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Popular Music Analysis And Prediction

ECE 143 - Group 15

Music Analysis
ECE 143

2:54 3:49

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Motivation & Objective

Exploratory Analysis

Analyze multiple datasets to understand worldwide popular music features.

Prediction

Utilize existing datasets and predict if music can show up on top rank list

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Datasets

Worldwide Music Rank

Metadata For Songs

Worldwide Music Rank

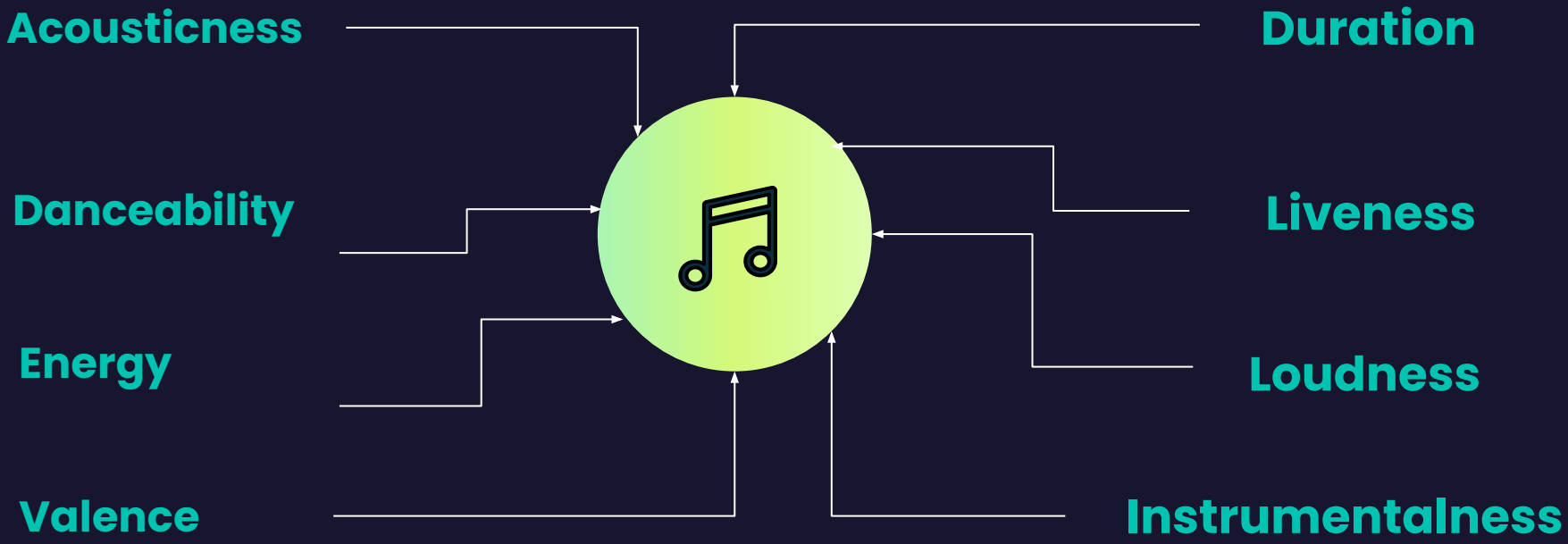
Content:

	date	weeks	title	artist	rank	peakpos	lastpos	isnew
0	2020-12-25	1	willow	taylor swift	1	1	0	True
1	2020-12-25	42	all i want for christmas is you	mariah carey	2	1	1	False
2	2020-12-25	37	rockin around the christmas tree	brenda lee	3	2	3	False
3	2020-12-25	34	jingle bell rock	bobby helms	4	3	5	False

Location:

- United States
- France
- United Kingdom

Music Metadata



Music Metadata

Spotify Audio Data

Million Song Data

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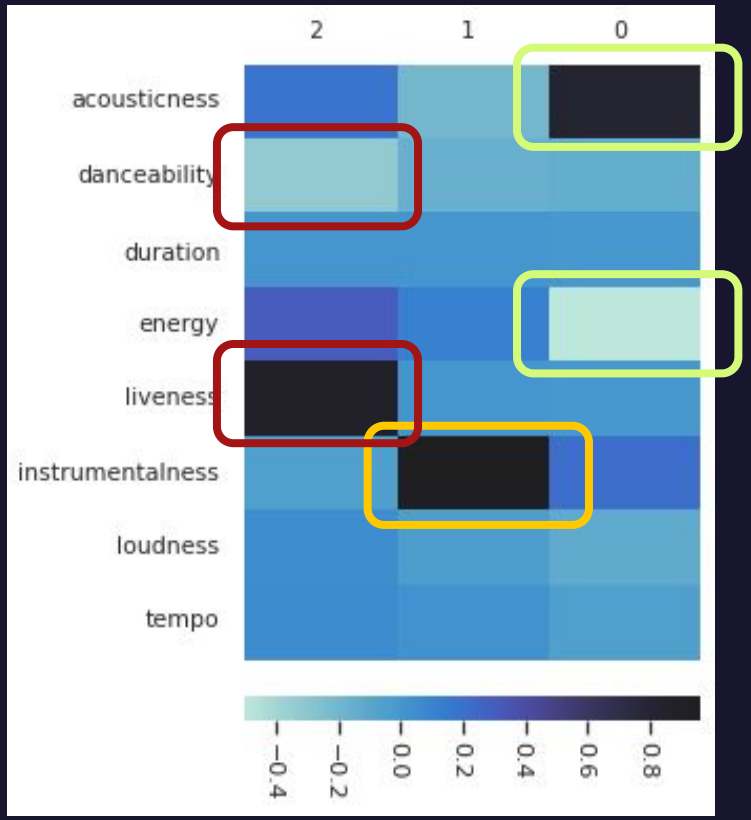
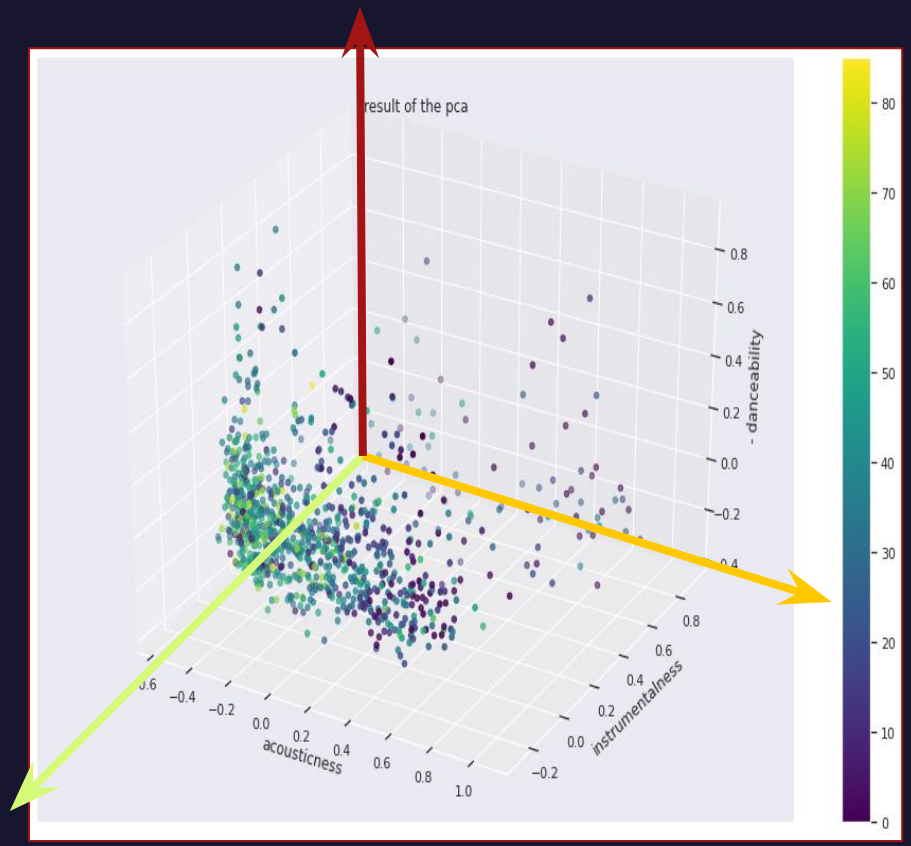
Analysis & Visualization

