Spotify's 2023 Music Trends: An Overview of the Year's Most Popular Hits

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Presented by,

Group 20

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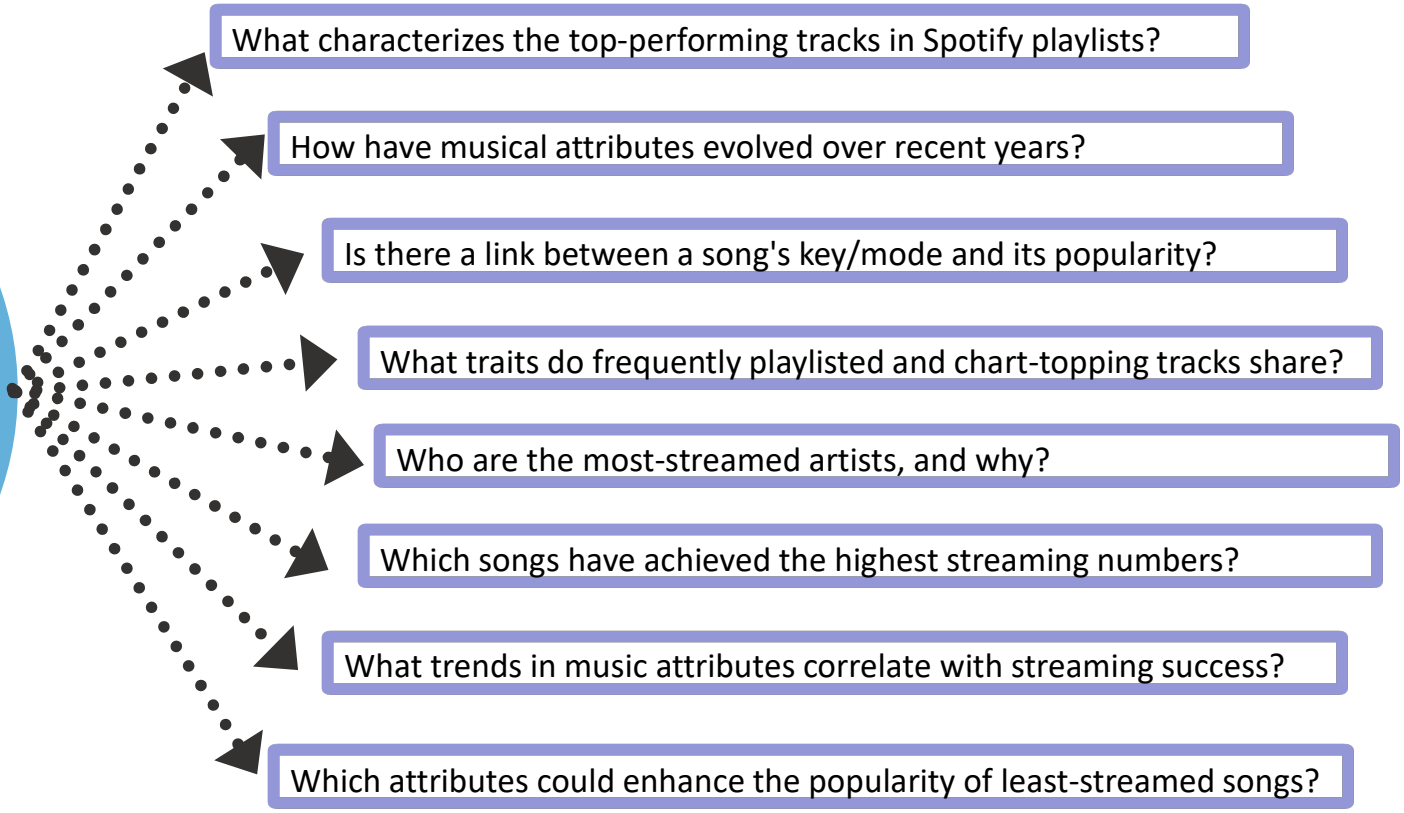
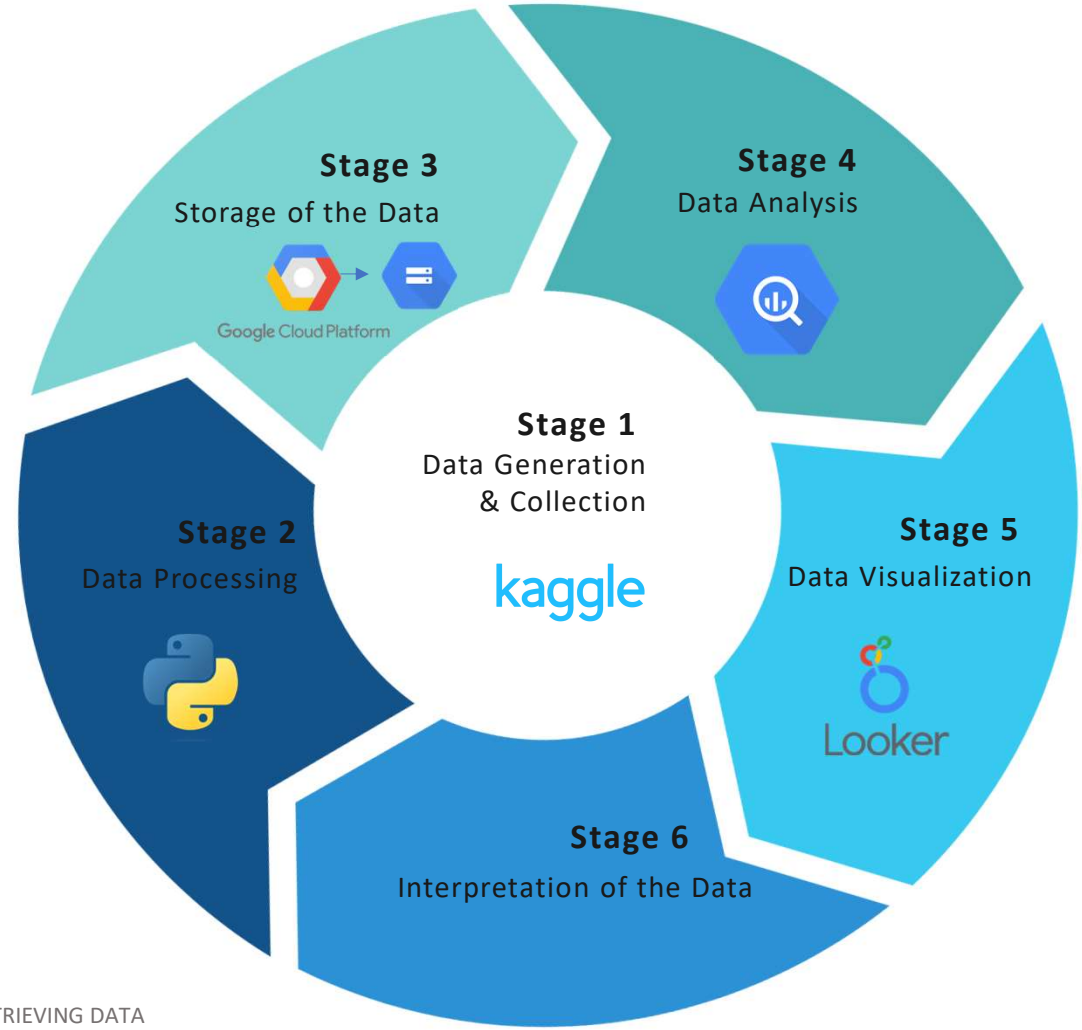
Our Approach



