# What Makes a Song Popular on Spotify?

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# Introduction

- We are comparing the top 100 songs on Spotify using Tableau and looking at how different attributes affect the ranking of these songs.
- Spotify has 191 million monthly active users
- Data set
  - Top Spotify Tracks of 2018

# Objective

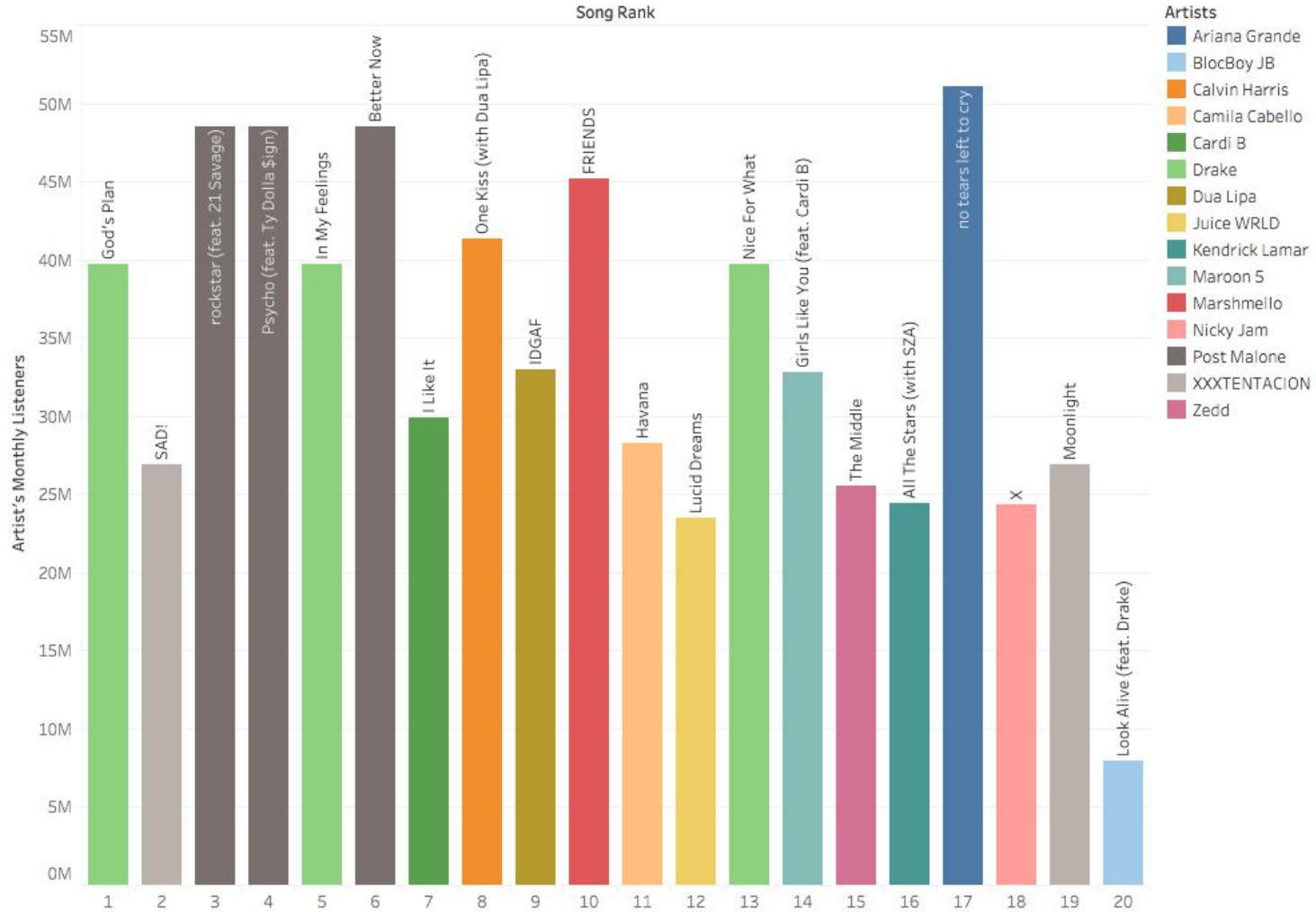
- Questions we'd like to answer:
  1. How much of an impact does an artist's name have on a song's rank?
  2. What attributes make a song popular?
  3. For less popular artists, what makes their songs reach the Top 100?

