WHAT MAKES A SONG POPULAR?

Kate Chen, Christine Go, Carley Lerner, Bailey Heit

PURPOSE

determine the qualities of a song that influence the popularity on spotify

ACOUSTICNESS

ENERGY

SPEECHINESS

GENRE

DANCEABILITY

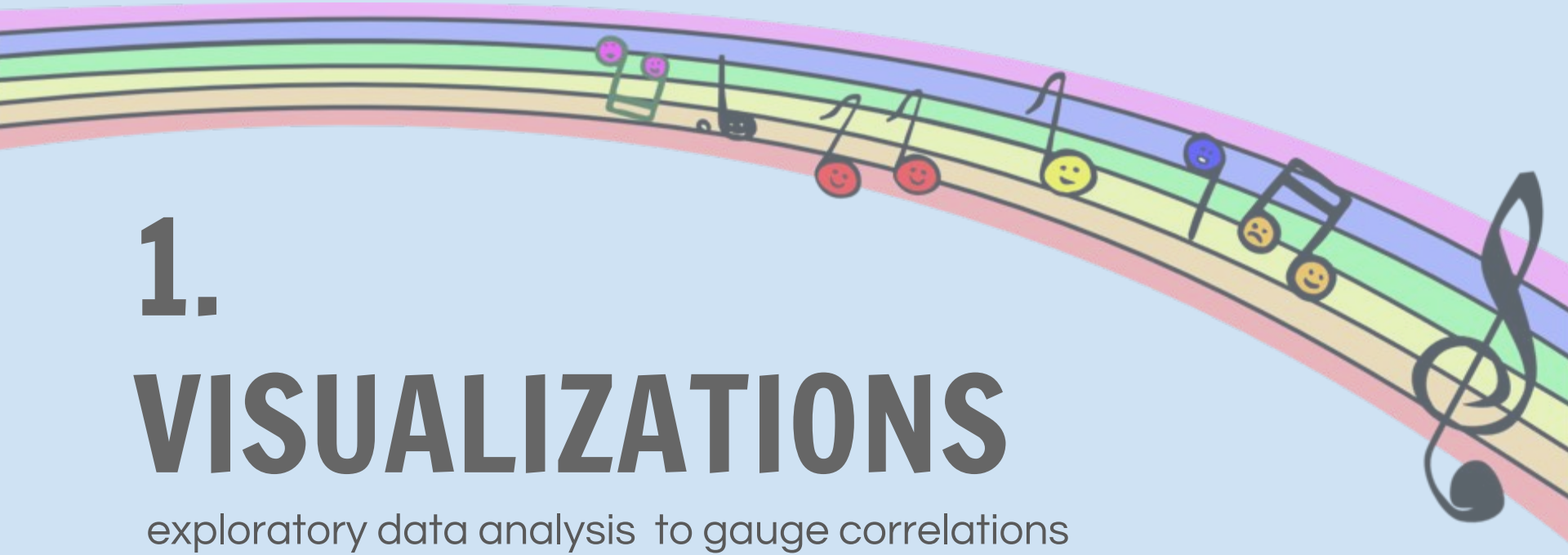
LIVENESS

LOUDNESS

ENERGY

KEY

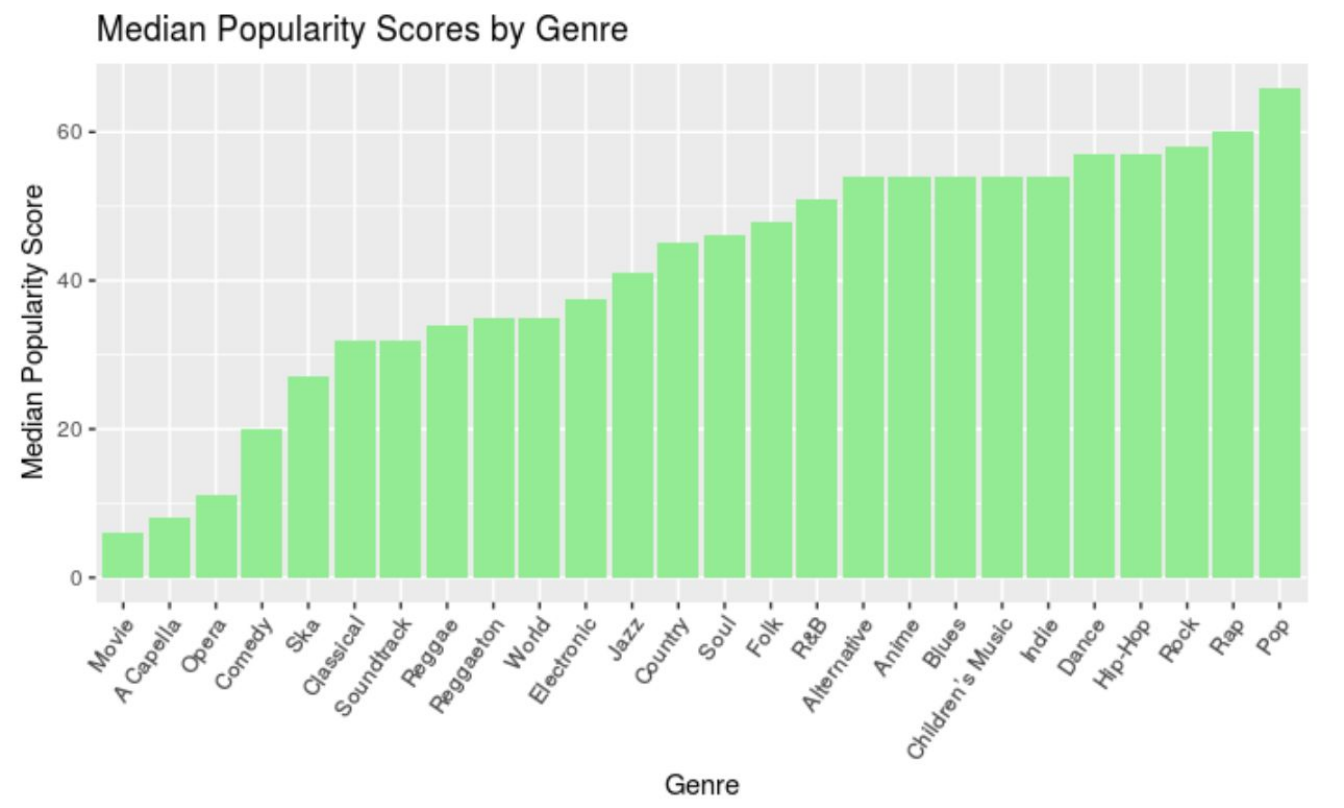
TEMPO



1.
VISUALIZATIONS

exploratory data analysis to gauge correlations between different variables and song popularity

