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**POWER BI DASHBOARD PROJECT REPORT  
ON  
“SPOTIFY PLAYLIST ANALYSIS”**

**“INT374”**

Submitted By –

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Under the Guidance of Savleen Kaur

**In partial fulfilment for the requirements of the award of the degree of**

SCHOOL OF COMPUTER SCIENCE

LOVELY PROFESSIONAL UNIVERSITY

PHAGWARA, PUNJAB

## **Student Declaration**

DECLARATION I, Prashant Yadav, student of Bachelor of Technology under CSE Discipline at, Lovely Professional University, Punjab, hereby declare that all the information furnished in this project report is based on my own intensive work and is genuine.

Date: 25-12-2025  
Registration No. 12315118

Signature  
Prashant Yadav

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## . Introduction

Music streaming platforms have revolutionized the global music industry by providing instant access to millions of tracks across genres, artists, and languages. Among these platforms, **Spotify** stands out as one of the largest and most influential music streaming services worldwide. With billions of daily streams, Spotify generates vast amounts of data related to songs, artists, release dates, and audio characteristics.

The **Spotify Music Analysis Dashboard** project aims to analyze large-scale music streaming data using **Microsoft Power BI** to identify trends, patterns, and insights related to music popularity and listener behavior. This project focuses on understanding how tracks perform over time, which artists dominate streaming platforms, and how musical features such as energy, danceability, and tempo influence popularity.

The dashboard uses interactive visualizations and KPIs to convert complex streaming data into meaningful insights. Users can dynamically filter data using slicers and observe changes in streaming trends in real time, enabling effective exploratory and comparative analysis.



## 2. Source of Dataset

The dataset used for this project was obtained from **Kaggle**, a popular online platform for data science and machine learning datasets. The specific dataset is titled “**Top Spotify Songs 2023**”, which contains information about the most streamed songs on Spotify for the year 2023.

### Dataset Details

Attribute	Description
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**Dataset Name** Top Spotify Songs 2023

**Source** Kaggle

**Hosted At** <https://www.kaggle.com/datasets/nelgiriyewithana/top-spotify-songs-2023>

**Data Provider** Kaggle User: nelgiriyewithana

**Data Type** CSV file

**Data Content** Song names, artists, streaming counts, and related Spotify metrics

**Time Frame** Songs released or most streamed in 2023

### Access Link

🔗 **Dataset URL:**

<https://www.kaggle.com/datasets/nelgiriyewithana/top-spotify-songs-2023>

### Description

This dataset includes records of the **most streamed songs on Spotify in 2023**, featuring key attributes such as artist name, track name, total streams, and other metrics relevant to song popularity. It serves as the primary data source for analyzing music streaming trends and performance on the Spotify platform during the year 2023.

The screenshot shows the Power BI interface with the following details:

- Top Bar:** power bi spotify dashboard • Last saved: 12/17/2025 at 11:59 AM
- Search Bar:** Search
- Header:** Share, Prashant Yadav
- Ribbon:** File, Home, Help, Table tools
- Table Tools Sub-Ribbon:**
  - Name: Spotify Dataset
  - Structure: Manage relationships, New measure, New column, New table, Mark as date table, Calendars
  - Relationships: Manage relationships
  - Calculations: New Quick, New table
- Data Grid:** A large table titled "Spotify Dataset" with 952 rows. The columns include track\_name, artist(s)\_name, artist\_count, Date, in\_spotify\_playlists, in\_spotify\_charts, streams, in\_apple\_playlists, and in\_ap.
- Right Panel:** Data pane showing the table structure and search bar, with a link to "Spotify Dataset".
- Bottom:** Taskbar showing weather (17°C, Cloudy), system icons, and system status (151 PM, 12/20/2025).