# Our Approach

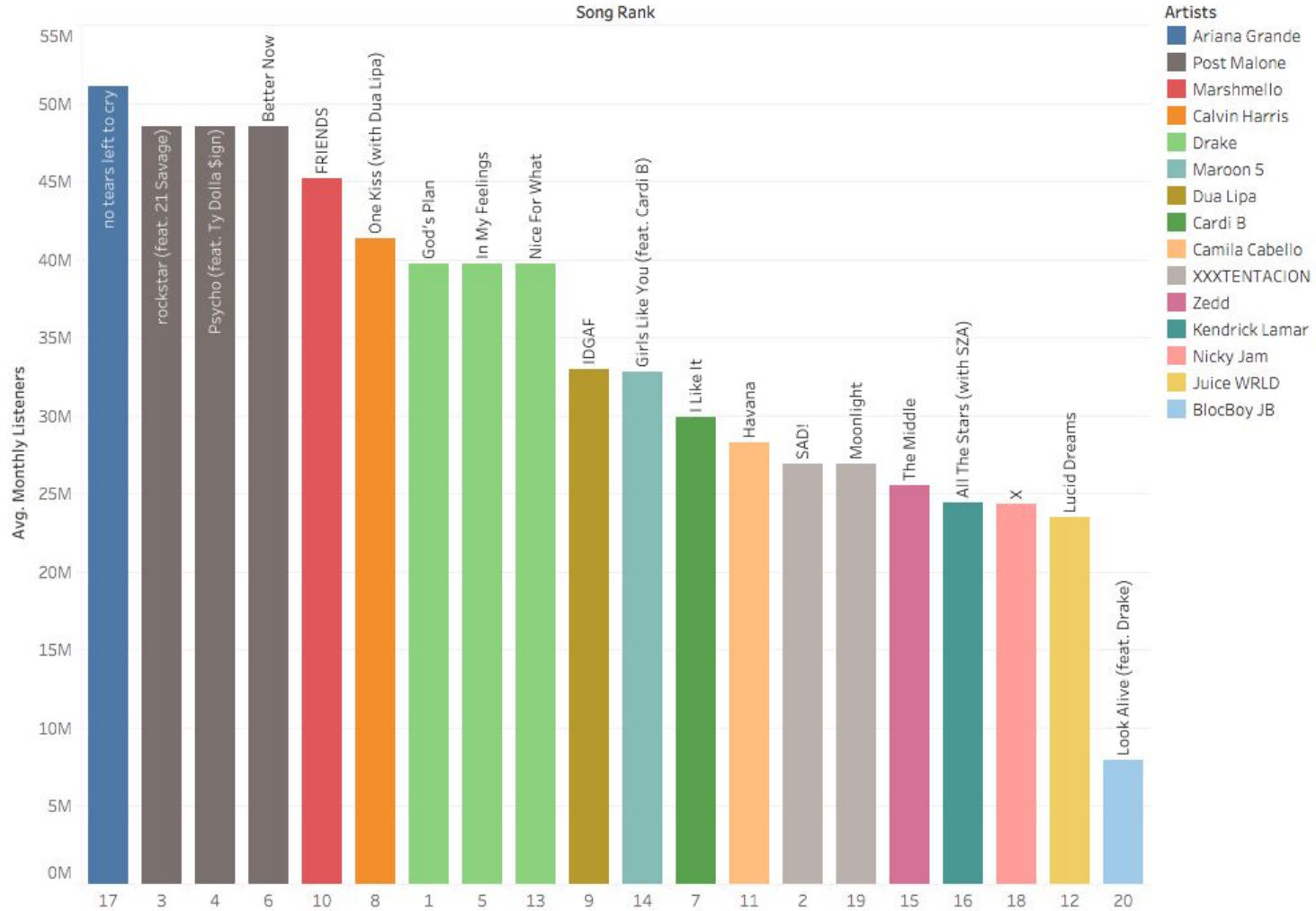
- Manually recorded each artists' monthly listeners on Spotify and their ranking in the world for listeners
  - Needed a way to quantify artist popularity
- Normalized each attribute to fall within the range of 0 to 1
  - Made it easier to draw conclusions on relationships between attributes
- Used data reduction for some questions to allow for easier visualization
  - For example, we looked at only the Top 20 songs (instead of the entire Top 100)  to answer some questions

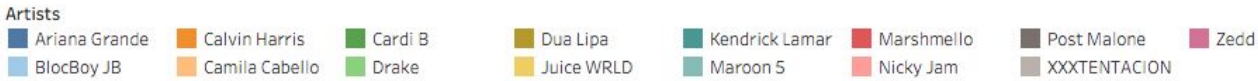
How much of an impact does an artist’s name have on a song’s rank?

# Actual Top 20 Songs



# Top 20 Songs Predicted by Artist's Popularity



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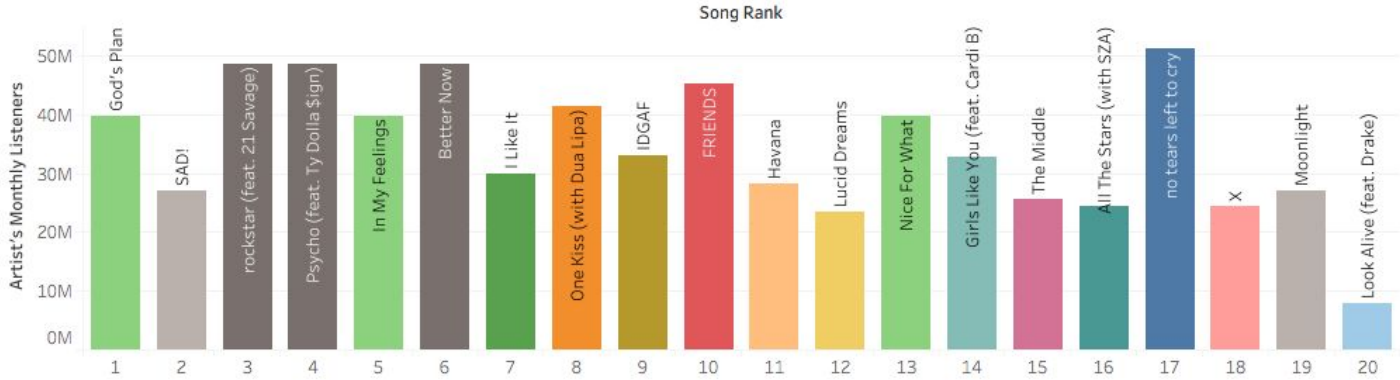


