Determining the Relationship Between Song Attributes and Top Chart Placements

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The Job

Warner Music Group has hired us to consult for their A&R department in effort to identify what causes a song to be successful.

Objectives

Compare song attributes to song success in top 200 songs for 2017-2019

Defined measure of success as song frequency on top charts and higher positions on top charts

Workflow

Spotify for Developers

MySQL

Seaborn

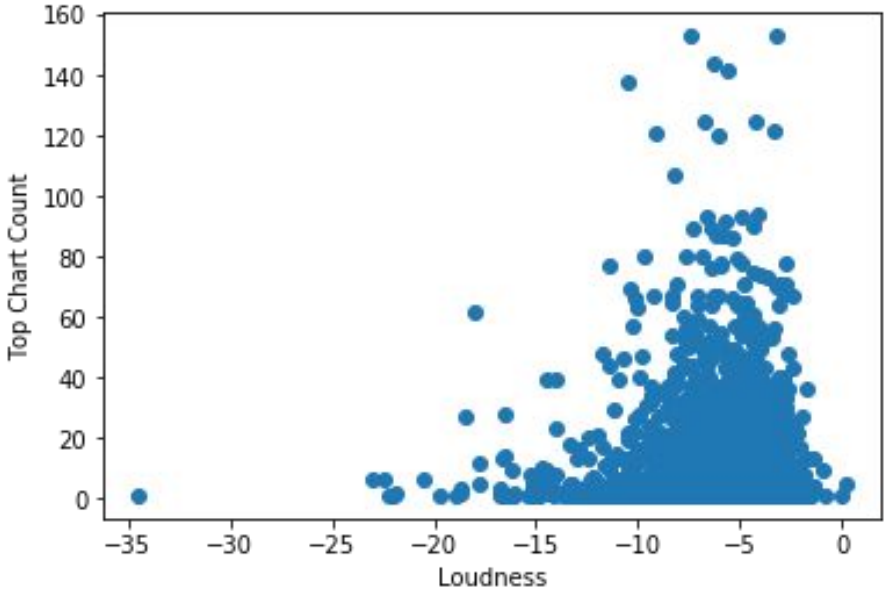
SciPy

No Significant Correlation Between Loudness and Top Chart Frequency of a Song

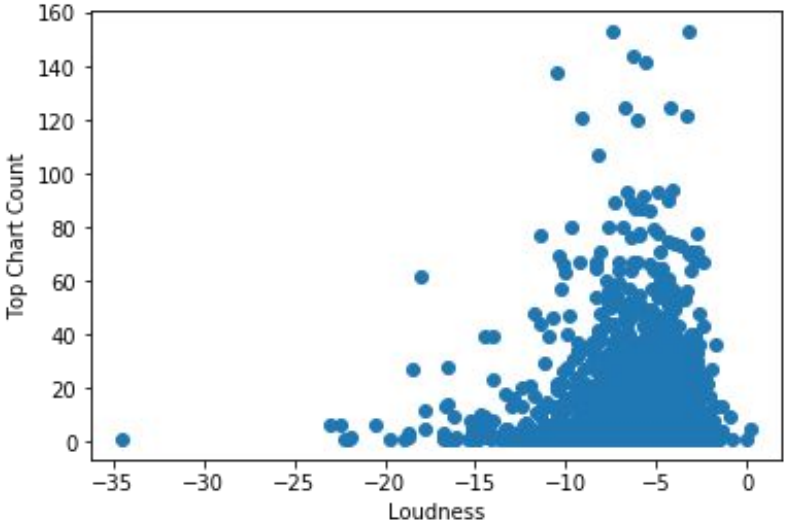
- Pearson Correlation Coefficient: 1.5×10^{-5}