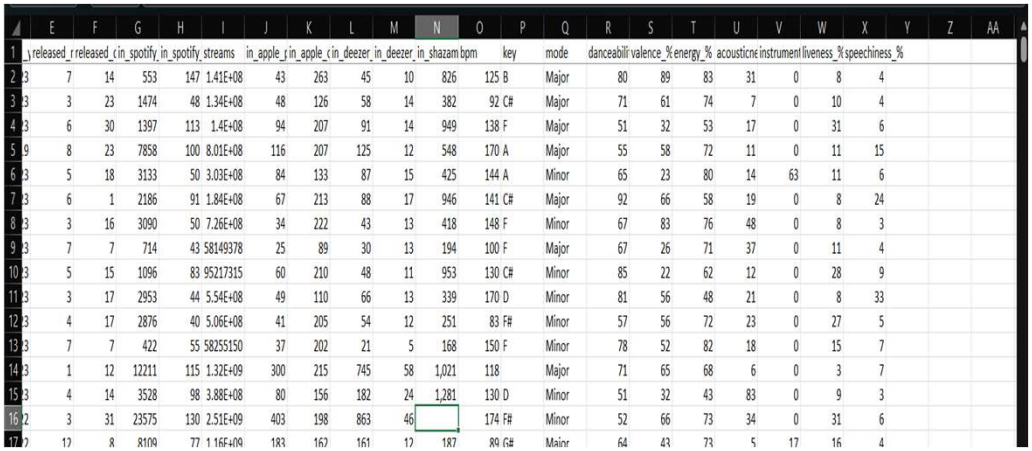
Data Life Cycle



Data Generation/ Collection

- Sourced from Kaggle, detailing Spotify's top 2023 tracks.
- Reflects user interactions for data generation.
- Highlights song characteristics and popularity metrics.
- Includes track titles, artist names, and release dates.
- Measures presence on Spotify playlists and charts.
- Provides streaming counts and audio feature insights.
- Offers a snapshot of user music preferences and trends.

Data Preprocessing



	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1	_y	released_r	released_c	in_spotify	in_spotify	streams	in_apple_p	in_apple_c	in_deezer_	in_deezer_	in_shazam	bpm	key	mode	danceabili	valence_%	energy_%	acousticne	instrument	liveness_%	speechiness_%			
2	23	7	14	553	147	1.41E+08	43	263	45	10	826	125	B	Major	80	89	83	31	0	8	4			
3	23	3	23	1474	48	1.34E+08	48	126	58	14	382	92	C#	Major	71	61	74	7	0	10	4			
4	23	6	30	1397	113	1.4E+08	94	207	91	14	949	138	F	Major	51	32	53	17	0	31	6			
5	19	8	23	7858	100	8.01E+08	116	207	125	12	548	170	A	Major	55	58	72	11	0	11	15			
6	23	5	18	3133	50	3.03E+08	84	133	87	15	425	144	A	Minor	65	23	80	14	63	11	6			
7	23	6	1	2186	91	1.84E+08	67	213	88	17	946	141	C#	Major	92	66	58	19	0	8	24			
8	23	3	16	3090	50	7.26E+08	34	222	43	13	418	148	F	Minor	67	83	76	48	0	8	3			
9	23	7	7	714	43	58149378	25	89	30	13	194	100	F	Major	67	26	71	37	0	11	4			
10	23	5	15	1096	83	95217315	60	210	48	11	953	130	C#	Minor	85	22	62	12	0	28	9			
11	23	3	17	2953	44	5.54E+08	49	110	66	13	339	170	D	Minor	81	56	48	21	0	8	33			
12	23	4	17	2876	40	5.06E+08	41	205	54	12	251	83	F#	Minor	57	56	72	23	0	27	5			
13	23	7	7	422	55	58255150	37	202	21	5	168	150	F	Minor	78	52	82	18	0	15	7			
14	23	1	12	12211	115	1.32E+09	300	215	745	58	1,021	118		Major	71	65	68	6	0	3	7			
15	23	4	14	3528	98	3.88E+08	80	156	182	24	1,281	130	D	Minor	51	32	43	83	0	9	3			
16	22	3	31	23575	130	2.51E+09	403	198	863	46		174	F#	Minor	52	66	73	34	0	31	6			
17	22	12	8	8109	77	1.16E+09	183	162	161	12	187	89	G#	Major	64	43	73	5	17	16	4			

Before Preprocessing

Tools:

- Python & libraries
- Jupyter Notebook

Before PreProcessing:

	Column	Data Type	Null Count
0	artist(s)_name	object	0
1	artist_count	int64	0
2	released_year	int64	0
3	released_month	int64	0
4	released_day	int64	0
5	in_spotify_playlists	int64	0
6	in_spotify_charts	int64	0
7	streams	object	0
8	in_apple_playlists	int64	0
9	in_apple_charts	int64	0
10	in_deezer_playlists	object	0
11	in_deezer_charts	int64	0
12	in_shazam_charts	object	50
13	bpm	int64	0
14	key	object	95
15	mode	object	0
16	danceability_%	int64	0
17	valence_%	int64	0
18	energy_%	int64	0
19	acousticness_%	int64	0
20	instrumentalness_%	int64	0
21	liveness_%	int64	0
22	speechiness_%	int64	0

