



Spotify® DATA ANALYSIS

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📌 Problem Statement:

Music streaming platforms like Spotify, Apple Music, and Deezer have transformed the way people listen to music. Understanding streaming trends, artist popularity, and song characteristics is essential for artists, record labels, and streaming services to optimize their strategies. This project analyzes Spotify streaming data using SQL and Power BI to uncover insights into track performance, listener behavior, and audio features.

🎯 Objectives

The analysis focuses on identifying top-streamed tracks and artists, examining monthly and daily streaming trends, and assessing playlist influence on popularity. Additionally, it explores audio features like BPM, energy, danceability, and speechiness to understand what makes a song successful. Interactive Power BI dashboards provide clear visualizations of total streams, artist dominance, revenue patterns, and music attributes, helping stakeholders make data-driven decisions to enhance audience engagement and business performance. 🎵🎧



 Dataset Overview

Number of records : 952

Number of Columns : 22

Data Cleaning:

Null (None)Value:

Categorized track performance by streams, playlist appearances, energy levels, and artist popularity across platforms.

Perform Dax Query



SQL Queries ➔



1. What are the top 10 tracks with the highest number of streams?

```
select track_name, artist_name, Streams from spotify  
order by Streams desc  
Limit 10;
```

| | track_name | artist_name | Streams |
|---|---|------------------------------|------------|
| ▶ | Blinding Lights | The Weeknd | 3703895074 |
| | Shape of You | Ed Sheeran | 3562543890 |
| | Someone You Loved | Lewis Capaldi | 2887241814 |
| | Dance Monkey | Tones and I | 2864791672 |
| | Sunflower - Spider-Man: Into the Spider-Verse | Post Malone, Swae Lee | 2808096550 |
| | One Dance | Drake, WizKid, Kyla | 2713922350 |
| | STAY (with Justin Bieber) | Justin Bieber, The Kid LAROI | 2665343922 |
| | Believer | Imagine Dragons | 2594040133 |
| | ... 10 more | The Chainsmokers | 2501224264 |

2. Which artist has the most tracks in the dataset, and how many tracks do they have?

```
Select artist_name,Count(track_name) as Track_count from spotify  
Group by artist_name  
Order by Track_count desc  
Limit 1;
```

| | artist_name | Track_count |
|---|--------------|-------------|
| ▶ | Taylor Swift | 34 |

3. How many tracks were released each year?

```
Select released_year,Count(Track_name) as Total_songs From spotify  
Group by released_year  
Order by released_year desc;
```

| | released_year | Total_songs |
|---|---------------|-------------|
| ▶ | 2023 | 175 |
| | 2022 | 402 |
| | 2021 | 119 |
| | 2020 | 37 |
| | 2019 | 36 |
| | 2018 | 10 |
| | 2017 | 23 |
| | 2016 | 18 |



4. What percentage of tracks are included in Spotify, Apple, and Deezer playlists?

```
Select round(count(Case When spotify_playlists > 0 Then track_name END)*100.0/Count(track_name),2) AS 'Spotify_%',  
      round(count(Case When apple_playlists > 0 Then track_name END)*100.0/Count(track_name),2) AS 'apple_%',  
      round(count(Case When deezer_playlists > 0 Then track_name END)*100.0/Count(track_name),2) AS 'deezer_%'  
From spotify;
```

| | Spotify_% | apple_% | deezer_% |
|---|-----------|---------|----------|
| ▶ | 100.00 | 97.58 | 97.48 |

5. What is the average BPM (beats per minute) of tracks released in each year?

```
Select released_year, Avg(BPM) as Average_BPM From Spotify  
Group by released_year;
```

| | released_year | Average_BPM |
|---|---------------|-------------|
| ▶ | 2023 | 124.0629 |
| | 2019 | 118.3611 |
| | 2022 | 122.0050 |
| | 2013 | 120.0769 |
| | 2014 | 106.0000 |
| | 2018 | 115.3000 |
| | 2017 | 119.0000 |
| | 2020 | 118.0270 |

