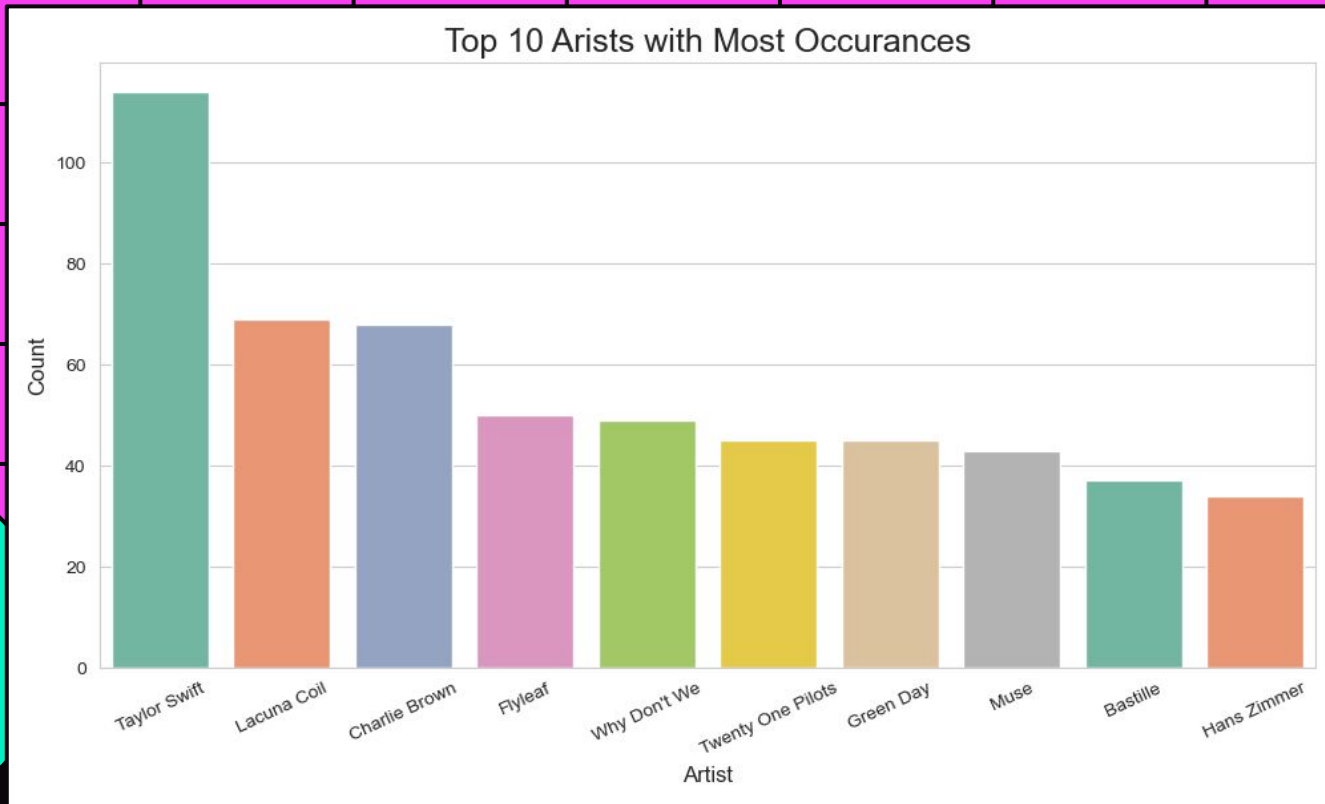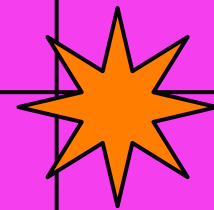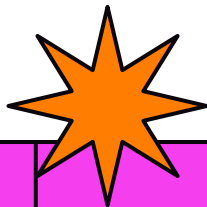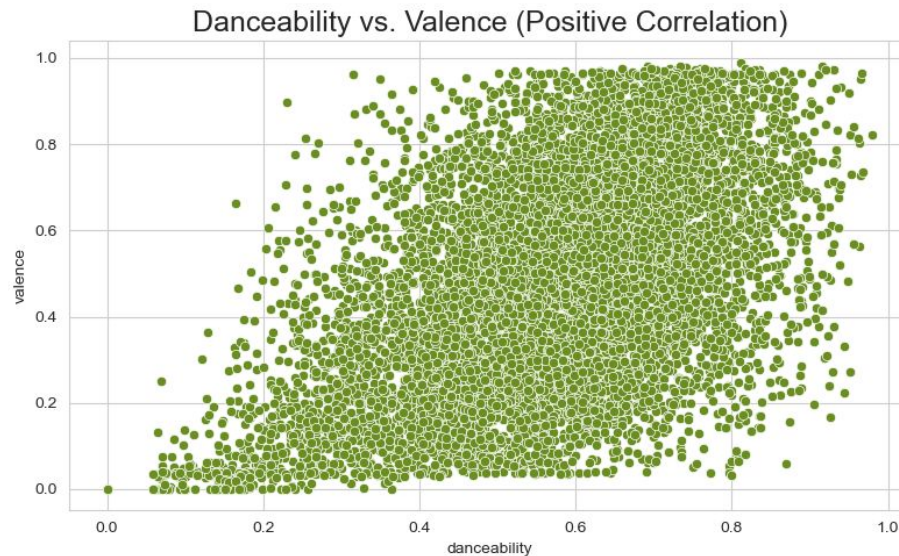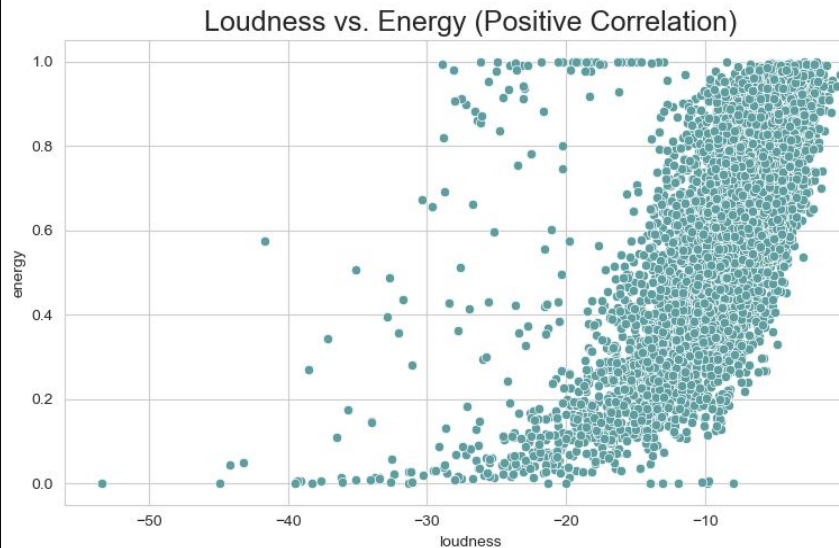