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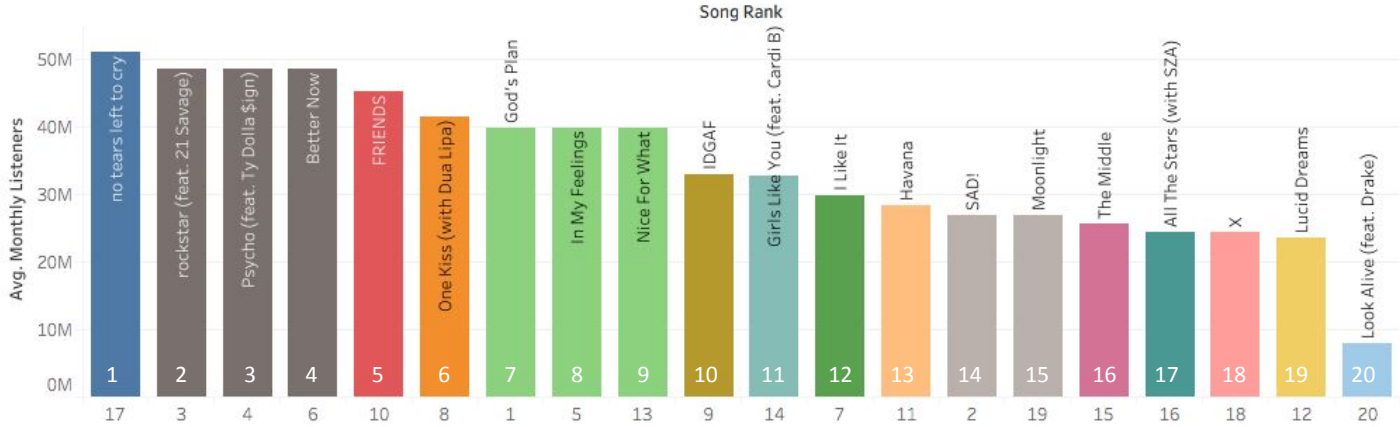

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Ariana Grande
BlocBoy JB
Calvin Harris
Camila Cabello
Cardi B
Drake
Dua Lipa
Juice WRLD
Kendrick Lamar
Maroon 5
Marshmello
Nicky Jam
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# Monthly Listener Measure

- Monthly listeners updates daily, and as regular Spotify users, we only had access to this most recent data
  - i.e., our monthly listeners data was as of 4/19/19, not an average from 2018 as a whole
  - Artists have accounts with more comprehensive stats on their music and in comparison to other artists, but you need to be approved in order to get one of these accounts

# Why is Ariana's song ranked lower than expected?

- Her hugely successful album Thank U, Next was released on February 8th, 2019
- Her popularity has skyrocketed since then, explaining the disparity between her monthly listeners in 2019 and her top song ranking in 2018

# Why is XXXTentacion's song ranked higher than expected?

- Sad! by XXX was released on March 2nd, 2018
- XXXTentacion was murdered on June 18th, 2018 at age 20
- In the week following his death, Sad! moved from 52nd to 1st on the Billboard Hot 100, making him the first artist to top the Hot 100 posthumously (after death) since the Notorious B.I.G. in 1997
- New music continues to be released under his name, including his single Moonlight that was ranked 18th in 2018 despite being released on August 14th, after his death

# Explanation

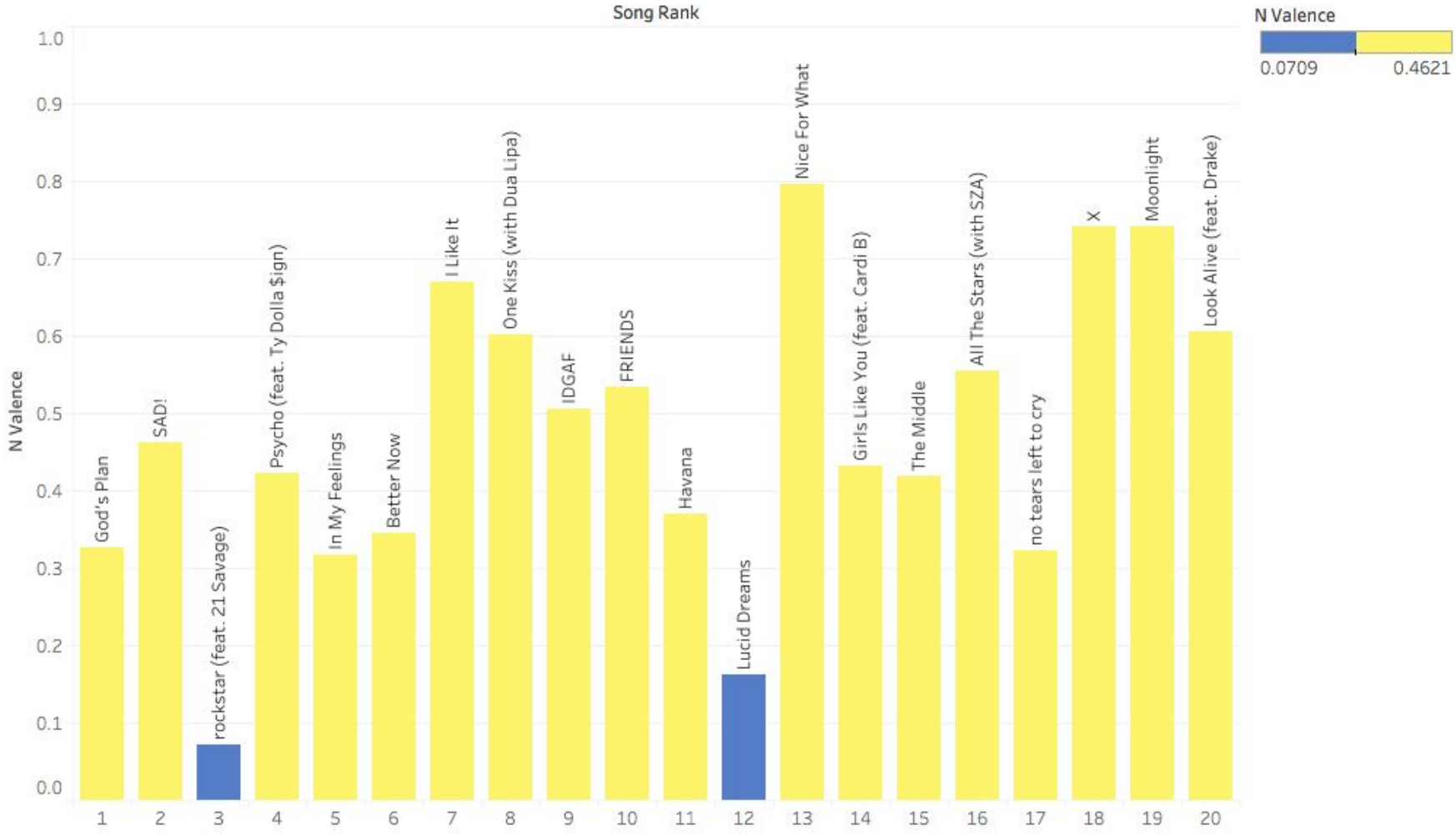
- High correlation between artist popularity and their songs making it in the Top 100
- Songs by artists who pass away at a young age tend to increase in popularity/streams immensely
  - Intriguing how songs by the artists can still be released after their death and also become very popular
  - Other young artists like Mac Miller, Avicii, & Nipsey Hussle have had similar experiences and recognition following their deaths in 2018-19