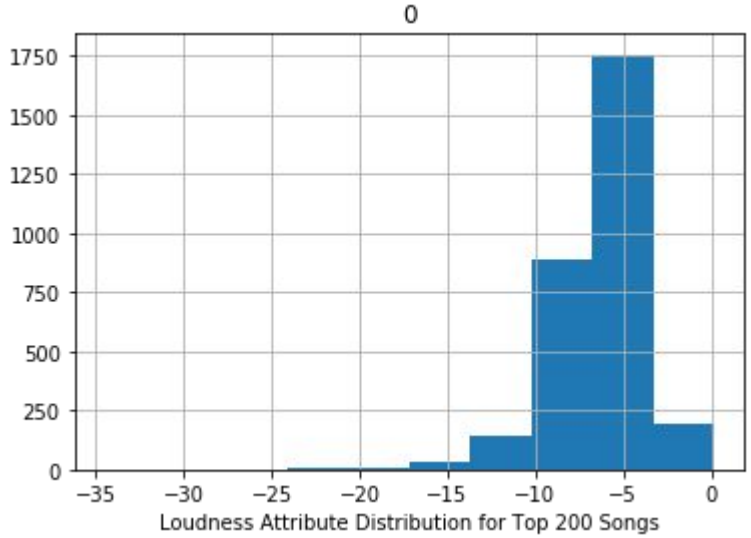
H_0: Song Loudness is not correlated to top chart placement frequency

H_A: Song Loudness is correlated to top chart placement frequency



Distribution of Loudness Attribute Explains the Insignificance in its Correlation to Songs





Pearson Correlations for Attributes and Top Chart Count of Songs

	Pearson Correlation to Top Chart Count
Danceability	2.4×10^{-4}
Liveness	2.7×10^{-3}
Duration of Song	7.3×10^{-3}
Speechiness	6.6×10^{-6}
Energy	0.17
Loudness	1.5×10^{-5}
Acoustiness	0.60

Top 10 Findings

What makes a song reach the top 10? Are there differences between a good song that reaches the top 200 and a great song that reaches the top 10? I wanted to look at the different attributes of top 10 songs to see if they were different from top 200 songs

Though there were some statistically significant differences in attributes between songs in the top 10 and songs in the top 200's, there were no significant differences in attributes between top 200

Liveness of Top Ten Songs

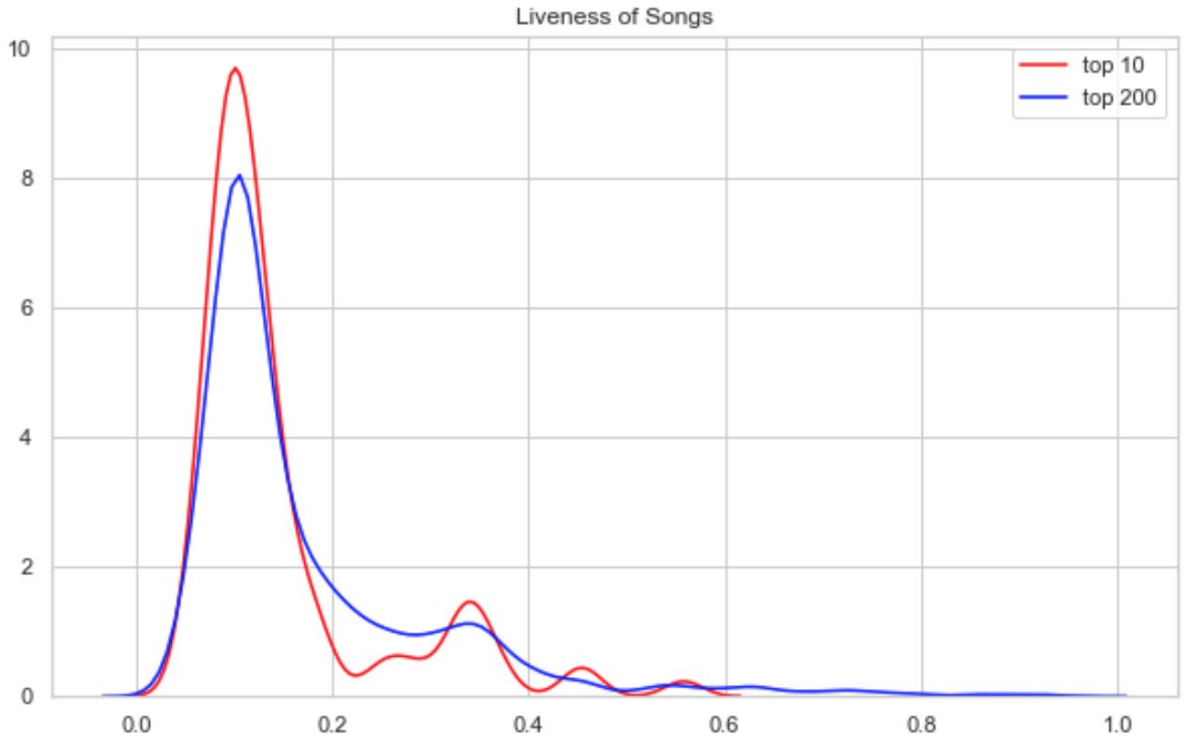
H_A - There is a difference between the liveness of Top Ten Songs from other Top songs
H_0 - There is no difference between the liveness of Top Ten Songs from other Top songs

