Spotify Playlist Generator:

A Music Recommendation System

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Overview

Problem Users struggle to find music that matches their taste.

Stakeholders Spotify users looking for new music

Goal Build a music recommendation system by clustering songs based on their audio features.

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The Data

Audio Feature	Definition
danceability	Measures how suitable a track is for dancing, helping to differentiate between high-energy and low-energy songs. energy: Captures the intensity and activity level of a song.
valence	Indicates how positive or negative a song sounds, helping to cluster songs based on mood.
tempo	Beats per minute (BPM), useful for identifying fast vs. slow songs.
liveness	Identifies live vs. studio-recorded performances.
loudness	Differentiates between soft acoustic songs and high-energy tracks.
speechiness	Helps distinguish spoken-word tracks (e.g., podcasts, rap) from instrumental music.
acousticness	Determines if a song is acoustic or electronic, useful for genre-based clustering.
instrumentalness	Helps separate instrumental tracks from songs with vocals.

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Methods

Method	Optimal k	Silhouette Score	Average Cosine Similarity
K-Means	6	0.188869	0.691475
K-Means	7	0.189058	0.697802
GMM	29	-0.054754	0.781639
Agglomerative Clustering	6	0.362828	0.446581
PCA KMeans	12	0.204933	0.824815
PCA GMM	19	-0.002914	0.807765
PCA Agglomerative Clustering	10	0.146661	0.7916

