VINUNIVERSITY

Analyzing Taylor Swift's Discography

Data Visualizaton Project 1 Report

Nguyễn Duy Minh, Hoàng Khôi Nguyên, Nguyễn Trọng Nhân

INTRODUCTION

- Motivation: analyze a dataset about Taylor Swift’s songs to gain insights into her success strategies.
- Importance: music production, marketing, and cultural impact, benefiting aspiring artists and music industry professionals.
- Dataset: Taylor Swift's studio albums, EPs, singles, and re-releases,
  - Song features, Album release dates, Metacritic scores, User scores.
  - Originates from the Genius lyrics database and Spotify's API

QUESTION 1:

How do features such as `danceability`, `energy`, `valence`, and `tempo` correlate with Taylor Swift's albums' critical and public reception?

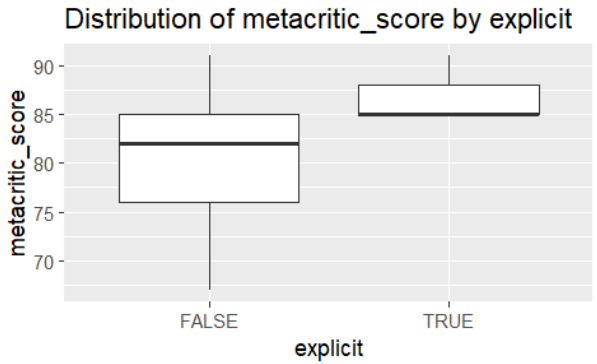
INTRODUCTION

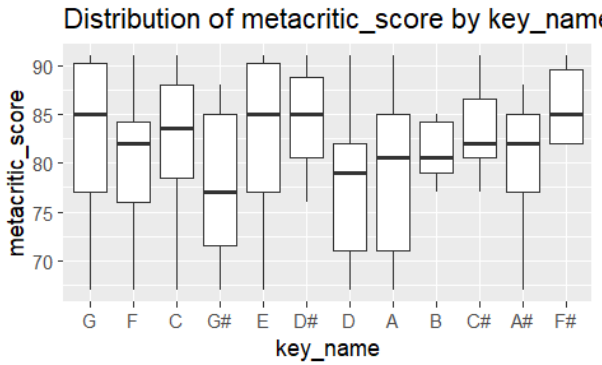
- By analyzing features such as lyrics' explicitness, tempo and key, we hope to uncover patterns in Taylor Swift's songs that contribute to her music's popularity.
- The overall dataset is as follows:
  - Three columns represent the index
  - 11 numerical features
  - 6 categorical features
  - 2 target numerical variables

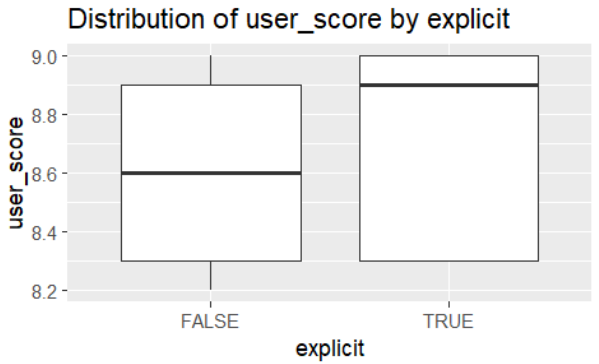
APPROACH

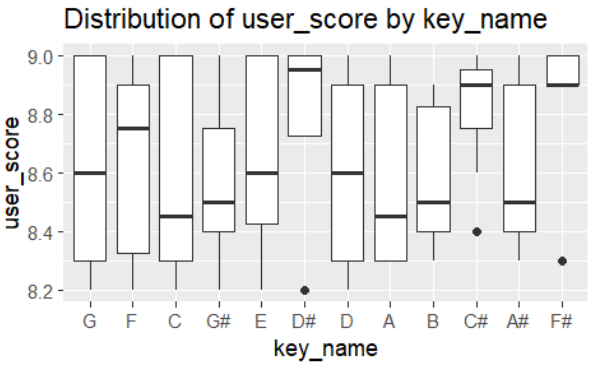
- The features incorporated in our analysis are split into two types: numerical and categorical features.
- Numerical variables: correlation matrix.
  - Common way to reveal relationships between numerical or binary variables
- Categorical variables: faceted box plots.
  - Using a correlation matrix is not recommended for non-binary categorical variables.
  - We also use bar charts to visualize class distribution, since class imbalance can impact our observations.

