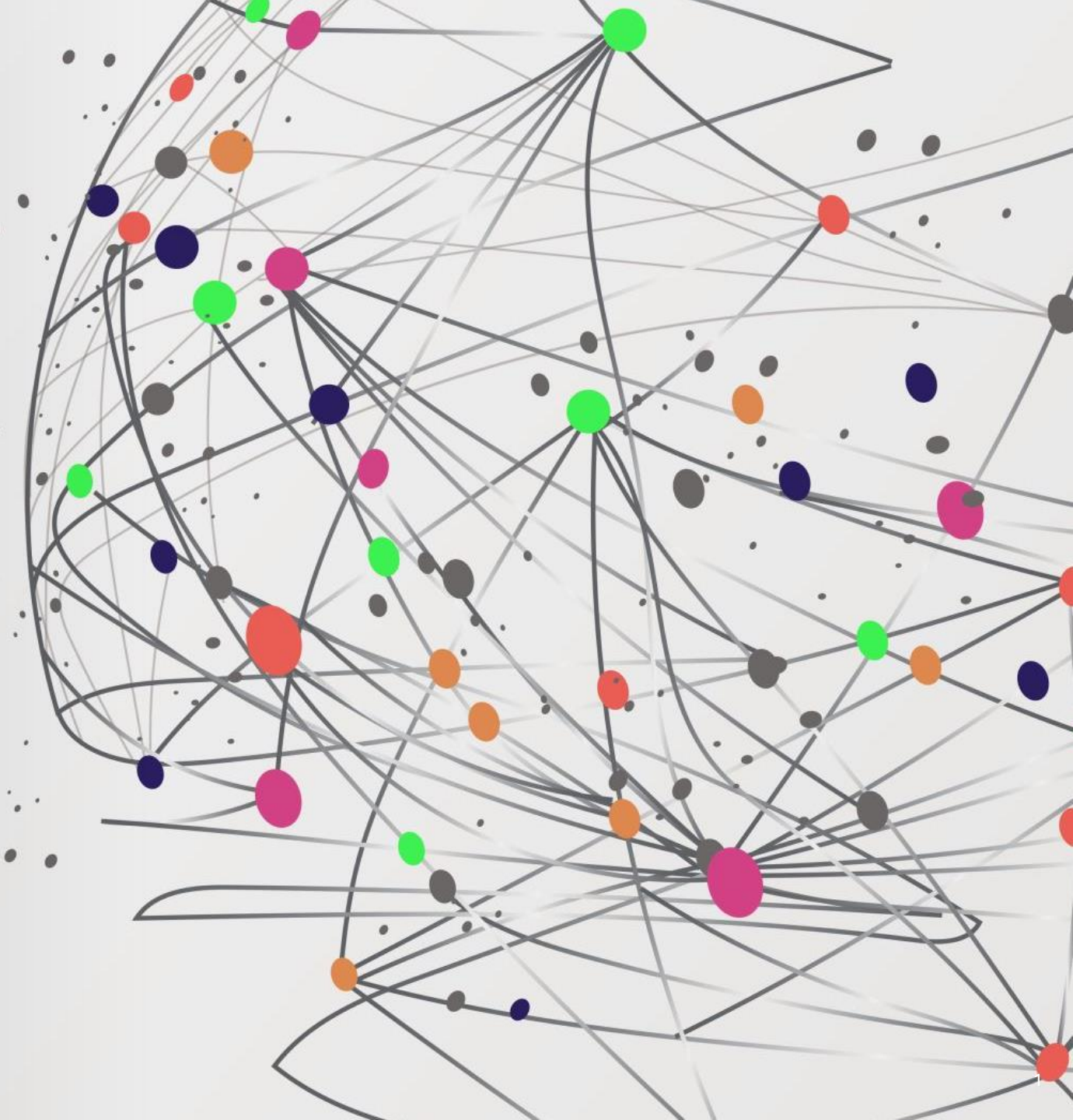
Spotify Dashboard



Visual Analytics

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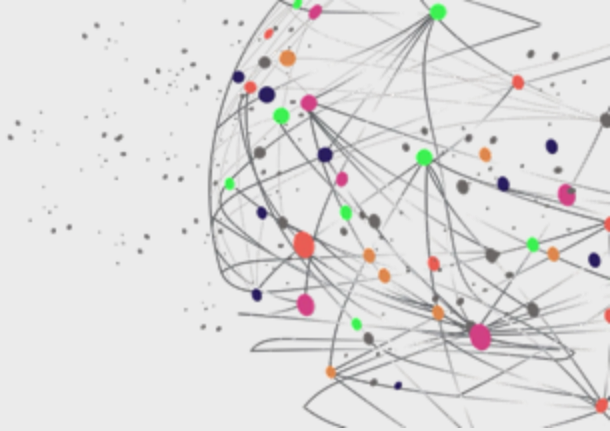
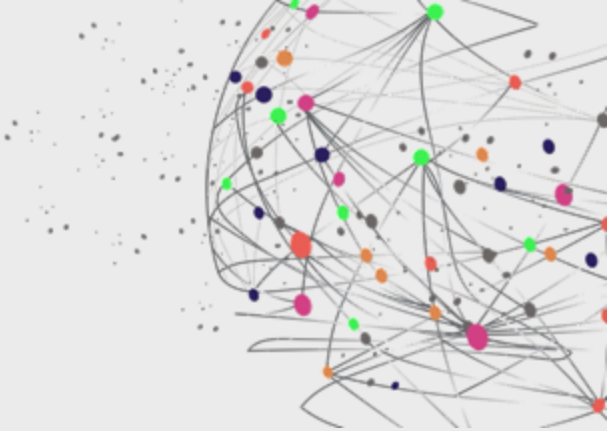
A.Y. 2024/2025

Project Goals



- *Visualizing Spotify's audio features*
- *Discover meaningful patterns and trends in Spotify songs.*
- *Enhance user understanding of song characteristics, genre and artist popularity, and temporal trends.*

Data Structure



Dataset:

High popularity and low popularity Spotify songs

Audio Features:

- *Energy*
- *Tempo*
- *Danceability*
- *Loudness*
- *Liveness*
- *Valence*
- *Speechiness*
- *Instrumentalness*
- *Mode*
- *Key*
- *Acousticness*

Data Processing Workflow

1. Preprocessing:
    - Removing duplicates, selecting audio features
    - Standardization

2. Dimensionality Reduction (PCA)

3. Clustering (K-Means)
    - Elbow method to identify optimal number of clusters

Visualizations

Scatterplot:

- Displays clusters based on PCA components.
- Interactive: Clicking filters related visualizations.

Bar Chart:

- Shows average values of audio features (e.g., energy, danceability).
