FINAL PROJECT FOR DATA SCIENCE BOOTCAMP

PROJECT: MUSIC RECOMMENDATION APP

CASE STUDY: SPOTIFY

TASK: *Develop a recommendation algorithm that leverages the Spotify dataset to suggest music based on user preferences and music attributes.*
This exercise will involve

- *Read the Spotify dataset and explore its contents. This step is crucial for understanding the data structure and preparing it for subsequent project phases.*
- *exploratory data analysis on the Spotify dataset. This analysis will help you understand trends in sound features over decades, examine the popularity and characteristics of top genres and artists, and generate word clouds to visualize the genres and artists present in the dataset.*
- *use clustering techniques to group genres and songs based on their characteristics. Clustering helps in discovering patterns and similarities within the dataset, enabling us to gain insights into the structure of the music data, and*
- *use the Spotify dataset and implement a recommendation system using song features. We will utilize the Spotify library to access the Spotify API and fetch additional song details. The recommendation system will calculate the similarity between songs based on their numerical features and recommend the top 10 similar songs to the user.*

PROPOSED SOLUTION

Project Overview

The music recommendation system to be built will be called **MelodyMatcher.**
MelodyMatcher is a music recommendation system that leverages clustering techniques and Spotify's vast music dataset to suggest personalized songs to users. The system aims to provide users with a unique listening experience by recommending songs that match their musical preferences.

Problem Statement

Existing music recommendation systems often rely on collaborative filtering or content-based filtering, which users' data availability and the complexity of music features can limit. MelodyMatcher addresses this problem by utilizing clustering techniques to group songs based on their acoustic features, genres, and moods, providing a more nuanced and accurate recommendation system.

Features

MelodyMatcher will consist of the following features:

1. Song Clustering: MelodyMatcher will cluster songs based on their acoustic features, such as tempo, genre, mood, and instrumentation.
2. User Profiling: Users will be able to create profiles, inputting their musical preferences, favorite artists, and genres.
3. Personalized Recommendations: Based on user profiles and song clusters, MelodyMatcher will provide personalized song recommendations.
4. Exploration Mode: Users will be able to explore different genres, moods, and decades, discovering new songs and artists.
5. Spotify Integration: MelodyMatcher will utilize the Spotify API to access millions of songs, ensuring a vast and diverse music library.

Technical Requirements

The building of MelodyMatcher will involve the use of:

1. Programming Language: Python
2. Libraries: Spotipy, Scikit-learn, Pandas, NumPy
3. Dataset: Spotify's Web API
4. Clustering Algorithm: K-Means, Hierarchical Clustering

Expected Outcomes

MelodyMatcher is expected to provide

1. Improved Music Discovery: MelodyMatcher will provide users with a unique and personalized music discovery experience.
2. Enhanced User Engagement: MelodyMatcher aims to increase user engagement and retention by offering a tailored music recommendation system.
3. Insights into Music Preferences: MelodyMatcher will provide valuable insights into user music preferences, enabling artists, labels, and music streaming services to better understand their audiences.