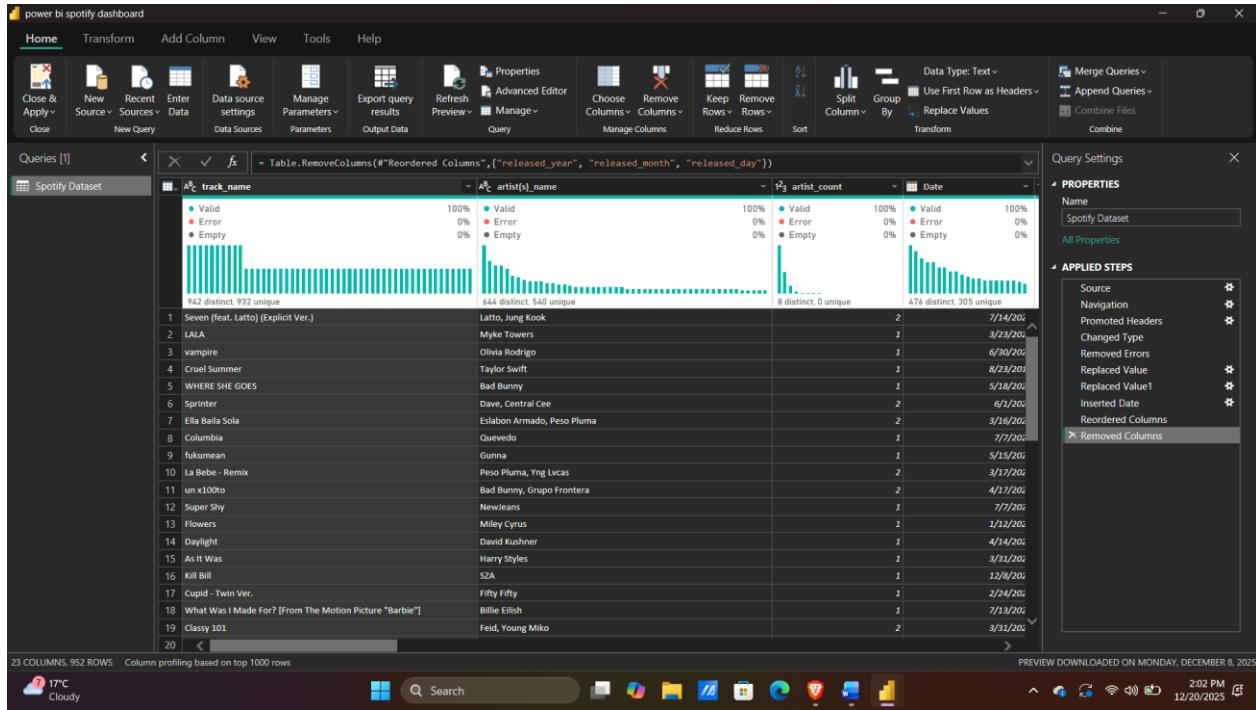
### 3. EDA Process (Exploratory Data Analysis)

Exploratory Data Analysis (EDA) was carried out using **Power Query Editor in Power BI** to ensure data accuracy, consistency, and readiness for visualization.

#### Data Cleaning Steps Performed

- Converted date columns into proper date format
- Changed data types for numerical streaming values
- Removed null and inconsistent records
- Extracted Year, Month, and Day from release date
- Standardized artist and track naming formats
- Validated ranges for audio feature values

Duplicate records were not removed unless they contained invalid streaming or date values, ensuring no meaningful data loss.



## 4. Analysis on Dataset

### 4.1 Artist-wise Streaming Impact Analysis

#### i. Introduction

The objective of this analysis is to understand how music streaming is distributed among different artists on Spotify in 2023. This analysis helps identify artists who contributed most significantly to overall streaming volume.

#### ii. General Description

This analysis is based on aggregating total streams for each artist from the dataset. Since multiple songs may belong to the same artist, summing streams provides a clear picture of artist dominance on Spotify.

