Exploring Global Music

ADM Course Project Report
in partial fulfilment of the
degree

Bachelor of Technology
in
Computer Science & Engineering

By

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Submitted to

School of Computer Science and Artificial Intelligence

DEPARTMENT OFCOMPUTERSCIENCE& ENGINEERING

CERTIFICATE

This is to certify that the Applications of DataMining– Course Project Report entitled "Exploring Global Music on Global_Music_Streaming_Listener_Preferences DataSet" is a record of bonafide work carried out by the student(s) P.Vaishanvi , S.Sathwika , Vishwa Teja , J.Naveen bearing Hallticket No(s) 2303A51069 , 2303A51075 , 2303A510I5 , 2303A510F5 during the academic year 2024-2025 in partial fulfillment of the award of the degree of *Bachelor of Technology* in Computer Science & Engineering by the SR University, Warangal.

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Professor

o ORGANIZATION OF REPORT

1. OBJECTIVE OF THE PROJECT
2. DEFINITIONS OF THE ELEMENTS USED IN THE PROJECT
3. BLOCK DIAGRAM
4. CODE
5. RESULT SCREENS
6. CONCLUSION

o OBJECTIVE OF THE PROJECT

The main objective of this project is to apply data analysis and visualization techniques to the Global Music Streaming Listener Preferences dataset to uncover useful patterns and insights about user behavior and platform trends. The project aims to:

- Analyze the popularity of streaming platforms across different countries.
- Identify the most preferred music genres and artists globally and by region.
- Examine user engagement metrics such as listening time, Discover Weekly usage, and repeat song rate.
- Explore differences in behavior between free and premium subscribers.
- Understand listening preferences across age groups and times of day.
- Visualize correlations between numerical attributes like streaming time and song preferences.
- Enable country-specific analysis to observe localized music trends.

o DEFINITIONS OF THE ELEMENTS USED IN THE PROJECT

- **Global Music Streaming Listener Preferences Dataset:**
  A structured dataset containing information about global users' music streaming habits. It includes details such as streaming platforms, genres, artists, user demographics, subscription types, and listening behavior. The dataset is used to explore trends and patterns using data analysis techniques.

- **Streaming Platform:**
  Refers to the service or app users use to listen to music, such as Spotify, Apple Music, YouTube, Amazon Music, etc. Understanding platform preferences helps identify which services are more popular across different countries.

- **Top Genre:**
  The most frequently listened-to music genre by a user, such as Pop, Rock, Hip-Hop, Reggae, or Country. Grouping users by genre helps explore musical tastes and cultural preferences.

- **Most Played Artist:**
  The artist that a user listens to the most. Analyzing artist popularity gives insight into global and regional music trends.

- **Number of Songs Liked:**
  The total count of songs marked as "liked" or "favorite" by a user. It's a measure of how much a user interacts with the content.