One sample T Test P-Value - 0.01736

We reject the null

There is a statistically significant difference in liveness of Top Ten Songs

Though statistically significant, the actual difference is not significant



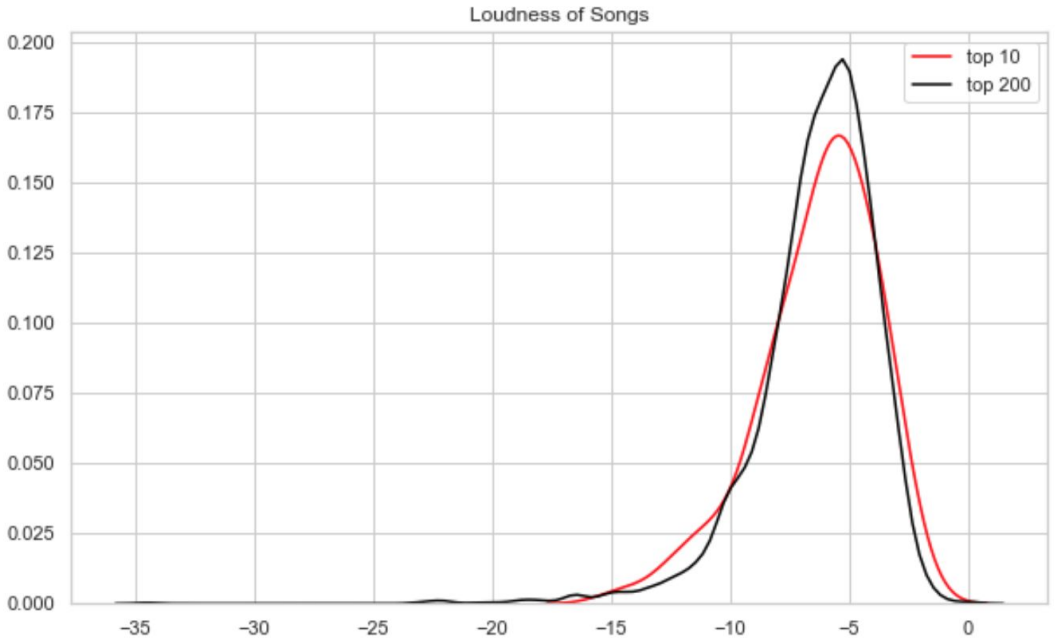
Loudness of Top Ten Songs

H_A - There is a difference between the loudness of Top Ten Songs from other Top songs
H_0 - There is a difference between the loudness of Top Ten Songs from other Top songs

One Sample T Test P-Value = 0.881891

We fail to reject the null

There is no statistically significant difference between the loudness of Top 10 songs and Top 200 songs