Data Preprocessing

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	track_nam	artist(s)_n	artist_cou	released_y	released_r	released_c	in_spotify	in_spotify	streams	in_apple_p	in_apple_c	in_deezer_	in_deezer_	in_shazam	bpm	key	mode	danceabili	valence_%	energy_%	acousticne	instrument	liveness_%	sp
2	Seven (fea	Latto, Jung	2	2023	7	14	553	147	1.41E+08	43	263	45	10	826	125	B	Major	80	89	83	31	0	8	
3	LALA	Myke Tow	1	2023	3	23	1474	48	1.34E+08	48	126	58	14	382	92	C#	Major	71	61	74	7	0	10	
4	vampire	Olivia Rod	1	2023	6	30	1397	113	1.4E+08	94	207	91	14	949	138	F	Major	51	32	53	17	0	31	
5	Cruel Sumi	Taylor Swi	1	2019	8	23	7858	100	8.01E+08	116	207	125	12	548	170	A	Major	55	58	72	11	0	11	
6	WHERE SH	Bad Bunny	1	2023	5	18	3133	50	3.03E+08	84	133	87	15	425	144	A	Minor	65	23	80	14	63	11	
7	Sprinter	Dave, Cent	2	2023	6	1	2186	91	1.84E+08	67	213	88	17	946	141	C#	Major	92	66	58	19	0	8	
8	Ella Baila S	Eslabon Ar	2	2023	3	16	3090	50	7.26E+08	34	222	43	13	418	148	F	Minor	67	83	76	48	0	8	
9	Columbia	Quevedo	1	2023	7	7	714	43	58149378	25	89	30	13	194	100	F	Major	67	26	71	37	0	11	
10	fukumean	Gunna	1	2023	5	15	1096	83	95217315	60	210	48	11	953	130	C#	Minor	85	22	62	12	0	28	
11	La Bebe - I	Peso Plum	2	2023	3	17	2953	44	5.54E+08	49	110	66	13	339	170	D	Minor	81	56	48	21	0	8	
12	un x100to	Bad Bunny	2	2023	4	17	2876	40	5.06E+08	41	205	54	12	251	83	F#	Minor	57	56	72	23	0	27	
13	Super Shy	NewJeans	1	2023	7	7	422	55	58255150	37	202	21	5	168	150	F	Minor	78	52	82	18	0	15	
14	Daylight	David Kush	1	2023	4	14	3528	98	3.88E+08	80	156	182	24	168	130	D	Minor	51	32	43	83	0	9	
15	As It Was	Harry Style	1	2022	3	31	23575	130	2.51E+09	403	198	863	46	168	174	F#	Minor	52	66	73	34	0	31	
16	Kill Bill	SZA	1	2022	12	8	8109	77	1.16E+09	183	162	161	12	187	89	G#	Major	64	43	73	5	17	16	
17	Cupid - Tw	Fifty Fifty	1	2023	2	24	2942	77	4.97E+08	91	212	78	6	0	120	B	Minor	78	76	59	43	0	34	
18	Classy 101	Feid, Youn	2	2023	3	31	2610	40	3.35E+08	43	100	54	14	187	100	B	Major	86	67	66	14	0	12	
19	Like Crazy	Jimin	1	2023	3	24	596	68	3.63E+08	8	104	23	2	29	120	G	Major	63	36	73	0	0	36	
20	LADY GAG	Gabito Bal	3	2023	6	22	332	26	86444842	11	163	10	4	0	140	F	Minor	65	87	74	22	0	42	
21	I Can See \	Taylor Swi	1	2023	7	7	516	38	52135248	73	119	42	1	150	123	F#	Major	69	82	76	6	0	6	
22	Peso Plum	Bizarrap, P	2	2023	5	31	1313	40	2.01E+08	17	152	32	11	139	133	F	Minor	85	81	67	26	0	12	

After Preprocessing

- Null Value Handling
- Normalizing Datatypes

After PreProcessing:

	Column	Data Type	Null Count
0	track_name	object	0
1	artist(s)_name	object	0
2	artist_count	int64	0
3	released_year	int64	0
4	released_month	int64	0
5	released_day	int64	0
6	in_spotify_playlists	int64	0
7	in_spotify_charts	int64	0
8	streams	float64	0
9	in_apple_playlists	int64	0
10	in_apple_charts	int64	0
11	in_deezer_playlists	object	0
12	in_deezer_charts	int64	0
13	in_shazam_charts	float64	0
14	bpm	int64	0
15	key	object	0
16	mode	object	0
17	danceability_%	int64	0
18	valence_%	int64	0
19	energy_%	int64	0
20	acousticness_%	int64	0
21	instrumentalness_%	int64	0
22	liveness_%	int64	0
23	speechiness %	int64	0

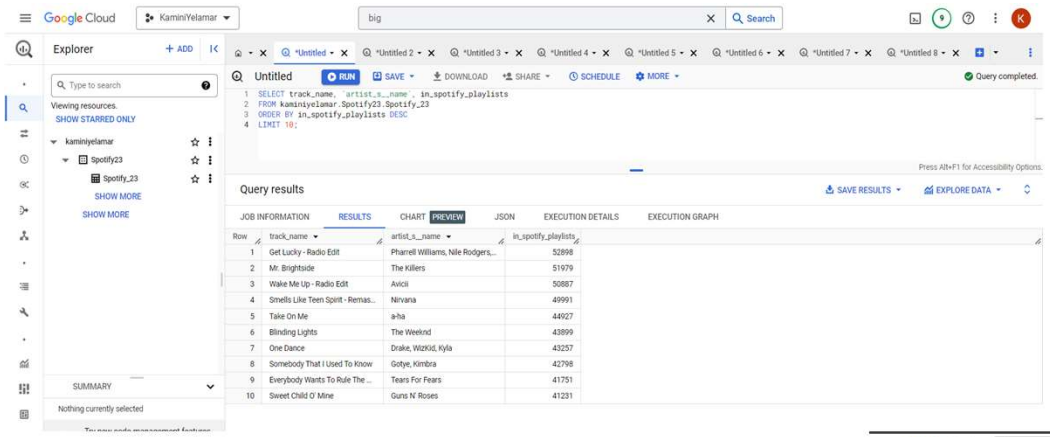
Data Storage

In Google Cloud Platform:

Cloud Storage:
- ✓ Bucket- first_adta_bucket

BigQuery:
- ✓ Project- kaminiyelamar
- ✓ Dataset- Spotify23
- ✓ Table- Spotify_23