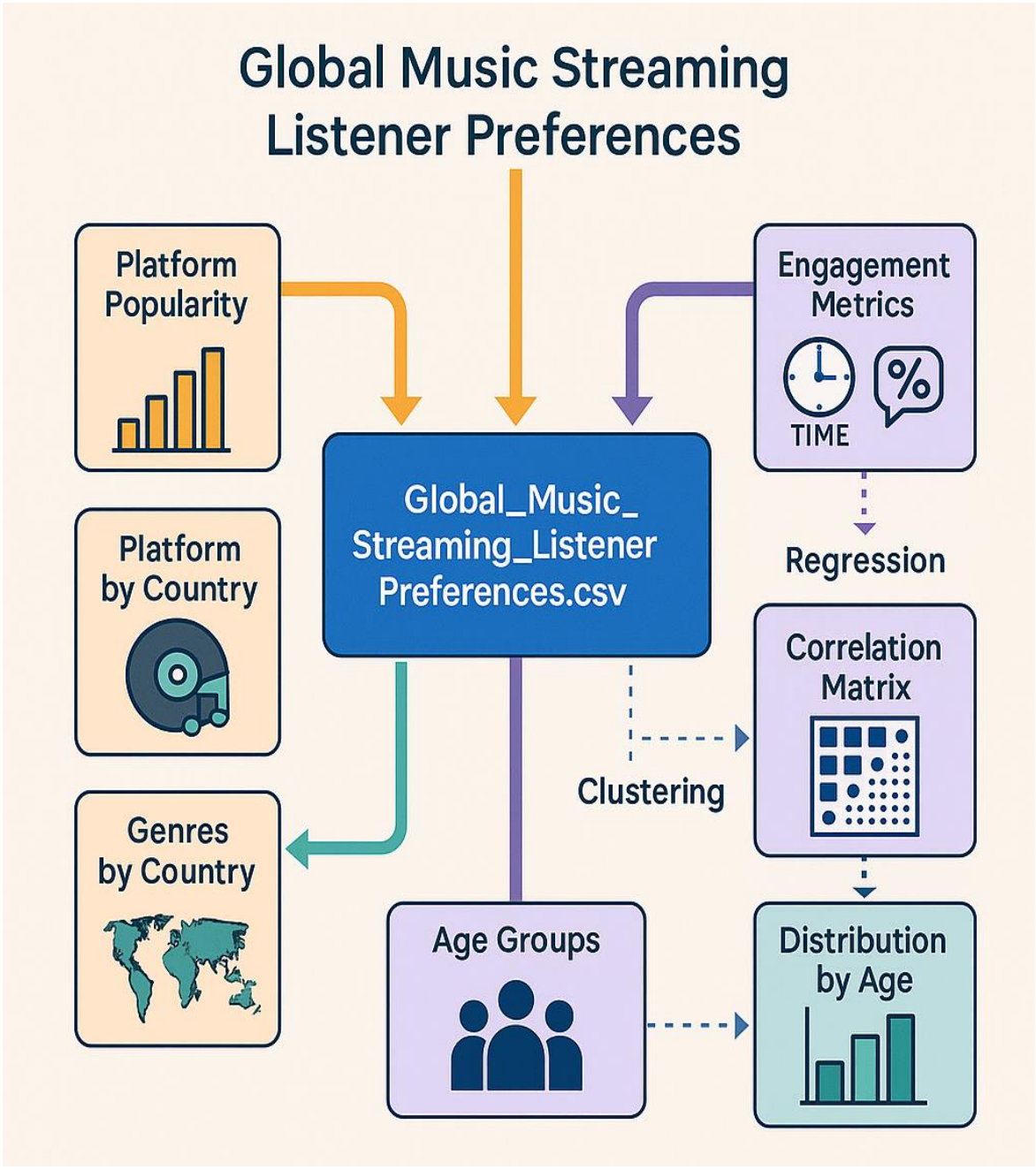
- **Subscription Type:**
  Indicates whether a user has a Free or Premium account. This is used to compare listening behavior between subscription tiers.

- **Age Group:**
  Users are categorized into age groups (e.g., <18, 18–25, etc.) to analyze preferences based on age demographics.

- **Correlation Matrix:**
  A table that shows how strongly numerical variables are related to one another. In this project, it reveals connections between age, listening time, and engagement metrics.

- **Country-Specific Analysis:**
  A detailed breakdown of user preferences and trends within a particular country. It helps observe regional differences in platform use, genre preferences, and artist popularity.

o DESIGN


Global Music Streaming Listener Preferences
Platform Popularity
Platform by Country
Genres by Country
Global_Music_ Streaming_Listener Preferences.csv
Engagement Metrics
TIME
Regression
Correlation Matrix
Clustering
Age Groups
Distribution by Age

o IMPLEMENTATION

CODE

First import the libraries

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from collections import Counter
```

Load the dataset

```
df = pd.read_csv('Global_Music_Streaming_Listener_Preferences.csv')
```

Convert categorical columns to proper data types

```
categorical_cols = ['Country', 'Streaming Platform', 'Top Genre', 'Most Played Artist',
'Subscription Type', 'Listening Time (Morning/Afternoon/Night)']
for col in categorical_cols:
    df[col] = df[col].astype('category')
```

Convert percentage columns to decimal (0-1)