# What attributes make a song popular?

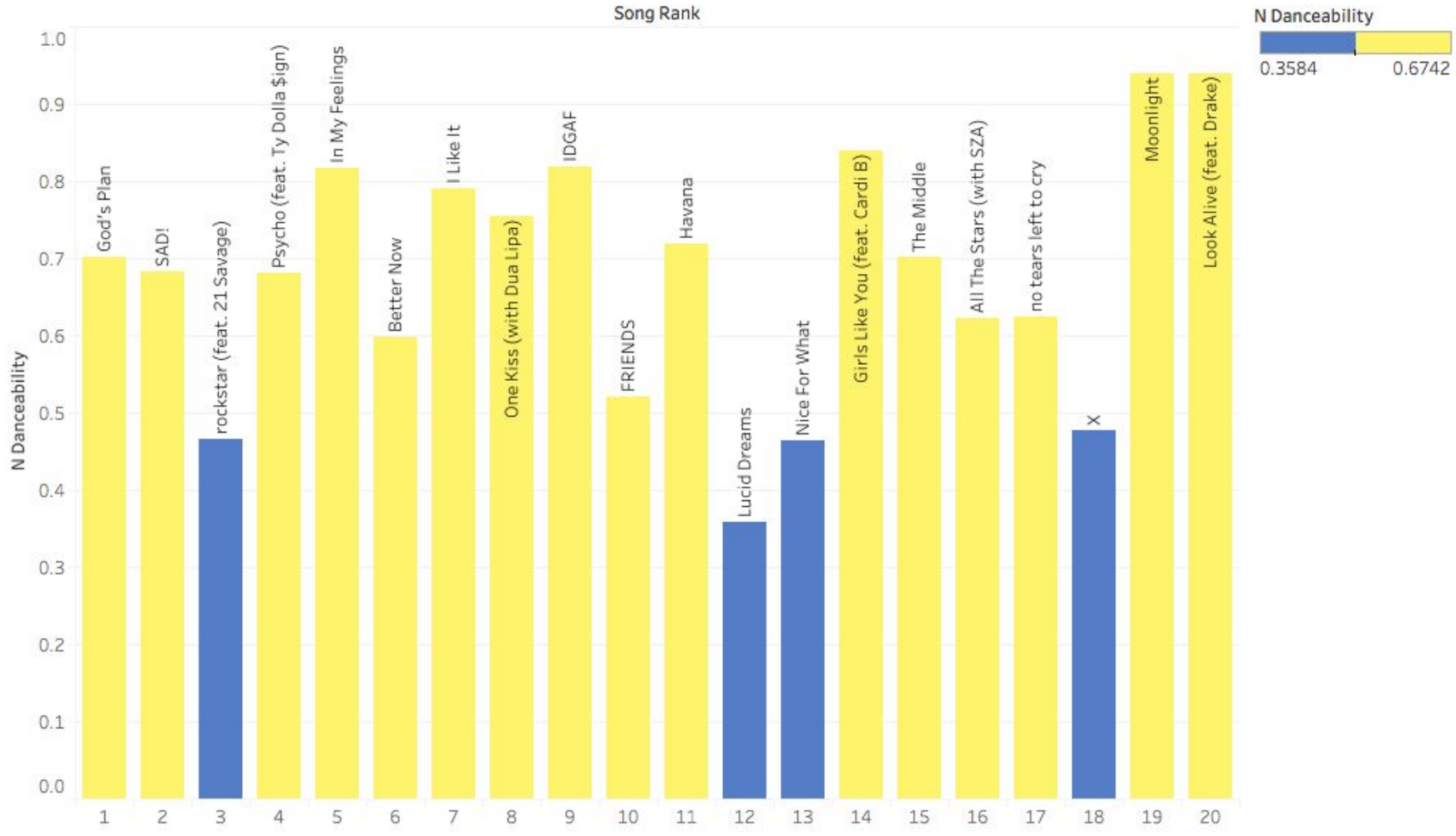
# Attribute Descriptions

- Danceability: how suitable a track is for dancing based on tempo, rhythm stability, beat strength, and overall regularity
- Energy: measure of intensity and activity based on dynamic range, perceived loudness, onset rate, and general entropy
- Valence: describes the musical “positiveness” (happy, cheerful, etc.)
- Song rank: Spotify does not release the algorithm that determines rank but most people agree it is ranked based on number of streams over some set period of time