Key Feature Analysis

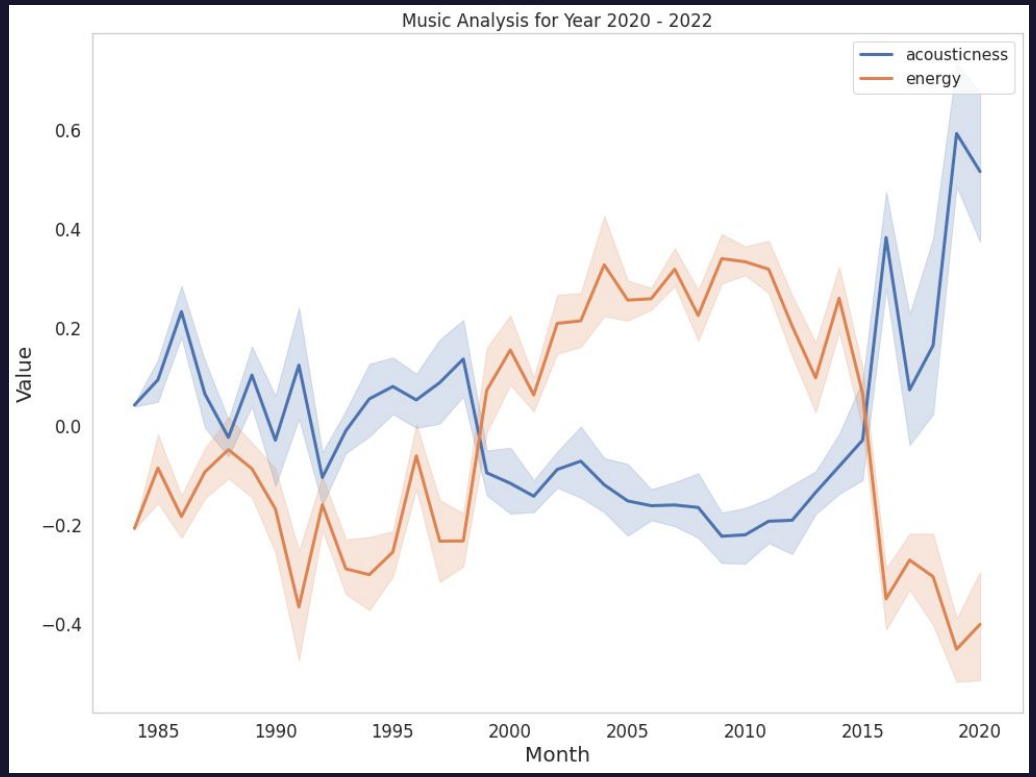
Cross Country Analysis

US Data: Principal Components Analysis (PCA)