Popularity by Genre



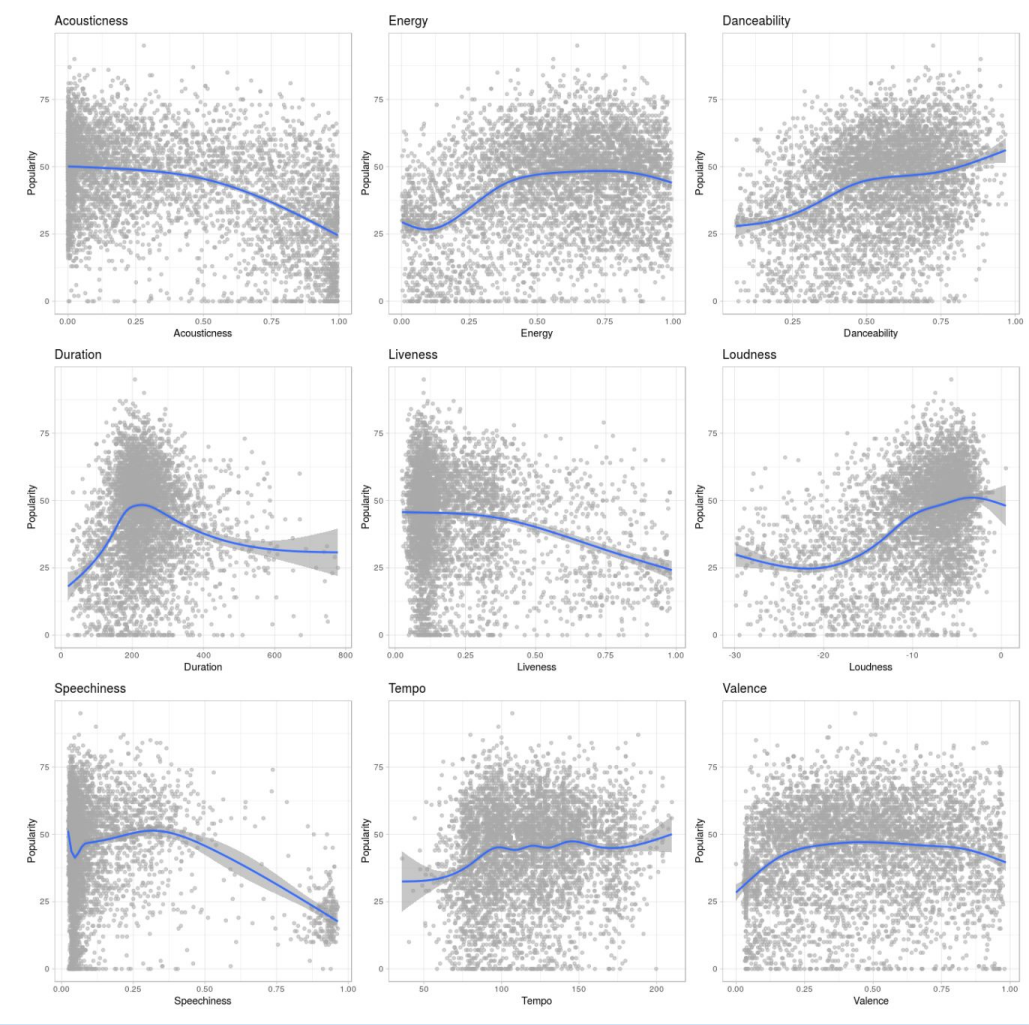
Trendlines

Positive relationship:

- Energy
- Danceability
- Loudness
- Tempo

Negative relationship:

- Acousticness
- Speechiness
- Liveness

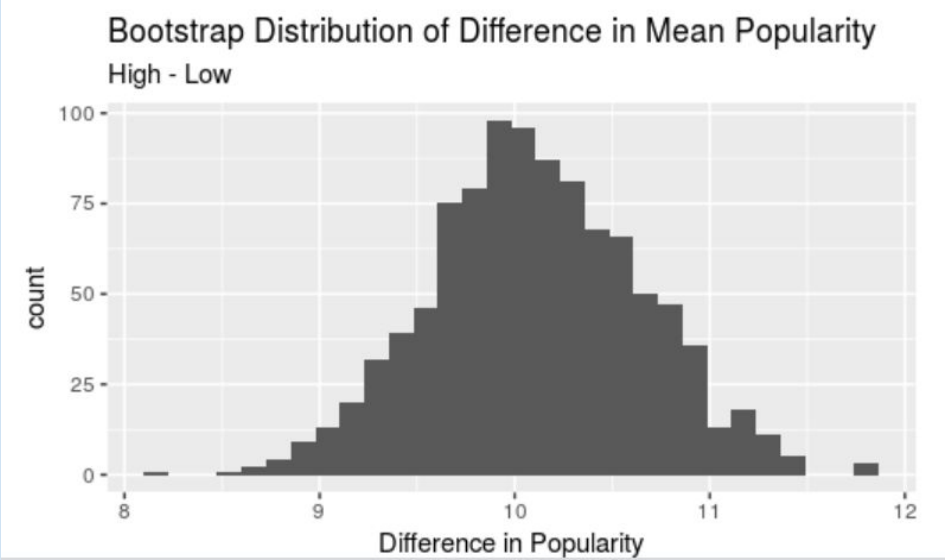


2. BOOTSTRAPPING

determine with confidence the extent to which variables impact popularity

High V. Low Danceability

Comparing **the highest 25%** and **lowest 25%** values to generate a bootstrap distribution of the difference in mean popularity scores



