



Spotify

Spotify Music Insights

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Team 3 - No Music No Life

Jialin Pan Yashu Jin Zilin Luo

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Team No Music No Life

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No Music No Life Inc.

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Data Source



Our Spotify data are from **Kaggle** and the **Spotify API**.

The dataset (updated at April 5th) contains **172,230 songs from 1920 to 2021** with several track attributes (energy, popularity, etc.) and basic information (release date, artists, ID).

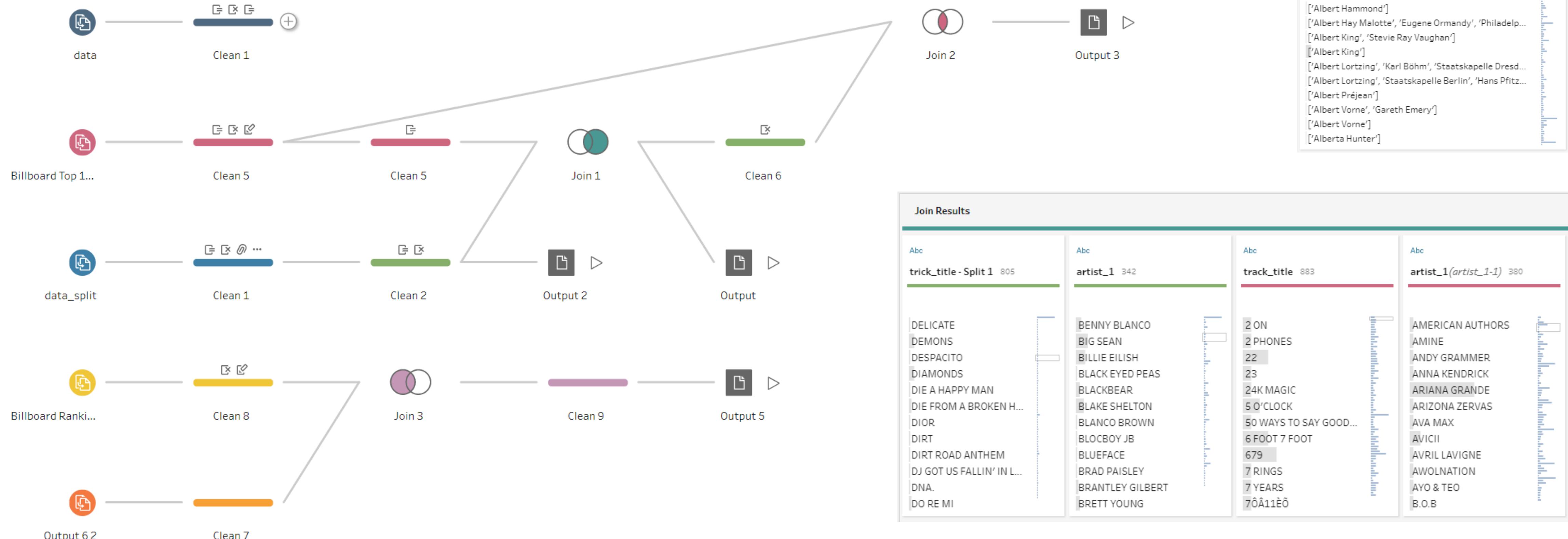


Our Billboard data are from **Kaggle** and the **Billboard official Website**.

The original dataset contains the **year-end top 100 songs of 2011 to 2019**, including track name, artist name, and ranking. We manually added the **2020** data from the official website.

We also added chords data from McGill Billboard Dataset that tagged chords for the

Data Cleaning

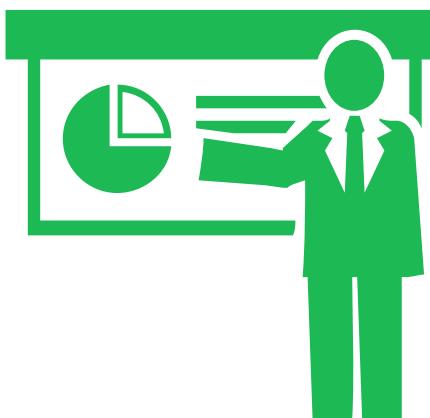


- Tableau PREP: Delete the duplicates, Split the artists' name into separated columns
- Excel: Cleaning Process like delete extra punctuations
- Tableau PREP: Match track name and artist name to join with Billboard data source

Data Quality

b_rank	b_year	year	track_title	id	acousticness	danceability	duration_ms	energy	explicit	instrumentalness	key	liveness	loudness	mode	popularity	speechiness	tempo	valence	release_date	artist_1	artists_2
95	2013	2013	#thatPOWER	01TuObJVd7owWchVRuQbQw	0.00112	0.797	279507	0.608	0	7.66E-05	G#	0.0748	-6.096	0	68	0.0584	127.999	0.402	2013/1/1	will.i.am	Justin Bieber
43	2013	2012	Same Love - feat. Mary Lambert	01uqlI4H13Gsd8LyI1EYd8H	0.716	0.688	318525	0.473	0	4.46E-05	A#	0.104	-9.059	1	67	0.167	84.958	0.299	2012/10/9	Macklemore & Ryan Lewis	Mary Lambert
4	2013	2013	Harlem Shake	01XFgRZfZl7oBagNf1Loml	0.0111	0.452	196664	0.794	0	0.00182	C	0.416	-5.151	1	58	0.0483	137.825	0.282	2013/2/12	Baauer	
11	2015	2015	Cheerleader - Felix Jaehn Remix Radio Edit	023OVLNzXhX0j7CxswUt6D	0.141	0.78	180560	0.68	0	1.20E-05	F#	0.138	-6.081	1	64	0.0305	118.026	0.594	2015/10/16	OMI	

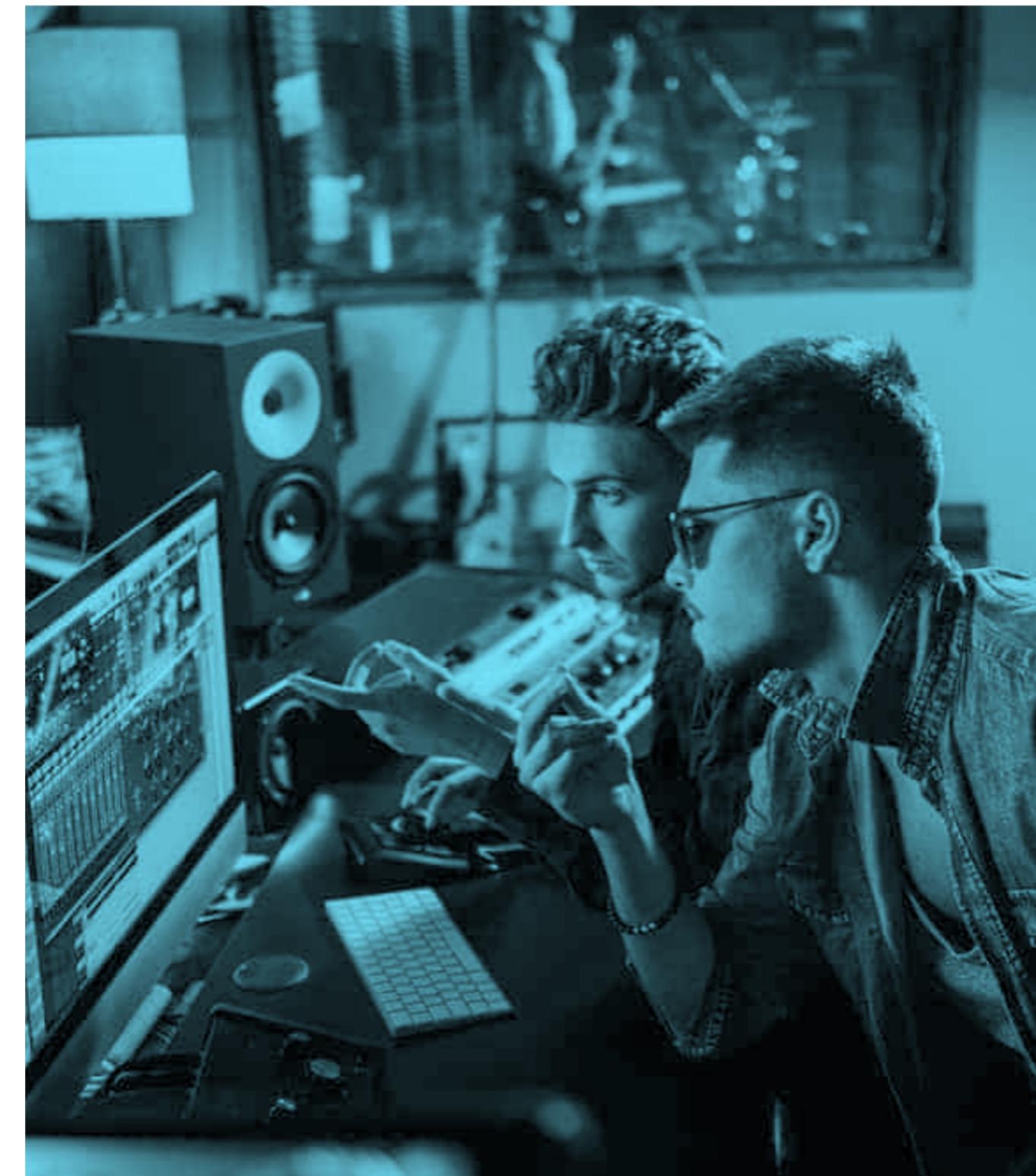
- **Accuracy:** All data directly acquired from official platforms, and did not lose any information during the cleaning process.
- **Completeness:** We have all the music attributes and information to help us analyze, there is no missing value.
- **Consistency:** We kept only ranking and year columns from Billboard source, using all the formatting from Spotify to keep consistency.
- **Integrity:** Our data maintained integrity by our reliable data collection and cleaning process.
- **Reasonability:** Our data meets the expected range, type and value. All music attributes are measured in reasonable values and make sense.
- **Timeliness:** We used the Spotify dataset updated in 2021 and added the 2020 Billboard year-end data to make sure our data is up-to-date.
- **Uniqueness:** The key value, music id, obtained from Spotify's official website guaranteed the uniqueness.