Data Analysis

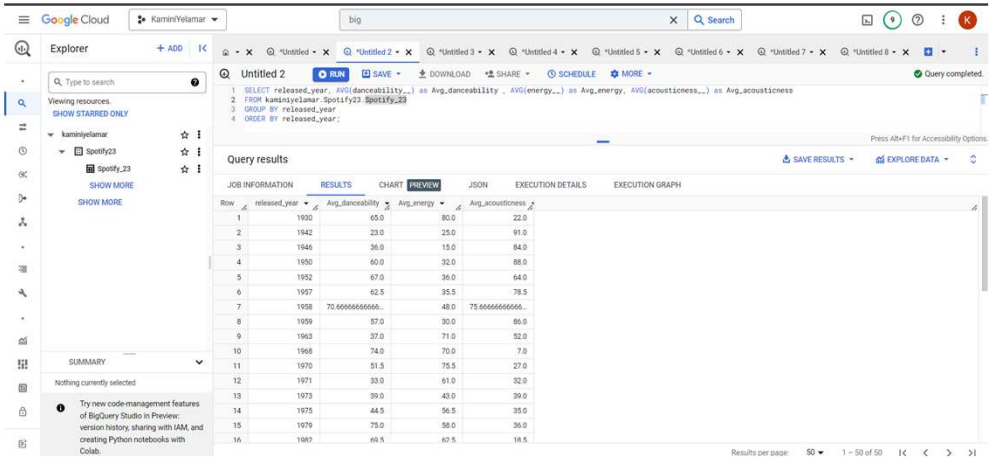


1. Most Popular Tracks in Playlists:

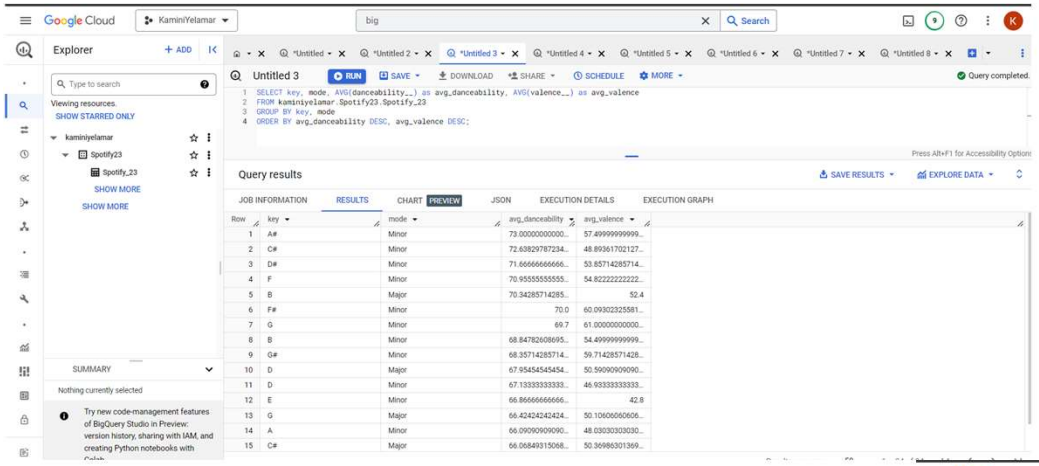
```
SELECT track_name, `artist_s__name`,
in_spotify_playlists
FROM kaminiyelamar.Spotify23.Spotify_23
ORDER BY in_spotify_playlists DESC
LIMIT 10;
```

2. Trends in Music Over Years:

```
SELECT released_year, AVG(danceability__) as
Avg_danceability , AVG(energy__) as Avg_energy,
AVG(acousticness__) as Avg_acousticness
FROM kaminiyelamar.Spotify23.Spotify_23
GROUP BY released_year
ORDER BY released_year;
```



Data Analysis

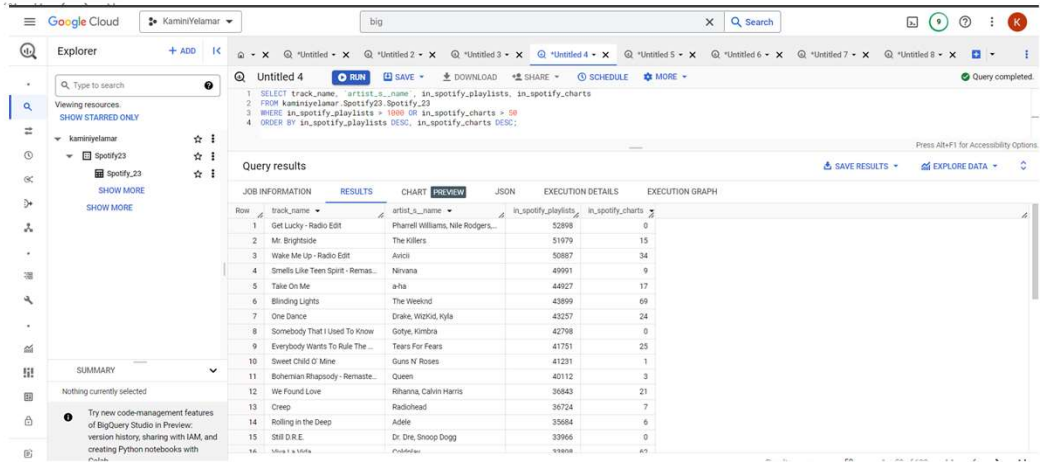


3. Popular Music Features:

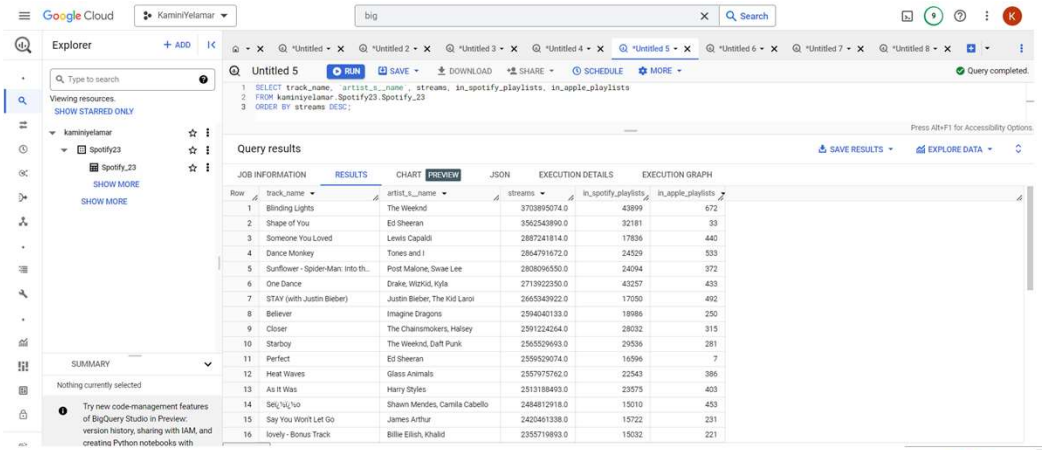
```
SELECT key, mode, AVG(danceability__) as
avg_danceability, AVG(valence__) as
avg_valence
FROM kaminiyelamar.Spotify23.Spotify_23
GROUP BY key, mode
ORDER BY avg_danceability DESC, avg_valence
DESC;
```