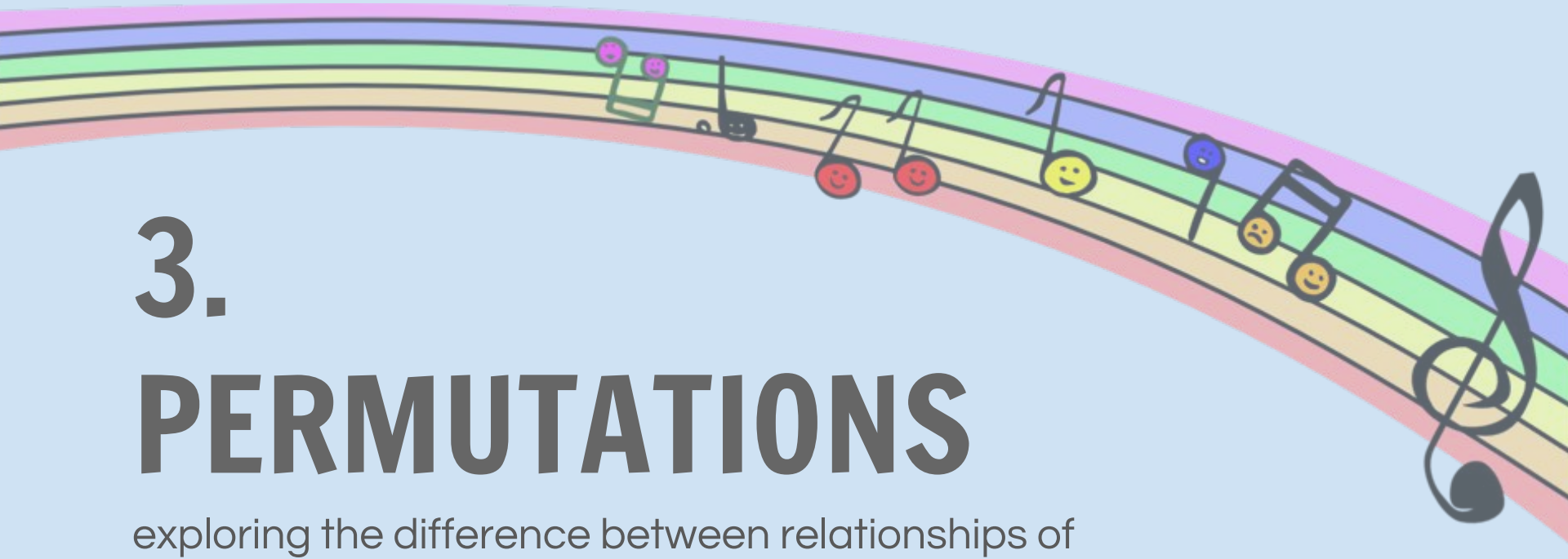
lower_bound <dbl>	upper_bound <dbl>
9.38982	11.57811

Confidence Intervals

95% Confidence intervals were calculated for the difference in mean popularity between the **highest 25%** and **lowest 25%** values of each of these variables.

Variables	Lower Bound	Upper Bound
Danceability	10.0	12.3
Energy	11.1	13.8
Loudness	18.4	20.9
Acousticness	-20.8	-28.4

Variables	Lower Bound	Upper Bound
4/4 v. Not 4/4	10.4	13.3
Rap v. Pop	3.82	7.04

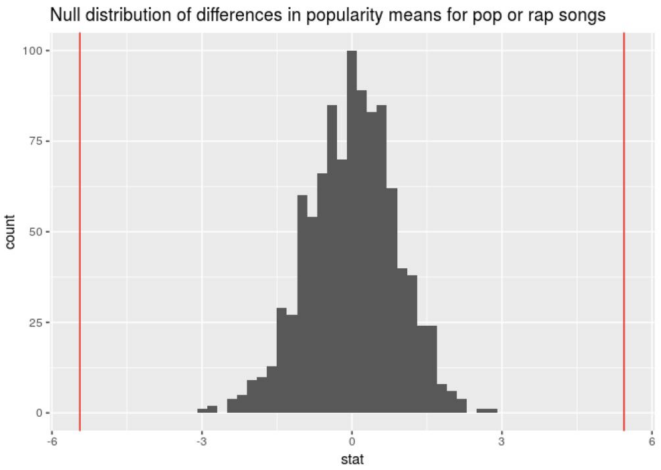


3. PERMUTATIONS

exploring the difference between relationships of different factors to song popularity