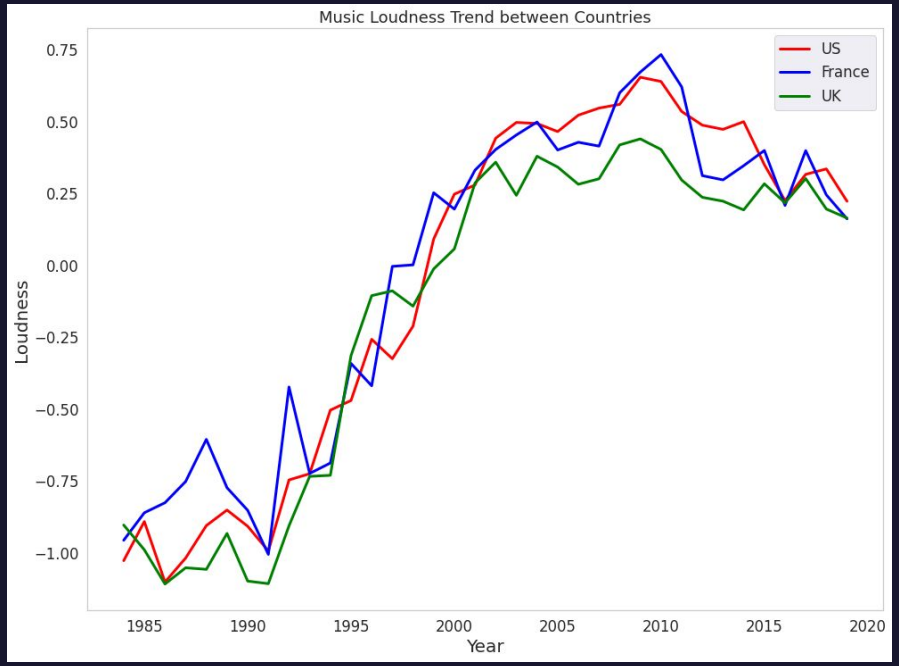
US Data: Features Analysis



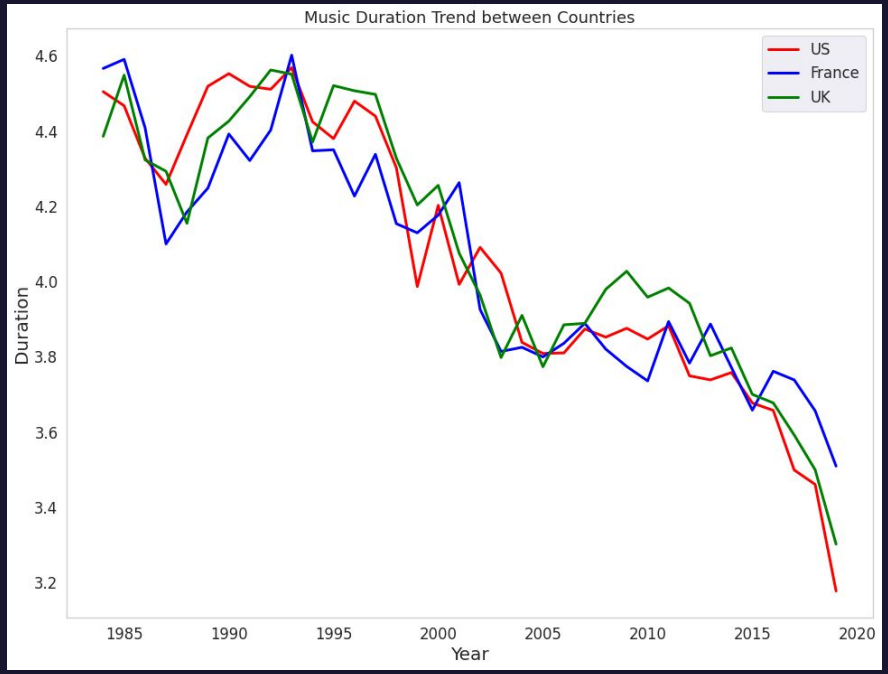
Intuitively, **Acouticness** and **Energy** rate have **inverse** relationship, which is also proved in the billboard dataset.