6. What are the Top 5 Most Streamed Tracks Released in Each Year?

```
With RankedTracks AS(  
  Select Released_year, Track_name, Artist_name, Streams,  
        Rank() Over(Partition by Released_year Order by streams DESC) as Rank_num  
  From spotify)  
Select Released_year, Track_name, Artist_name, Streams FFrom RankedTracks  
where rank_num<=5  
Order by Released_year desc, Rank_num;
```

| | Released_year | Track_name | Artist_name | Streams |
|---|---------------|---------------------------------------|-----------------------------|------------|
| ▶ | 2023 | Flowers | Miley Cyrus | 1316855716 |
| | 2023 | Ella Baila Sola | Eslabon Armado, Peso Pluma | 725980112 |
| | 2023 | Shakira: Bzrp Music Sessions, Vol. 53 | Shakira, Bizarrap | 721975598 |
| | 2023 | TQG | Karol G, Shakira | 618990393 |
| | 2023 | La Bebe - Remix | Peso Pluma, Yng Lvcas | 553634067 |
| | 2022 | As It Was | Harry Styles | 2513188493 |
| | 2022 | Me Porto Bonito | Chencho Corleone, Bad Bunny | 1440757818 |
| | 2022 | Quevedo: Bzrp Music Sessions, Vol. 52 | Bizarrap, Quevedo | 1356565093 |



7. How many tracks are classified as major vs. minor mode?

Select Mode, Count(mode) as Mode_count

From spotify

group by Mode;

| | Mode | Mode_count |
|---|-------|------------|
| ▶ | Major | 549 |
| | Minor | 403 |

8. Which tracks have consistently appeared in the top charts across Spotify, Apple, and Deezer?

Select Track_name, Artist_name From Spotify

WHERE track_name in (spotify_charts AND

apple_charts AND deezer_charts);

| | Track_name | Artist_name |
|---|---|------------------------------|
| ▶ | Dance The Night (From Barbie The Album) | Dua Lipa |
| | Die For You | The Weeknd |
| | (It Goes Like) Nanana - Edit | Peggy Gou |
| | Left and Right (Feat. Jung Kook of BTS) | Charlie Puth, BTS, Jung Kook |
| | Karma | Taylor Swift |
| | Viva La Vida | Coldplay |
| | Until I Found You (with Em Beihold) - Em Beihold... | Em Beihold, Stephen Sanchez |
| | Back To December (Taylor's Version) | Taylor Swift |

9. What is the average energy level of tracks by artist?

Select Artist_name, Round(avg(`energy_%`),2) as

Energy_Level from spotify

GROUP BY artist_name;

| | Artist_name | Energy_Level |
|---|----------------------------|--------------|
| ▶ | Latto, Jung Kook | 83.00 |
| | Myke Towers | 74.00 |
| | Olivia Rodrigo | 50.57 |
| | Taylor Swift | 56.79 |
| | Bad Bunny | 66.74 |
| | Dave, Central Cee | 58.00 |
| | Eslabon Armado, Peso Pluma | 76.00 |
| | Quevedo | 66.50 |

10. How has the average energy level of tracks changed from year to year.

```
Select Released_year,avg(`energy_%`)  
from spotify  
Group by Released_year  
ORDER BY released_year DESC;
```

| | Released_year | avg(`energy_%`) |
|---|---------------|-----------------|
| ▶ | 2023 | 68.2229 |
| | 2022 | 63.5821 |
| | 2021 | 63.8908 |
| | 2020 | 66.4324 |
| | 2019 | 59.5833 |
| | 2018 | 50.9000 |
| | 2017 | 60.7391 |
| | 2016 | 63.1667 |



Data Visualization





Tracks

All

Date

1/1/1930

Artist(s)