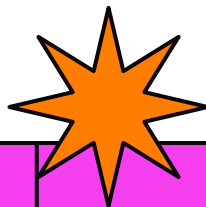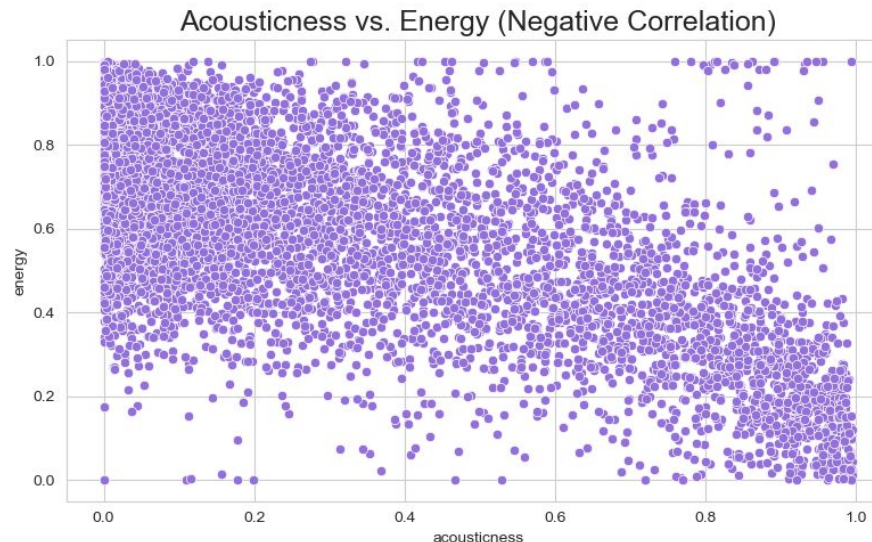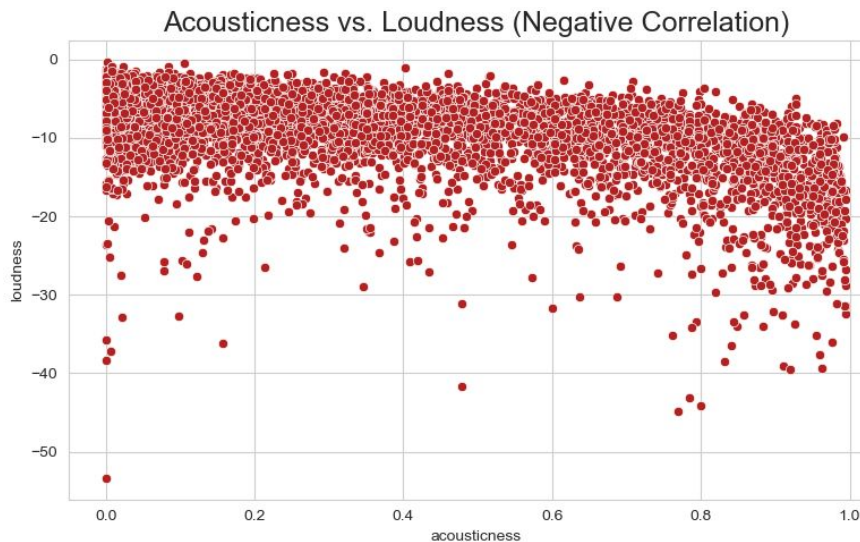
# Cluster Characteristics