4. Comparison of Playlist vs Chart Presence:

```
SELECT track_name, `artist_s__name`,
in_spotify_playlists, in_spotify_charts
FROM kaminiyelamar.Spotify23.Spotify_23
WHERE in_spotify_playlists > 1000 OR
in_spotify_charts > 50
ORDER BY in_spotify_playlists DESC, in_spotify_charts
DESC;
```



Data Analysis

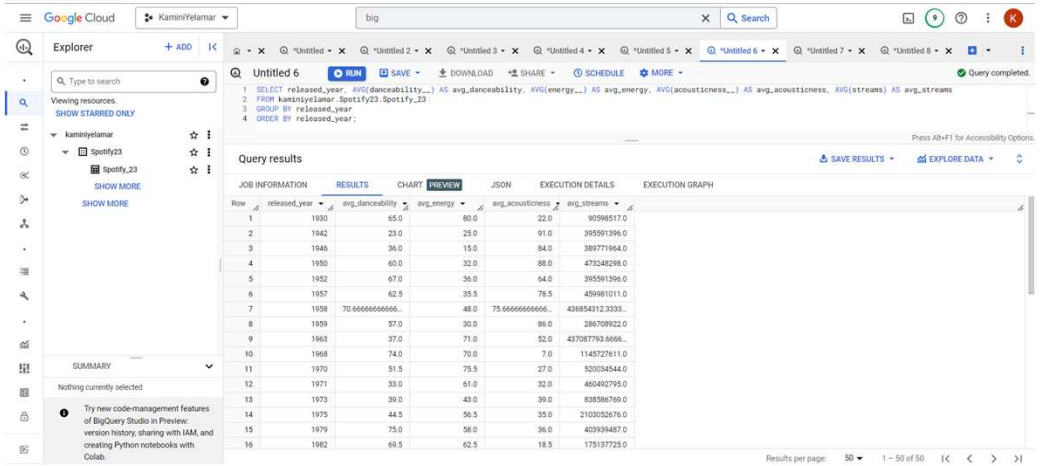


5. Comparing Song Popularity Across Different Music Streaming Platforms:

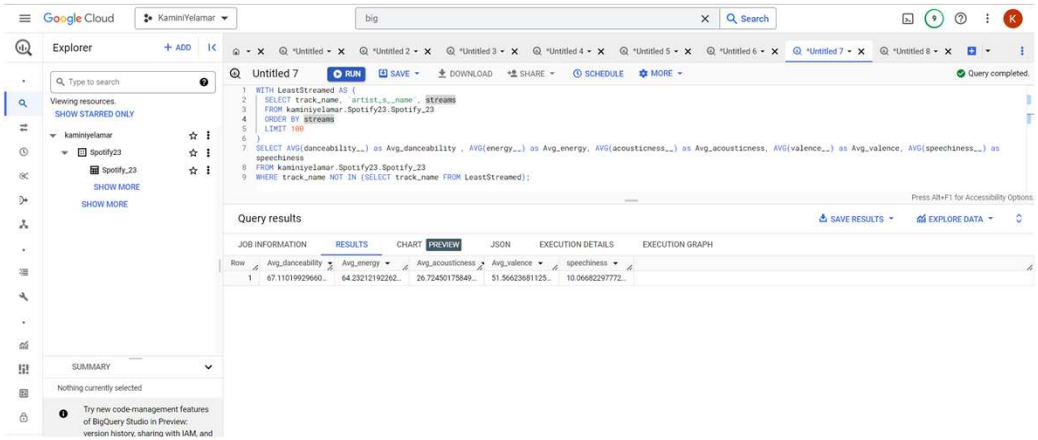
```
SELECT track_name, `artist_s__name`, streams,
in_spotify_playlists, in_apple_playlists
FROM kaminiyelamar.Spotify23.Spotify_23
ORDER BY streams DESC;
```

6. Relationships Between Song Attributes and Music Popularity Over Time:

```
SELECT released_year, AVG(danceability__) AS
avg_danceability, AVG(energy__) AS avg_energy,
AVG(acousticness__) AS avg_acousticness,
AVG(streams) AS avg_streams
FROM kaminiyelamar.Spotify23.Spotify_23
GROUP BY released_year
ORDER BY released_year;
```