Cross Country Music Trend: Similar Change

Increasing Trend : Loudness

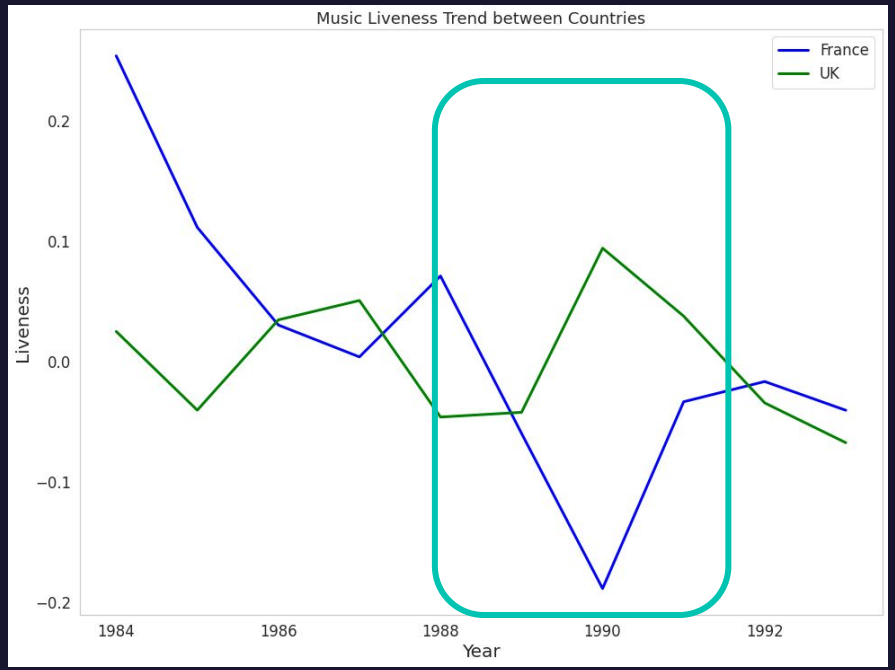


Decreasing Trend : Duration

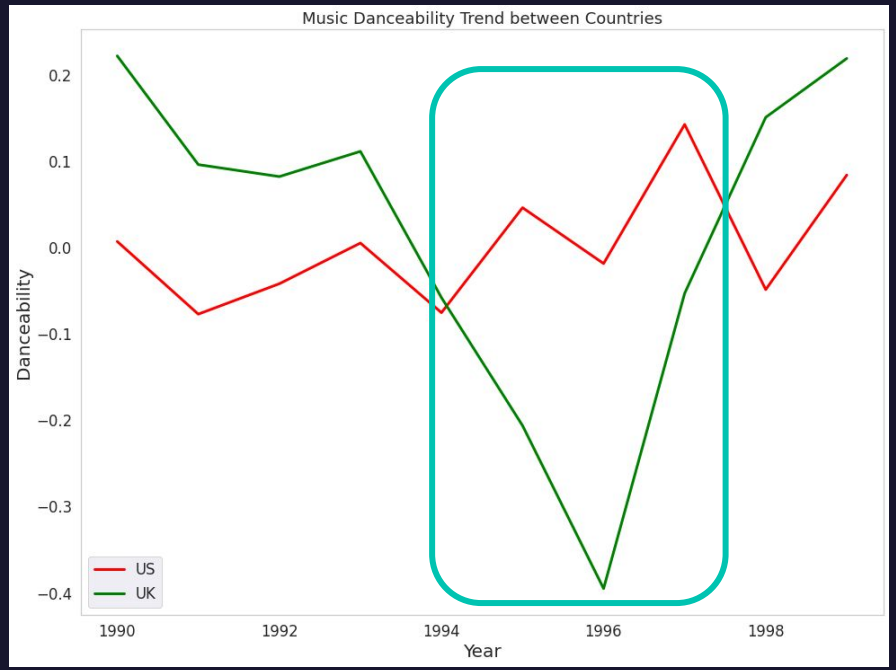


Cross Country Music Trend: Inverse Change

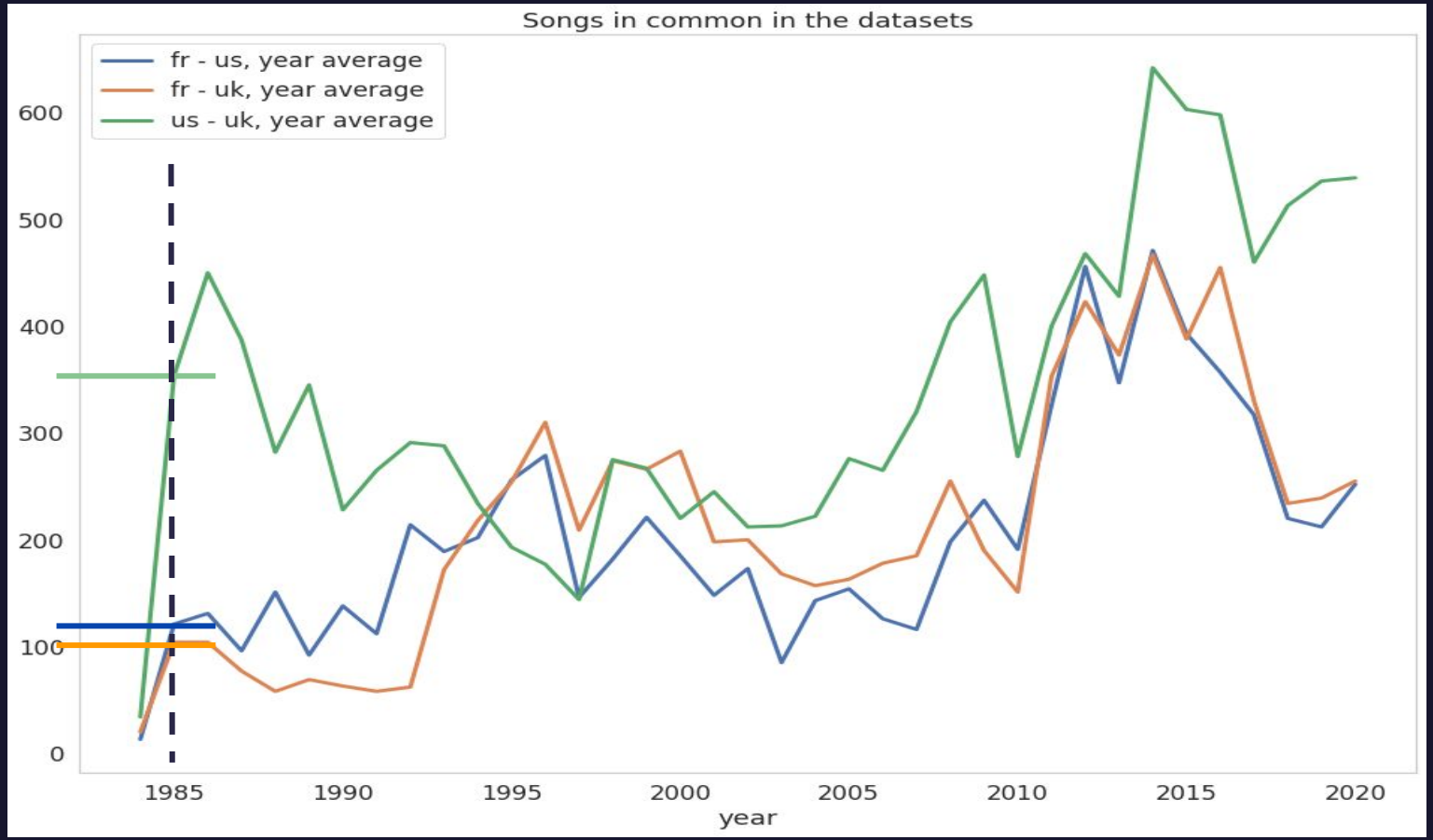
Liveness



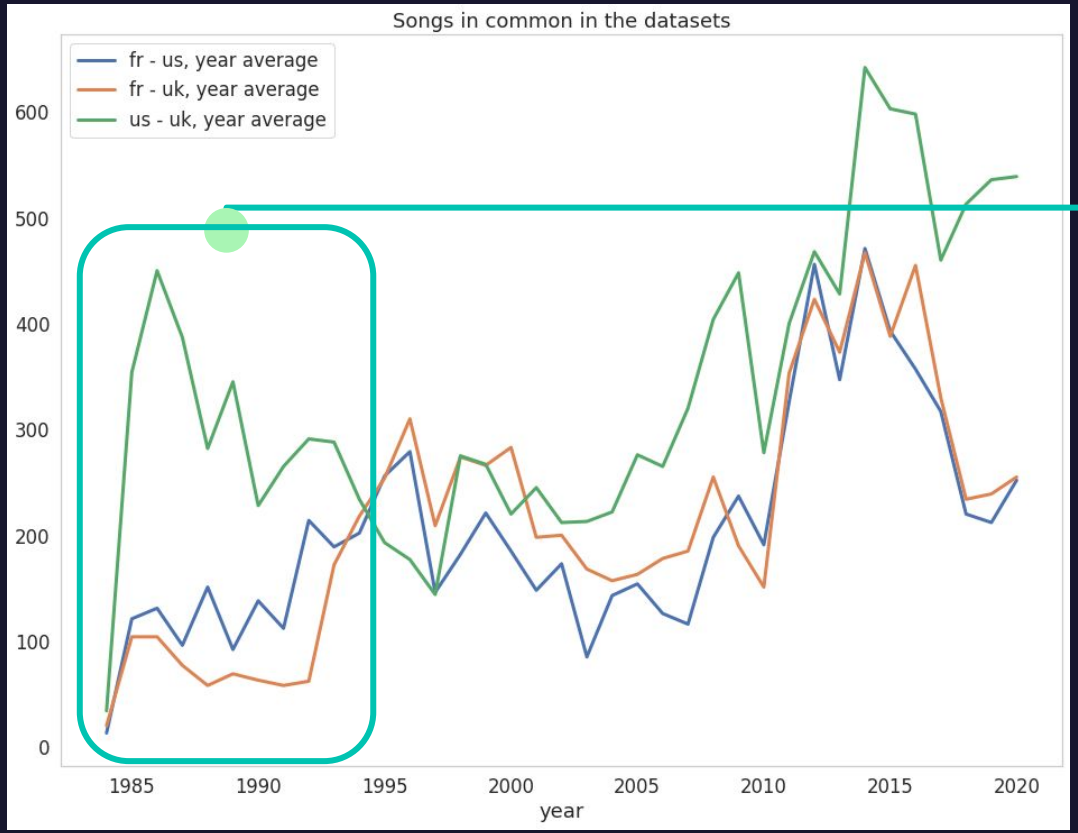
Danceability



Cross Country Analysis: Common Songs

