



STATS 418 Final Project

Spotify Cover Art Quiz

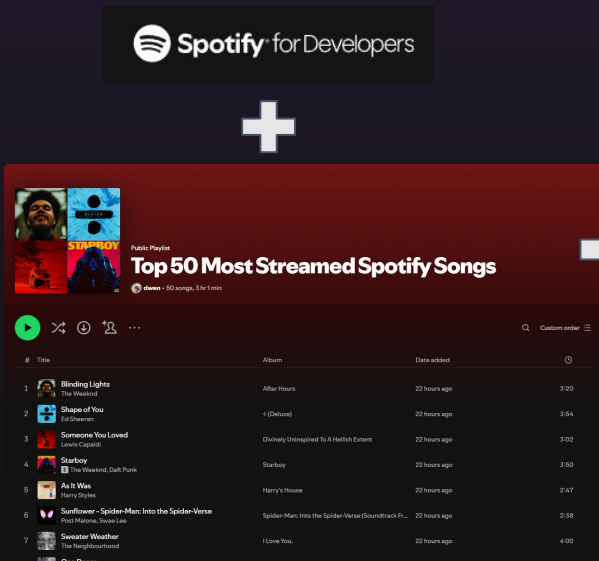
Derek Wen

The Data

Call Spotify API on Spotify Playlist

Python Script To Fetch and Create Dataset

Dataset created as CSV



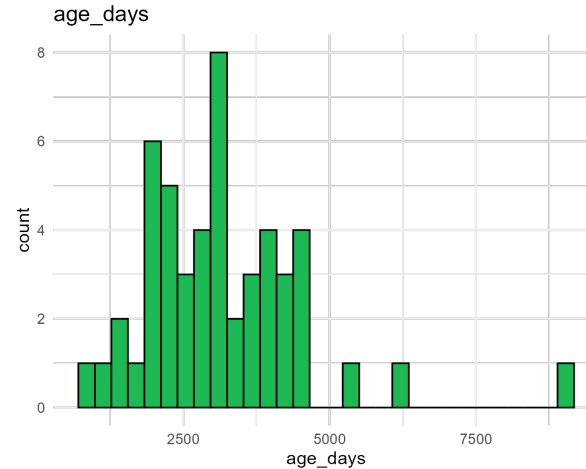
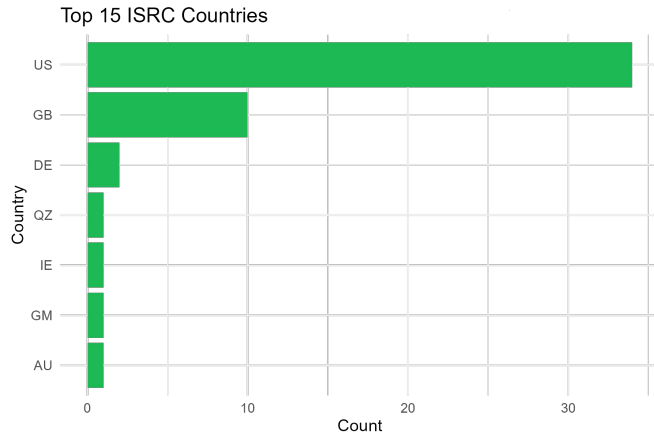
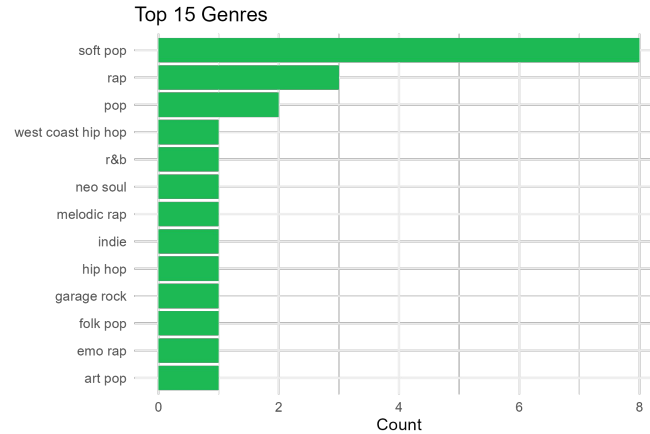
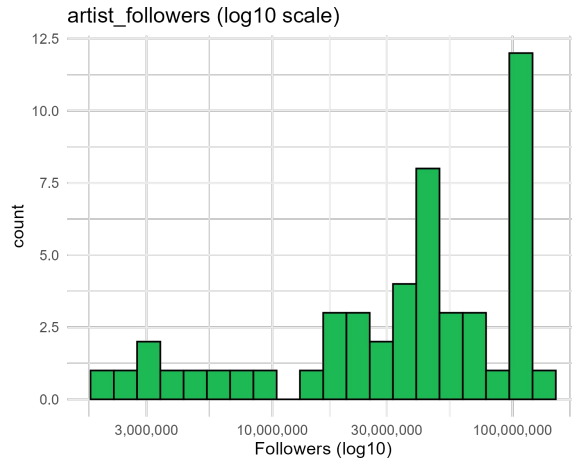
```
C:\Users\derek\top50-spotify-quiz>python src/fetch_top50.py
Fetched 50 tracks
→ playlist_enriched.csv written with 50 rows

C:\Users\derek\top50-spotify-quiz>
```