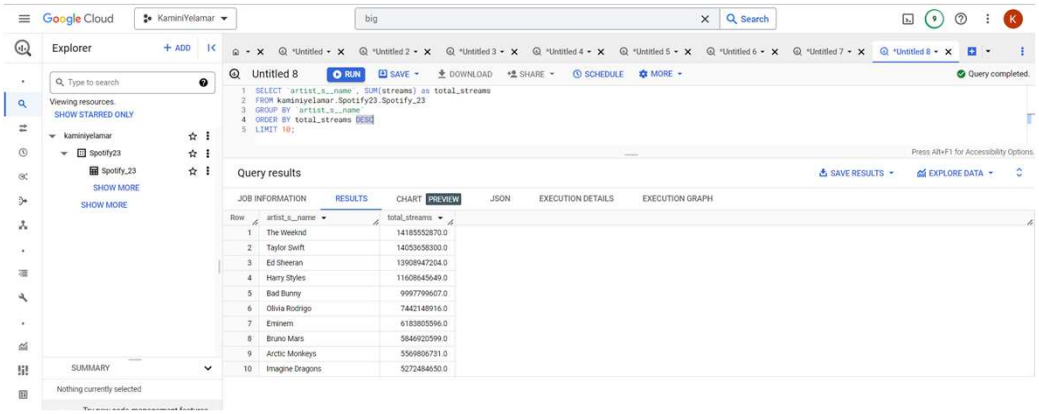


Data Analysis



7. Improving Attributes for Least Streamed Songs:

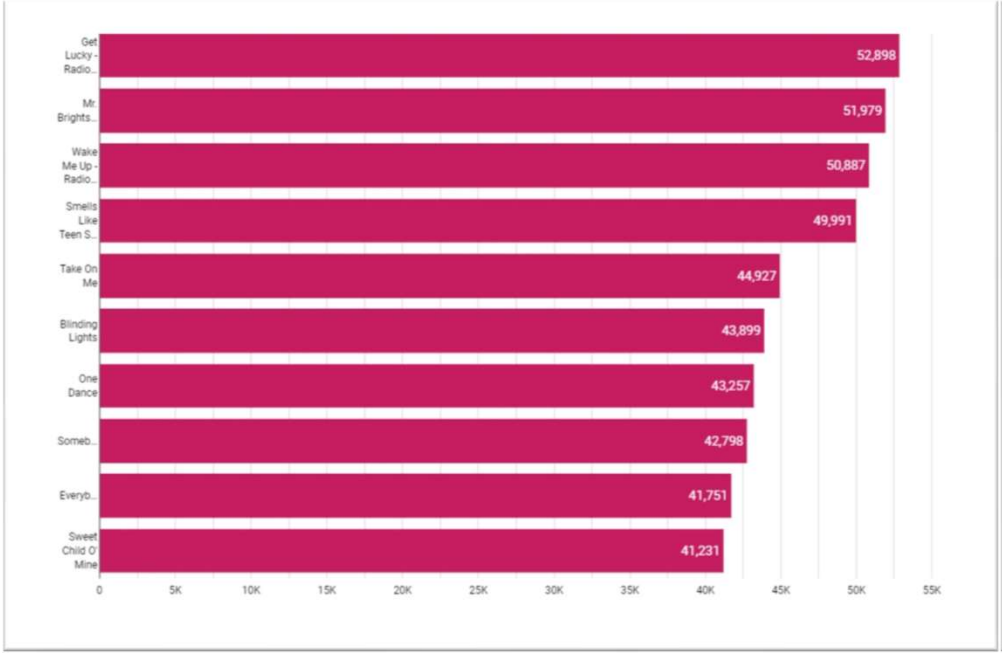
```
WITH LeastStreamed AS (
  SELECT track_name, `artist_s__name`, streams
  FROM kaminiyelamar.Spotify23.Spotify_23
  ORDER BY streams LIMIT 100)
SELECT AVG(danceability__) as Avg_danceability , AVG(energy__) as
Avg_energy, AVG(acousticness__) as Avg_acousticness,
AVG(valence__) as Avg_valence, AVG(speechiness__) as speechiness
FROM kaminiyelamar.Spotify23.Spotify_23
WHERE track_name NOT IN (SELECT track_name FROM
LeastStreamed);
```



8. Top Artists by Stream Count:

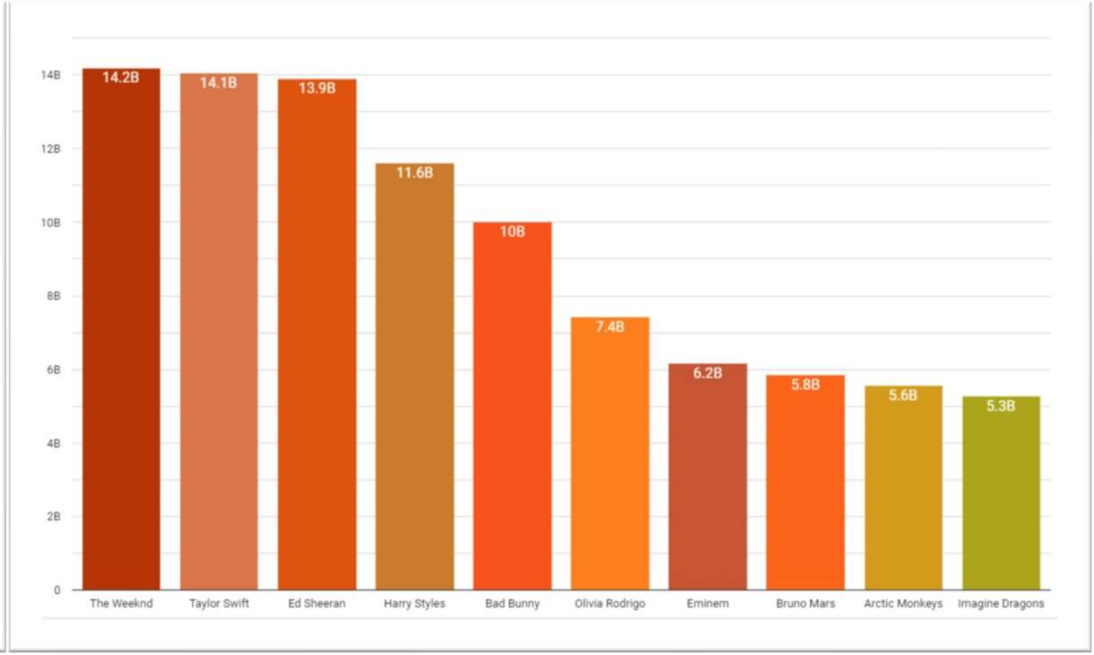
```
SELECT `artist_s__name`, SUM(streams) as
total_streams
FROM kaminiyelamar.Spotify23.Spotify_23
GROUP BY `artist_s__name`
ORDER BY total_streams DESC
LIMIT 10;
```

Data Visualization



Most popular tracks in Playlists (Top 10)