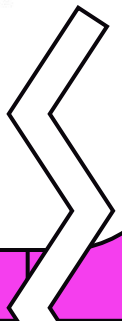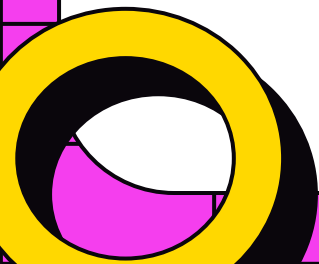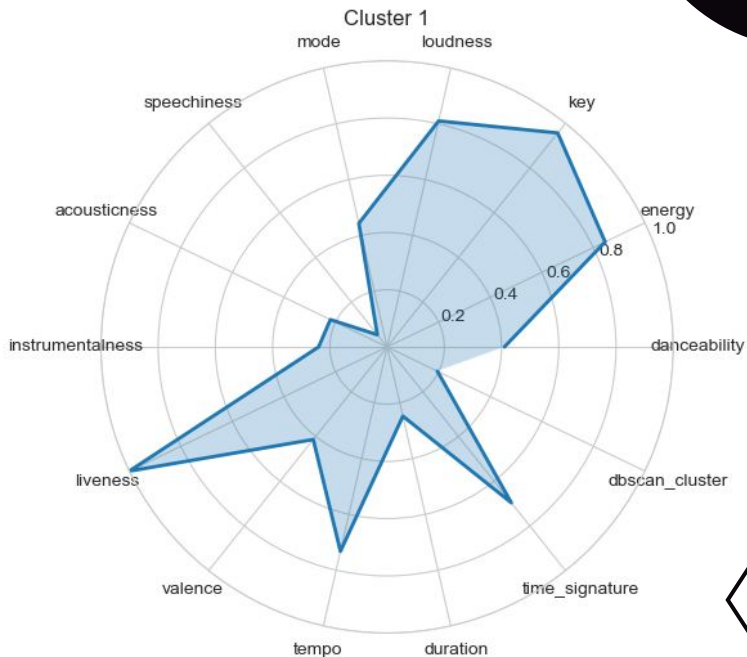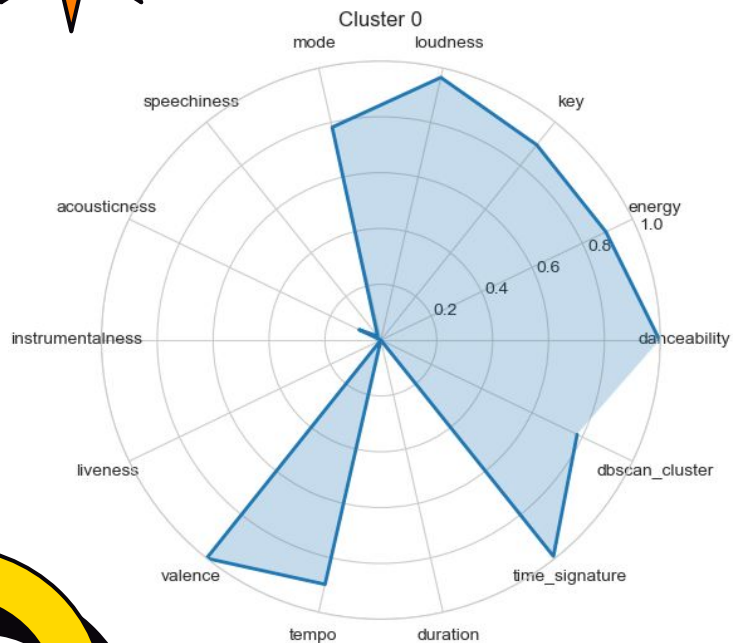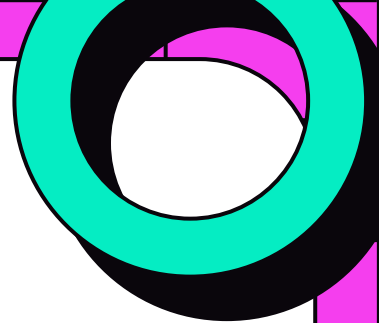