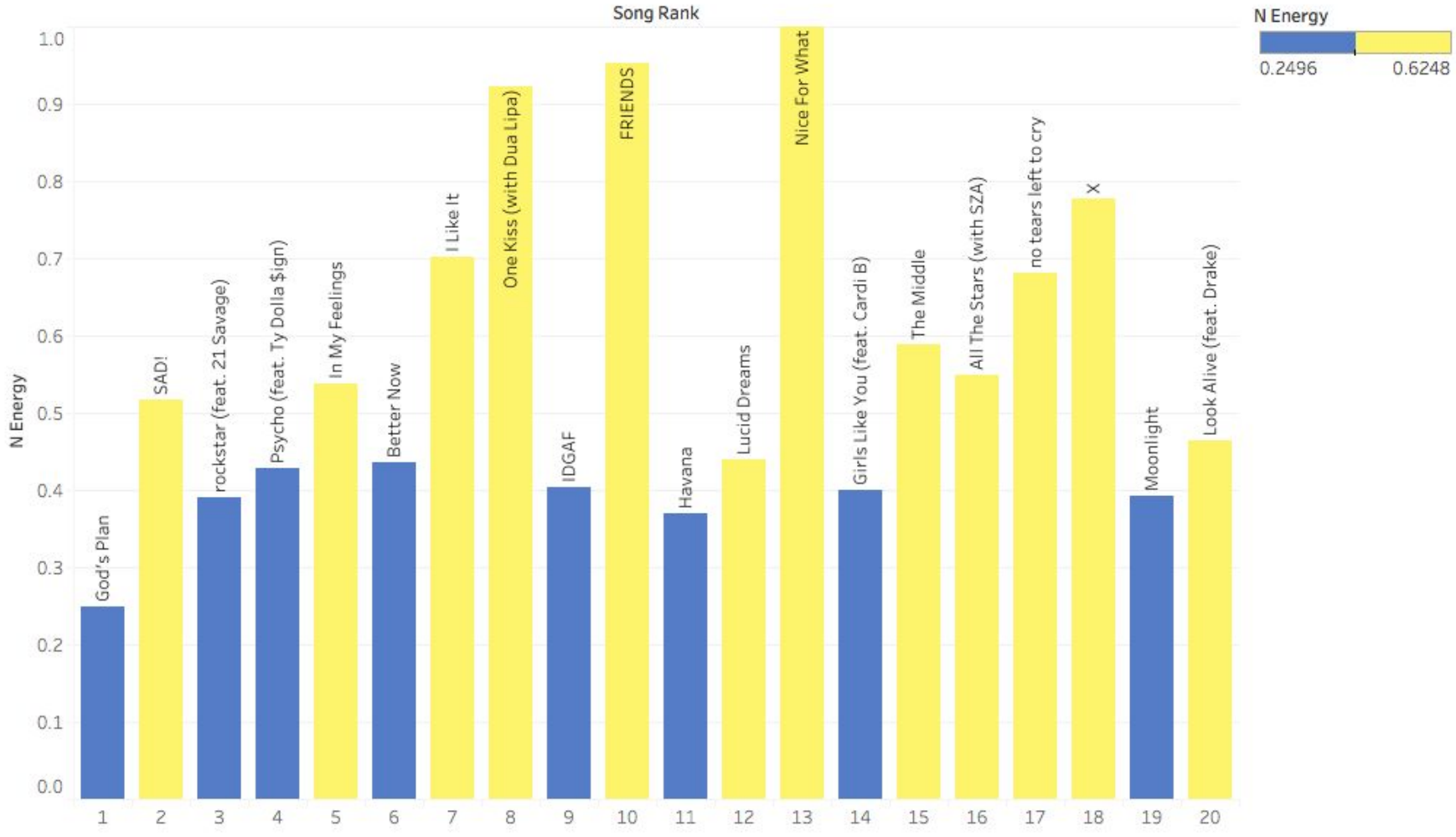
# Are the top 20 songs "happy"?



# Are the top 20 songs "danceable"?



# Are the top 20 songs "high energy"?



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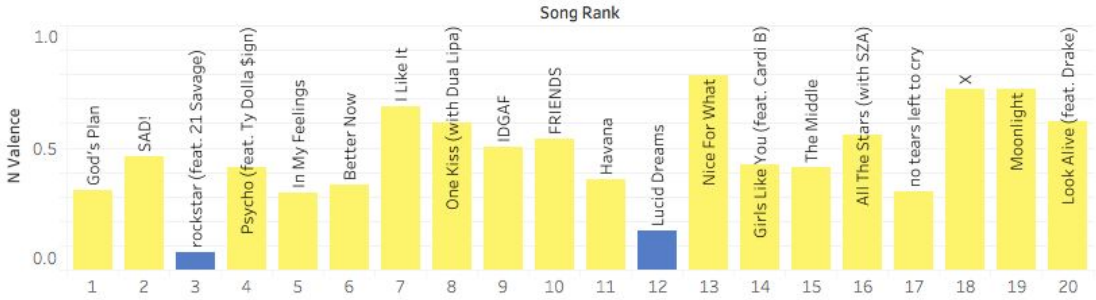


N Valence
0.0709 0.4621

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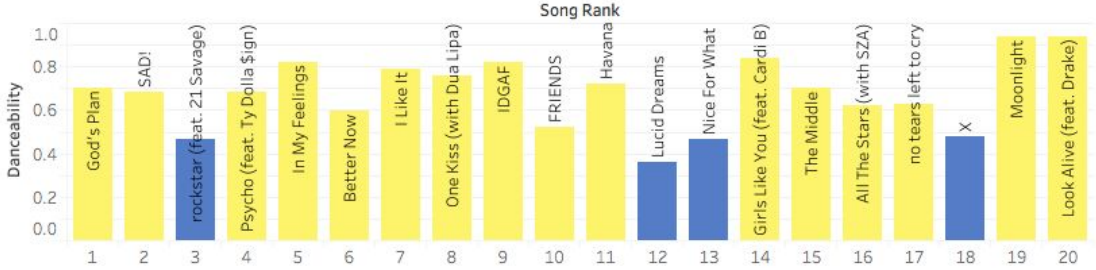