- Dynamic updates with smooth transitions.

Date Interval Selector:

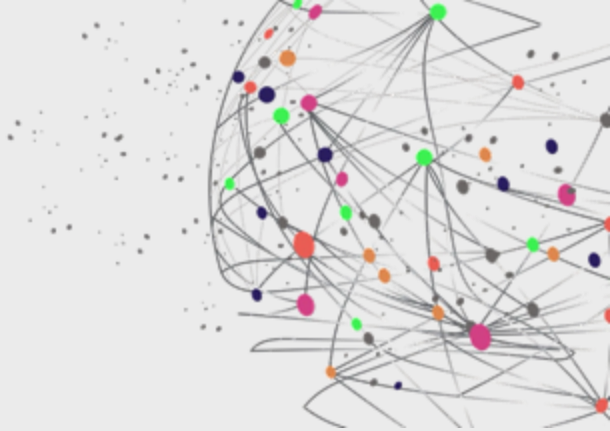
- Slider to filter songs by release date.

Top 10 Genres, Artists, and Tracks:

- Quick insights with filtering capabilities.

Dataset Overview Panel:

- Key statistics like total songs, average energy, and more.



Key Insights

Cluster Characteristics: Differentiating upbeat tracks vs. mellow songs.

Trends: Popularity of genres like K-pop, artist trends.

Temporal Patterns: Bias toward recent releases.

Feature Correlations: Positive correlation between energy & loudness.

Related Works

Study	Objective	Clustering Technique	Reduction Method	Dataset Used
Our Approach	Visualize Spotify audio features to discover patterns	K-means	PCA	Spotify Dataset
Li (2024)	Enhance music recommendations using machine learning	K-means	PCA	Spotify Dataset
Wang & Haque (2017)	Cluster classical music based on acoustic features	Spectral Clustering	None	MusicNet Database (Classical Music)
Mukhopadhyay et al. (2024)	Compare content-based filtering with K-means for recommendations	K-means	PCA	Spotify Dataset

Thank you for your attention