# Cluster Characteristics
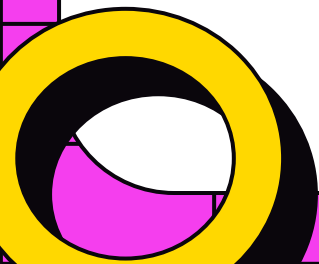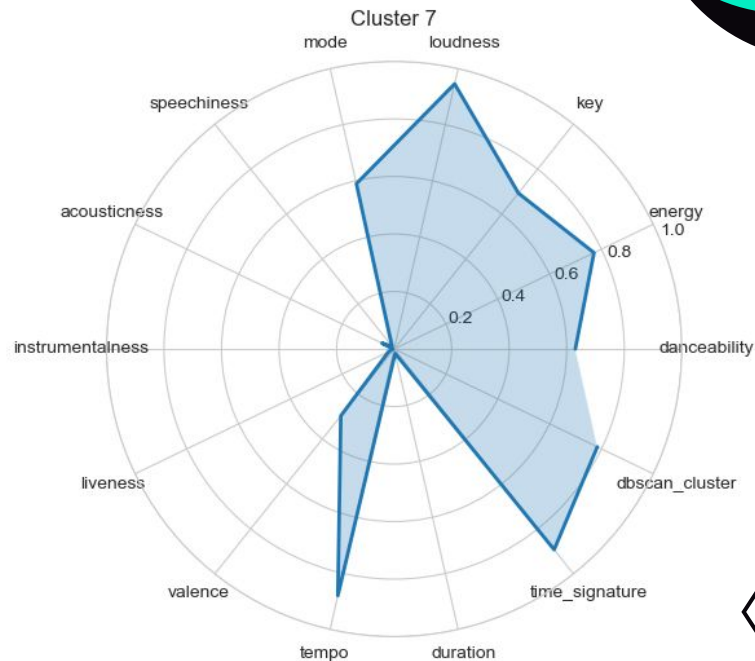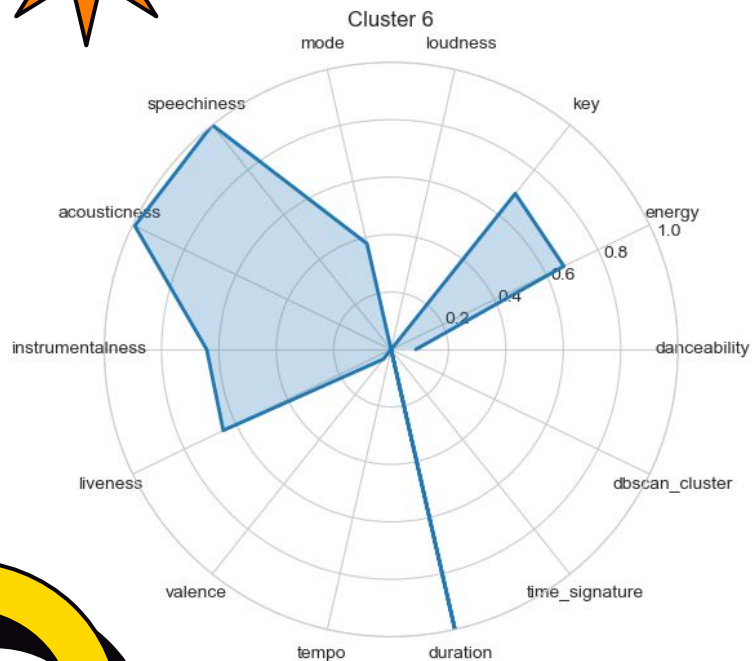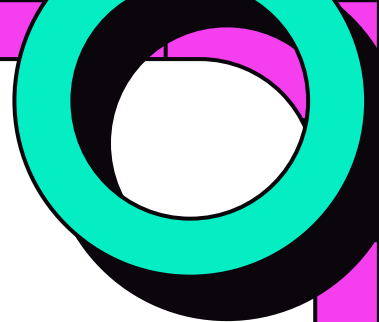
# 05