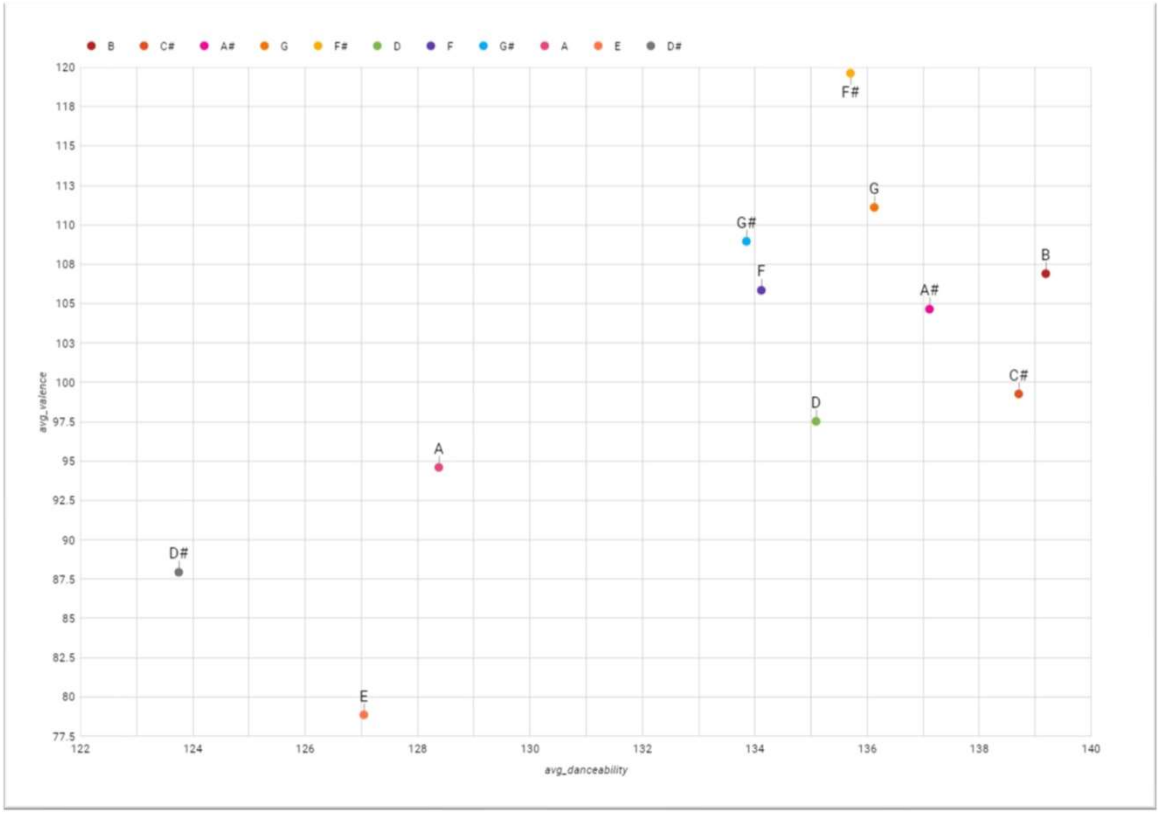
Track_names vs streams



Top 10 Artists by Stream Count

Artist names vs total streams

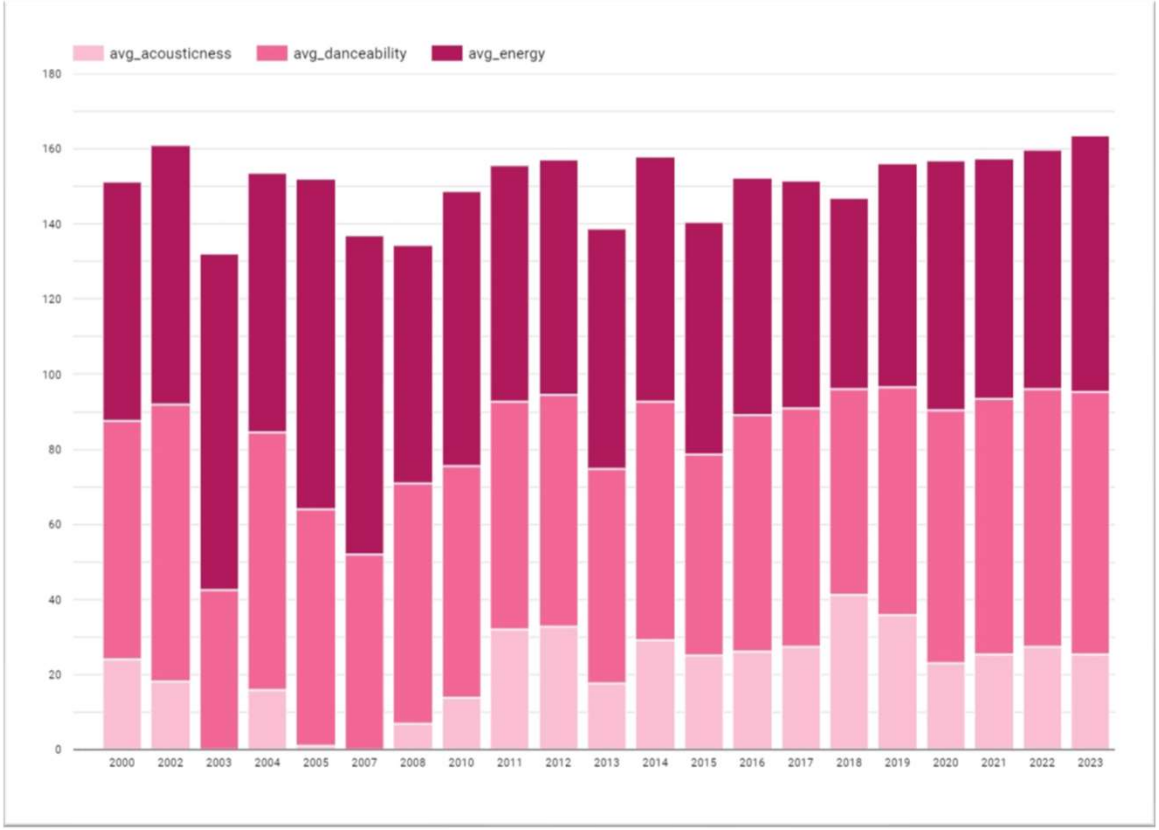
Data Visualization



Popular Music Features

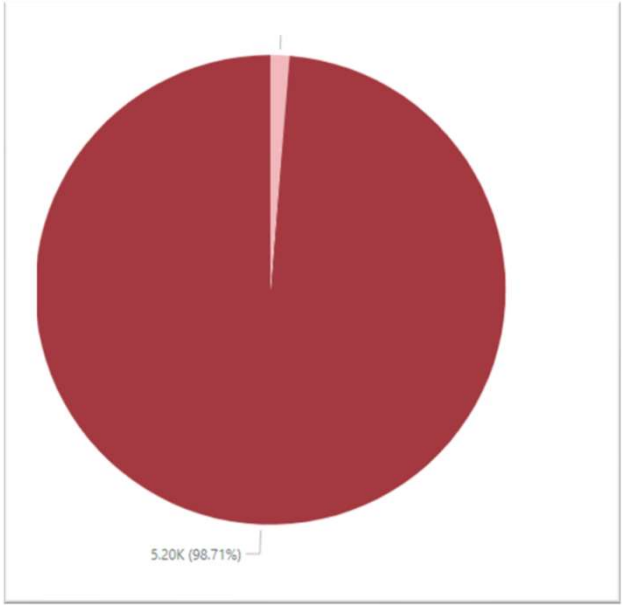
Danceability and valence for different musical keys

