🎶 **Spotify Listening Behavior Analysis Power BI Project**

**Introduction**

In today’s digital music era, streaming platforms like Spotify have revolutionized the way people consume music. With millions of tracks available, understanding user listening patterns provides valuable insights for both users and platforms. This project analyzes Spotify streaming data at the **track, artist, and album level**, focusing on user engagement, platform usage, and listening behaviors.

**Significance of the Research**

**For Listeners**: Helps understand personal listening habits, preferences, and trends.

**For Artists & Labels**: Identifies which songs, albums, or artists gain traction and where engagement drops.

**For Platforms**: Provides insights into how and when users engage with music, which can improve recommendation systems and personalization strategies.

**For Data Enthusiasts**: Demonstrates practical data analysis, modeling, and visualization using real-world music data.

**Objectives of the Research**

This project aims to answer key analytical questions such as:

* 📅 How do **album, artist, and track listening trends** evolve across months and years?
* 🏆 What are the **Top 5 tracks, artists, and albums** based on engagement?
* 🔄 How do listening habits differ between **weekdays vs weekends**?
* ⏰ What are the **peak listening hours** during the day?
* 📊 How do **Latest Year (LY) vs Previous Year (PY)** trends compare, including YoY growth?
* 🎧 What are the patterns of **skipped songs vs completed plays** and how do they relate to user engagement?

**Scope of the Research**

 **Data Fields**: Includes metadata such as spotify\_track\_uri, ts (timestamp), platform, ms\_played, track\_name, artist\_name, album\_name, reason\_start, reason\_end, shuffle, and skipped.

 **Analytical Dimensions**:

* **Tracks**: Frequency, popularity, skip rates.
* **Artists**: Popularity ranking and diversity over time.
* **Albums**: Listening volume, patterns, and year-over-year growth.
* **Listening Patterns**: Heatmaps of peak hours, session behavior, and shuffle usage.

 **Exclusions**: This research does not focus on user demographics or external datasets (e.g., genre classification).

## Research Methodology

The project follows a structured analytics pipeline:

1. **Requirement Gathering** – Defined business requirements based on Spotify listening behavior.
2. **Data Walkthrough** – Explored available fields and metadata for usability.
3. **Data Connection** – Imported and connected raw streaming data.
4. **Data Cleaning & Quality Check** – Handled duplicates, missing values, and formatting issues (e.g., timestamps, URIs).
5. **Data Modeling** – Built relationships between tracks, artists, and albums for structured analysis.
6. **Data Processing** – Derived metrics such as skip rates, average play duration, and listening frequency.
7. **DAX Calculations (Power BI)** – Implemented custom calculations for YoY growth, top N rankings, and engagement patterns.
8. **Dashboard Development** – Designed interactive dashboards for tracks, artists, albums, and listening patterns.
9. **Insights Generation** – Identified key findings on user engagement, listening trends, and skip behavior.

## Expected Outcome

By the end of this project, we expect to achieve:

* **Interactive Dashboards** that showcase insights at track, artist, and album levels.
* **Rankings of Top Tracks, Artists, and Albums** based on engagement metrics.
* **Peak Listening Hour Analysis** to identify when users stream the most.
* **Weekday vs Weekend Trends** highlighting differences in user behavior.
* **Skip vs Completion Insights** to evaluate engagement and drop-off patterns.
* **Year-over-Year (YoY) Growth Reports** comparing latest year vs previous year consumption.
* **Behavioral Insights** on shuffle usage, reasons for starting/stopping a track, and platform preferences (desktop, mobile, web, smart speakers).