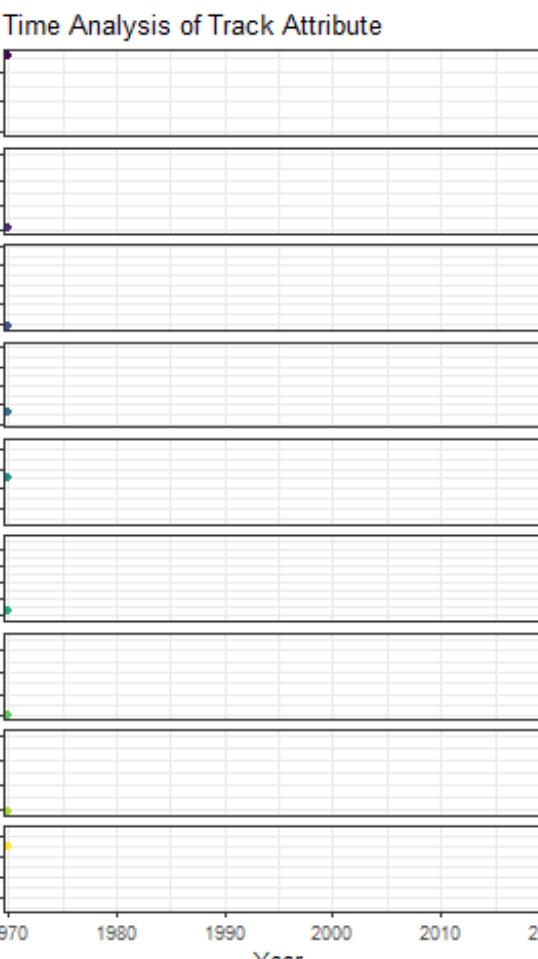
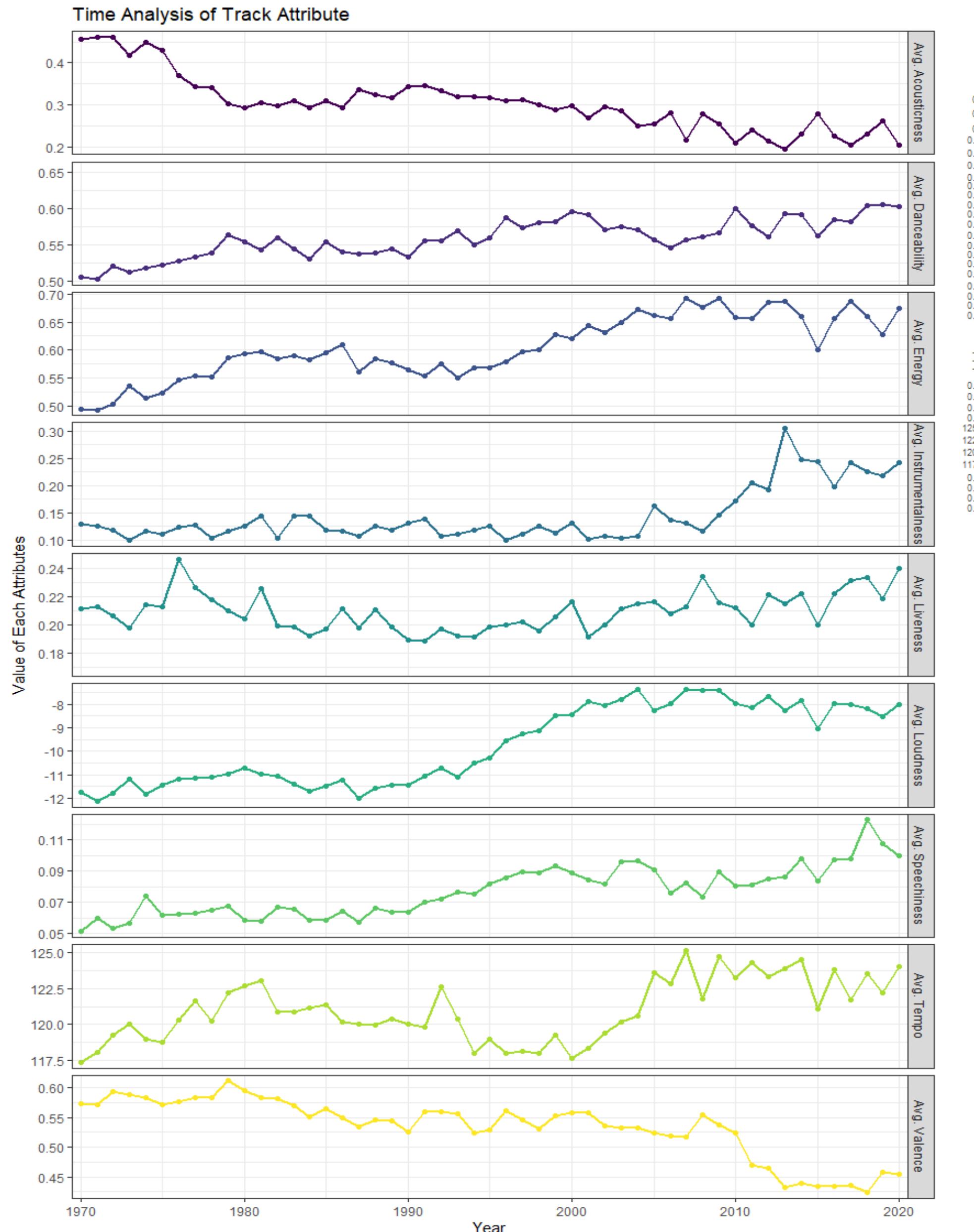


No Music No Life Inc. — providing best music data solutions to clients

Our consultancy focuses on the **music industry**, one of the most important parts of people's daily entertainment. In this market, we have **several stakeholders** – **audiences** who listen to music, **artists and producers** who make music, and **music platforms** that connect everything.

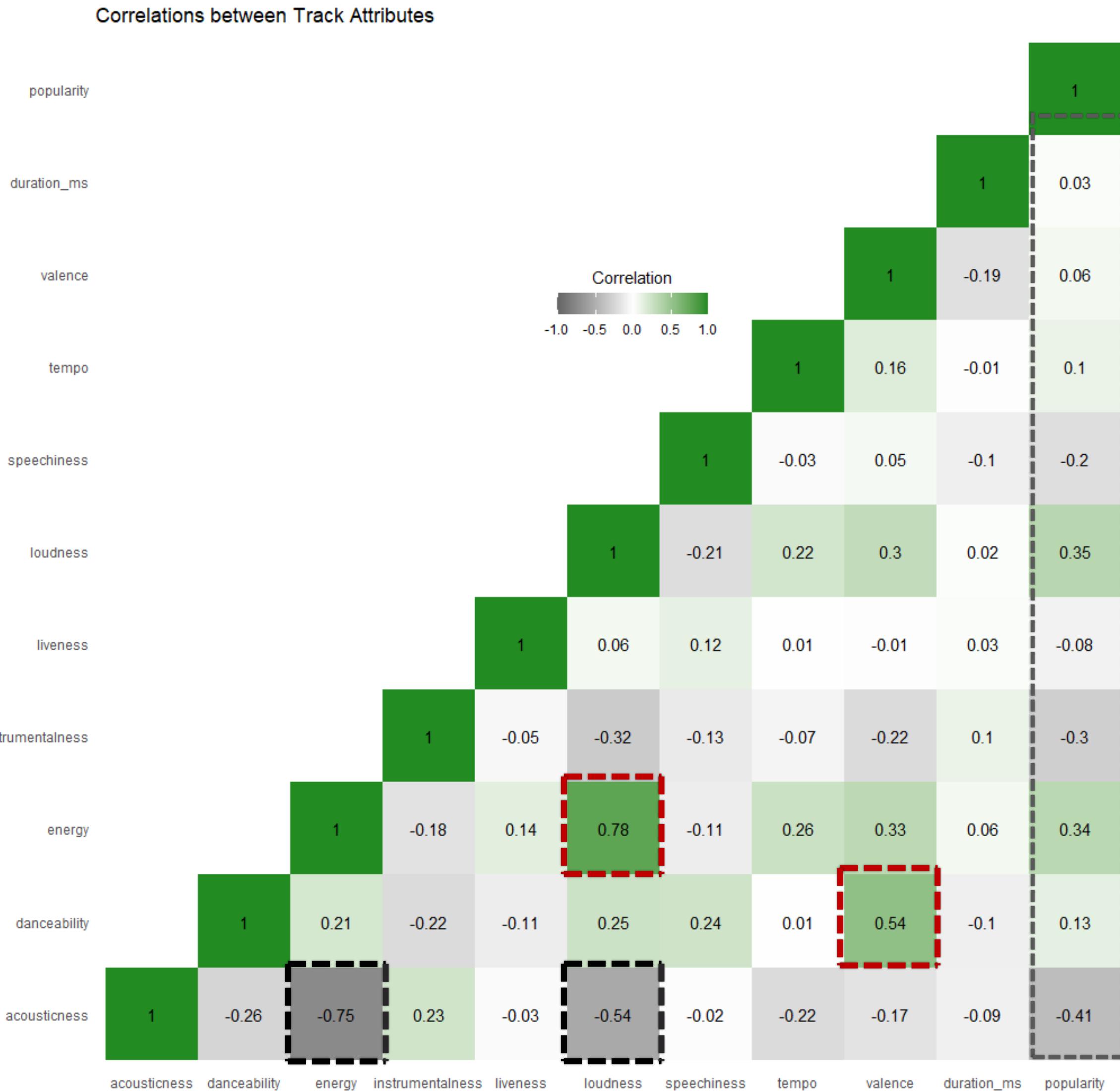


Analysis of Track Attributes – Time Analysis of track attributes



Attributes	Description
Acousticness	The relative metric of the track being acoustic, ranging from 0 to 1. The higher the value is, the track is more likely to be acoustic.
Danceability	The relative measurement of the track being danceable, ranging from least danceable (0) to most danceable (1).
Energy	The energy of the track, ranging from least energetic (0) to most energetic (1).
Instrumentalness	The relative ratio of the track being instrumental, ranging from 0 to 1. The closer the instrumentalness value is to 1, the greater likelihood the track contains no vocal content.
Liveness	The relative duration of the track sounds like a live performance, ranging from 0 to 1. Higher liveness values represent an increased probability that the track was performed live.
Loudness	Relative loudness of the track in the typical range [-60, 0] in decibel (dB).
Popularity	The popularity of the song lately, default country = US, ranging from least popular (0) to most popular (100).
Speechiness	The relative length of the track contains any kind of human voice, ranging from 0 to 1. The more exclusively speech-like the recording, the closer to 1.0 the attribute value.
Tempo	The tempo of the track in Beat Per Minute (BPM), floats typically ranging from 50 to 150.
Valence	The positiveness of the track, ranging from 0 to 1. Tracks with high valence sound more positive), while tracks with low valence sound more negative.

