

Spotify Trend Analysis

Jahneulie Weste, Grecia-Melany Morales, Gabriel Carson, & Sean Ward

Abstract— This project analyzes Spotify’s top 50 songs across 73 countries (2023–2025) to identify musical features most associated with popularity. It aims to uncover global and regional trends in listener preferences.

I. OBJECTIVE

The primary objective of this project is to analyze global music trends by examining Spotify’s daily top charting songs across 73 countries. The analysis aims to:

- Identify key musical features (e.g., danceability, energy, speechiness, etc.) that are most strongly correlated with song popularity
- Explore regional variations by determining how the influence of these features differs across geographical locations

II. MOTIVATION

As regular Spotify users and avid music listeners, our team has a personal interest in understanding the factors that drive a song’s popularity. Music plays a significant role in the daily lives of many college students, making this project both relevant and engaging for the team and our audience.

Given Spotify’s global reach and its influence on modern music consumption, we are curious about the musical attributes (e.g., tempo, valence, energy, etc.) that contribute to a song’s success across different regions. By analyzing these trends, we hope to uncover insights that satisfy our curiosity and deepens our understanding of music interests worldwide.

III. DATA COLLECTION & USAGE

This project utilizes the Top Spotify Songs in 73 Countries (Daily Updated) dataset, sourced from Kaggle, for trend analysis. The dataset contains approximately 2.1 million records, representing the daily top 50 songs across 73 countries during the years 2023, 2024, and 2025. While comprehensive, the dataset includes some missing daily entries in each year, which will be addressed during preprocessing.

The dataset contains 25 features, including:

- **Track Metadata:** spotify_id, name, artists, is_explicit, album_release_date
- **Ranking Information:** daily_rank, daily_movement, weekly_movement, country, snapshot_date
- **Audio Features (from Spotify API):** duration_ms, popularity, danceability, energy, key, loudness, mode, speechiness, acousticness, instrumentalness, liveness, valence, tempo, time_signature

Data Preprocessing

The dataset will undergo the following preprocessing steps:

- Handling missing values and incomplete entries
- Removing duplicate records

Data Usage & Analysis

The cleaned dataset will be analyzed in various ways to identify patterns and important features. We will perform different analyses such as audio feature correlation, explicitness versus popularity, feature selection, genre and artist popularity, geographical music preferences, and temporal analysis.

IV. MEMBER RESPONSIBILITIES

A. Shared Responsibilities

- Discuss and create project proposal
- Discuss and create final project report

B. Jahneulie Weste

- Finalize and submit project proposal
- Integrate presentation into Flask dashboard

C. Grecia-Melany Juan Morales

- Integrate presentation into Flask dashboard
- Finalize and submit final project report

D. Gabriel Carson

- Create visualization dashboard
- Integrate trend analysis into dashboard

E. Sean Ward

- Pre-Process dataset
- Perform analyses

V. PROJECT TIMELINE

A. Week 1

We will focus on finalizing our project proposal to get an understanding of the scope of our project.

B. Week 2

We will also preprocess the data to remove any missing values, duplicates or invalid entries. Lastly, we will identify the most important 5-6 features that will be used in our trend analysis.

C. Week 3-4

We conduct the different analyzes on the data to discover any trends.

D. Week 5-6

We will use the information gathered from the trend analysis to create the Flask visualization dashboard.

E. Week 7-8

We will integrate the final presentation into the Flask dashboard.

F. Week 9

We will complete the final report.

VI. EXPECTED OUTCOME

A. Flask Dashboard

We will develop a web dashboard using Flask to visualize key findings from the trend analysis. The dashboard will display interactive charts and graphs that highlight relationships between song popularity and top musical features.

B. Project Report

The final report will provide an in-depth description of our analysis process and the findings from our trend analysis. We will describe any challenges with the project and our ideas for future work.

C. Final Presentation

We will develop a presentation that describes the project's goals, methods, findings, and insights. The presentation will include pictures of our developed Flask dashboard.