Pop V. Rap Genres

```
## # A tibble: 26 x 2
##    genre             medianpop
##    <chr>                 <dbl>
##  1 Pop                      66
##  2 Rap                      60
##  3 Rock                     58
##  4 Dance                    57
##  5 Hip-Hop                  57
##  6 Alternative              54
##  7 Anime                    54
##  8 Blues                    54
##  9 Children's Music         54
## 10 Indie                    54
## # … with 16 more rows
```



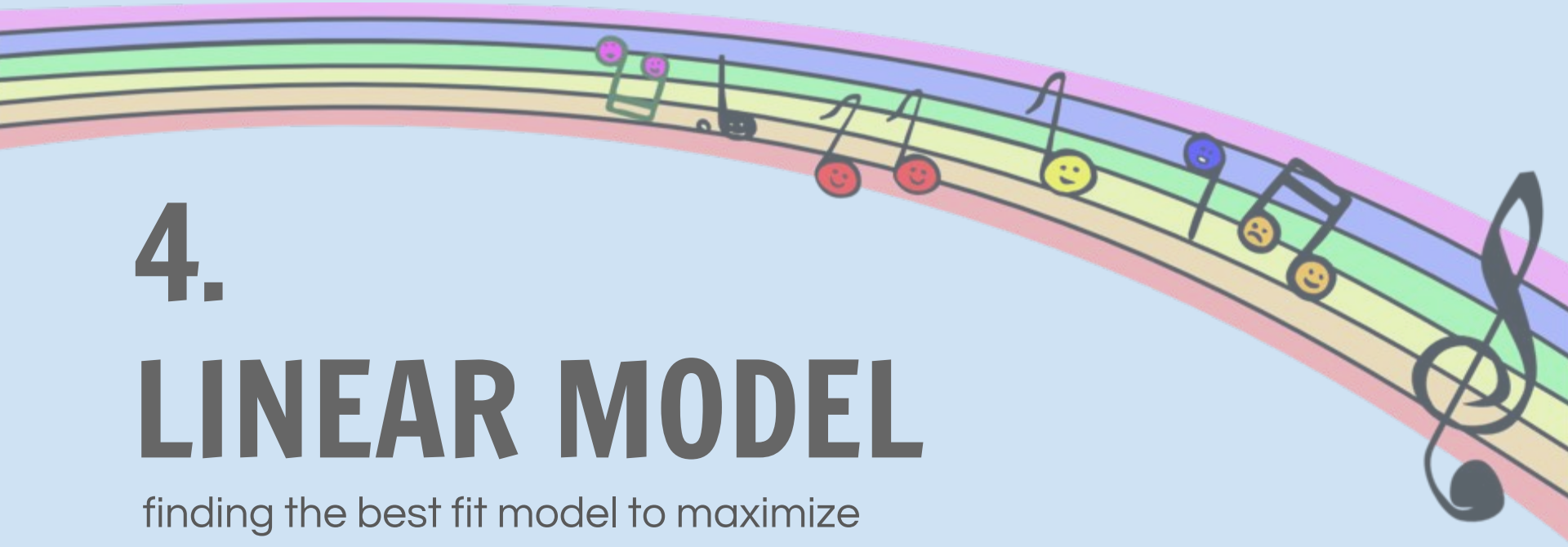

```
## # A tibble: 1 x 1
##   pvalue
##    <dbl>
## 1      0
```

The p-value is 0, so there is evidence that **there is a difference** in mean popularities between pop and rap songs

Continuous Numerical Variables

Variable	Observed Difference	P-Value
Energy	10.35	0
Danceability	9.2	0
Speechiness	21.43	0

Within each of these variables, there is a **significant difference** between high and low values of each, indicating that the trends are impactful on popularity.