Analysis of Track Attributes – Correlations between Track Attributes

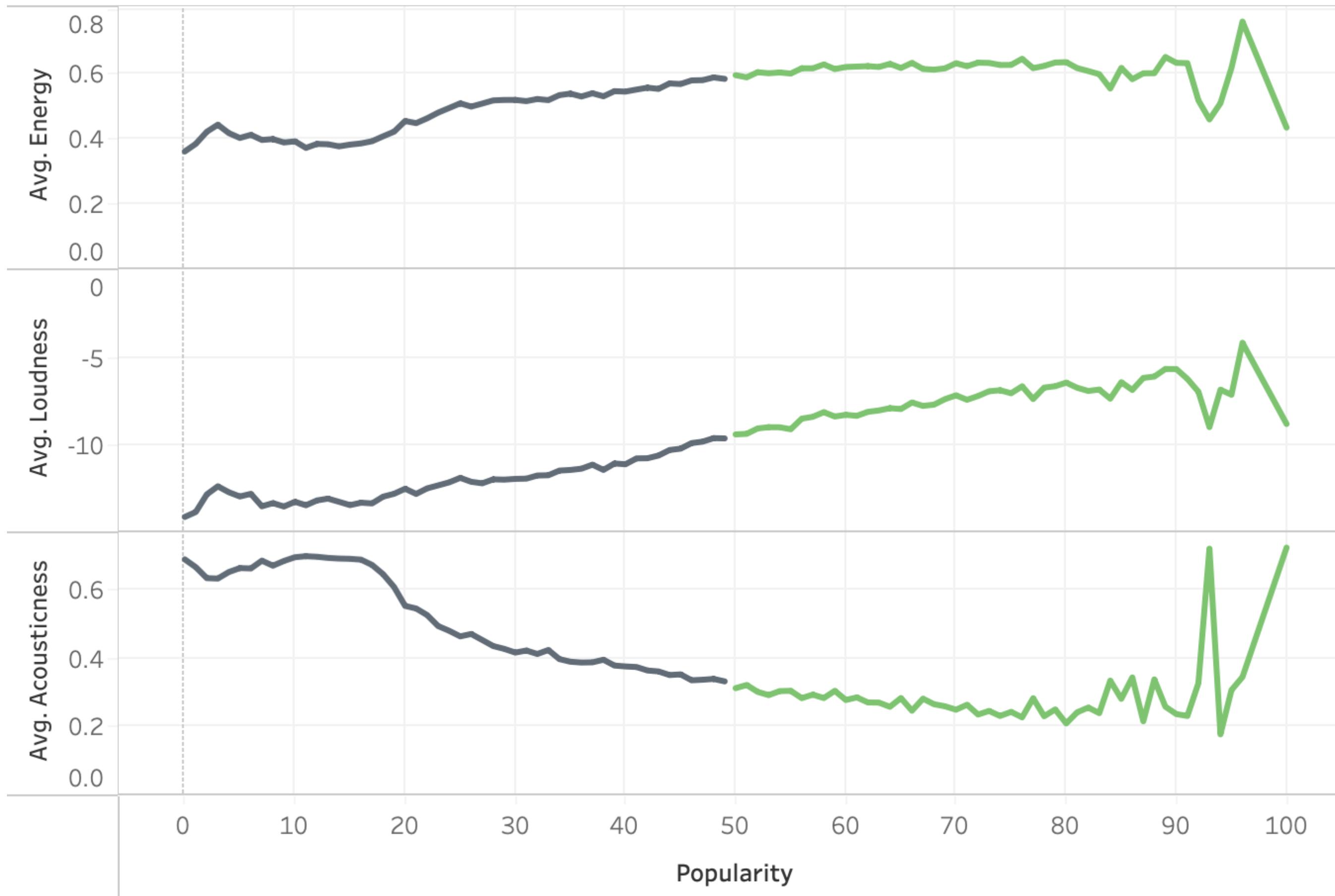


- Positive correlation:**
energy and loudness (0.78),
danceability and valence(positive mood) (0.54)
- Negative correlations :**
energy and acousticness (-0.75),
acousticness and loudness (-0.54)
- Energetic songs tend to be louder and less acoustic.
Most Danceable songs tends to be more positive.
- Popularity have not quiet strong relationship with any attributes. Maybe higher loudness (0.35) and energy (0.34) can attract people's attention, which slightly adds to the popularity.
While for acousticness, less acousticness comes to higher popularity.



Analysis of Track Attributes — Popularity vs. Music Attributes

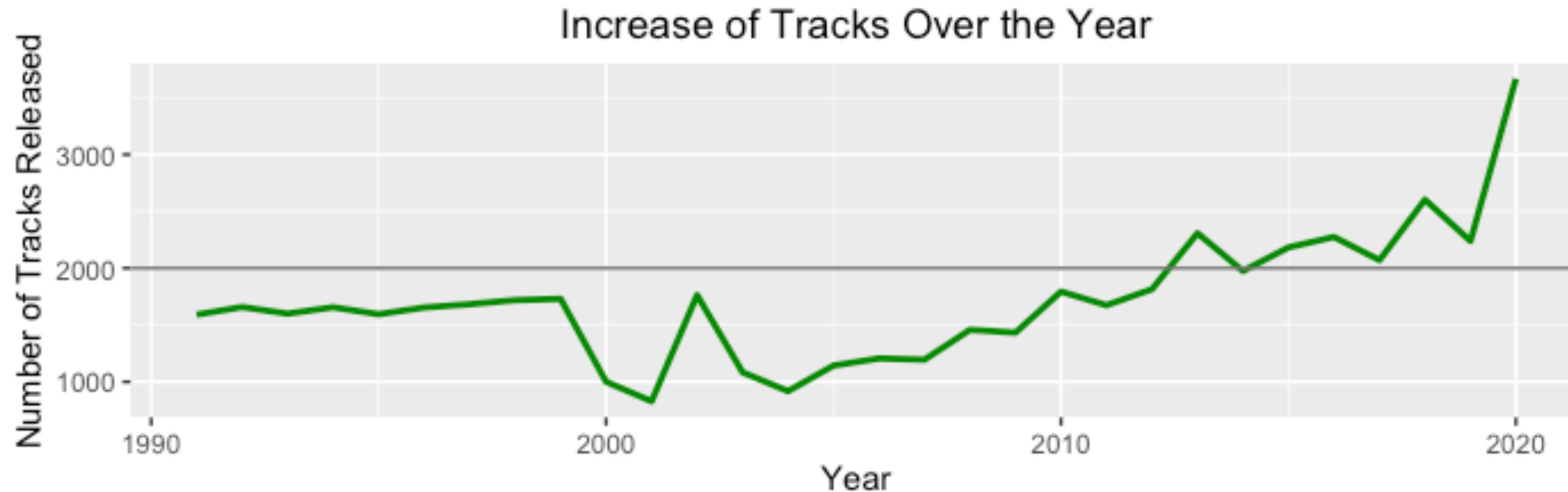
Popularity vs. Music Attributes



- Generally, energy and loudness show upward trends with popularity, while for acousticness, it would drop down with popularity in a wide range.
- For top hits, the value of music attributes fluctuate a lot, it may be significantly affected by some top songs. So it is necessary to do some analysis on most popular tracks to learn strategies to keep popular in our following analysis.



Analysis of Track Attributes — Increase of Songs over the Year



- Mostly, 2000 songs are added for each year on Spotify.
- During the epidemic, artists created 1.5 times as many songs as

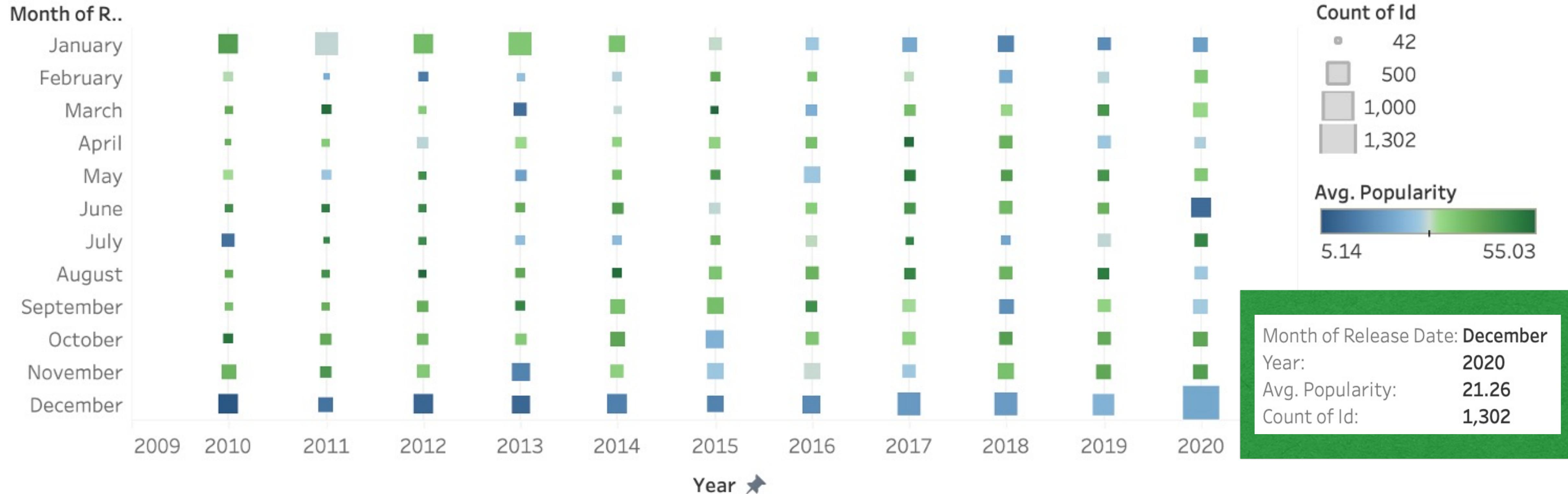


before.

- For Platform:**
- Manage the budget on music rights-holders.
 - Optimize song upload review speed.



Analysis of Track Attributes — Popularity vs Release Date



For Artist:

- ✓ Decide when to release new songs
- ✓ Make full plans for new songs
(composition\Post Production\No Music\No lyrics)



No Music\No lyrics

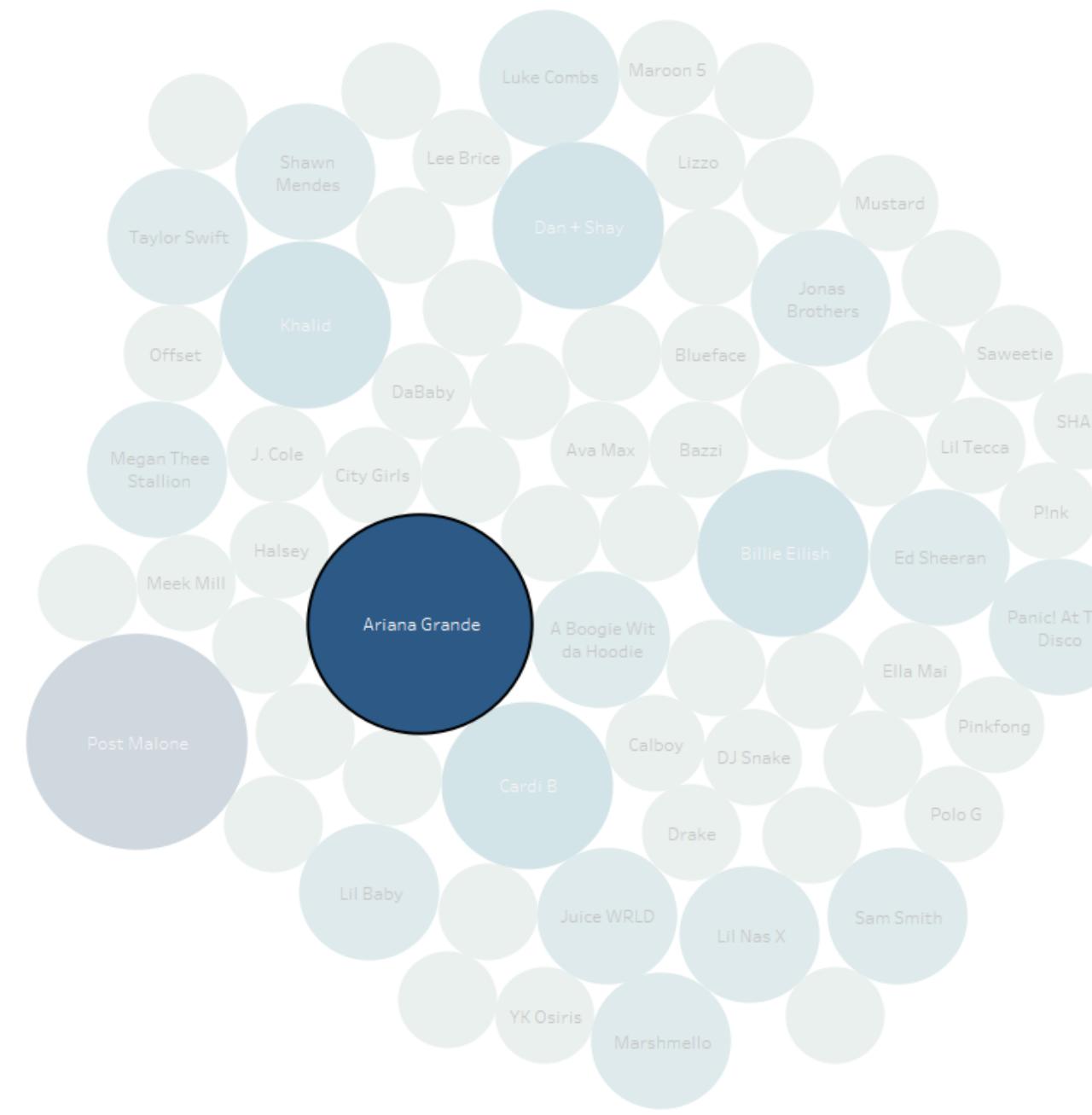
For Record Company:

