Project Report And Insights

Music Analytics Using SQL & Spotify Dataset

🎧 Project Overview

This SQL-based project explores digital music trends using a dataset of 20,594 tracks with Spotify and YouTube metrics. The goal is to extract interactive insights into track popularity, artist impact, platform engagement, and licensing effects.

🗄️ Objectives

- ✅ Evaluate track popularity using streams, views, likes, and comments
- ✅ Analyze artist and album-level content creation
- ✅ Identify high-energy, danceable, and live-feel tracks
- ✅ Compare content performance on Spotify vs. YouTube
- ✅ Understand effects of licensing and official video status
- ✅ Lay the foundation for playlist curation and strategic insights

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🗁 Dataset Summary

- **Rows:** 20,594
- **Columns:** 24 (e.g., Artist, Track, Album, Energy, Views, Likes)
- **Sources:** Spotify and YouTube
- **Flags:** official_video, licensed
- **Feature Engineering:** energy_liveness = energy * liveness

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🏋️ SQL Solutions Breakdown

🌟 Solution 1: Billion-Stream Tracks

```
SELECT track, stream

FROM spotify

WHERE stream > 1000000000;
```

Insight: Benchmarks top-performing songs with >1B streams.

🎶 Solution 2: Artist-Album Relations

```
SELECT artist, COUNT(album) AS total_albums

 FROM spotify

GROUP BY artist ORDER BY artist;
```

Insight: Measures artist productivity.

🔢 Solution 3: Comments on Licensed Tracks

SELECT SUM(comments) FROM spotify WHERE licensed = 'true';

Insight: Shows engagement levels for legally authorized music.

🎶 Solution 4: Single-Type Tracks

SELECT track FROM spotify WHERE album_type = 'single';

Insight: Detects trend of single releases.

🎤 Solution 5: Track Count per Artist

SELECT artist, COUNT(track) AS total_tracks

FROM spotify

GROUP BY artist

ORDER BY total_tracks DESC;

Insight: Highlights prolific contributors.

💃 Solution 6: Danceability Analysis

SELECT track, AVG(danceability) AS avg_danceability

FROM spotify

GROUP BY track ORDER BY avg_danceability DESC;

Insight: Reveals high-energy, dance-friendly songs.

🌟 Solution 7: Highest Energy Tracks

SELECT track, energy_liveness

FROM spotify

WHERE energy_liveness IS NOT NULL ORDER BY energy_liveness

DESC LIMIT 5;

Insight: Top 5 tracks with combined energy & liveness.

📺 Solution 8: Views & Likes for Official Videos

SELECT track, SUM(views) AS total_views, SUM(likes) AS total_likes

FROM spotify

WHERE official_video = 'true'

GROUP BY track ORDER BY total_views DESC;

Insight: Measures impact of verified content.

🎗️ Solution 9: Album-wise View Count

SELECT track, album, SUM(views) AS total_views FROM spotify GROUP BY track, album ORDER BY total_views DESC;

Insight: Popularity at the album level.

🎛️ Solution 10: Spotify vs. YouTube Streams

```
SELECT track,
    COALESCE(SUM(CASE WHEN most_played_on = 'Youtube' THEN stream END), 0) AS streamed_on_youtube,
    COALESCE(SUM(CASE WHEN most_played_on = 'Spotify' THEN stream END), 0) AS streamed_on_spotify
FROM spotify
GROUP BY track
HAVING streamed_on_spotify > streamed_on_youtube AND streamed_on_youtube <> 0;
```

Insight: Tracks more popular on Spotify.

🤿 Solution 11: Top 3 Most-Viewed Tracks per Artist

```
WITH ranking_artist AS (
  SELECT artist, track, SUM(views) AS total_views,
      DENSE_RANK() OVER(PARTITION BY artist ORDER BY SUM(views) DESC) AS rank
  FROM spotify
  GROUP BY artist, track
)
SELECT artist, track, total_views FROM ranking_artist WHERE rank <= 3 ORDER BY artist, total_views DESC;
```

Insight: Most successful tracks per artist.

⚡ Solution 12: Above-Average Liveness Tracks

```
SELECT track, artist, liveness AS liveness_greaterthan_average
FROM spotify
WHERE liveness > (SELECT AVG(liveness) FROM spotify);
```

Insight: Tracks with live, concert-like feel.

🔷 Solution 13: Energy Range per Album

```
WITH cte AS (
```

```
    SELECT album, MAX(energy) AS highest_energy, MIN(energy) AS lowest_energy
    FROM spotify
    GROUP BY album
)
SELECT album, highest_energy - lowest_energy AS energy_diff FROM cte ORDER BY energy_diff DESC;
```

Insight: Albums with wide emotional/musical variety.

🔍 Highlights

- **Top Tracks:** >1B streams & most-viewed by artist (S1, S11)
- **Platform Preference:** Spotify-dominant content (S10)
- **Audio Analytics:** Danceability, liveness, energy range (S6, S12, S13)
- **Engagement Drivers:** Licensed content & official videos (S3, S8)
- **Content Volume:** Artist/album output leaders (S2, S5)

End of Report