Overview

The Data
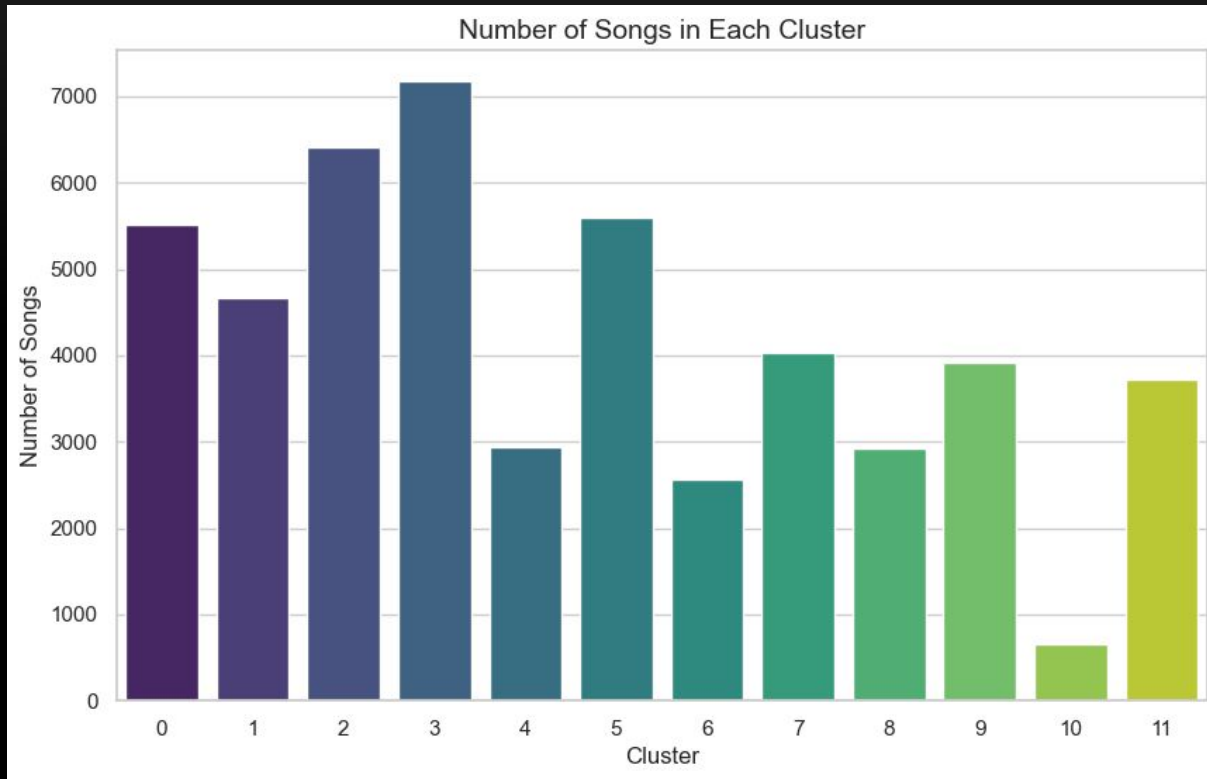
Methods

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Methods

Number of Songs in Each Cluster

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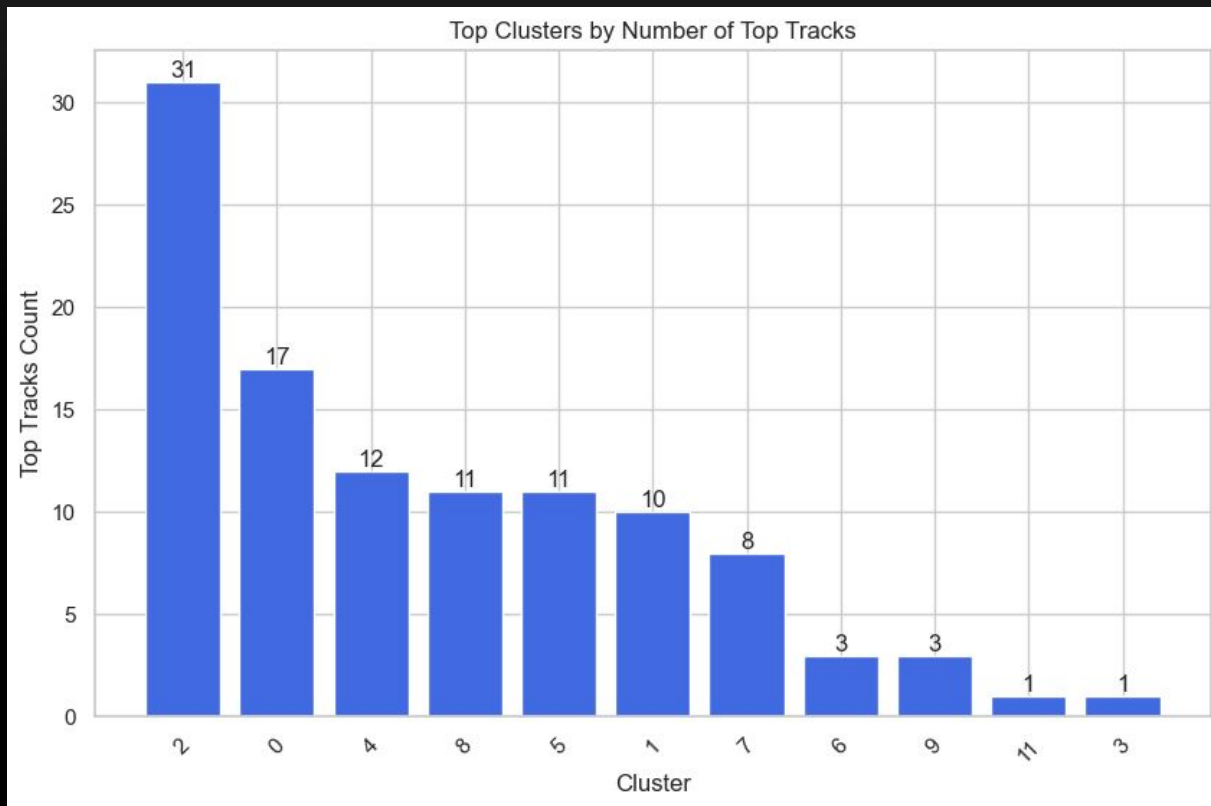

Top Clusters by Number of Top Tracks

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Results

Sunshine & Seratonin
Hannah

6418 songs (31 known, 6387 new)

Upbeat & Moody
Hannah

2931 songs (12 known, 2919 new)

Cafe Contemplation
Hannah

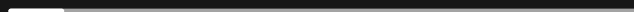5509 songs (17 known, 5492 new)

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Questions?

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