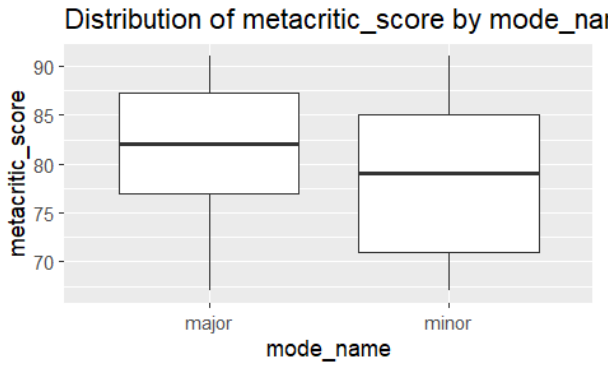
CATEGORICAL VARIABLES

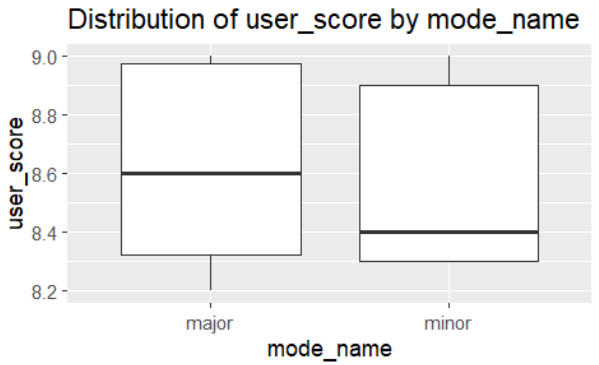




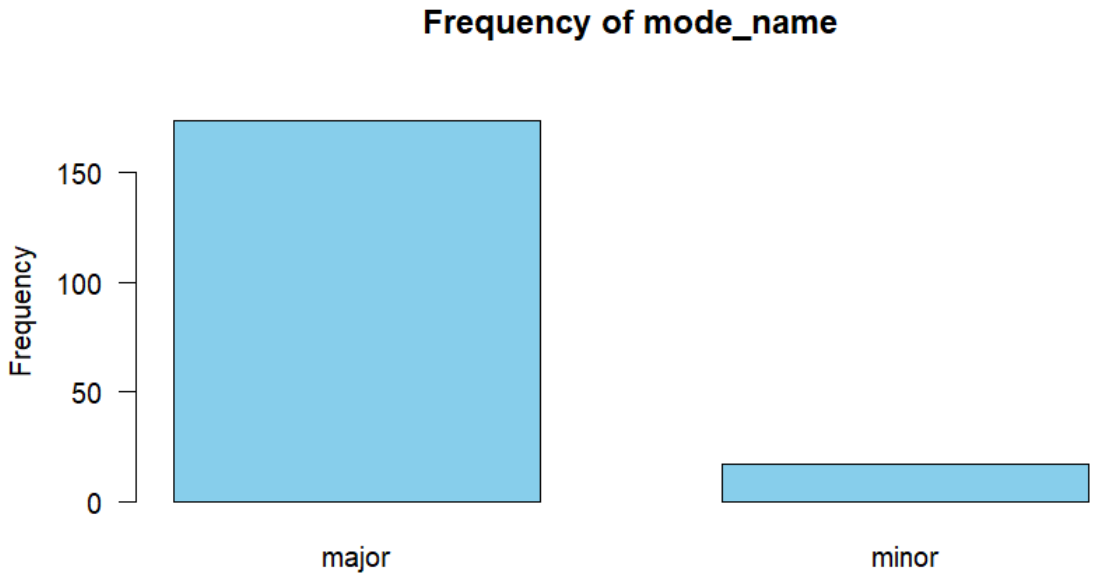


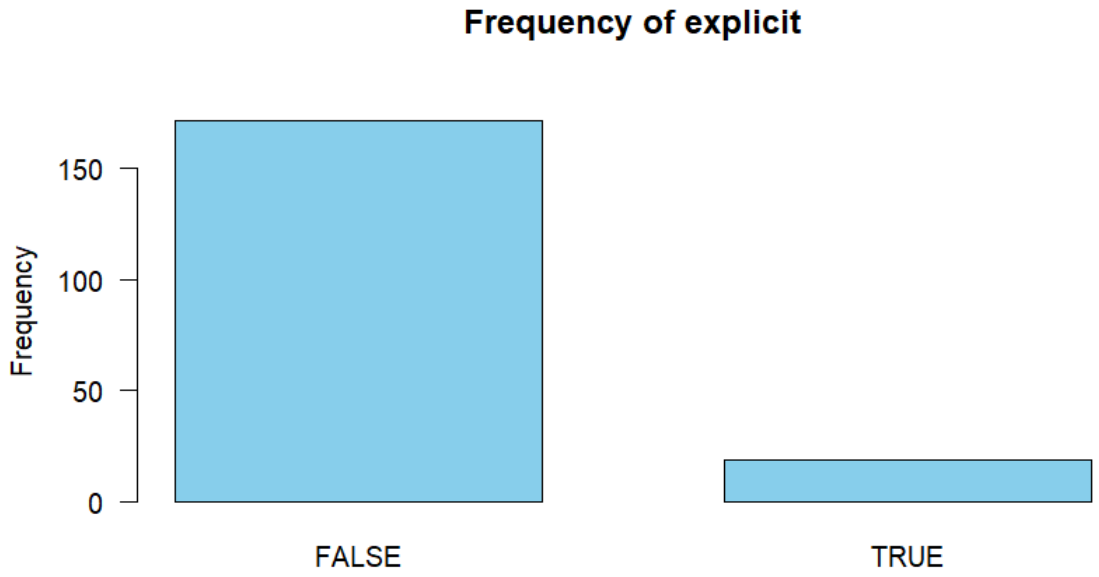




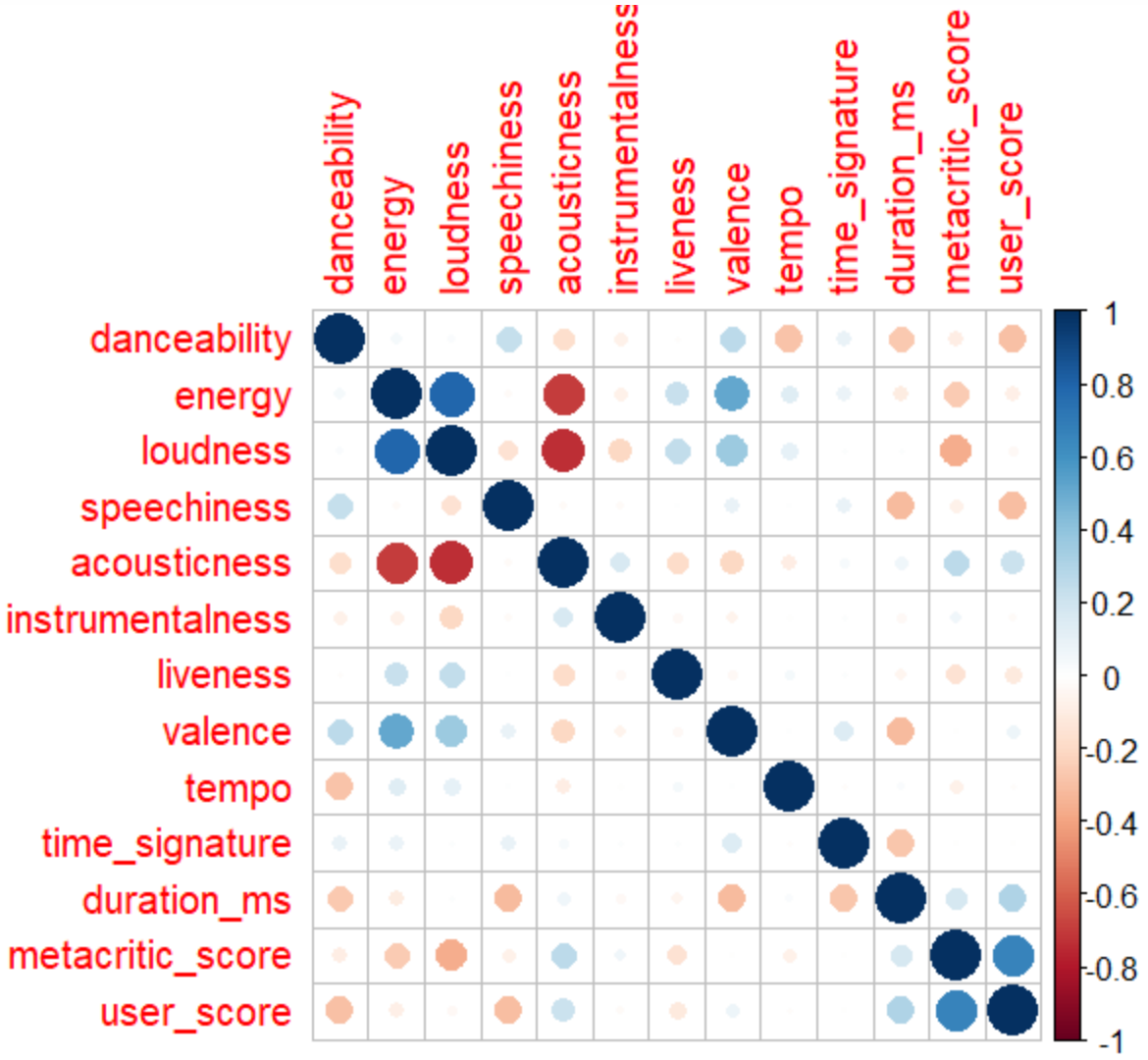