4.
LINEAR MODEL

finding the best fit model to maximize popularity of a song

Selected Model Excluding Genre

Adjusted R^2 Value: 0.30

Intercept	57.28	Liveness	-11.85
Acousticness	-13.77	Loudness	0.78
Danceability	16.52	Speechiness	-7.72
Energy	-6.24	Tempo	0.012
Instrumentalness	-3.26	Valence	-9.29

Selected Model Including Genre

Adjusted R^2 Value: 0.71

Intercept	9.15	Danceability	3.28	Loudness	0.12
Speechiness	-2.055	Valence	-1.32	Alternative	44.97
Anime	44.67	Blues	45.81	Children's music	45.82
Classical	24.01	Comedy	13.64	Country	37.92
Dance	47.85	Electronic	28.50	Folk	40.34
Hip-hop	49.09	Indie	45.57	Jazz	31.07
Movie	1.94	Opera	4.96	Pop	56.81
R&B	42.54	Rap	51.31	Reggae	26.72
Reggaeton	27.86	Rock	49.95	Ska	19.29
Soul	37.95	Soundtrack	25.83	World	27.13

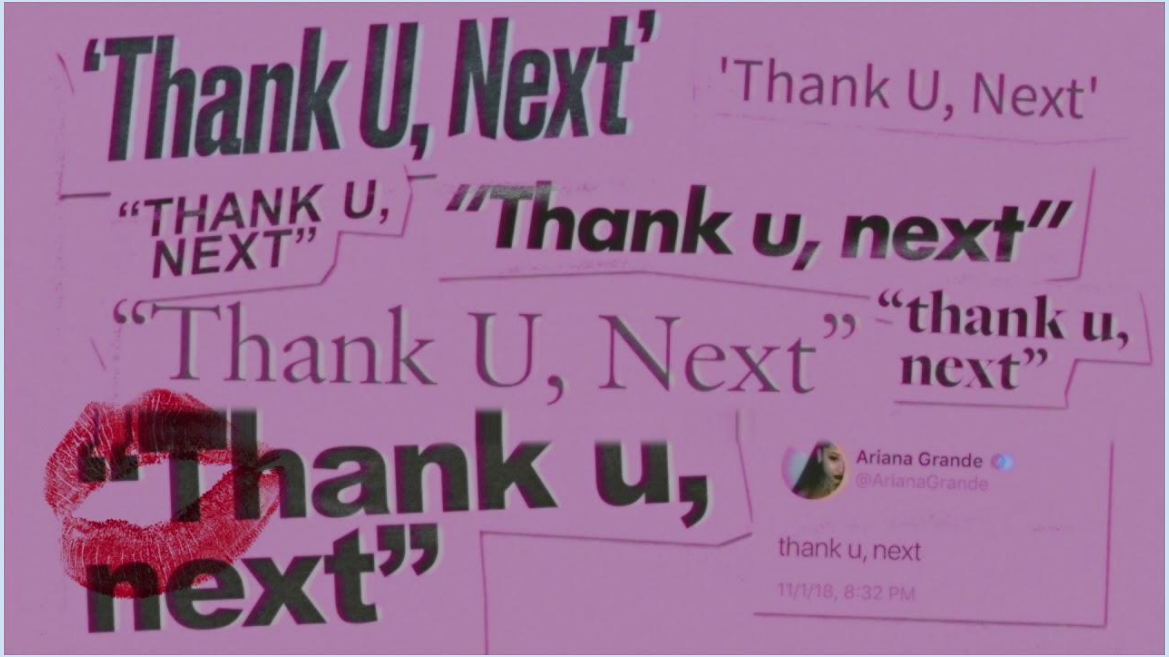
Discussion

- **71.0%** of **variability** in **popularity** can be explained by regression model
  - **Strong positive overall relationship**

- **Genre** is the strongest predictor of song popularity
  - Popularity **increased most** when song is **POP** or **RAP**.
  - MAKES SENSE!! 72% of spotify listeners are millennials*

*https://somespotify.wordpress.com/2018/03/08/spotify-target-audience-millenials/

The Sample's MOST Popular Spotify Song?



Ariana Grande's Pop Song:

"Thank u, next"

Implications

Spotify can use data to create playlists based on certain qualities

Important implications in the music industry

Help artists determine how to create popular songs

THANK YOU

go forth and make a popular song!