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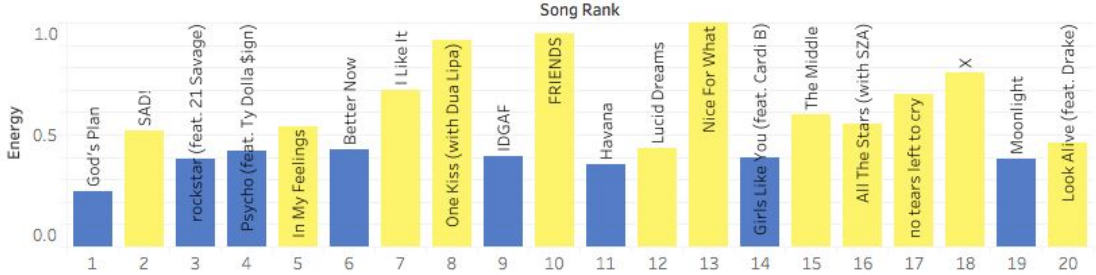
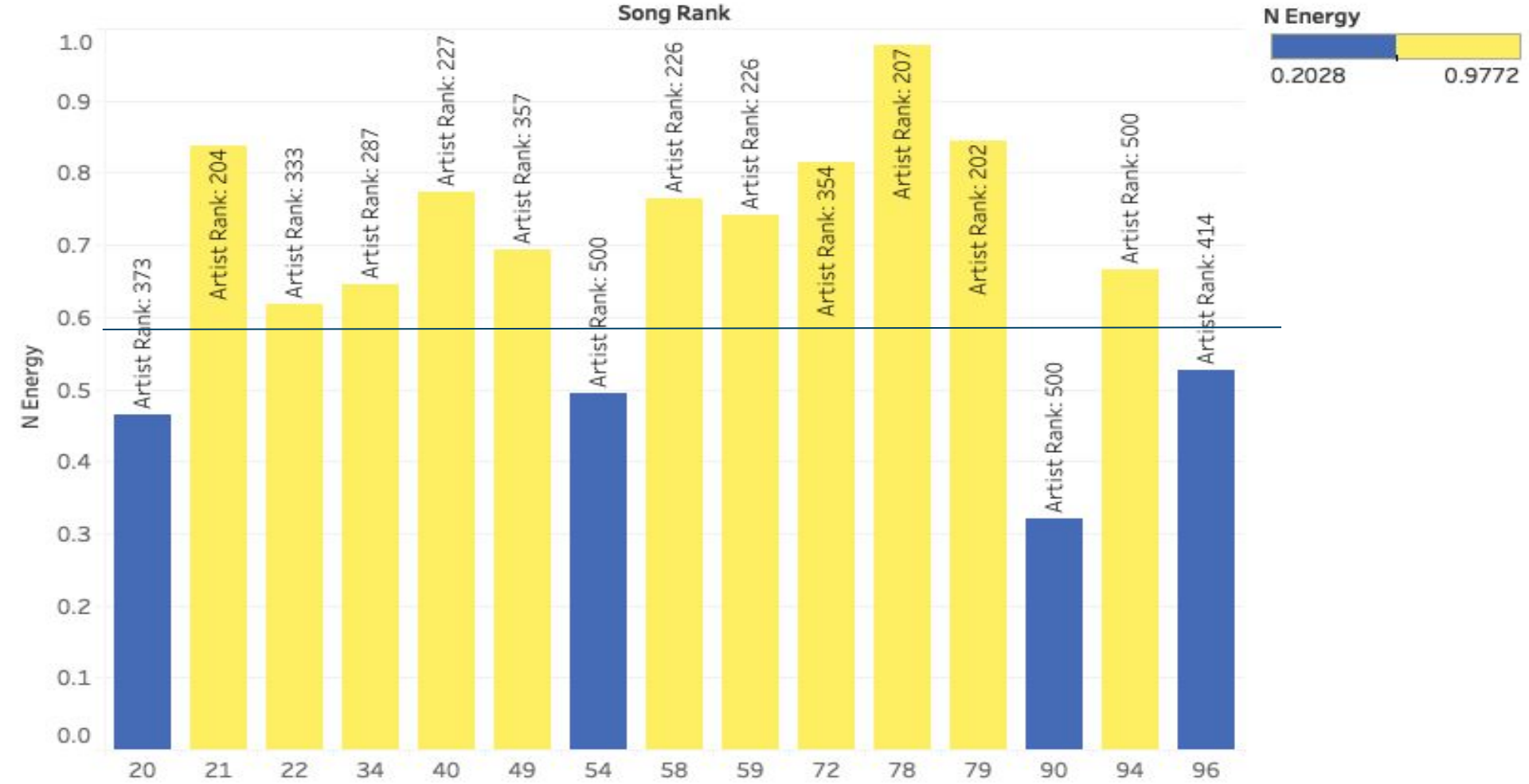