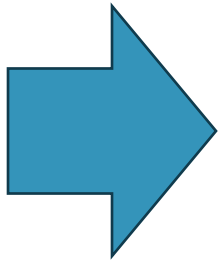
CATEGORICAL VARIABLES

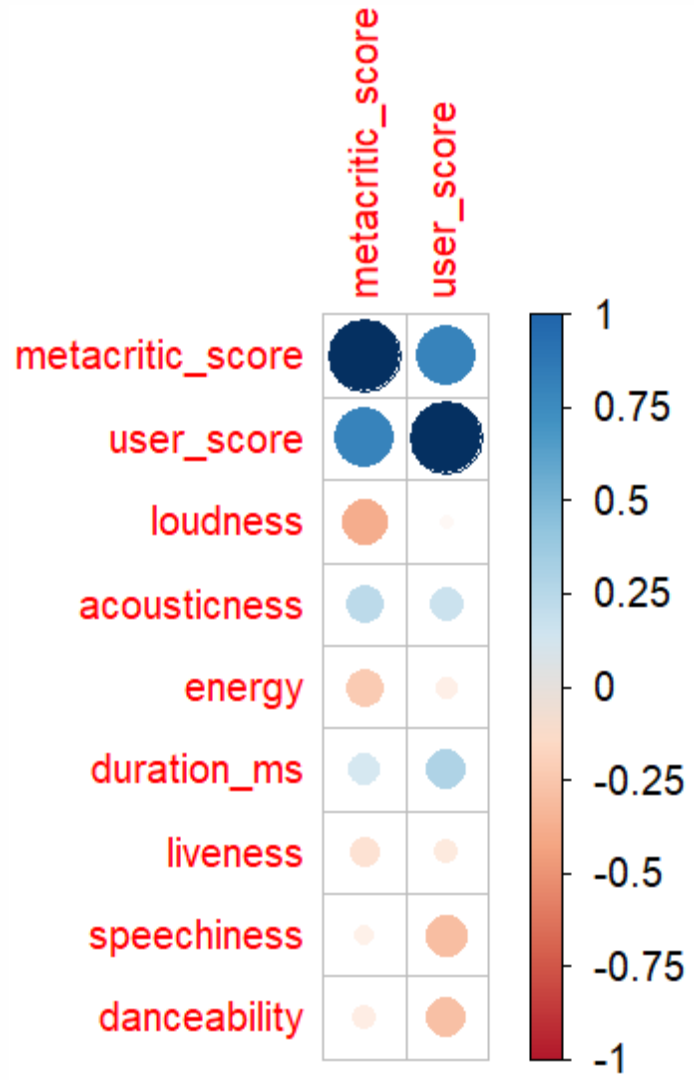




NUMERICAL VARIABLES







SUMMARY

- Explicit and upbeat songs tend to score higher
  - Cannot be certain due to data imbalance
- Songs in C#, D#, and F# tend to get the highest scores with little variance, while those in keys such as A, C, and G often score lower and have more variance.
- Loudness, energy, liveness, speechiness, and danceability are frowned upon.
- Longer and more acoustic songs are favoured.