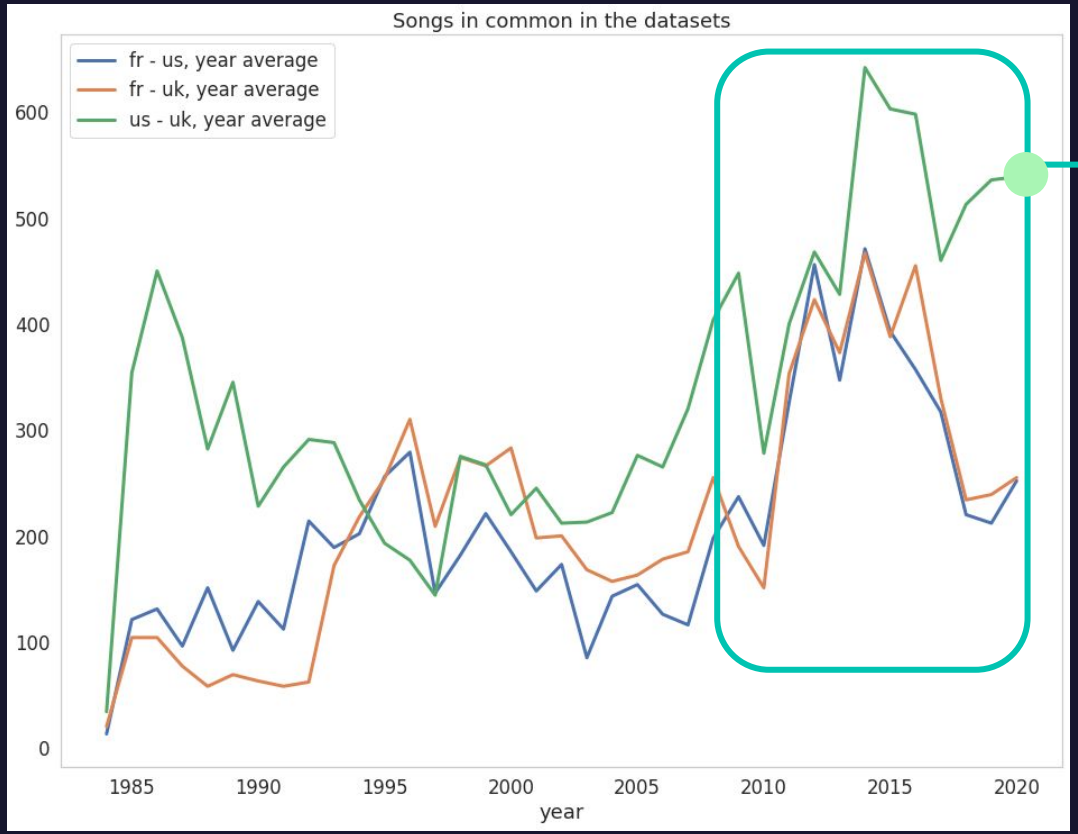


Cross Country Analysis: Common Songs



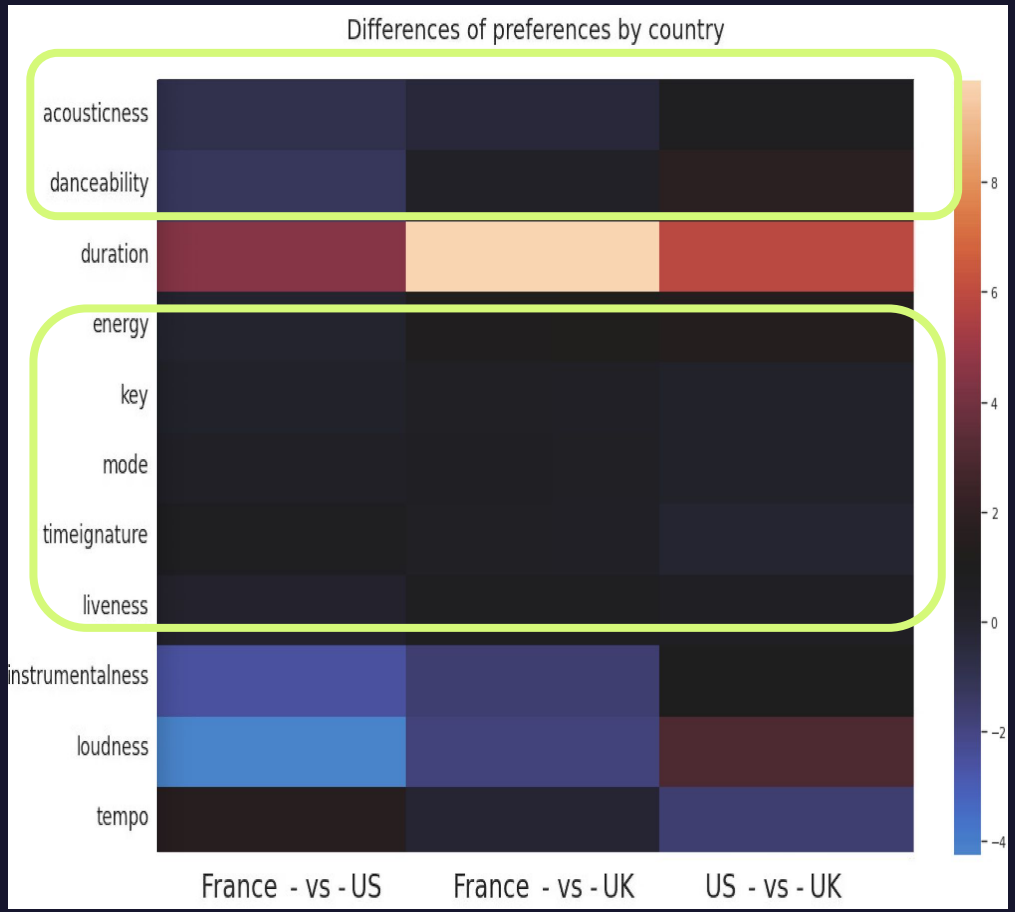
US – UK curve is above the other two, confirming the theory of a "language barrier"

Cross Country Analysis: Common Songs



Cross country curves shows high correlation after 2010s

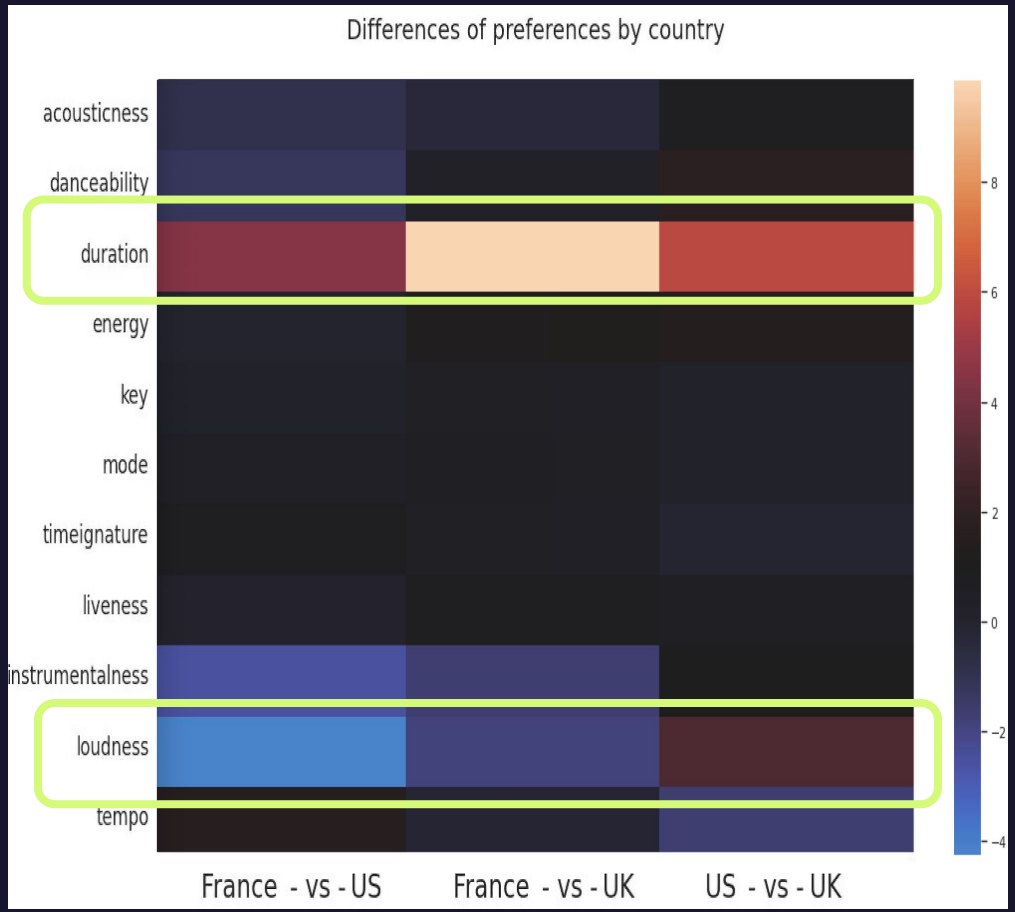
Cross Country Analysis: Preference Difference