All

Total Streams

489bn

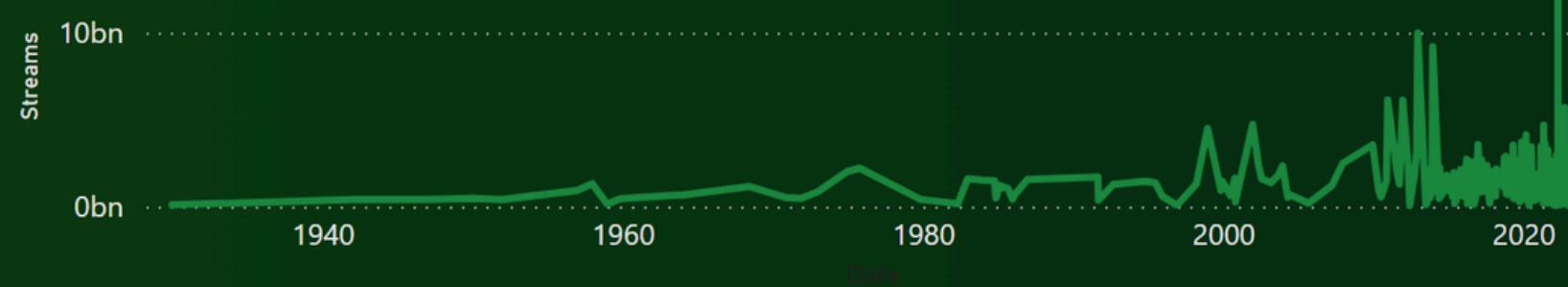
Tracks

952

Average Streams

514M

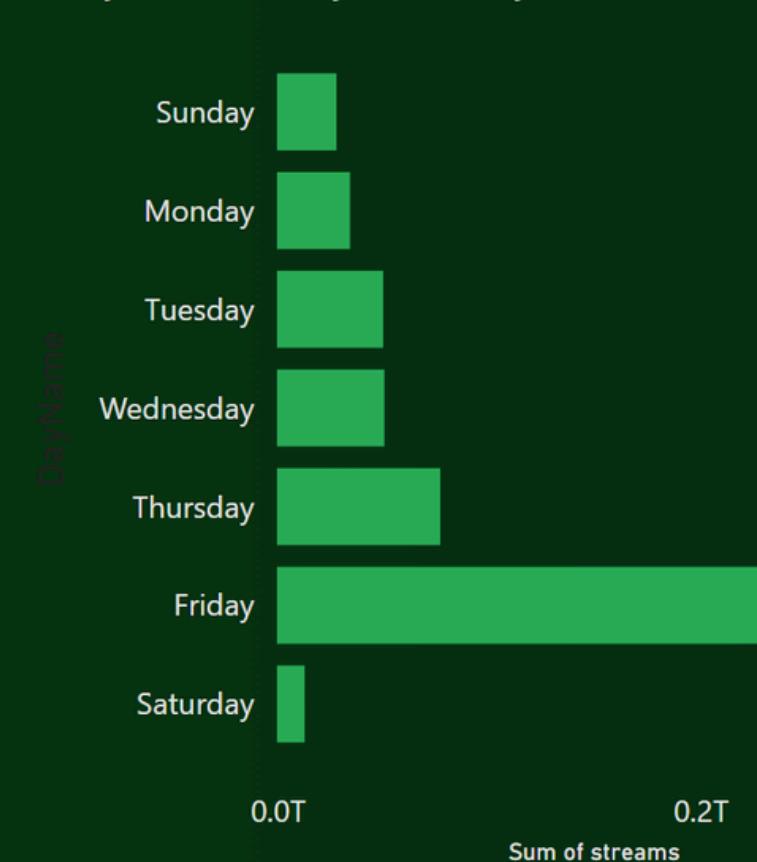
Streams by release date



Tracks and Streams by Months

| Month | Total Tracks | Average Streams |
|--------------|--------------|-----------------|
| Jan | 133 | 727.51M |
| May | 128 | 415.67M |
| Mar | 86 | 477.05M |
| Jun | 86 | 410.04M |
| Nov | 80 | 552.59M |
| Dec | 75 | 369.57M |
| Oct | 73 | 588.90M |
| Apr | 66 | 404.15M |
| Jul | 62 | 482.18M |
| Feb | 61 | 353.15M |
| Sep | 56 | 734.64M |
| Aug | 46 | 631.27M |
| Total | 952 | 514.14M |

