



SPOTIFY ANALYSIS

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GROUP 5



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INTRODUCTION

Our primary goal will be to comprehensively understand user music preferences within the Spotify platform. We'll delve into user interactions, exploring playlist creation, track listening patterns, and favored genres to derive behavioral insights.



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METHODOLOGIES IMPLEMENTED

- **Python libraries (Spotipy, Requests):** These are used to access and get Spotify music data. Spotipy makes it easier to connect with the Spotify Web API, allowing data to be extracted from user playlists and tracks. Requests can let you get more data or make specialized API calls.
- **Visualization of data (Numpy, Pandas, Matplotlib):** Utilized to generate comprehensive visual representations. Numpy and Pandas help with data manipulation and preparation, while Matplotlib generates graphs, charts, and other visuals to effectively present results.
- **Natural Language Processing:** We did the sentiment and emotion analysis on our data using NLTK and NRC Lexicon. VADER Sentiment Analysis (via NLTK) is a rule-based sentiment analysis tool. It is effective in handling sentiments expressed in a context-dependent manner. The NRC Emotion Lexicon annotates words with emotions and intensity scores, enabling fine-grained sentiment and emotion analysis in text.



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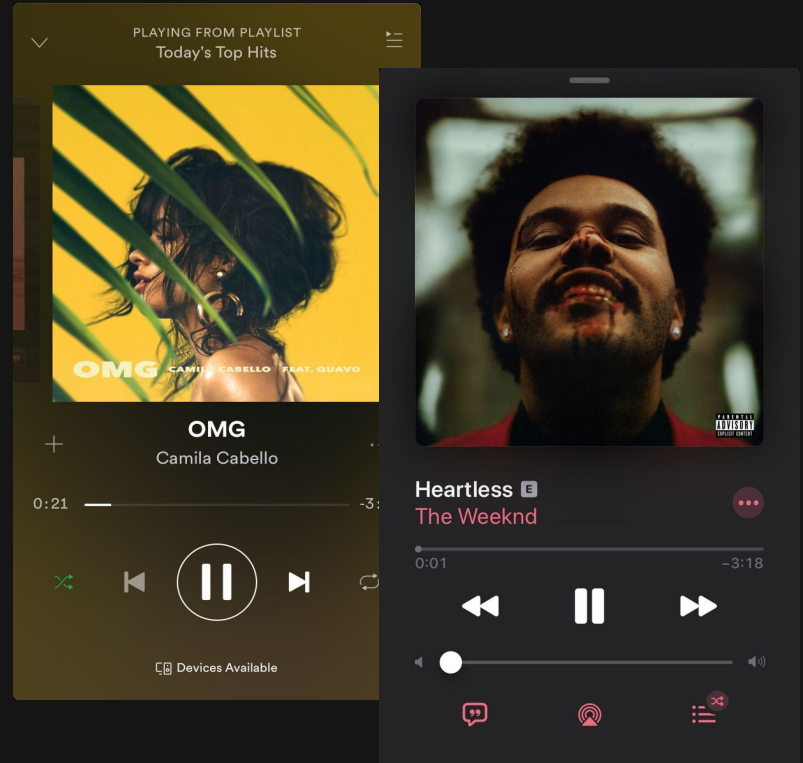


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Unit of Analysis

Our study concentrates on individual songs and user playlists as the core elements of our investigation.

- **Playlists:** Our analysis expands to encompass user-generated playlists, investigating patterns related to genres, artist preferences, and the arrangement of songs within playlists.