# Modeling and Recommender

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# Cluster Classification & Evaluation

| | Model Type | Accuracy | F-1 | Precision | Recall |
|---|---|---|---|---|---|
| 1 | Stacking | 98.23% | 98.23% | 98.25% | 98.23% |
| 2 | Logistic Regression | 97.73% | 97.73% | 97.75% | 97.73% |
| 3 | Gradient Boosting Gridsearch | 96.28% | 96.28% | 96.31% | 96.28% |
| 4 | Random Forest Gridsearch | 95.60% | 95.59% | 95.63% | 95.60% |
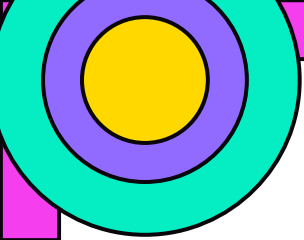
# Song Recommender

**Cosine Similarity Scores**

**Implemented into function**

# Examples of Recommender Function

```
get_recommendations("when i was your man", 10)
```

Recommendations for When I Was Your Man

|   | recommended song | artist | similarity score |
|---|---|---|---|
| 0 | Sing Together | Train | 0.979379 |
| 1 | Dirty Work | Steely Dan | 0.971719 |
| 2 | Bloom - Bonus Track | The Paper Kites | 0.967229 |
| 3 | Perfekt | Bendik | 0.966851 |
| 4 | What Am I To You? | Norah Jones | 0.966176 |
| 5 | Ho Hey | The Lumineers | 0.965025 |
| 6 | One Day | Tate McRae | 0.964515 |
| 7 | Count on Me | Bruno Mars | 0.962009 |
| 8 | I Hung My Head | Johnny Cash | 0.955586 |
| 9 | Sweet Louise | Passenger | 0.955227 |

```
get_recommendations("one dance", 10)
```