#### iii. Specific Requirements, Functions and Formulas

- **Fields used:** Artist Name, Streams
- **Aggregation method:** Sum of Streams
- **Filters applied:** Artist, Track Name
- **Nature of calculation:** Dynamic aggregation based on slicer selection

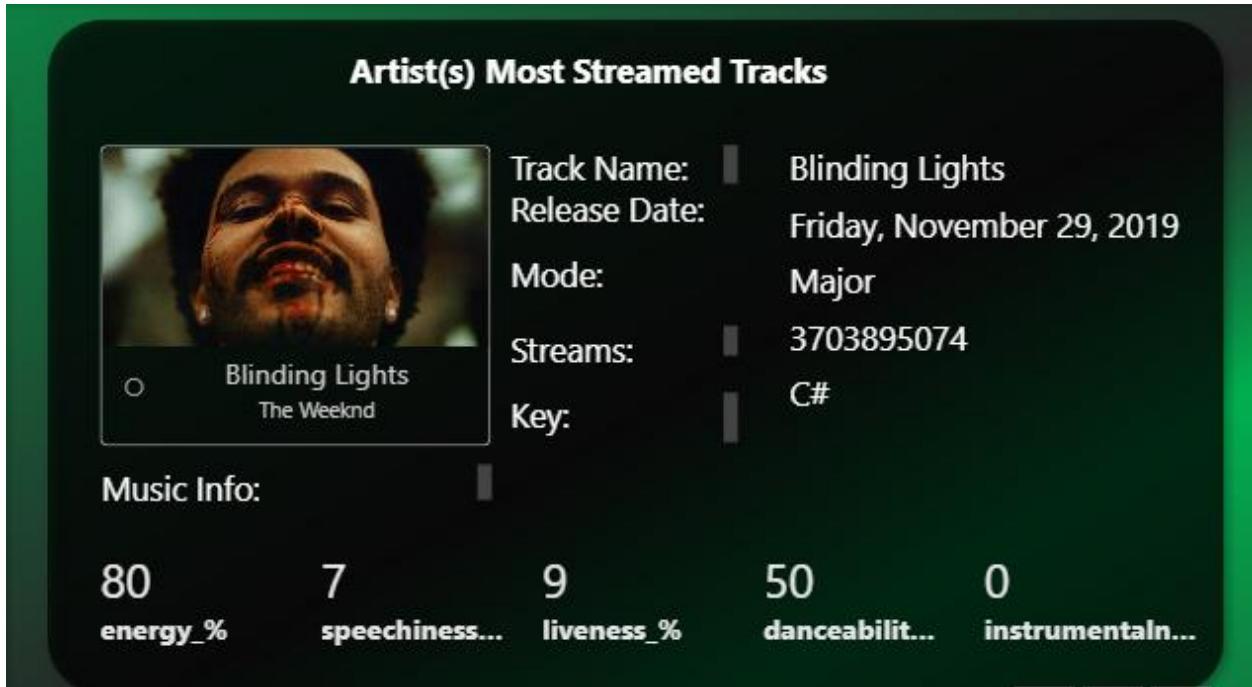
#### iv. Analysis Results

- A limited number of artists contribute a major share of total streams.

- Popular global artists dominate Spotify streaming charts.
- Artist rankings change dynamically when track-level filters are applied.

#### v. Visualization

This analysis is supported using **card visuals and bar charts**, highlighting top artists based on total streams.



## 4.2 Track-wise Streaming Performance Analysis

### i. Introduction

The objective of this analysis is to identify the most streamed songs on Spotify in 2023 and compare their performance.

### ii. General Description

Each track is evaluated based on its total number of streams. This helps in identifying global hit songs and understanding listener preferences.