No Preference:

1. Liveness
2. Danceability
3. ……

Cross Country Analysis: Preference Difference



No Preference:

1. Liveness
2. Danceability
3. ……

Distinct Preference:

1. Loudness: US < UK < FR
2. Duration: UK < FR < US

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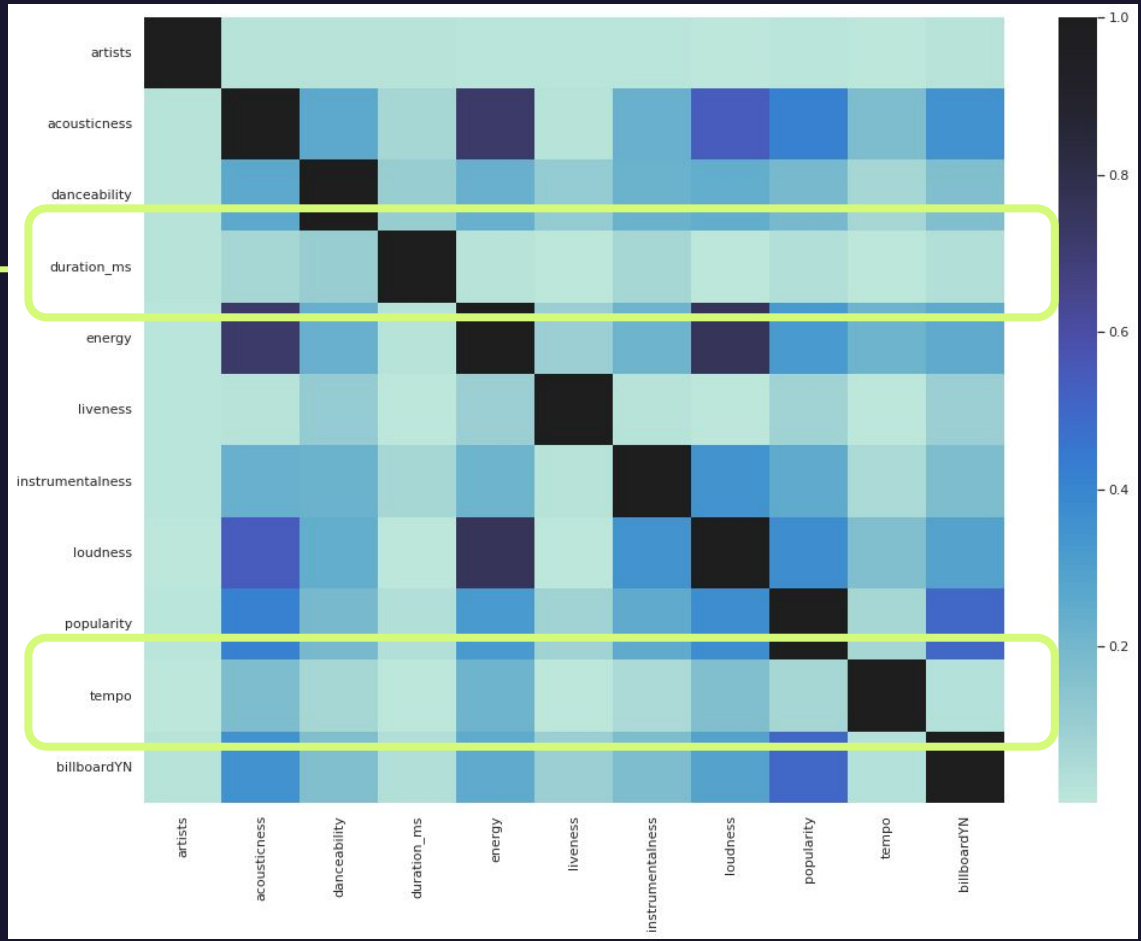
Prediction