- ✓ Reasonably arrange the budget and personnel input for each singer
- ✓ Maximize exposure to the public and profits

Spotify to Billboard – Billboard Top 100 of the Decade

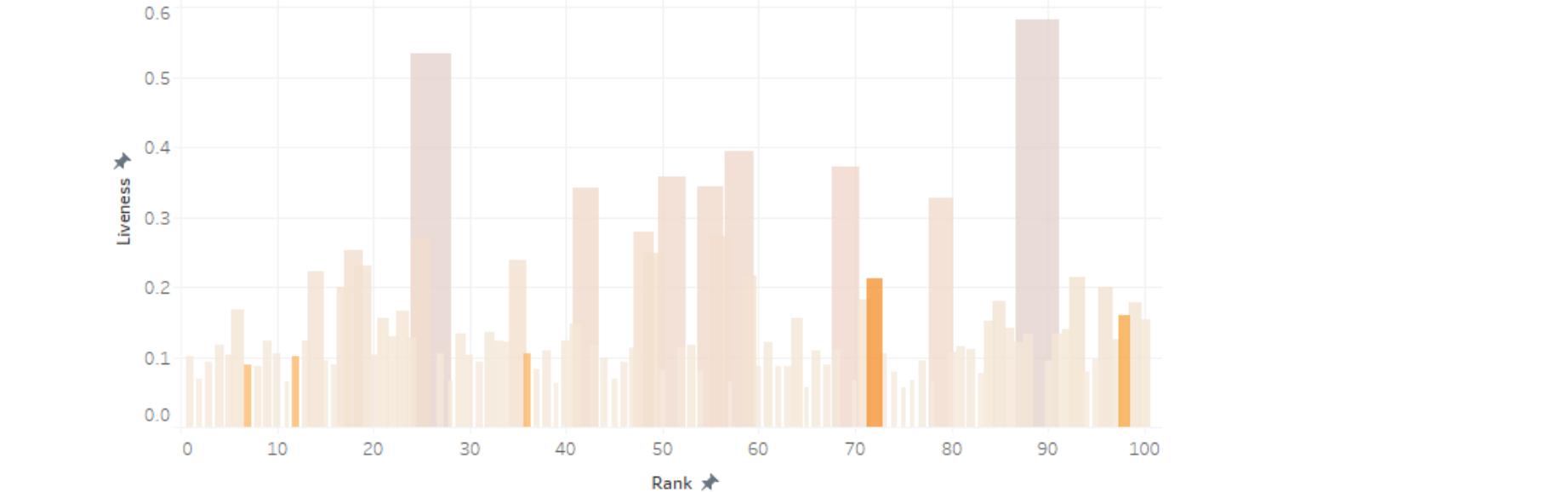
Billboard Top 100 of the Decade

Artist

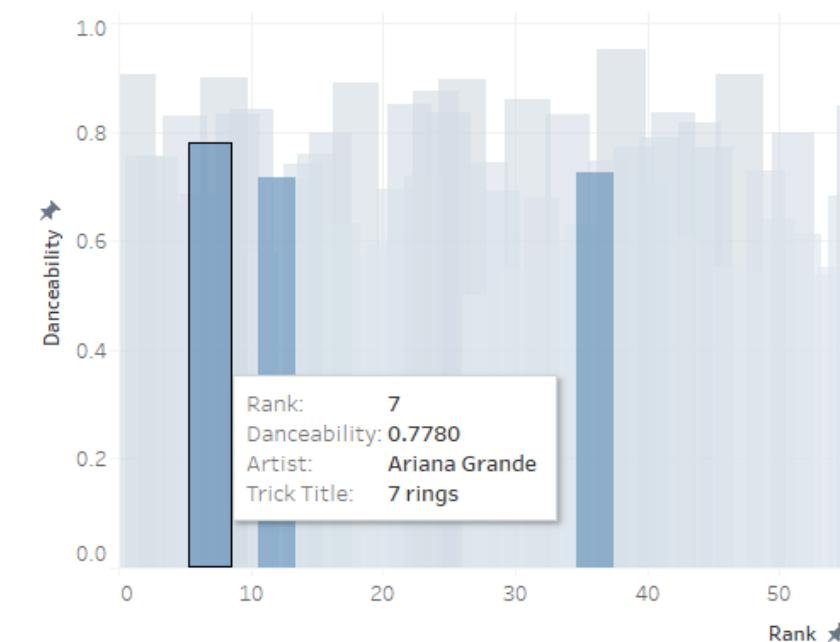


Artist	Trick Title
5 Seconds of Summer	Youngblood
21 Savage	a lot
A Boogie Wit da Hoodie	Look Back at It
	Swervin (feat. 6ix9ine)
Ariana Grande	7 rings
	boyfriend (with Social House)
	break up with your girlfriend, i'm bored
	breathin
	thank u, next
Ava Max	Sweet but Psycho
Bad Bunny	MIA (feat. Drake)
Bazzi	Beautiful
benny blanco	Eastside (with Halsey & Khalid)
Billie Eilish	bad guy (with Justin Bieber)
	bury a friend
	when the party's over
Blake Shelton	God's Country
Blanco Brown	The Git Up
Blueface	Thotiana