### iii. Specific Requirements, Functions and Formulas

- **Fields used:** Track Name, Streams
- **Aggregation method:** Sum of Streams
- **Sorting:** Descending order by streams

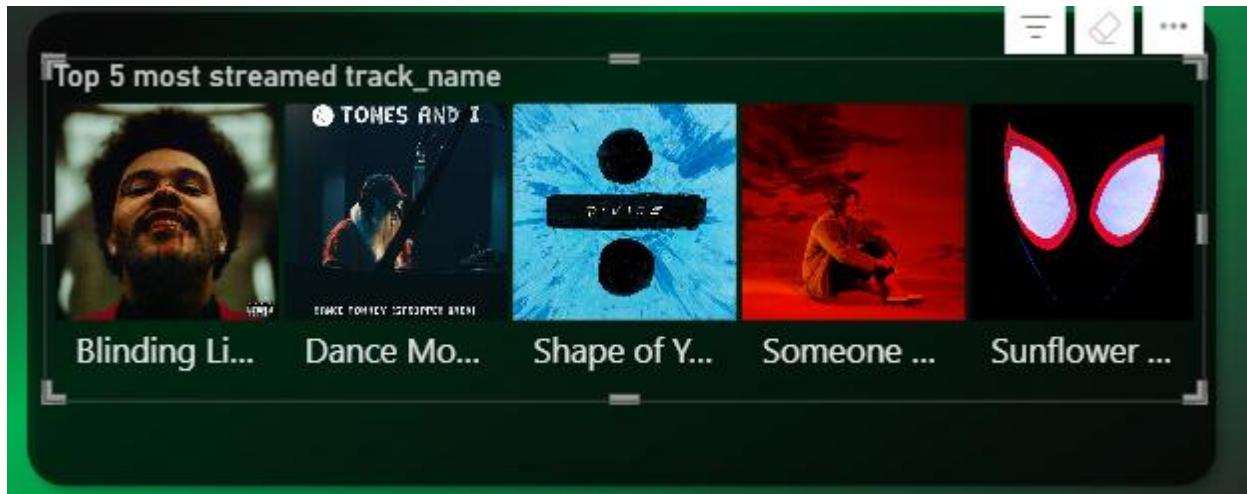
### iv. Analysis Results

- A small number of tracks achieve extremely high streaming counts.

- Songs such as globally popular pop tracks dominate the top rankings.
- There is a large gap between the most streamed track and lower-ranked tracks.

#### v. Visualization

A **horizontal bar chart / image-based chart** is used to represent the **Top 5 Most Streamed Songs**.



### 4.3 Release Year-wise Streaming Trend Analysis

#### i. Introduction

The objective of this analysis is to understand how song release year influences streaming performance.

#### ii. General Description

Tracks are grouped by release year, and their total streams are analyzed to observe historical and recent music trends.

#### iii. Specific Requirements, Functions and Formulas

- **Fields used:** Release Year, Streams
- **Aggregation method:** Sum of Streams
- **Filters applied:** Year range slicer

#### iv. Analysis Results

- Songs released in recent years show significantly higher streaming volumes.
- Older songs still contribute to streams but at a comparatively lower scale.
- Streaming popularity increases sharply after the rise of digital platforms.

#### v. Visualization

A **line chart** is used to represent year-wise streaming trends.



## 4.4 KPI-based Spotify Performance Analysis

### i. Introduction

This analysis provides a summarized overview of Spotify streaming performance using key numerical indicators.

### ii. General Description

Key Performance Indicators (KPIs) are calculated from the dataset to quickly understand its scale and popularity.

### iii. Specific Requirements, Functions and Formulas

The following KPI measures are used:

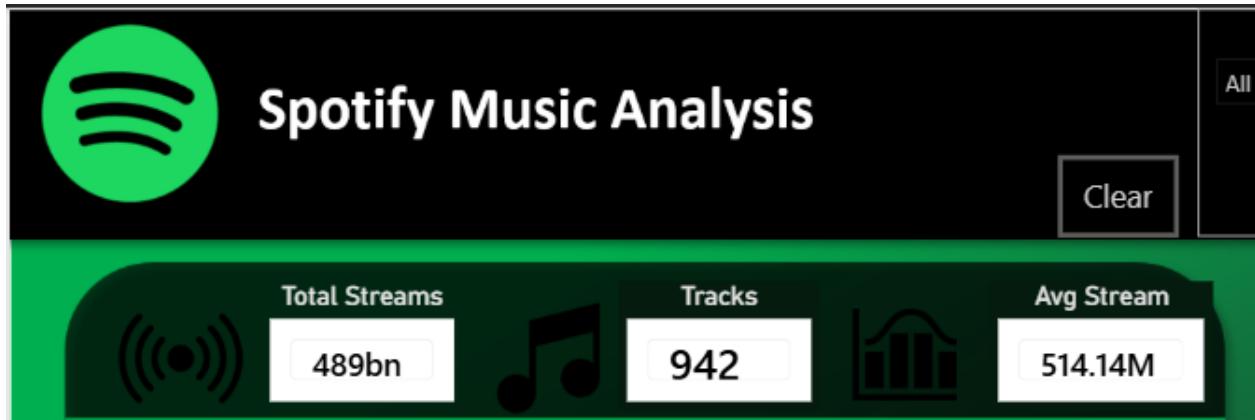
- Total Streams
- Total Tracks
- Average Streams per Track

### iv. Analysis Results

- The dataset represents billions of total streams.
- Average streams per track are significantly high, indicating strong listener engagement.
- KPIs update dynamically based on slicer selections.

### v. Visualization

This analysis is displayed using **KPI cards** at the top of the dashboard.



## 4.5 Audio Feature Impact Analysis

### i. Introduction

The objective of this analysis is to study how Spotify audio features influence a song's popularity.

### ii. General Description

Spotify provides multiple audio features such as energy, danceability, speechiness, liveness, and instrumentalness. These features are analyzed to understand listener preferences.

### iii. Specific Requirements, Functions and Formulas

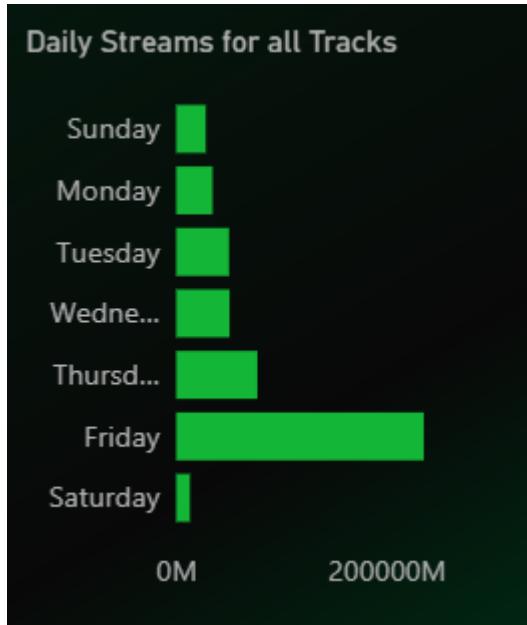
- **Fields used:** Energy, Danceability, Speechiness, Liveness, Instrumentalness
- **Aggregation method:** Average value calculation

### iv. Analysis Results

- High-energy and danceable tracks receive more streams.
- Instrumental tracks generally have lower popularity.
- Speech-heavy tracks show moderate engagement.

### v. Visualization

This analysis is represented using **numeric indicators and bar visuals**.



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## 4.6 Monthly Streaming Pattern Analysis

### i. Introduction

The objective of this analysis is to examine whether music streaming shows seasonal patterns throughout the year.

### ii. General Description

Tracks are grouped by month to evaluate variations in streaming performance.