Feature Correlation

Model Selection

Feature Correlation

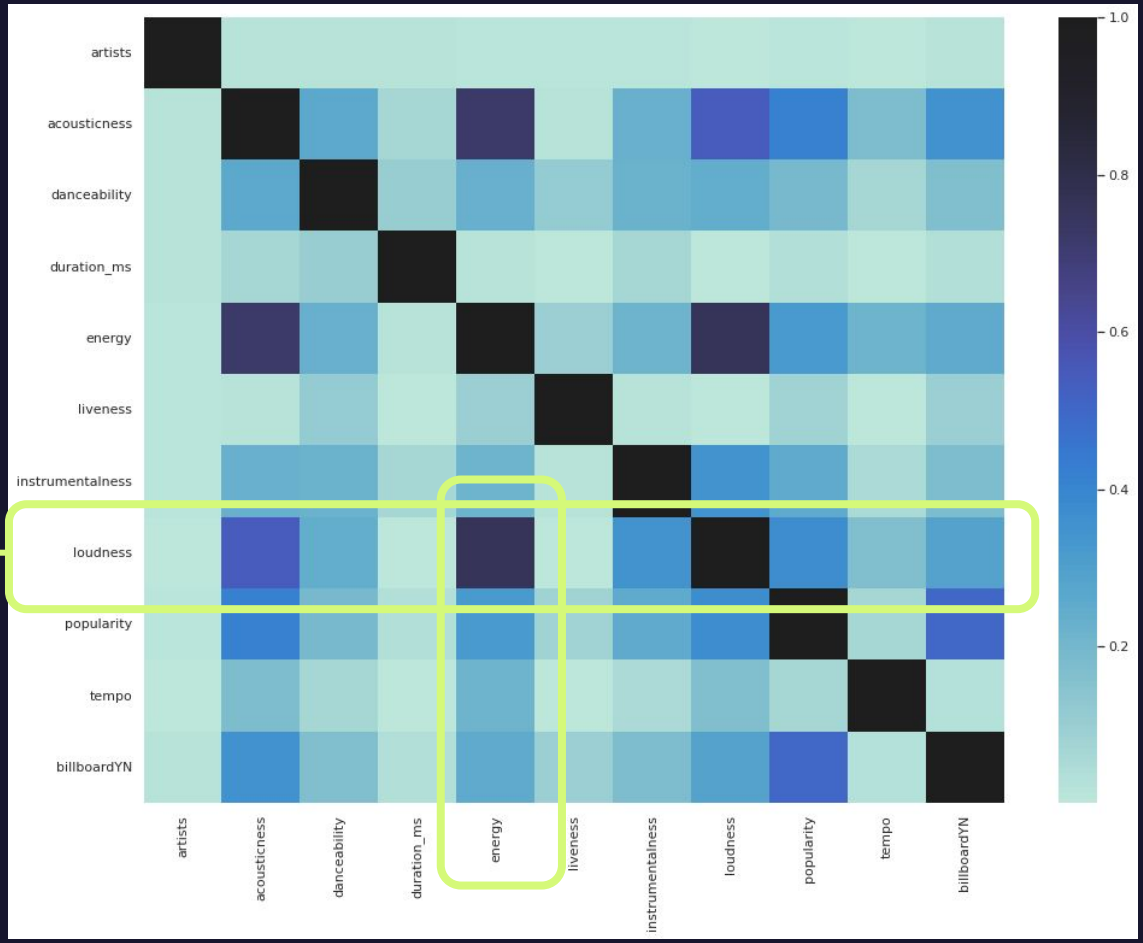
Duration VS Others



Feature Correlation

Duration VS Others

Loudness VS Energy

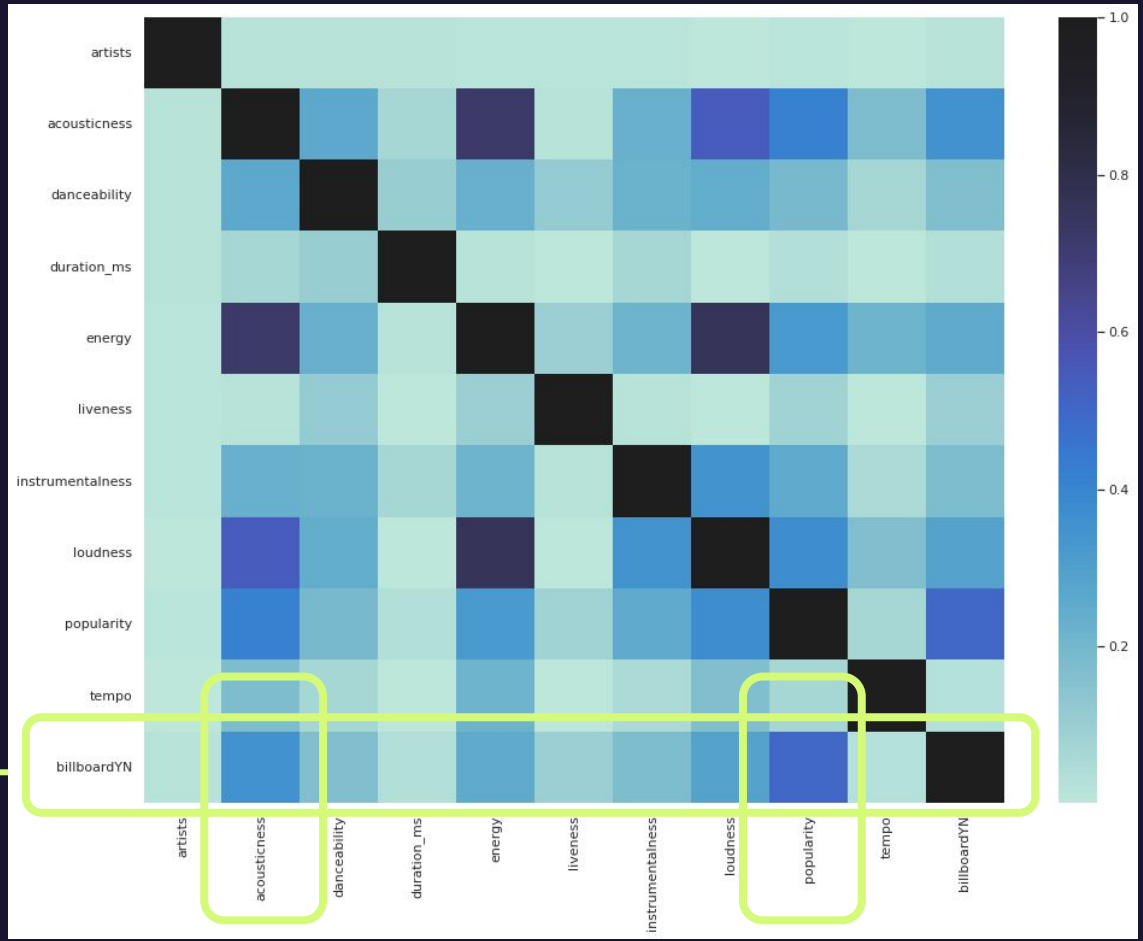


Feature Correlation

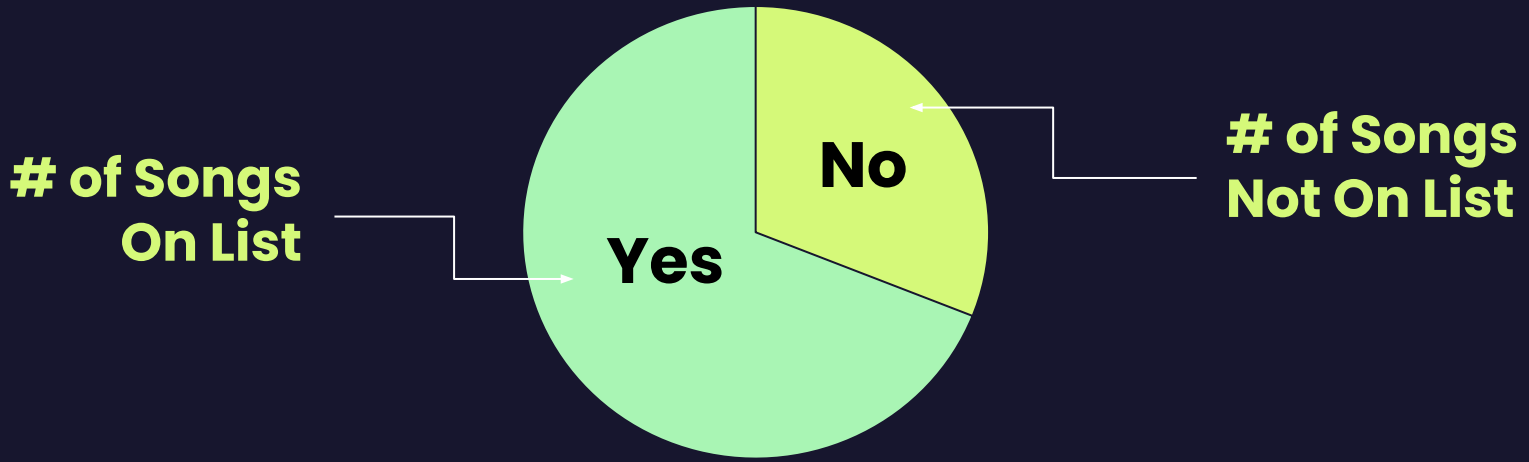
Duration VS Others

Loudness VS Energy

Billboard VS Popularity/Acousticness

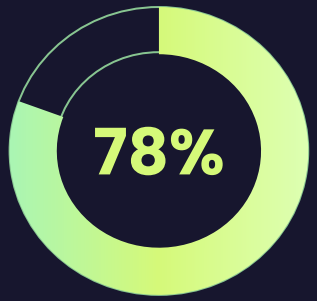
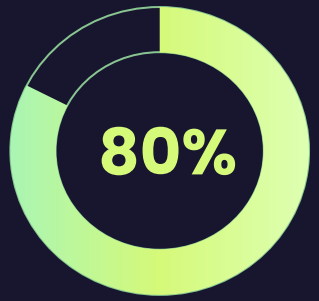
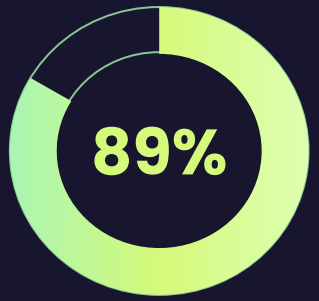


Model Selection



Classification -> Logistic Regression

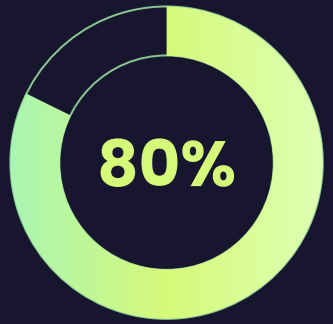