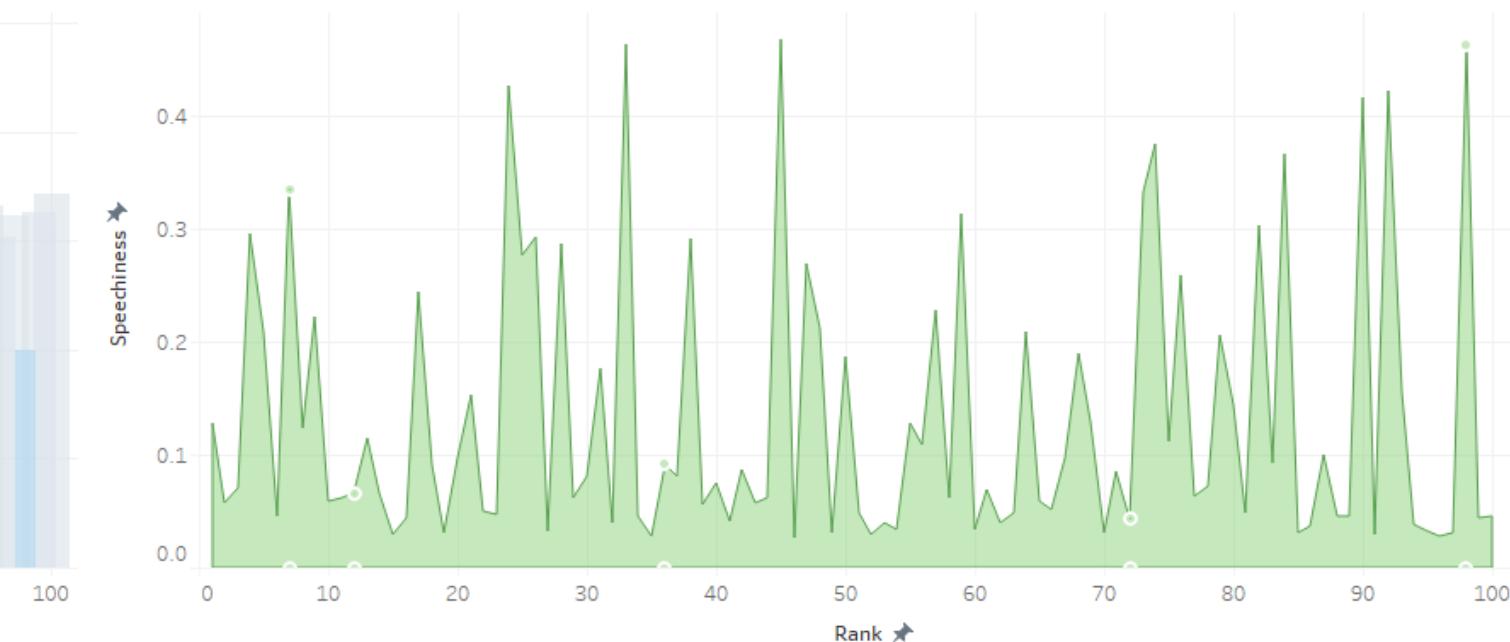
Liveness



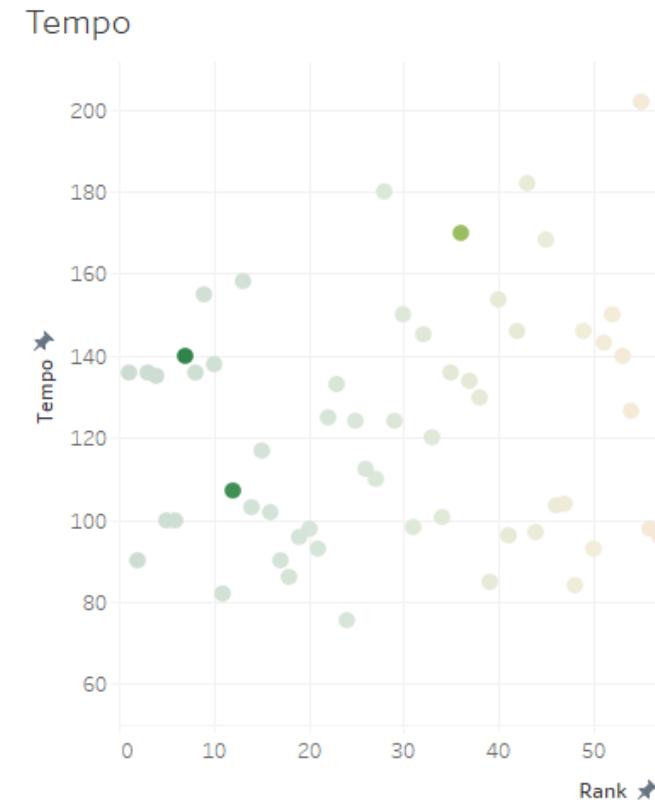
Danceability



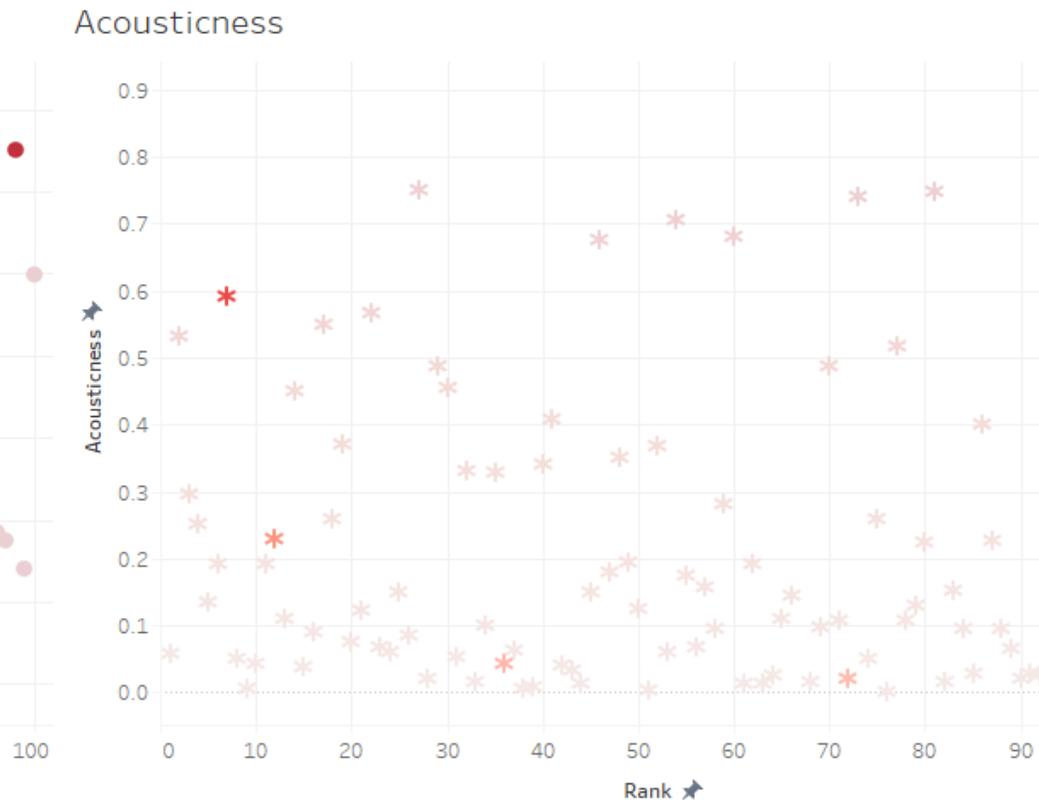
Speechiness



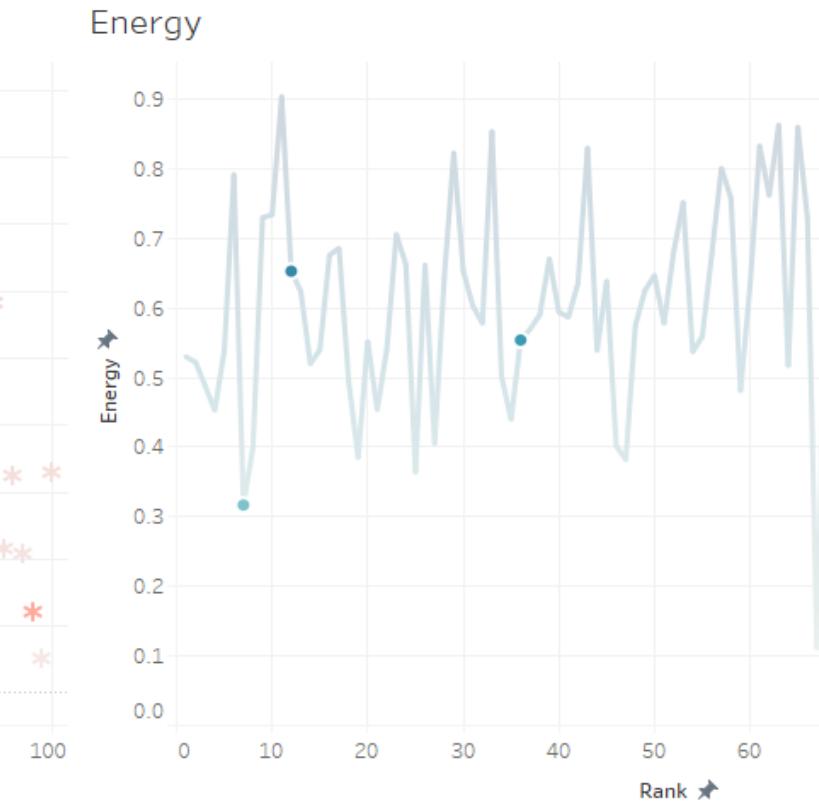
Tempo



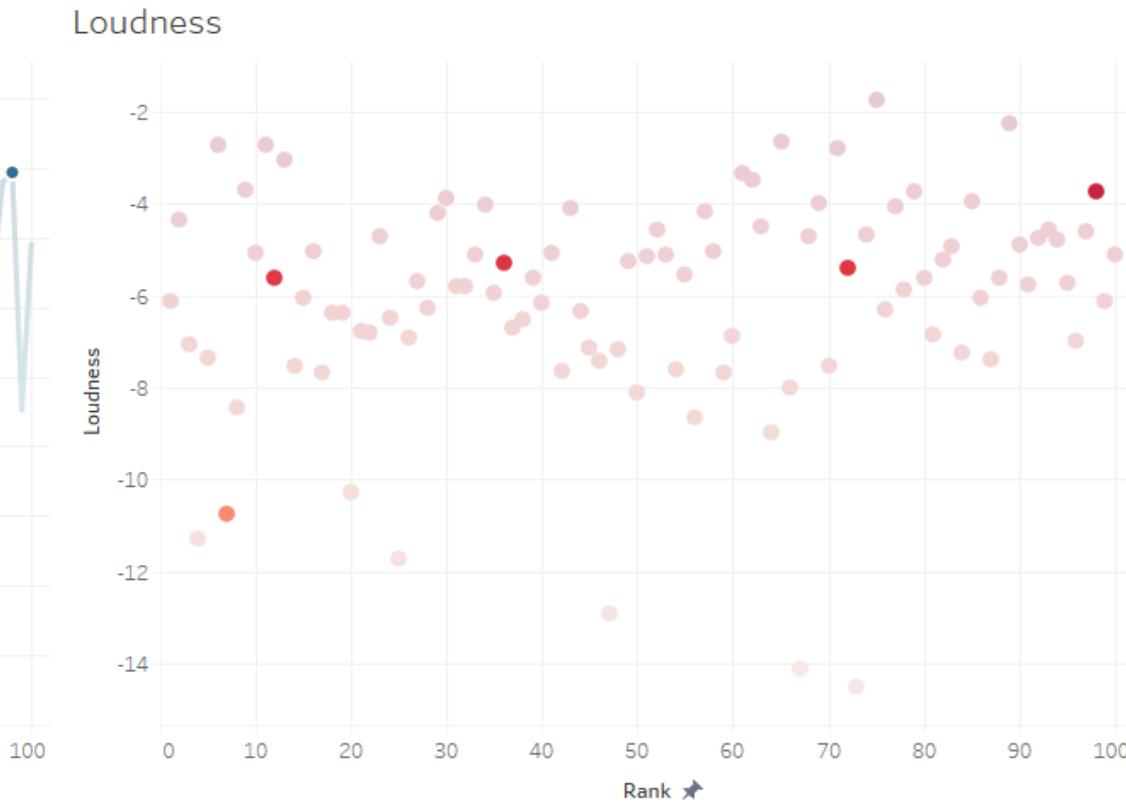
Acousticness



Energy



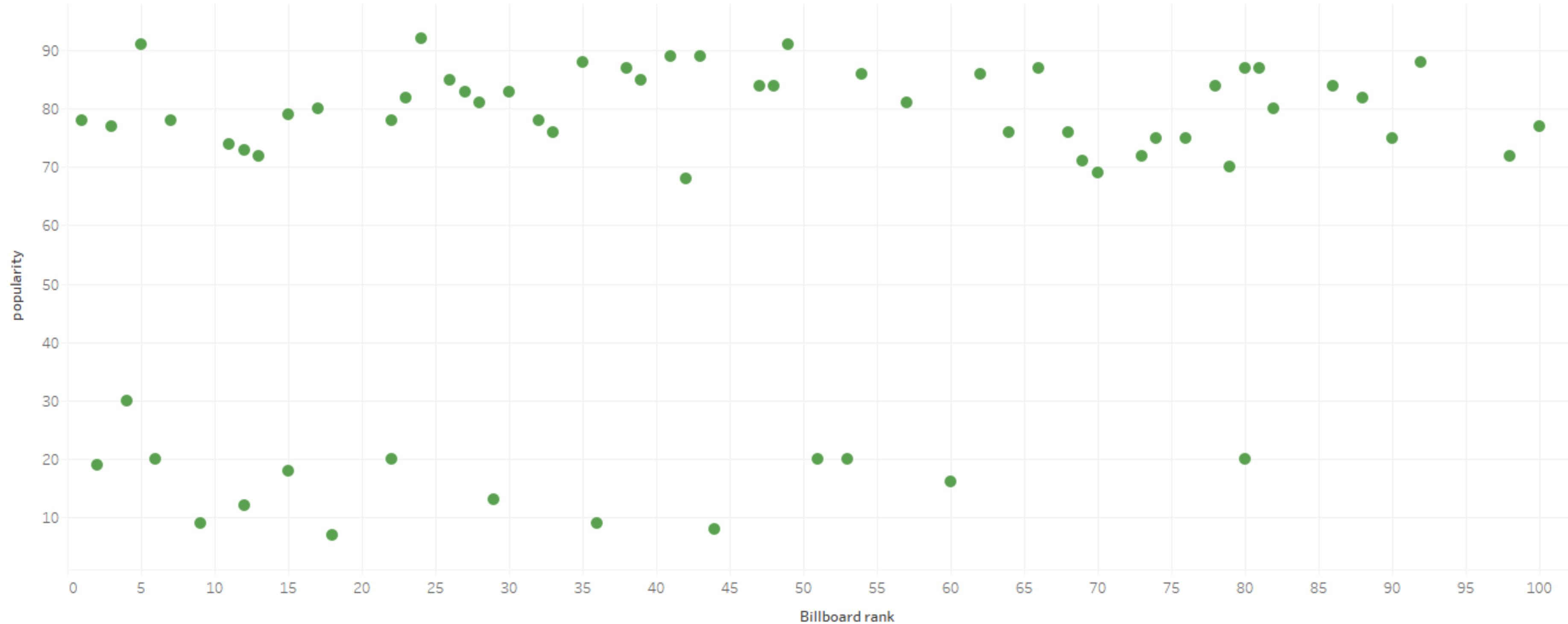
Loudness



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Spotify to Billboard – Different Algorithm between Spotify Popularity and Billboard Rank

Billboard Rank Vs. Spotify Popularity



✓ Billboard Rank

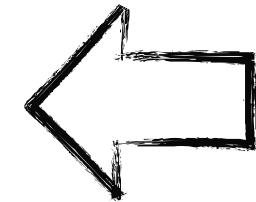
Total points = Sales/12 +
Airplay/7500 + On-
Demand/Tethered Streaming/150
+ Radio Streaming/300.
So the Billboard rank is based on
multi-platforms and resources.



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✓ Spotify Popularity

The popularity is calculated by
algorithm and is based, for the
most part, on the total number
of plays the track has had and
how recent those plays are.



Correlation is small

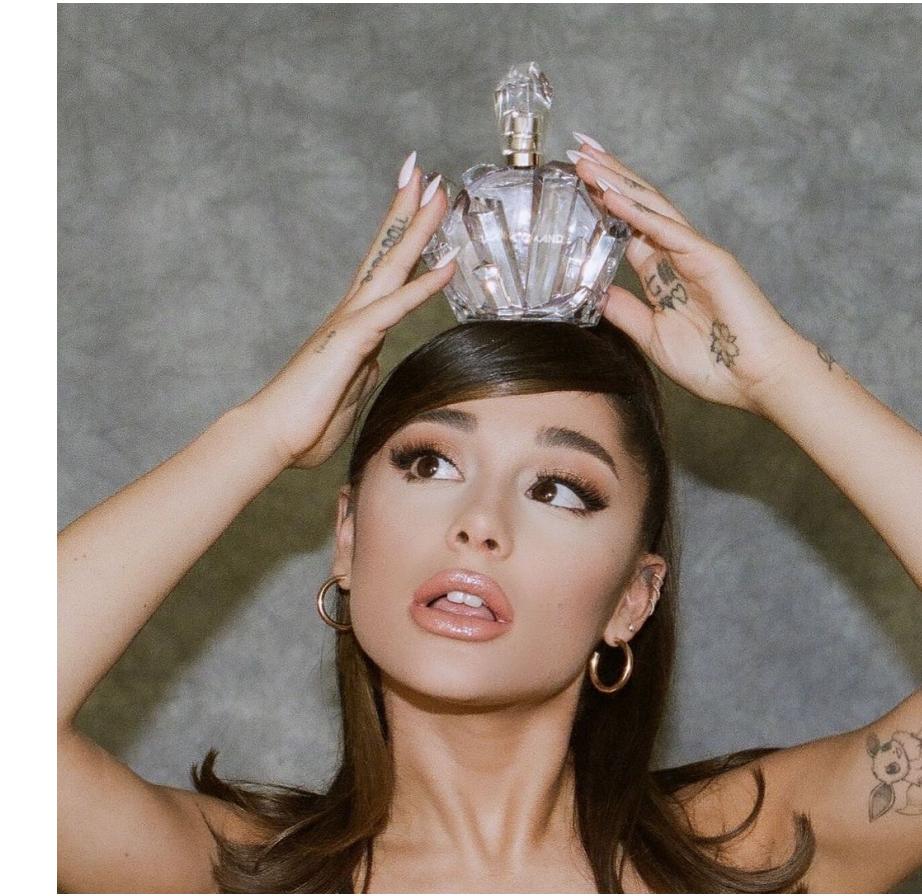
We analyzed the relationship between the
popularity index of Spotify and the rank of
Billboard, but the correlation between the
popularity index of Spotify and the rank of the
Billboard can be small.