### iii. Specific Requirements, Functions and Formulas

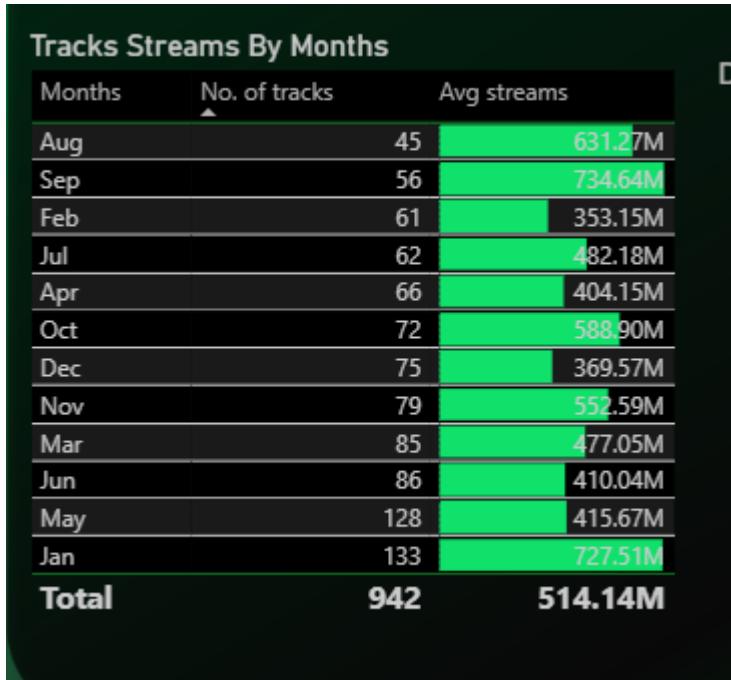
- **Fields used:** Month, Streams
- **Aggregation method:** Average Streams

### iv. Analysis Results

- Certain months show higher average streams, indicating favorable release timing.
- Seasonal trends influence listener engagement.

### v. Visualization

A table or bar chart with conditional formatting is used to highlight monthly patterns.



## 4.7 Slicer-based Interactive Analysis

### i. Introduction

The objective of this analysis is to demonstrate the interactivity of the Spotify dashboard using slicers.

### ii. General Description

Slicers allow users to filter data dynamically and explore insights across different dimensions.

### iii. Specific Requirements

The following slicers are implemented:

- Artist
- Track Name
- Release Year

### iv. Analysis Results

- All charts and KPIs update instantly when slicers are applied.
- Users can focus on specific artists or time periods for deeper analysis.

### v. Visualization

This analysis is supported using **interactive slicers connected to all visuals**.



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## 5. Conclusion

The Spotify Music Analysis Dashboard successfully transforms raw streaming data into meaningful insights. The analysis highlights trends in music popularity, artist dominance, release timing impact, and audio feature influence on streaming performance. The interactive dashboard enables quick exploration and supports informed decision-making for music analytics.

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## 6. Future Scope

- Integrating **genre-level analysis**
  - Adding **user demographic data** for deeper insights
  - Real-time streaming data integration using APIs
  - Predictive analysis for future hit songs
  - Sentiment analysis using lyrics or social media data
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## 7. References

- Spotify Public Dataset
  - Spotify Audio Features Documentation
  - Power BI Official Documentation
  - Data Visualization Best Practices
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## 8. LinkedIn Link

[https://www.linkedin.com/feed/update/urn:li:activity:7405510752402309120/?commentUrn=urn%3Ali%3Acomment%3A\(ugcPost%3A7405510462982979584%2C7408024056723124224\)&dashCommentUrn=urn%3Ali%3Afsd\\_comment%3A\(7408024056723124224%2Curn%3Ali%3AucPost%3A7405510462982979584\)](https://www.linkedin.com/feed/update/urn:li:activity:7405510752402309120/?commentUrn=urn%3Ali%3Acomment%3A(ugcPost%3A7405510462982979584%2C7408024056723124224)&dashCommentUrn=urn%3Ali%3Afsd_comment%3A(7408024056723124224%2Curn%3Ali%3AucPost%3A7405510462982979584))

9.Github Link

<https://github.com/prashantyadavv/spotify-powerbi-dashboard>