Recommendations for One Dance

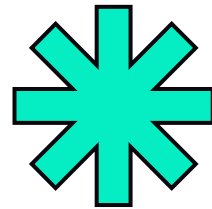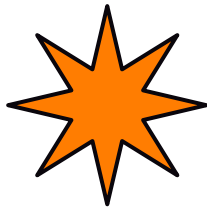|   | recommended song | artist | similarity score |
|---|---|---|---|
| 0 | I Don't Fuck With You | Big Sean | 0.976151 |
| 1 | In My Feelings | Drake | 0.926173 |
| 2 | Dj Turn It Up | Heretic Klick | 0.925024 |
| 3 | Outta My Head (with John Mayer) | Khalid | 0.921419 |
| 4 | Ready To Love You | HEDEGAARD | 0.906303 |
| 5 | It Wasn't Me | Shaggy | 0.898671 |
| 6 | Decisions (feat. Maia Wright) | KREAM | 0.897975 |
| 7 | It's Alright | Matt and Kim | 0.886191 |
| 8 | I'd Be Jealous Too | Dustin Lynch | 0.883109 |
| 9 | By The River | Klingande | 0.882705 |

# More Examples

```python
get_recommendations("stay with me", 10)
```

Recommendations for Stay With Me

|   | recommended song | artist | similarity score |
|---|---|---|---|
| 0 | Blood Stutter | Handsome Ghost | 0.967303 |
| 1 | Oh Ms Believer | Twenty One Pilots | 0.966553 |
| 2 | I Won't Tell a Soul | Charlie Puth | 0.962002 |
| 3 | Homesick | Kings of Convenience | 0.955392 |
| 4 | Lost | Liza Anne | 0.953457 |
| 5 | Perfekt | Bendik | 0.947825 |
| 6 | It's All Coming Back to Me Now | Céline Dion | 0.939375 |
| 7 | Jar of Hearts | Christina Perri | 0.924217 |
| 8 | Merry Little Christmas | Why Don't We | 0.922970 |
| 9 | Marianna | Ingrid Helene Håvik | 0.922125 |

```python
get_recommendations("we the people", 10)
```
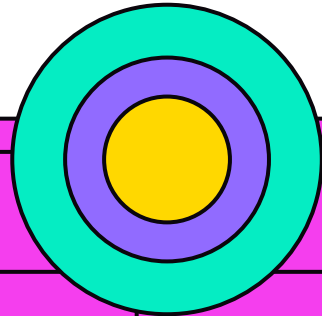
It appears that we do not have any matching songs in our dataframe for: we the people. Please try another song!

# 06 Conclusions & Next Steps

# Conclusions

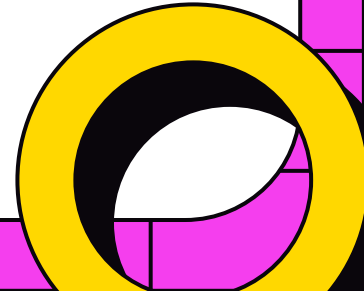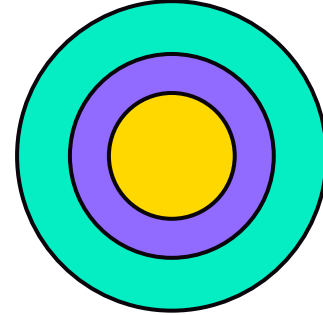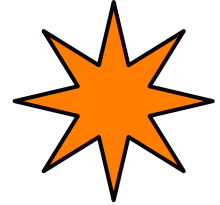## 9 Song Clusters
Only tested 2 clustering techniques

## Cluster Classification Models
- 98.23% accuracy
- Misclassification trend

## Recommender
Personal Opinion: Good, but not great

# Next Steps

- Address imbalanced classes

- Additional clustering techniques

- MORE DATA!

- Outside feedback on recommender

# THANKS!

## Do you have any questions?