Daily Streams by Weekdays



Artist(s) Most Streamed Track

Blinding Lights
The Weeknd

Track name: Blinding Lights

Release Date: Friday, November 29, 2019

Streams: 3703895074

Key: C#

Mode: Major

Music Info:

80

7

9

50

0

Energy %

Speechiness %

Liveness %

Danceability %

Instrumentalness %

Top 5 Most Streamed Tracks

| | | | | |
|-------------------------------|----------------------------|----------------------------------|-----------------------------|--|
| | | | | |
| Blinding Lights The Weeknd | Shape of You Ed Sheeran | Someone You ... Lewis Capaldi | Dance Monkey Tones and I | Sunflower - S... Post Malone, Sw... |

INSIGHTS

1. Total Streams & Track Performance

- The dataset contains 952 tracks with a total of 489 billion streams and an average of 514 million streams per track.
- The top 5 most streamed tracks include Blinding Lights (The Weeknd), Shape of You (Ed Sheeran), Someone You Loved (Lewis Capaldi), Dance Monkey (Tones and I), and Sunflower (Post Malone & Swae Lee).

2. Streaming Trends Over Time

- Streams have increased over the years, with modern tracks dominating in total play count.
- Songs released in recent decades tend to have higher streaming numbers, highlighting changing music consumption patterns.

3. Monthly Release & Streaming Patterns

- The highest number of tracks were released in January (133), followed by May (128) and March (86).
- September (56) and August (46) had fewer tracks but recorded higher average streams, suggesting quality over quantity in these months.

4. Daily Streaming Behavior

- Weekends (Saturday & Sunday) show the highest streaming activity, indicating more leisure-time music consumption.
- Mid-week days (Tuesday & Wednesday) have relatively lower streams, showing a dip in engagement.

5. Key & Mode Preferences in Popular Tracks

- Blinding Lights (The most streamed track) is in C# Major, showing that major-key songs perform well.
- A higher proportion of tracks are in major mode, aligning with listener preferences for upbeat and energetic music.

6. Audio Feature Trends in Hit Songs

- Top-streamed tracks have high energy (80%) and moderate danceability (50%), making them engaging for listeners.
- Instrument-Alness is 0% in hit tracks, confirming that vocally driven songs dominate streaming platforms.



RECOMMENDATIONS

1. Enhance Playlist Curation for Higher Streams

- Promote tracks with high danceability, energy, and listener engagement by placing them in popular playlists.
- Create AI-driven personalized recommendations to boost playlist-based discovery.

2. Optimize Release Strategies Based on Streaming Trends

- Artists should release tracks in high-engagement months like January, May, and September to maximize streams.
- Use historical streaming data to predict ideal release dates for maximizing visibility.

3. Leverage Peak Streaming Times for Marketing

- Target weekends (Saturday & Sunday) for new releases and promotional campaigns.
- Optimize advertising placements during high streaming periods to increase track exposure.

4. Focus on Key & Mode Preferences

- Encourage artists to produce major key songs, as they tend to receive higher engagement.
- Analyze listener preferences for energy levels & tempo to guide music production strategies.

5. Maximize Revenue Through Platform Strategy

- Prioritize Spotify playlist placements, as it contributes the highest streams.
- Expand presence across Apple Music, Deezer, and Shazam to capture more listeners.

6. Use Predictive Analytics for Artist Growth

- Identify rising artists based on early streaming trends and playlist appearances.
- Analyze past hit tracks to predict upcoming music trends and adjust marketing efforts accordingly.