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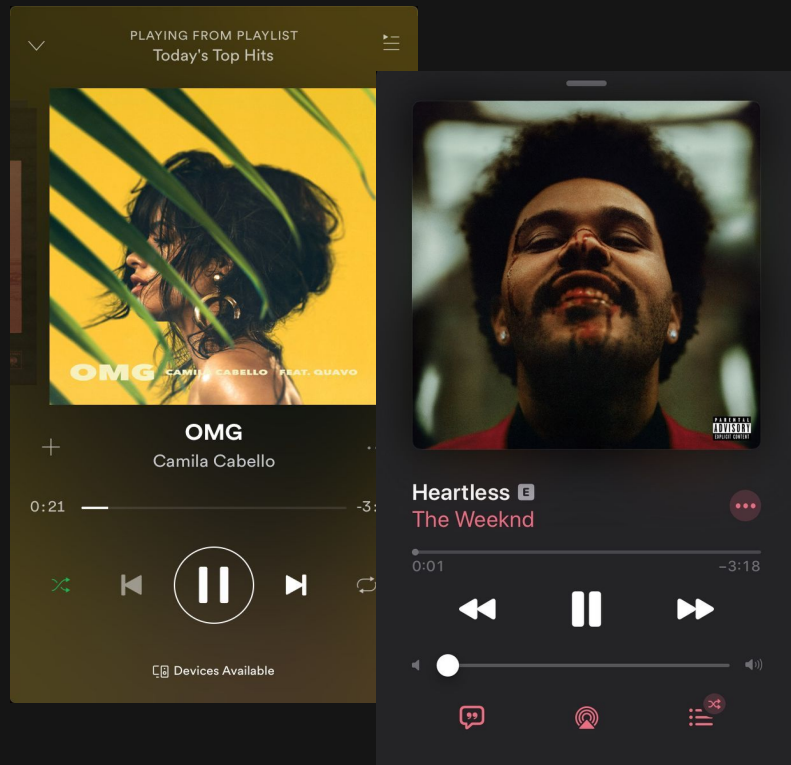
Unit of Analysis

Audio Attributes:

We analyze characteristics like:

- tempo(speed of a song measured in beats per minute)
- key,valence(the emotional positivity or negativity conveyed by a track, defining its mood)
- danceability(A measure of how suitable a song is for dancing based on its rhythm and tempo.)
- energy

These features aid in identifying user preferences based on musical traits.



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Source & Data Type

The key data acquisition sources: Spotify API

Data Types:

Spotify API Structured Data: The Spotify API makes structured data available via Python libraries. JSON datasets including various attributes connected to songs.

It comprises song metadata (such as titles, artists, and albums), audio qualities (such as tempo, key, and danceability), and signs of song popularity (such as number of streams and user playlists).



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Advanced Analysis with VADER Sentiment Analysis & NRC Lexicon

- **Purpose:** VADER and NRC Lexicon, integral to our Spotify project, analyze sentiments in song lyrics. VADER evaluates sentiments in top Spotify tracks, while NRC unveils deeper emotional associations, enriching our understanding of user preferences.
- **Significance:** Enhances understanding of user tastes, potentially refining recommendation algorithms and enabling mood-based playlist creation for a personalized Spotify experience.



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Limitations

- **Privacy Challenges:**

Detailed user data, like complete listening histories, raises privacy concerns. Balancing analysis while safeguarding privacy is crucial yet challenging.

- **Limited Multilingual Support:**

NLTK's focus has traditionally been on English, and while it supports multiple languages to some extent, it may not have the same level of robustness for all languages.



Conclusions

- **Comprehensive Music Analysis:** The project conducts a detailed analysis of music tracks, encompassing both audio features and lyrical content.
- **User Music Preferences:** The analysis of playlists and tracks provides insights into the user's music preferences, like genres which where filmi and pop.
- **Sentiment Analysis of Lyrics:** The application of VADER Sentiment Analysis on lyrics revealed that the prevalent sentiment of the user's preference was with positive lyrics.
- **Emotion Analysis with Lexicon:** The utilization of emotion analysis through NRC lexicon, provided valuable insights such as the user prefers happy songs over melancholic and others.



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Insights

1. **Personalized Music Recommendations:** Insights from this analysis can be used to refine music recommendation algorithms.
2. **Mood-Based Playlist Creation:** Understanding the sentiment of lyrics can help in creating mood-based playlists, like upbeat, happy songs or melancholic, reflective tracks.
3. **Music Industry Trends Analysis:** For music producers and artists, these insights can be valuable for understanding current trends in music preferences, helping them create content that resonates with listeners' emotional inclinations.
4. **User Engagement and Marketing Strategies:** For platforms like Spotify, this analysis can inform marketing strategies and user engagement by highlighting what types of music resonate most with their audience.



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Thank You

Do you have any questions?



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