Prediction Result

	UK	US	France
Prediction Accuracy			

Ground Truth			
Y	72%	77%	80%
N	28%	23%	20%

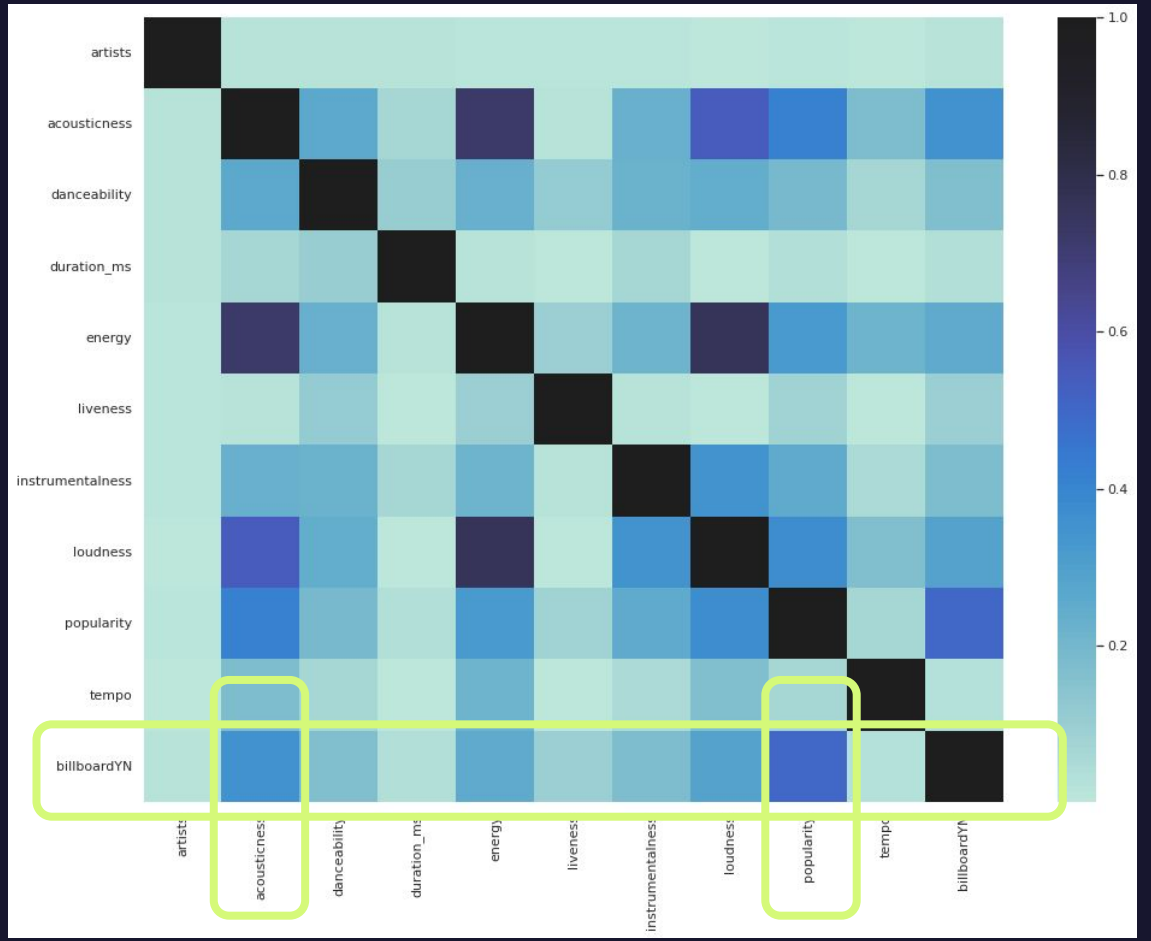
Prediction Result

US



8.0% on Spotify Popularity

0.82% on Acousticness



Conclusion

In US data, we found that Energy and Acousticness are inversely related.

Distinct preference between countries' music taste

Predictive analysis on music's popularity

Future Work

Expand Cultural Diversity

Make Prediction on Specific Rank

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Thanks!

Do you have any questions?