QUESTION 2

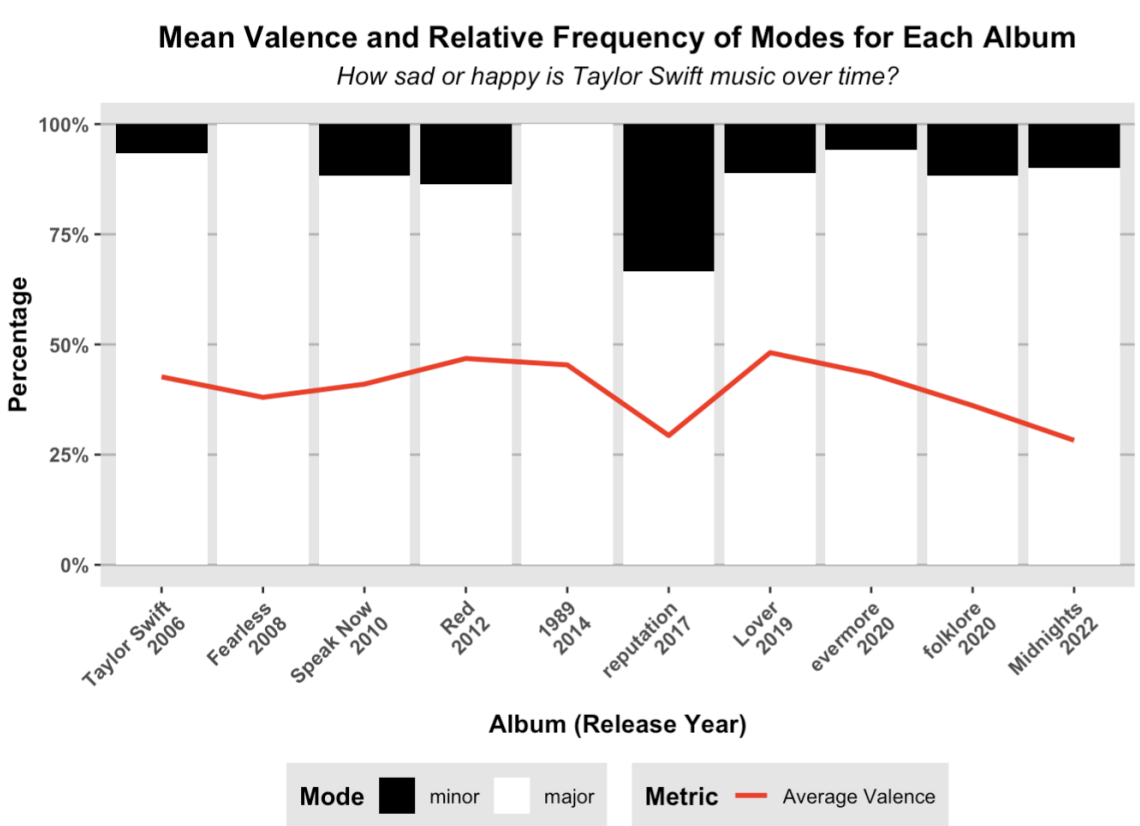
HOW HAS TAYLOR SWIFT'S MUSICAL STYLE EVOLVED OVER HER CAREER?