Acousticness

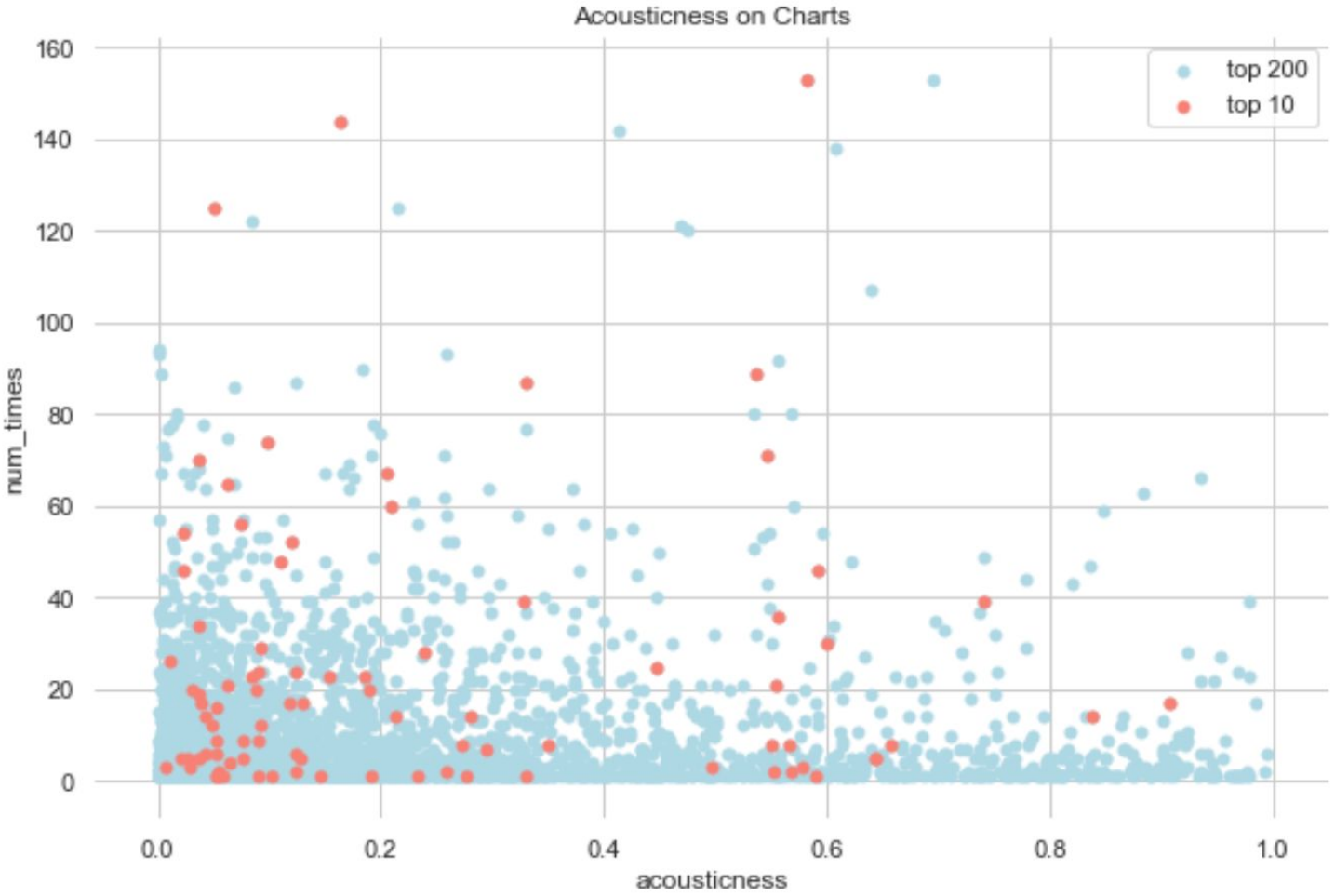
A confidence measure from 0.0 to 1.0 of whether the track is acoustic. 1.0 represents high confidence the track is acoustic.

H_0:

There *is no difference* in acousticness in the top 10 songs of the top 200 chart

$H_{A:}$

There *is a difference* in acousticness in the top 10 songs of the top 200 chart


Acousticness on Charts
top 200
top 10
num_times
160
140
120
100
80
60
40
20
0
0.0
0.2
0.4
0.6
0.8
1.0
acousticness

Acousticness Findings

Type of test: One Sample T-Test

Top 10 vs Top 200

Outcome: pvalue=0.6305769979326019

Therefore we fail to reject the Null hypothesis

There is no statistical significance.

Results/Conclusion

- No statistically significant correlation between attributes and songs on top charts
- No statistically significant difference between attributes for top 10 songs and top 200 songs

Future Work

- Widen range from top 200 to all songs
- New attributes
- Artist popularity/following/past success
- Record labels