# Explanation

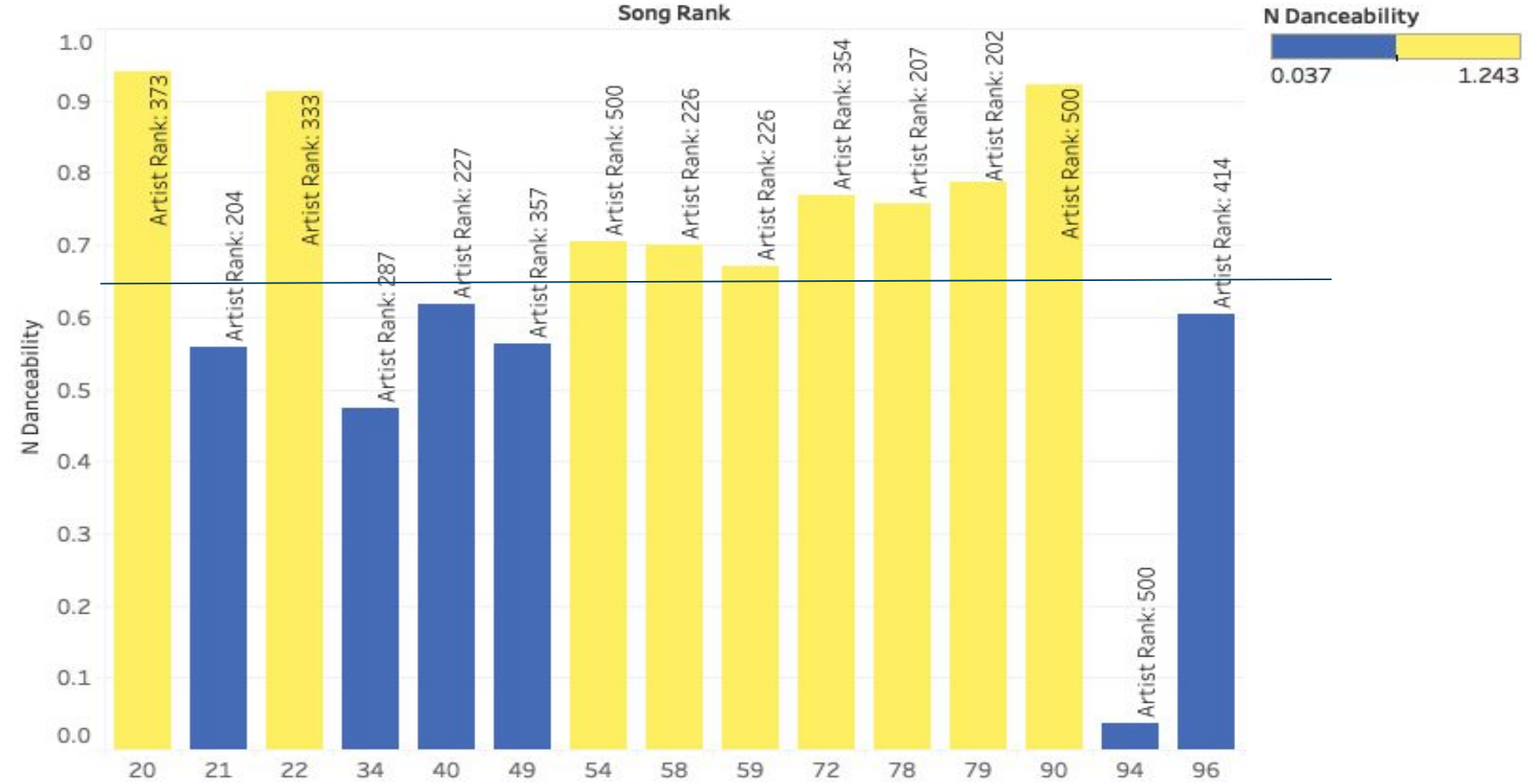
- The most popular songs tend to be happier and more danceable
- Energy doesn’t seem to play a role in a song’s popularity

For less popular artists, what makes their songs reach the Top 100?