Data Visualization



Relationships Between Song Attributes and Music Popularity Over Time

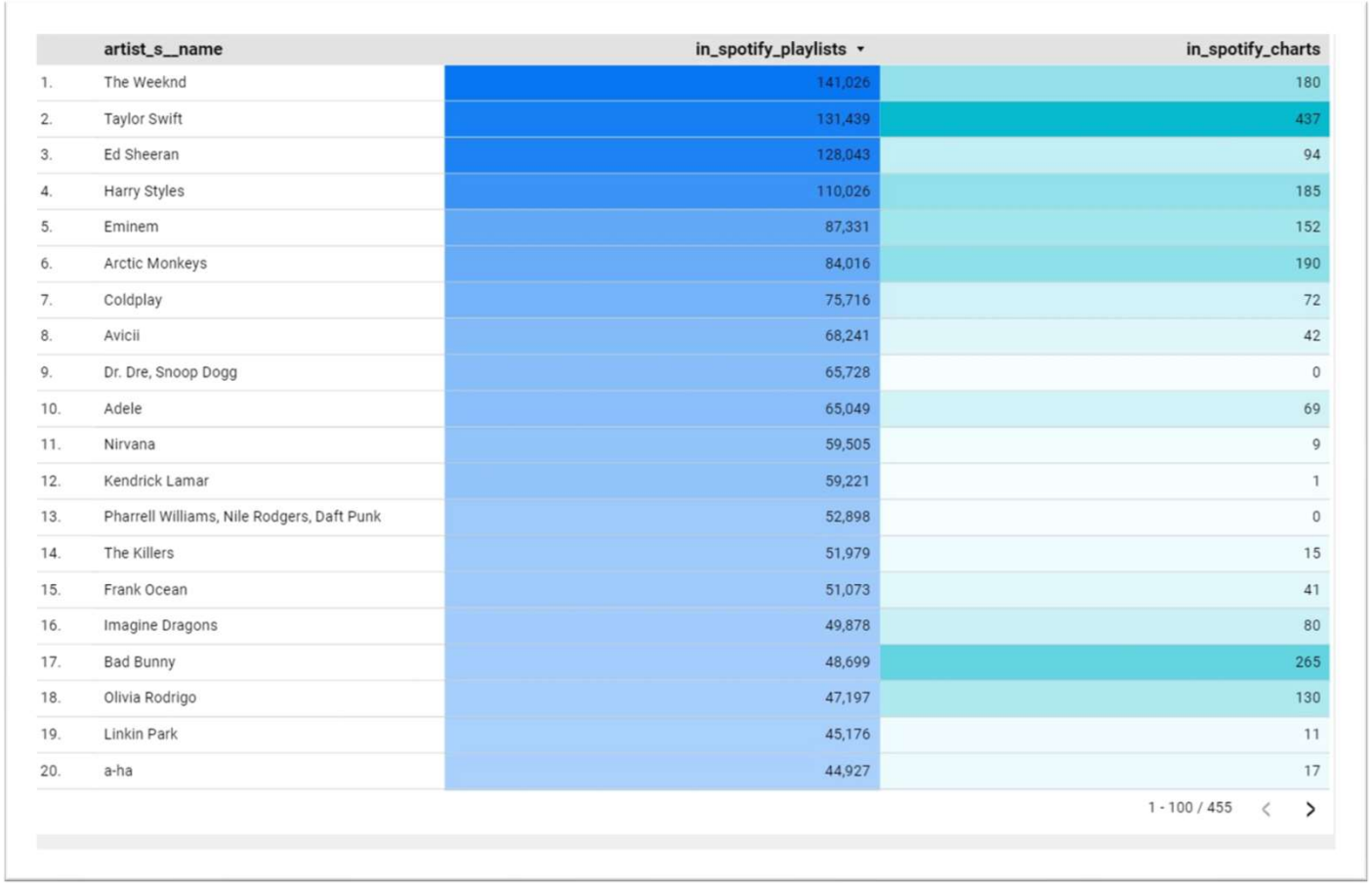
Acoustic Ness, Danceability, Energy vs Years



Comparing Song Popularity Across Different Music Streaming Platforms

Average of in_apple_playlists
Average of in_spotify_playlists

Data Visualization



	artist_s__name	in_spotify_playlists	in_spotify_charts
1.	The Weeknd	141,026	180
2.	Taylor Swift	131,439	437
3.	Ed Sheeran	128,043	94
4.	Harry Styles	110,026	185
5.	Eminem	87,331	152
6.	Arctic Monkeys	84,016	190
7.	Coldplay	75,716	72
8.	Avicii	68,241	42
9.	Dr. Dre, Snoop Dogg	65,728	0
10.	Adele	65,049	69
11.	Nirvana	59,505	9
12.	Kendrick Lamar	59,221	1
13.	Pharrell Williams, Nile Rodgers, Daft Punk	52,898	0
14.	The Killers	51,979	15
15.	Frank Ocean	51,073	41
16.	Imagine Dragons	49,878	80
17.	Bad Bunny	48,699	265
18.	Olivia Rodrigo	47,197	130
19.	Linkin Park	45,176	11
20.	a-ha	44,927	17

1 - 100 / 455

Playlist vs Chart Presence

Data Interpretation

- Throughout the years, it's evident that the levels of energy and danceability have significantly influenced song popularity and streaming success.
- Exploring musical keys, employing certain key combinations can enhance a song's characteristics, particularly in varying genres.
- Additionally, the platform on which a song is available can impact its stream count.
- Typically, songs with higher energy and danceability tend to exhibit lower acoustic ness. Conversely, when these attributes are lower, it may be beneficial to enrich the song's acoustic ness, which can be especially true for tracks within the softer, more serene genres.

Conclusion

- Analyzed Spotify's 2023 music trends uncovered distinct patterns in listener preferences.
- Examined song popularity on streaming platforms highlighted subtle disparities.
- Studied correlations between track characteristics such as danceability, energy, and acoustic properties offered insights into their influence on song success.
- Our study revealed specific attributes that, when optimized, could boost the appeal of less popular songs, deepening our grasp of consumer tastes and strategies for music enhancement.