Spotify Data Analysis

Introduction

This report presents an analysis of a Spotify dataset sourced from Kaggle. The dataset includes various attributes of songs such as genre, duration, popularity, and more. The analysis addresses several questions to uncover insights into song characteristics and trends over time, providing actionable recommendations for stakeholders in the music industry.

Questions, Methodology, Insights & Recommendations

1. How Does Song Duration Vary Across Different Genres?

Methodology:

I visualized the results using a bar plot to compare the average song durations across genres.

Insight: Song duration varies significantly across genres. Genres like Easy and Folk/Acoustic tend to have longer average song durations compared to genres like Pop and Rock.

Recommendation:

- **Artists and Producers:** Consider genre-specific trends in song duration when creating or promoting new music.
- **Streaming Services:** Curate playlists with songs of varying lengths to cater to different listener preferences.

2. Is There a Correlation Between Song Popularity and Explicit Content?

Methodology:

I visualized the results using a scatterplot to compare average popularity of explicit versus non-explicit songs

Insight: The correlation between song popularity and explicit content is very weak (0.05), indicating that explicit content alone does not strongly influence a song's popularity.

Recommendation:

- **Content Creators:** Focus on other aspects of music quality and audience engagement beyond explicit content to enhance popularity.
- **Marketing Teams:** Develop marketing strategies that emphasize overall song quality and artist appeal rather than focusing on the presence of explicit content.

3. What Is the Distribution of Danceability Scores Across Different Years?

Methodology:

I visualized the distribution using a violin plot to observe variations in danceability scores over the years.

Insight: Danceability scores have fluctuated over the years, with noticeable increases in recent years. This suggests a growing preference for more danceable tracks.

Recommendation:

- **Music Producers:** Align new releases with current trends in danceability to meet audience preferences.
- **Artists:** Experiment with danceable elements in music production to remain relevant and engaging.

4. Are There Any Trends in Energy Levels of Songs Over the Years?

Methodology:

I visualized the trend using a line plot to observe changes in energy levels over the years.

Insight: Energy levels of songs have shown fluctuations over the years, with peaks in the mid-2010s and 2020. This indicates changing trends in the energy and vibrancy of popular music.

Recommendation:

- **Artists and Producers:** Monitor energy level trends to align with listener preferences. High-energy tracks may be more engaging and successful during certain periods.
- **Marketing Teams:** Highlight high-energy tracks in promotions to capitalize on current trends.

5. How Does the Average Popularity of Top Hits Vary Among the Top 10 Artists, and How Does the Number of Total Songs They Have Relate to This Popularity?

Methodology:

I visualized the relationship between total songs and average popularity using a horizontal bar plot.

Insight: Among the top 10 artists with the most songs, there is a variation in average popularity. Artists like Rihanna and Eminem have higher average popularity despite having a large number of songs.

Recommendation:

- **Artists:** Balance the number of songs released with maintaining high popularity. Strategic release schedules and engaging content can help sustain or enhance popularity.
- **Record Labels:** Optimize marketing efforts based on the number of releases and artist performance to maximize impact.

6. What Is the Distribution of Songs with and Without Explicit Content in the Dataset?

Methodology:

I visualized the distribution using a pie chart to represent the proportion of songs with and without explicit content.

Insight: The dataset contains a higher number of songs with explicit content compared to those without. This distribution suggests a significant presence of explicit content in the dataset.

Recommendation:

- **Content Managers:** Adjust content policies and create diverse playlists to cater to different audience preferences regarding explicit content.
- **Marketing Teams:** Develop targeted campaigns that address both explicit and non-explicit content to maximize audience engagement.

7. What Is the Relationship Between Acousticness and Song Valence?

Methodology:

I visualized the relationship between acousticness and song valence using a scatterplot

Insight: The relationship between acousticness and valence is weakly negative (-0.13). This indicates that songs with higher acousticness tend to have slightly lower valence, but the correlation is minimal.

Recommendation:

- **Artists and Producers:** While the relationship is weak, consider balancing acoustic and emotional qualities in music production to cater to diverse listener preferences.
- **Music Analysts:** Use this insight to offer nuanced recommendations on song characteristics for various emotional impacts.

8. Are There Notable Differences in Tempo Across Various Modes (Major vs. Minor)?

Methodology:

I visualized using Bar plot to compare the average tempo for major and minor modes.

Insight: Songs in minor modes tend to have a slightly higher average tempo (121.31 BPM) compared to songs in major modes (118.73 BPM).

Recommendation:

- **Composers and Producers:** Experiment with minor modes to achieve different tempo variations and enhance the dynamic range of compositions.
- **Music Analysts:** Incorporate mode-based tempo differences into genre analyses for more refined recommendations.

9. How Has the Popularity of Genres Evolved Over the Years?

Methodology:

I visualized the trends using a line plot to observe changes in genre popularity over the years.

Insight: The popularity of genres has evolved over time, reflecting changing listener preferences and trends in the music industry.

Recommendation:

- **Music Producers and Record Labels:** Stay updated on genre popularity trends to align new releases with current audience interests and preferences.
- **Marketing Teams:** Use genre popularity data to target marketing efforts and promotional strategies effectively.

10. Is There a Relationship Between Song Liveliness and Its Instrumentalness?

Methodology:

- A scatter plot was used to show the relationship between liveliness and instrumentalness, along with the correlation coefficient..

Insight: The correlation between liveliness and instrumentalness is very weak (-0.03), suggesting that these attributes do not strongly influence each other.

Recommendation:

- **Artists and Producers:** Focus on creating lively tracks without being overly concerned about the instrumentalness correlation. Emphasize other factors that impact song success.
- **Music Analysts:** Use the weak relationship to explore other factors influencing song liveliness and audience engagement.

Conclusion

This analysis provides valuable insights into various aspects of the Spotify dataset, including trends in song duration, explicit content, danceability, energy levels, and genre popularity. The actionable recommendations aim to guide artists, producers, and marketers in making informed decisions to align with audience preferences and industry trends.