[illegible]

Data includes track id, song name, artist name, cover url, artist popularity, song duration (ms), explicit, song age, artist popularity score, genres, number of artist genre, and artist country.

Exploratory Data Analysis



The Recommendation Model

- k-Nearest Neighbors
 - Lightweight, very fast, no training labels needed, simple and interpretable
 - Take song vector and compute Euclidean distance to all other songs and return closest ones
- Features Used:
 - popularity, duration_ms, explicit, age_days, artist_popularity, artist_followers, n_artist_genres
 - one-hot encode for genre and countries
- Step by Step
 - All numerical features scaled using StandardScaler to ensure equal influence in distance calculations
 - Each song is represented by a numeric feature vector
 - k-NN identifies tracks similar to the current song
 - Similarity measured using Euclidean distance after scaling

Deployment

- Frontend: R Shiny (hosted on shinyapps.io)
 - Interactive UI for quiz gameplay
 - Displays Spotify cover art for user
 - Provides instant recommendations from Flask API
- Backend: Flask API (hosted on Amazon EC2)
 - Serves recommendations using Docker container
- App
 - User has five rounds in a single session and has to guess song name and artist name based on cover art
 - Shows answers and shows whether or not the user guess the song and artist name correctly
 - + 0.5 for correctly guessing song name or artist name
 - After each round, recommends similar songs based on recommender model

Demo

<https://dwen.shinyapps.io/spotify-cover-art-quiz/>

Spotify Cover Art Quiz

0.5 / 1



Round 1 / 5

im not sure...

the weeknd

Submit

Next

The correct song was "Die For You" ❌

Correct! ✔

Recommended songs:

Locked out of Heaven — Bruno Mars
That's What I Like — Bruno Mars
lovely (with Khalid) — Billie Eilish, Khalid
Blinding Lights — The Weeknd
bad guy — Billie Eilish

Source: Top 50 Most Streamed Songs
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Spotify Cover Art Quiz

1.0 / 2



Round 2 / 5

as it was

i forgot...

Submit

Next

Correct! ✔

The correct artist was Harry Styles ❌

Recommended songs:

Watermelon Sugar — Harry Styles
Señorita — Shawn Mendes, Camila Cabello
Sunflower - Spider-Man: Into the Spider-Verse — Post Malone, Swae Lee
Circles — Post Malone
Kill Bill — SZA

Source: Top 50 Most Streamed Songs
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Spotify Cover Art Quiz

2.0 / 3



Round 3 / 5

locked out of heaven

bruno mars

Submit

Next

Correct! ✔

Correct! ✔

Recommended songs:

Just the Way You Are — Bruno Mars
Love Yourself — Justin Bieber
That's What I Like — Bruno Mars
Die For You — The Weeknd
Sweater Weather — The Neighbourhood

Source: Top 50 Most Streamed Songs
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Spotify Cover Art Quiz

0.0 / 3



Round 3 / 5

Enter song title

Enter artist name (any one)

Submit

Next

The correct song was "Someone You

Loved" ❌

The correct artist was Lewis Capaldi ❌

Recommended songs:

Say You Won't Let Go — James Arthur
Watermelon Sugar — Harry Styles
Señorita — Shawn Mendes, Camila Cabello
As It Was — Harry Styles
The Night We Met — Lord Huron

Source: Top 50 Most Streamed Songs
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