Analysis of Popular Artists — The Most Appeared Artists on Top 100 Charts

A Boogie Wit da Hoodie XXXTENTACION
Alessia Cara Thomas Rhett
Kelly Clarkson Travis Scott
Major Lazer The Chainsmokers Gym Class Heroes
Pop Smoke Beyoncé David Guetta Gucci Mane
DJ Khaled Florida Georgia Line
Charlie Puth OneRepublic
Kendrick Lamar Shawn Mendes
Morgan Wallen Luke Combs Imagine Dragons
5 Seconds of Summer Future Calvin Harris The Weeknd
Trey Songz Katy Perry Taylor Swift
Dua Lipa Blake Shelton Ella Mai
Zedd Marshmello Rae Sremmurad
Dan + Shay Sam Hunt Coldplay
Flo Rida Adele Lady Gaga Fall Out Boy
Ellie Goulding Cardi B Meghan Trainor
Black Eyed Peas Justin Bieber Lil Baby Demi Lovato
Twenty One Pilots Miguel Pink Sia Halsey
Fetty Wap Ed Sheeran
Avicii Ariana Grande Nicki Minaj
Britney Spears Lorde Billie Eilish
Eminem Post Malone DJ Snake
Fifth Harmony Chris Brown Lizzo
Jonas Brothers Bruno Mars One Direction
G-Eazy Jason Aldean Migos DaBaby
Sam Smith Jason Derulo Jessie J Camila Cabello
Lukas Smith LMFAO Lee Brice
J. Cole Kesha Pitbull
Kanye Usher Khalid
Hunter Hayes Post Malone
Ne-Yo Selena Gomez Justin Timberlake
Juice WRLD Lil Wayne Kenny Chesney
Big Sean Wiz Khalifa Phillip Phillips
Kane Brown Harry Styles
Lewis Capaldi Miley Cyrus Tove Lo
Megan Thee Stallion Miranda Lambert
Nick Jonas



#1 – Drake



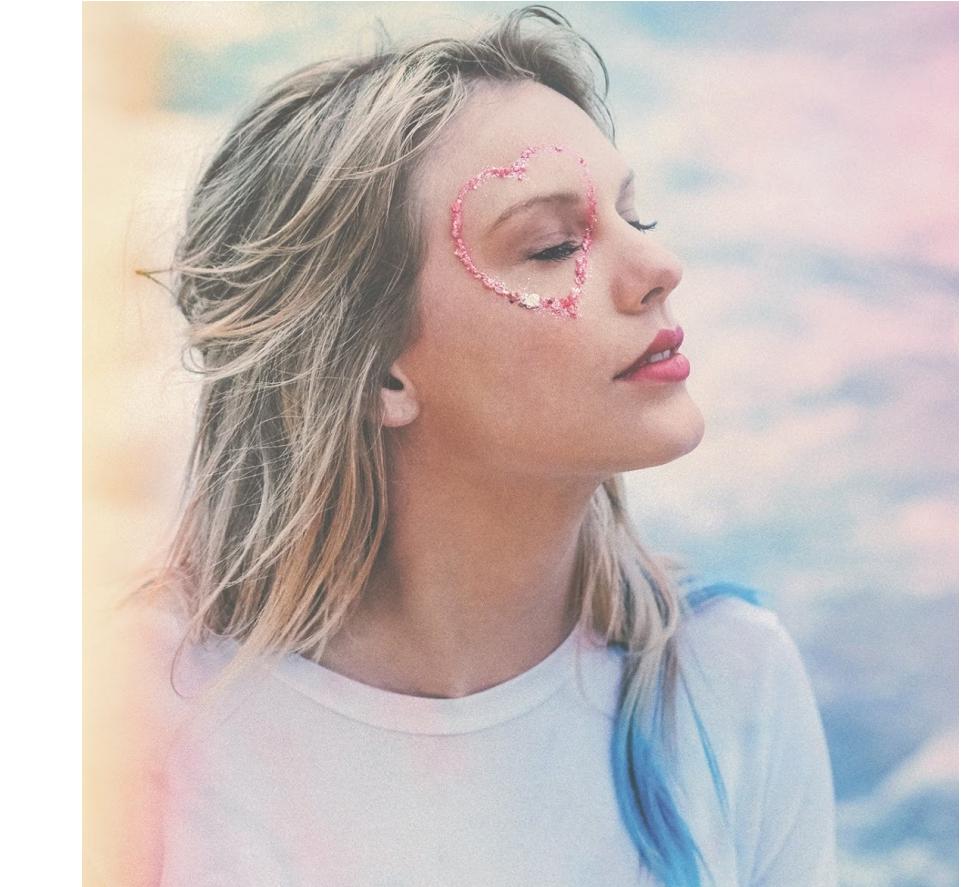
#2 – Ariana Grande



#3 – Maroon 5



#4 – Rihanna

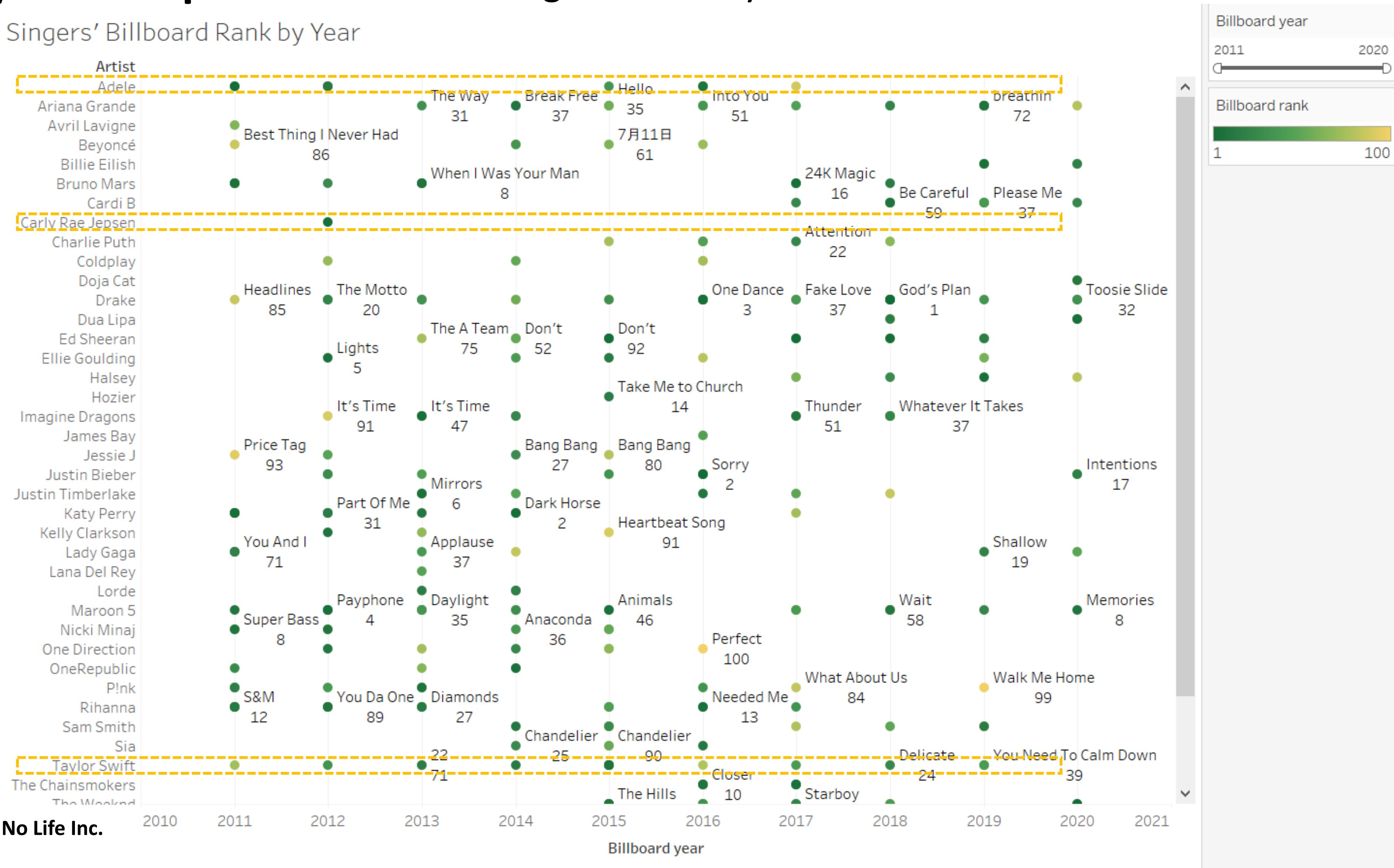


#5 – Taylor Swift



Analysis of Popular Artists — Singers' Rank by Year

Singers' Billboard Rank by Year



Analysis of Popular Artists – How to keep Popular?