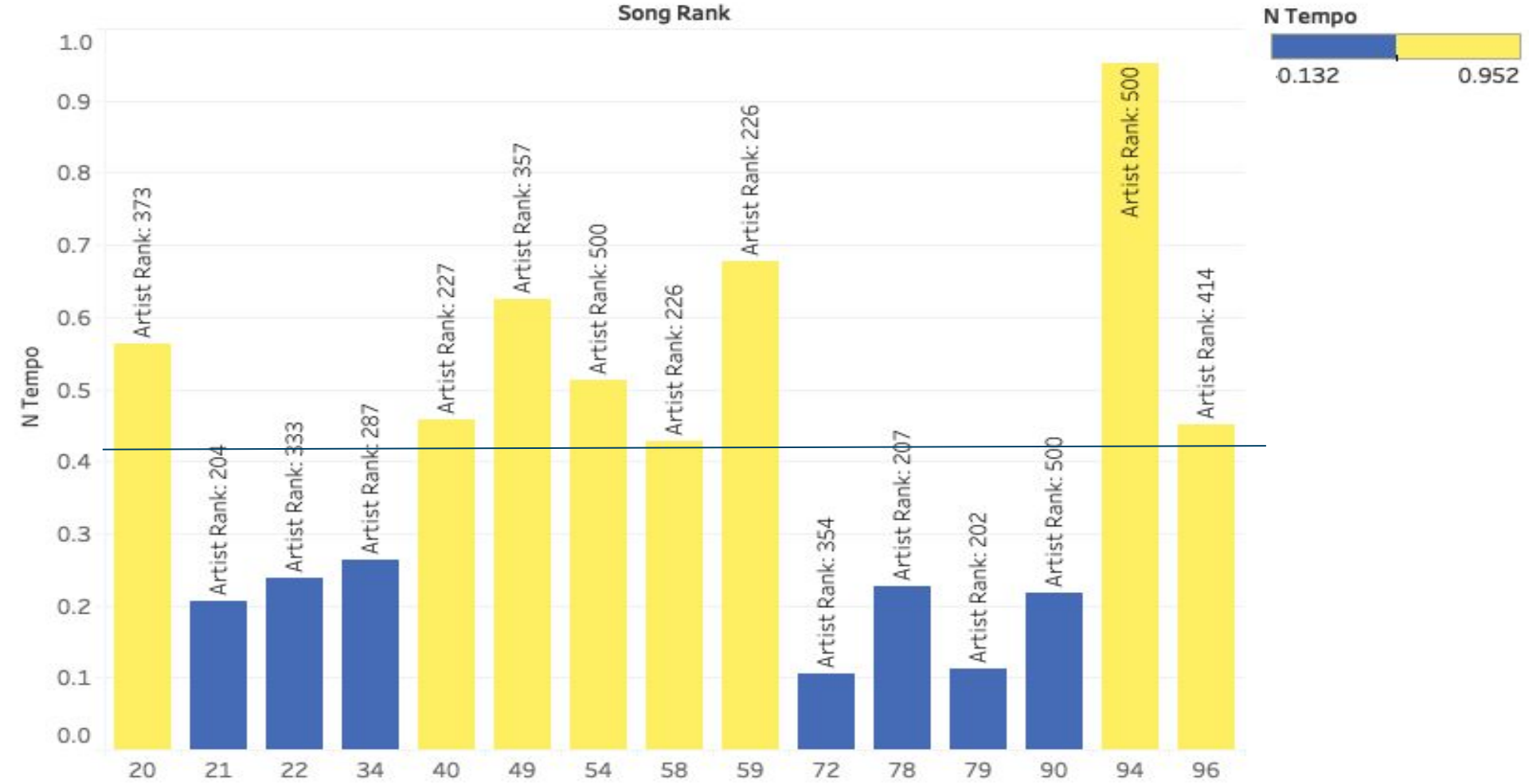
# Energy Among Less Popular Artists



# Dancability Among Less Popular Artists



# Tempo Among Less Popular Artists



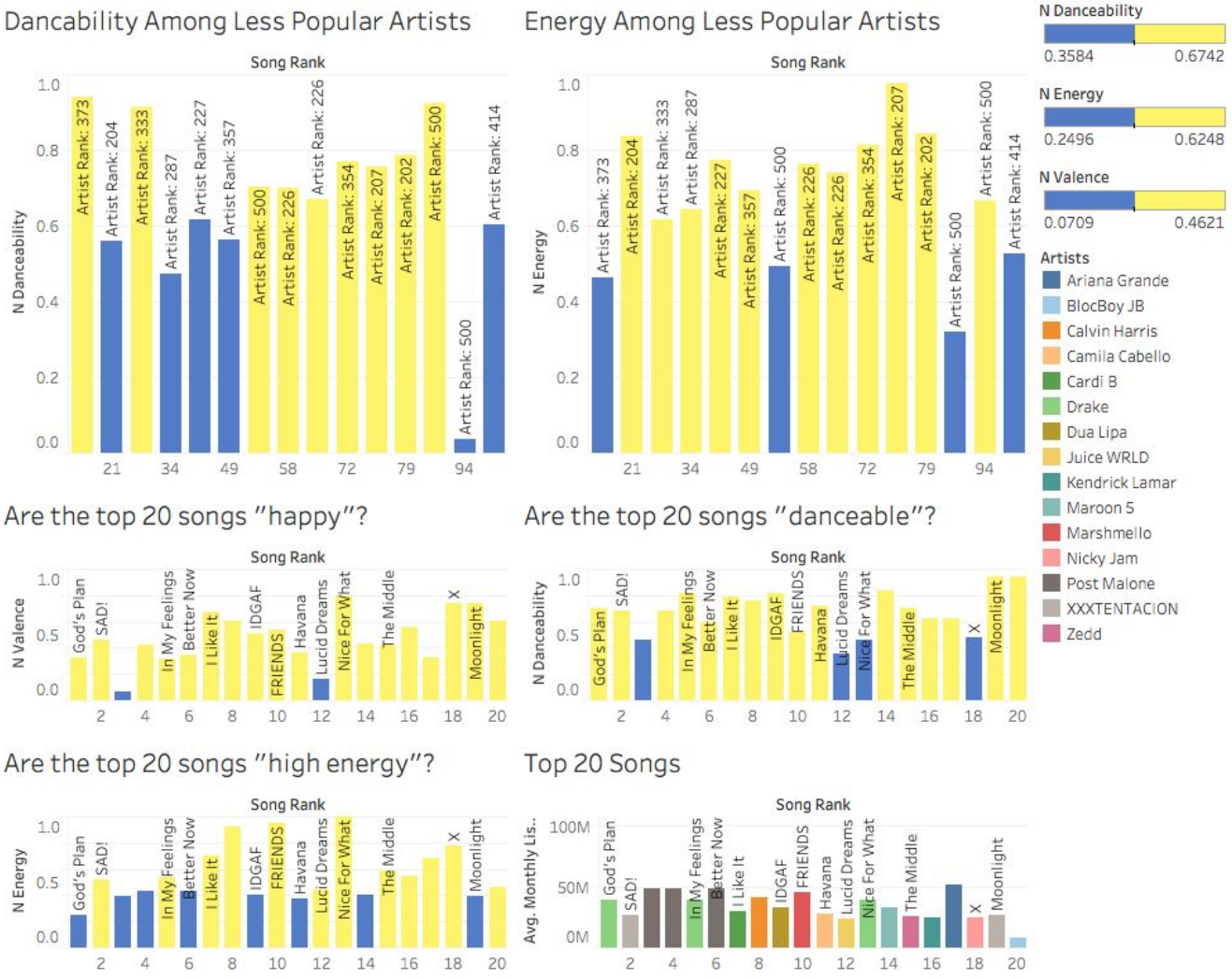
# Explanation

- Lesser known artists are more likely to create a hit song if they incorporate elements with high energy and danceability
- However, tempo seems to have no impact on popularity
- These are more likely to attract attention among first time listeners
- Catchy, upbeat songs attract popularity if the artist’s name alone does not

# Final Summary

- There is a high correlation between artist popularity and their songs making it in the Top 100
- Songs by artists who pass away at a young age tend to increase in popularity/streams immensely
- The most popular songs have high danceability and valence, but energy doesn’t seem to influence popularity
- Danceability and energy have a positive effect on making a lesser known artist’s songs popular, but tempo has little impact

# Dashboard


Dancability Among Less Popular Artists
Song Rank
N Danceability
Artist Rank: 373
Artist Rank: 204
Artist Rank: 333
Artist Rank: 287
Artist Rank: 227
Artist Rank: 357
Artist Rank: 500
Artist Rank: 226
Artist Rank: 226
Artist Rank: 354
Artist Rank: 207
Artist Rank: 202
Artist Rank: 500
Artist Rank: 500
Artist Rank: 414
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Artist Rank: 227
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# Sources

- Information on stats available to artists
  - https://artists.spotify.com/faq/stats#can-i-compare-my-stats-with-other-artists-stats
- Ariana’s newest album
  - https://en.wikipedia.org/wiki/Thank_U,_Next
- XXXTentacion
  - https://en.wikipedia.org/wiki/XXXTentacion
- Number of spotify users
  - http://www.businessofapps.com/data/spotify-statistics/
- Top Spotify Tracks of 2018 dataset
  - https://www.kaggle.com/nadintamer/top-spotify-tracks-of-2018

# Questions?