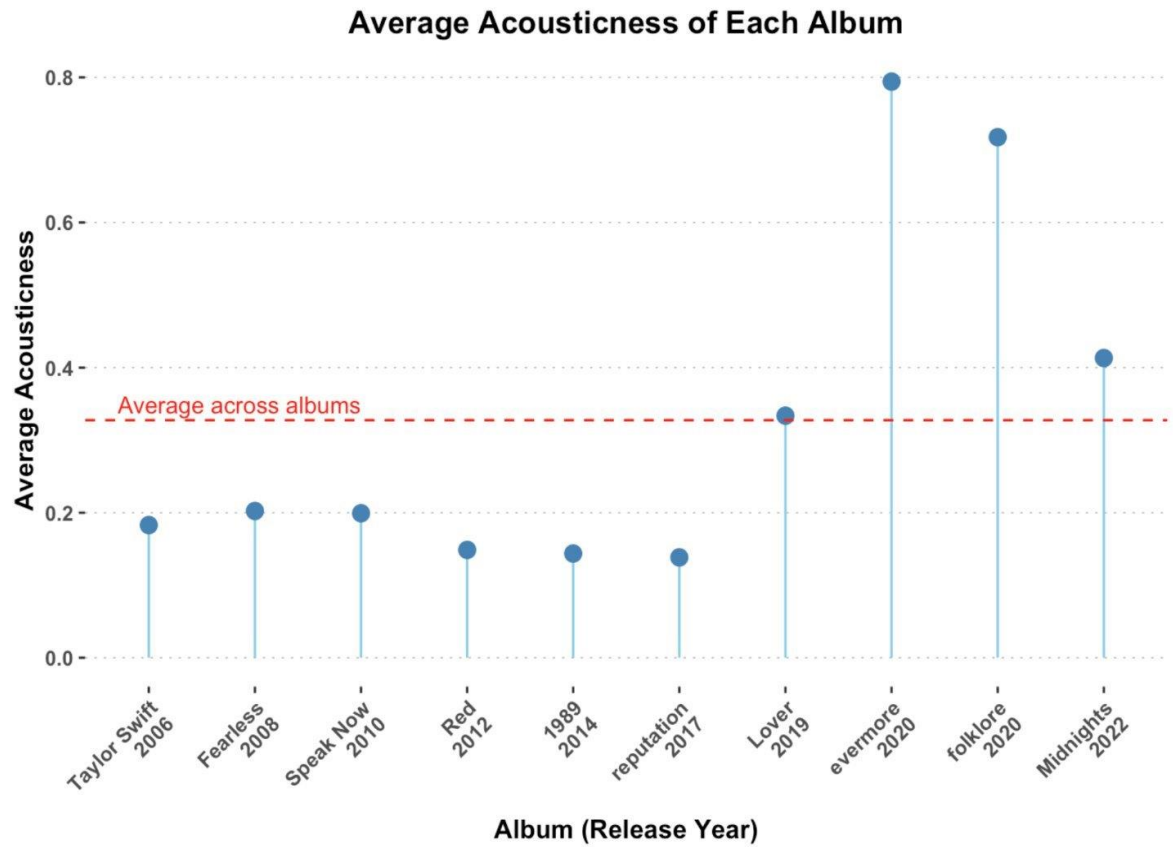
INTRODUCTION

- The question seeks to investigate the changes of Taylor Swift's musical style throughout her career.
- By examining and comparing audio features across her albums, we can identify potential trends and changes in her music.

APPROACH

- Our approach includes the use of three types of graph:
  - (1) a relative frequency bar plot:
    - Compare the distribution of songs in minor versus major modes for each album.
  - (2) line chart:
    - Show average valence.
  - (3) a lollipop plot:
    - Compare average acousticness scores across albums.


Mean Valence and Relative Frequency of Modes for Each Album
How sad or happy is Taylor Swift music over time?
Percentage
100%
75%
50%
25%
0%
Taylor Swift 2006
Fearless 2008
Speak Now 2010
Red 2012
1989 2014
reputation 2017
Lover 2019
evermore 2020
folklore 2020
Midnights 2022
Album (Release Year)
Mode
minor
major
Metric
Average Valence


Average Acousticness of Each Album
Average Acousticness
0.8
0.6
0.4
0.2
0.0
Average across albums
Taylor Swift 2006
Fearless 2008
Speak Now 2010
Red 2012
1989 2014
reputation 2017
Lover 2019
evermore 2020
folklore 2020
Midnights 2022
Album (Release Year)

DISCUSSION

- **Major Modes Dominance**: major modes for a brighter sound.
- **Low Valence Scores**: valence scores are under 50%, indicating moderate positivity.
- **"Reputation" as an Outlier**: 2017's "Reputation" has more **minor mode** tracks, resulting in the **lowest valence score** and making it her saddest album.
- **Increase in Acousticness Post-"Reputation"**: A significant rise in acousticness in albums after "Reputation," with "Evermore" showcasing a fourfold increase.
- **Influence of External Events**: Changes in style potentially linked to the 2016 Kanye West scandal, reflecting a shift towards more authentic sounds.