1 Define Yourself

- Discover what is ‘REMARK’-able
- Create a tagline
- Be authentically extra

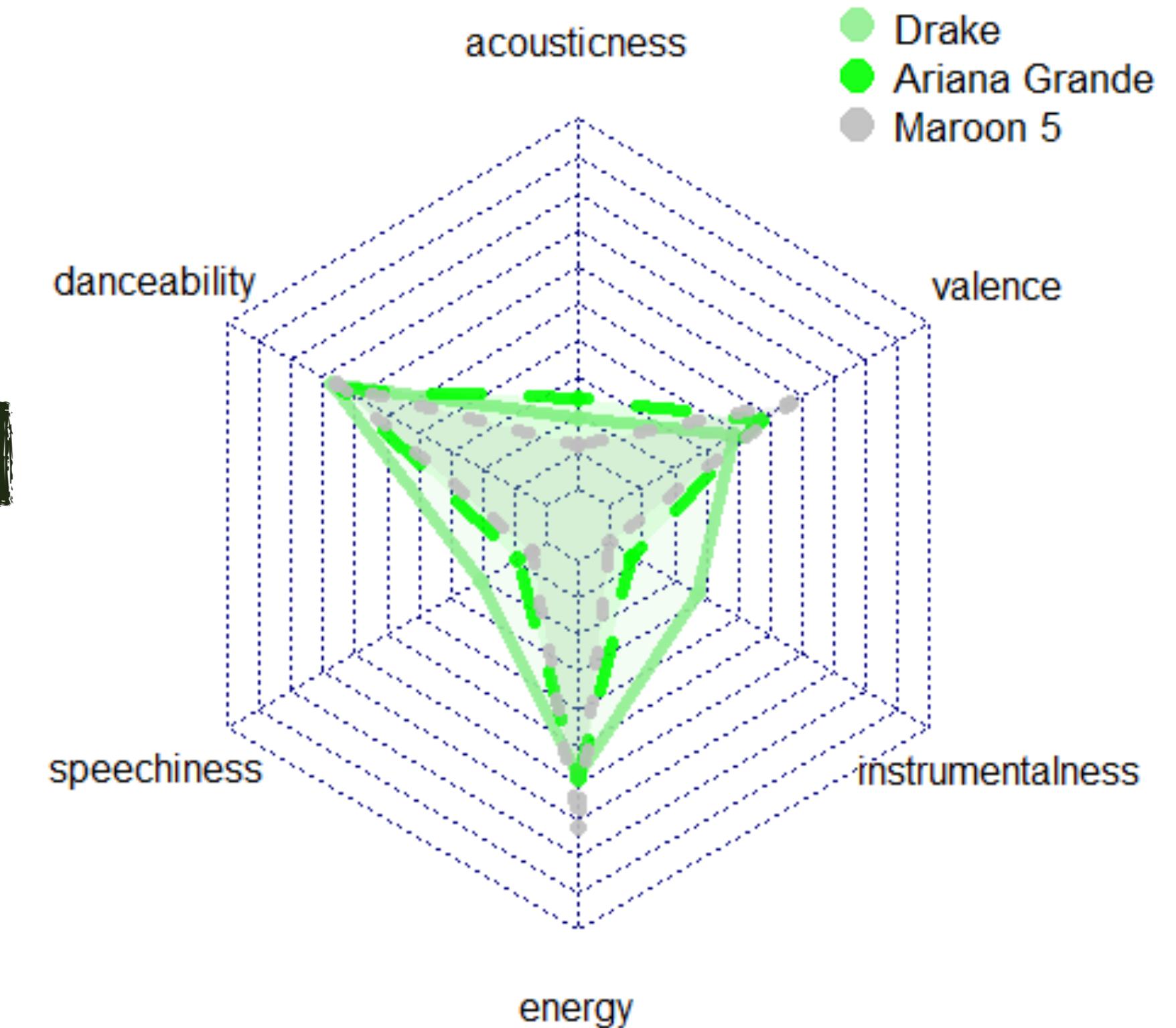
2 The ability to compose

- Try more styles
- Composing songs based on singers' characteristics
- Memory point
- In general, Rhythmed and positive songs are more attractive

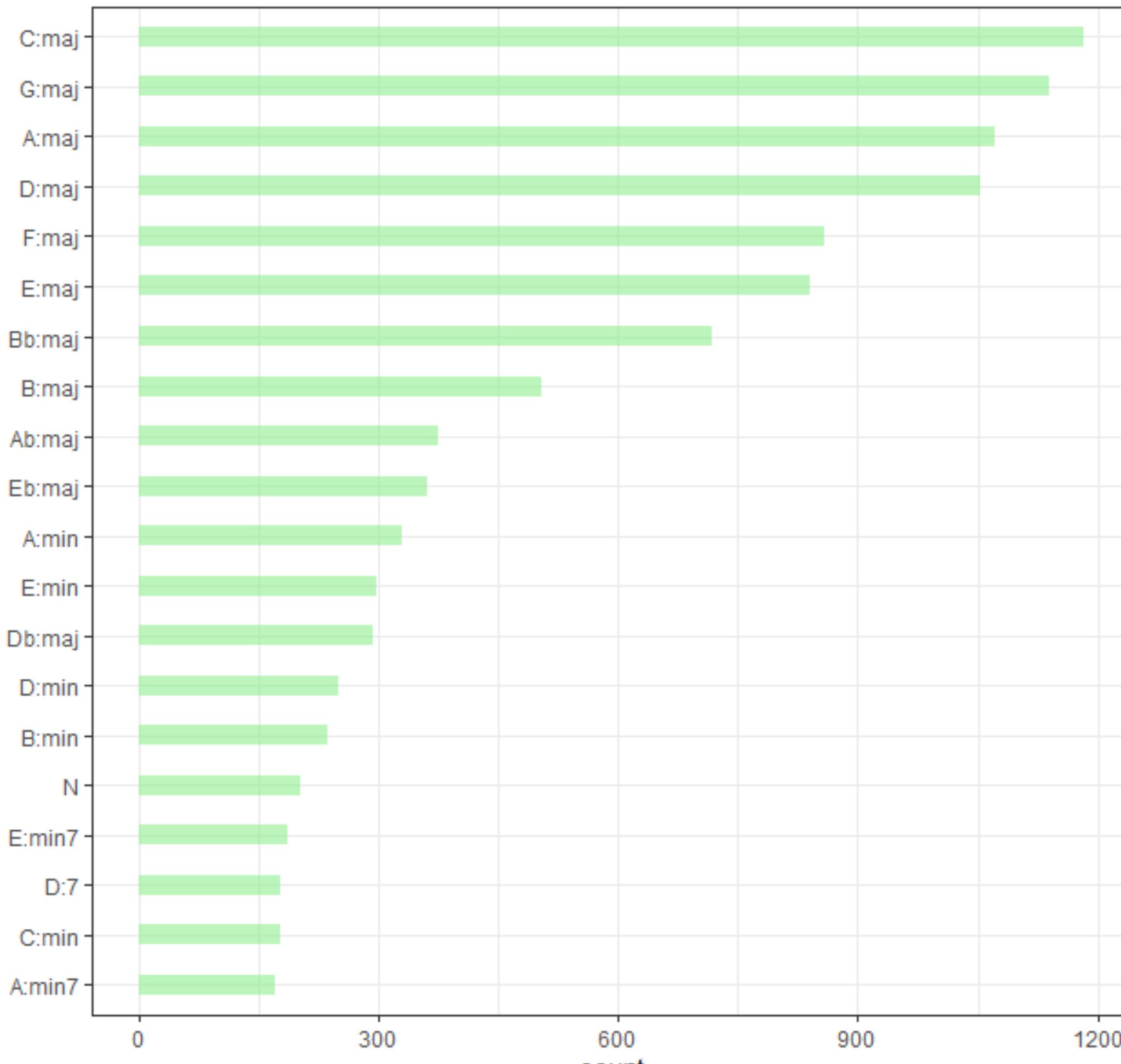
3 Make a hit by cooperation

- ‘Feat.’ other popular singer
- Tap into cultural moments to help amplify your release
- Keep engaging with fans to maintain momentum post-release

Attributes of Top 3 singers' songs



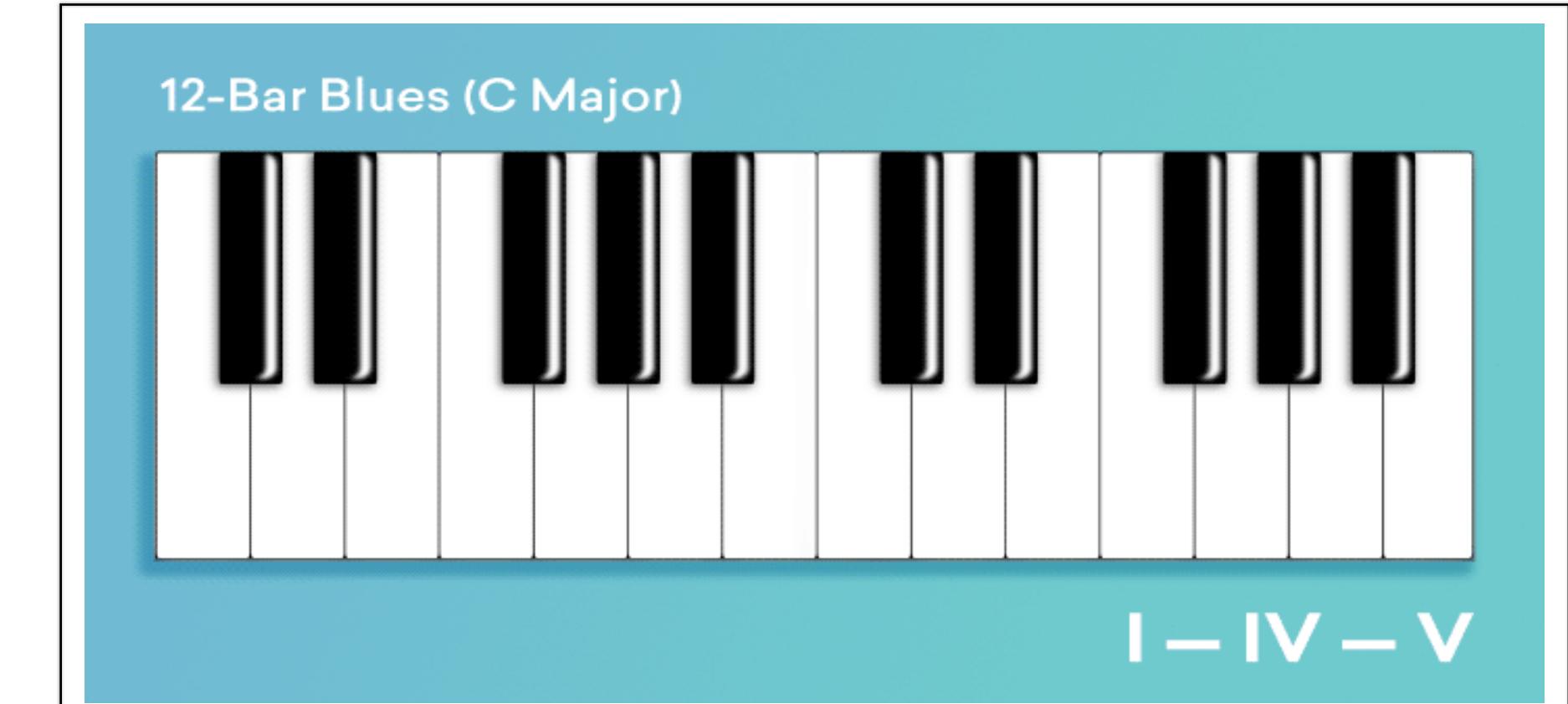
Analysis of Popular Artists – Common Chords Analysis for Billboard Hot 100



