

# Hit Song Predictor

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# Introduction

- Motivation

- Love of music

- Goals

- Create a model that predicts the peak rank of a song on the Billboard top 100 chart
  - Identify important audio features to be a hit song (top 25)

# Music Data

## Billboard Hot 100 Chart

- 6 Chart Features:
  - Song Name
  - Song Title
  - Chart Information
  - Etc..
- 4 Weeks

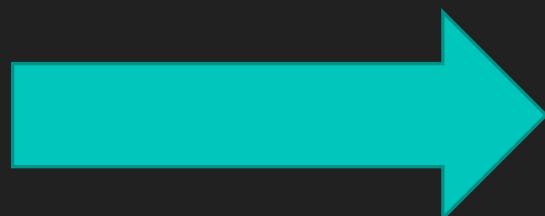
## Spotify Web API

- 14 Audio Features:
  - Danceability
  - Energy
  - Liveness
  - Tempo
  - Duration
  - Etc..

See Appendix for Screenshot

# Model

Lasso  
Regression



Linear  
Regression

Linear Regression RMSE Score: 12.8

# (+) Model Top Predictors

## Audio Features

- Mode
- Speechiness
- Tempo
- Duration
- Beats per Measure (BPM)

## Billboard Features

- Weeks on chart

# (-) Model Top Predictors

## Audio Features

- Acousticness

## Billboard Features

- Current Rank
- Last week rank

# Top 25%: Averages of Audio Features

- Speechiness: 0.137
  - i.e. Khalid - Talk
- Acousticness: 0.182
  - i.e. Lil Tecca - Did It Again
- Tempo: 120.65
  - i.e. Lil Tjay - F.N.
- Duration – 185 seconds
  - i.e. Young Boy - Self Control
- Beats per Measure: 4.01
  - i.e. Lizzo- Truth Hurts
- Mode: 0.53
  - i.e. Lizzo- Truth Hurts

# Conclusion

Songs that peak higher on the Billboard chart are happier songs that have a quicker tempo and more lyrics

- Dance, EDM, Rap/Hip-Hop, and Pop songs

Thank you!

# Appendix

# Data: Top 25 Songs

artist_name	song_title	last_week_rank	peak_rank	weeks_on_chart	danceability	energy	key	loudness	mode	speechiness	acousticness	instrumentalness
Lizzo	Truth Hurts	1	1	18	0.715	0.624	4	-3.046	0	0.114	0.11	0
Shawn Mendes & Camila Cabello	Señorita	2	1	11	0.759	0.54	9	-6.039	0	0.0287	0.037	0
Billie Eilish	Bad Guy	3	1	23	0.701	0.425	7	-10.965	1	0.375	0.328	0.13
Lil Tecca	Ran\$om	6	4	14	0.745	0.642	7	-6.257	0	0.287	0.0204	0
Lil Nas X Featuring Billy Ray Cyrus	Old Town Road	5	1	27	0.878	0.619	6	-5.56	1	0.102	0.0533	0
Chris Brown Featuring Drake	No Guidance	7	6	13	0.698	0.454	1	-6.756	0	0.151	0.123	0
Post Malone	Circles	0	7	1	0.695	0.762	0	-3.497	1	0.0395	0.192	0.00244
Ed Sheeran & Justin Bieber	I Don't Care	9	2	17	0.798	0.675	6	-5.041	1	0.0442	0.0912	0
Khalid	Talk	8	3	30	0.901	0.4	0	-8.575	1	0.126	0.051	0
Post Malone Featuring Young Thug	Goodbyes	12	3	9	0.548	0.653	5	-3.875	1	0.081	0.456	0
Lewis Capaldi	Someone You Loved	13	11	17	0.501	0.405	1	-5.679	1	0.0319	0.751	0
Taylor Swift	You Need To Calm Down	4	2	12	0.771	0.671	2	-5.617	1	0.0553	0.00929	0
Jonas Brothers	Sucker	15	1	27	0.842	0.734	1	-5.065	0	0.0588	0.0427	0
Post Malone & Swae Lee	Sunflower (Spider-Man: Into The Spider-Verse)	17	1	46	0.76	0.479	2	-5.574	1	0.0466	0.556	0
Drake Featuring Rick Ross	Money In The Grave	14	7	12	0.831	0.502	10	-4.045	0	0.046	0.101	0
Shawn Mendes	If I Can't Have You	16	2	18	0.692	0.809	2	-4.198	1	0.0602	0.524	0
Ed Sheeran Featuring Khalid	Beautiful People	20	17	10	0.64	0.648	5	-8.113	0	0.187	0.124	0
Dababy	Suge	18	7	23	0.876	0.662	2	-6.482	0	0.426	0.0608	0
Ariana Grande & Social House	Boyfriend	22	8	5	0.4	0.795	10	-3.731	0	0.461	0.119	0
Blanco Brown	The Git Up	19	14	13	0.847	0.678	9	-8.635	1	0.109	0.0669	0
Megan Thee Stallion, Nicki Minaj & Ty Dolla \$ign	Hot Girl Summer	31	11	4	0.872	0.814	0	-4.568	1	0.155	0.00485	0.00000196
Saweetie	My Type	21	21	10	0.899	0.811	2	-6.294	1	0.258	0.000677	0
Taylor Swift	Lover	10	10	3	0.359	0.543	7	-7.582	1	0.0919	0.492	0.0000158
Young Thug, J. Cole & Travis Scott	The London	25	12	15	0.796	0.586	4	-6.946	0	0.147	0.0247	0
Sam Smith & Normani	Dancing With A Stranger	26	7	34	0.741	0.52	8	-7.513	1	0.0656	0.45	0.00000197

Week of: Oct. 05 2019