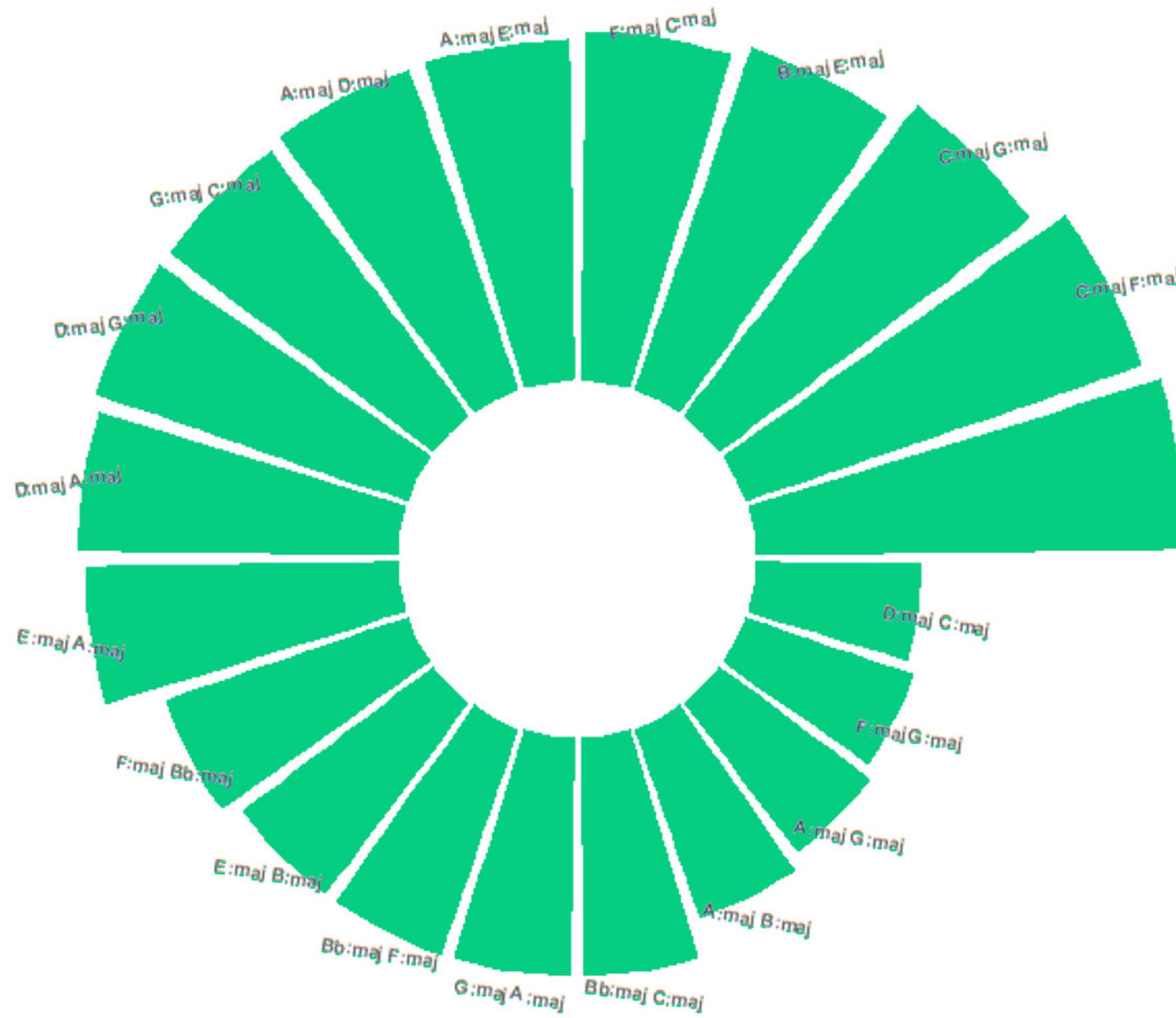
Most Common Chords for Hot 100 songs

Reasons behind these most common chords

- Piano-driven and guitar-driven songs
- C, G, A, F chords are widely used in the most popular chord progressions
- Shift of these chords gives people comfortable feelings
- Major chords express positive and familiar feelings



Analysis of Popular Artists – Chord Progressions Analysis for Billboard Hot 100



Circular bar plot for common chord progressions



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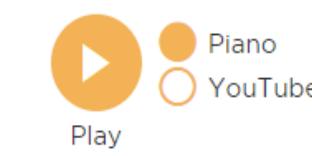
Reasons Behind

- Piano-driven and guitar-driven songs
- G-D, C-F, C-G: Switch of these progressions doesn't require a big jump
- Suitable for musicians' inertial thinking
- Listeners get used to these forms

Complicated by Avril Lavigne Chords and Melody

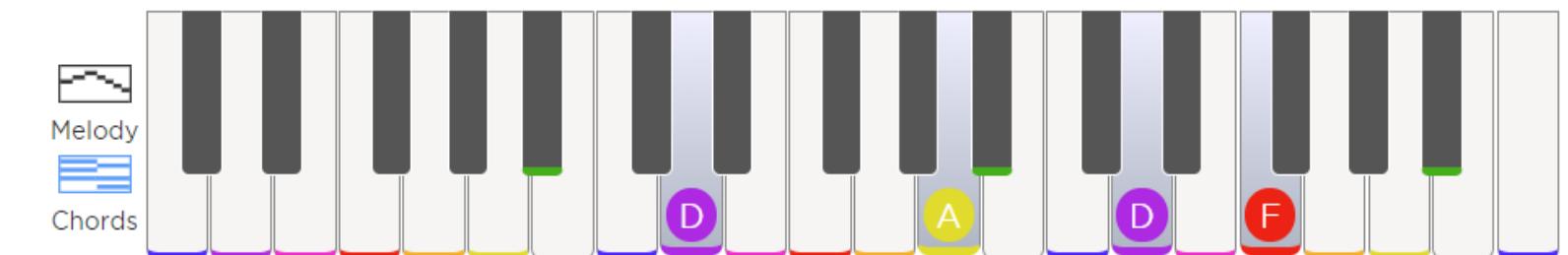
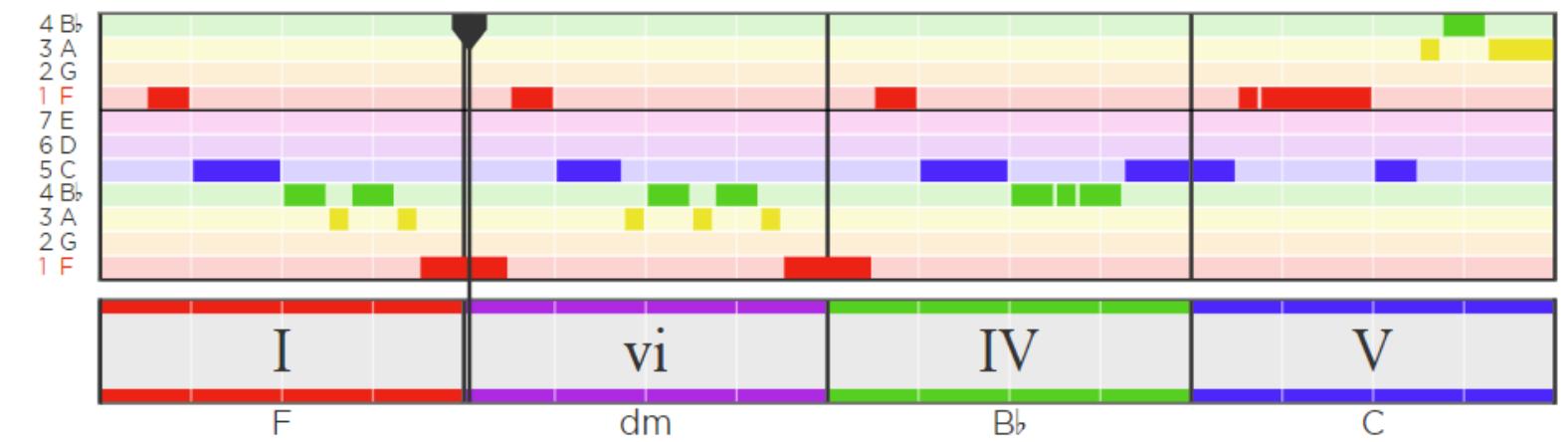
Sections: Verse ○ , Pre-Chorus □ , Chorus ○○ .

Verse

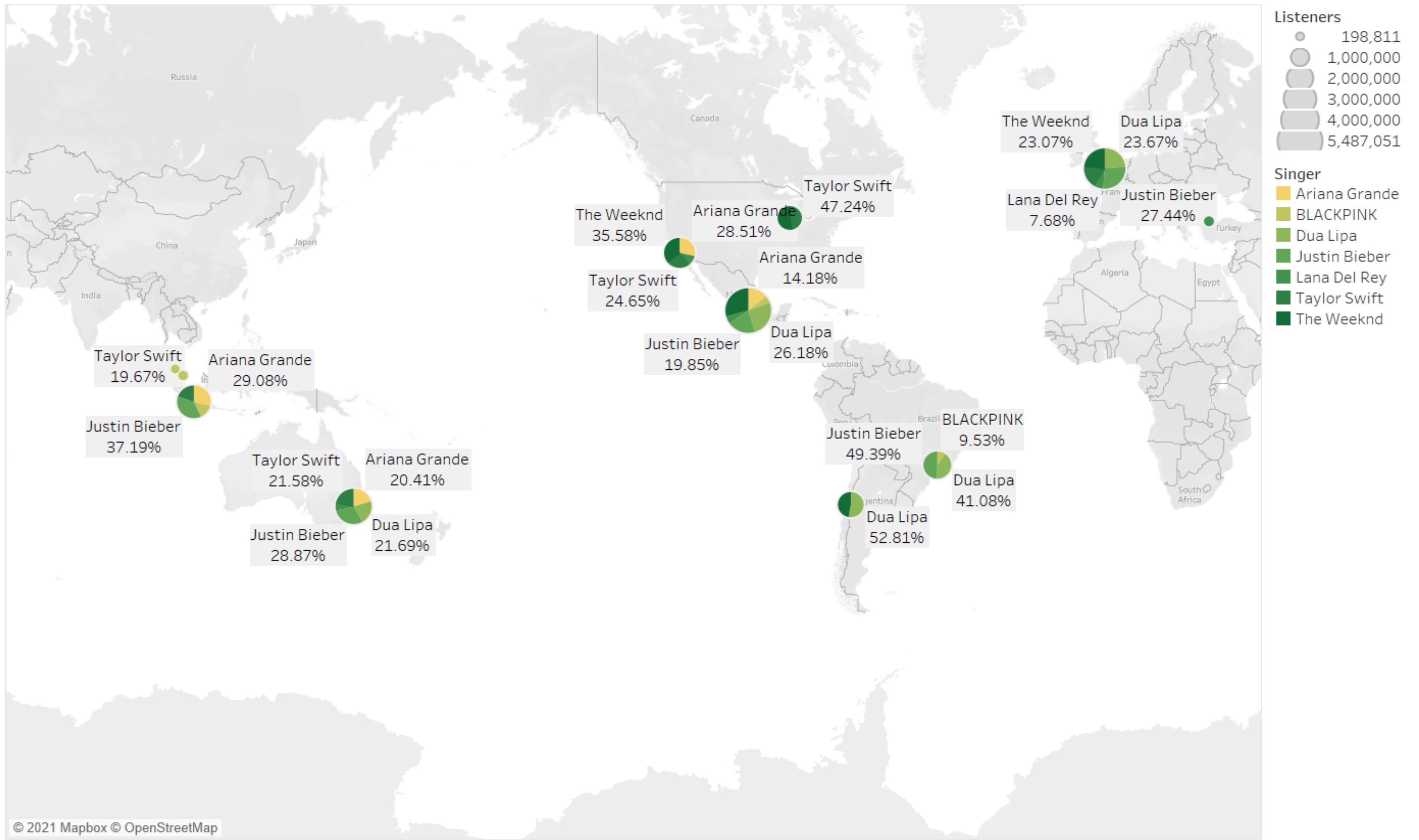


Play

[Open In Hookpad](#)



Analysis of Popular Artists — Map of Listeners



Map based on Longitude (generated) and Latitude (generated). Color shows details about Singer. Size shows sum of Listeners. The marks are labeled by Singer and % of Total Listeners. Details are shown for Country and City. The view is filtered on Singer, which keeps 7 of 7 members.



Conclusion and Suggestion

For Listeners

- Interactive dashboards give listeners a whole picture of their music taste
- Compare their favorites with top hits, help them explore new songs that meet their demands
- Understand the links between attributes and their emotion

For Producers/Artists

- Consider what makes them remarkable and define themselves
- The ability to compose is the key for long-term success: various styles, highlight singers' strengths, create memory point
- Leveraging others' power: other artists, cultural moments
- Trade-off during composition: common used chord progressions VS. innovation
- Demographic information of their listeners: to determine the concert location and target

For Streaming Platforms

- Help platform understand user behavior and make better daily recommendations based historical preference of track attributes
- Improve Spotify popularity algorithm consider other resource (Billboard, Grammy)





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UPGRADE

NMNL ▾



Home



Search



Your Library

Playlist



Data Description



Visualization



Conclusion



More Things

More Things We Can Do



User Behavior



Track Language



Track Genre



Grammy Nominated and Winning Tracks



0:00

3:55



More Things We Can Do



please

Contact us.

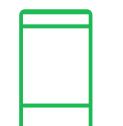
If you have further question, please do not hesitate to reach out to us using the following methods.



**PO Box 210505 Visual Street
Victoria 7980 USA**



info@NMNL.com



+1 323 240 2021



9:00 – 19:00 every day



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