```
percentage_cols = ['Discover Weekly Engagement (%)', 'Repeat Song Rate (%)']
for col in percentage_cols:
    df[col] = df[col] / 100
```

Platform popularity

```
plt.figure(figsize=(12, 6))
sns.countplot(data=df, y='Streaming Platform', order=df['Streaming Platform'].value_counts().index)
plt.title('Streaming Platform Popularity')
plt.xlabel('Number of Users')
plt.show()
```

Platform by country

```
plt.figure(figsize=(15, 8))
platform_by_country = df.groupby(['Country', 'Streaming Platform']).size().unstack().fillna(0)
platform_by_country.plot(kind='bar', stacked=True, figsize=(15, 8))
plt.title('Streaming Platform Distribution by Country')
plt.ylabel('Number of Users')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

Top genres overall

```
top_genres = df['Top Genre'].value_counts().head(15)
plt.figure(figsize=(12, 6))
sns.barplot(x=top_genres.values, y=top_genres.index)
plt.title('Top 15 Most Popular Music Genres')
plt.xlabel('Number of Users')
plt.show()
```

Genre by country

```
top_countries = df['Country'].value_counts().head(10).index
plt.figure(figsize=(15, 8))
for i, country in enumerate(top_countries):
    plt.subplot(2, 5, i+1)
    country_genres = df[df['Country'] == country]['Top Genre'].value_counts().head(5)
    sns.barplot(x=country_genres.values, y=country_genres.index)
    plt.title(country)
    plt.tight_layout()
plt.suptitle('Top 5 Genres by Country', y=1.02)
plt.show()
```

Top 10 most played artists

```
top_artists = df['Most Played Artist'].value_counts().head(10)
plt.figure(figsize=(12, 6))
sns.barplot(x=top_artists.values, y=top_artists.index)
```

```
plt.title('Top 10 Most Played Artists')
plt.xlabel('Number of Users')
plt.show()
```

Artist popularity by country

```
top_artists_list = top_artists.index.tolist()
plt.figure(figsize=(15, 8))
for i, artist in enumerate(top_artists_list):
    plt.subplot(2, 5, i+1)
    artist_countries = df[df['Most Played Artist'] ==
artist]['Country'].value_counts().head(5)
    sns.barplot(x=artist_countries.values, y=artist_countries.index)
    plt.title(artist)
    plt.tight_layout()
plt.suptitle('Top 5 Countries for Each Popular Artist', y=1.02)
plt.show()
```

Subscription type distribution

```
plt.figure(figsize=(8, 6))
df['Subscription Type'].value_counts().plot(kind='pie', autopct='%1.1f%%')
plt.title('Subscription Type Distribution')
plt.ylabel('')
plt.show()
```

Subscription by platform

```
plt.figure(figsize=(12, 6))
sns.countplot(data=df, y='Streaming Platform', hue='Subscription Type')
plt.title('Subscription Type by Platform')
plt.xlabel('Number of Users')
plt.show()
```

Subscription by country

```
plt.figure(figsize=(15, 8))
subscription_by_country = df.groupby(['Country', 'Subscription
Type']).size().unstack().fillna(0)
subscription_by_country.plot(kind='bar', stacked=True, figsize=(15, 8))
```

```
plt.title('Subscription Type Distribution by Country')
plt.ylabel('Number of Users')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

Age groups by genre

```
df['Age Group'] = pd.cut(df['Age'], bins=[0, 18, 25, 35, 50, 100],
labels=['<18', '18-25', '26-35', '36-50', '50+'])
plt.figure(figsize=(15, 8))
for i, age_group in enumerate(df['Age Group'].cat.categories):
    plt.subplot(2, 3, i+1)
    age_genres = df[df['Age Group'] == age_group]['Top
Genre'].value_counts().head(5)
    sns.barplot(x=age_genres.values, y=age_genres.index)
    plt.title(age_group)
    plt.tight_layout()
plt.suptitle('Top 5 Genres by Age Group', y=1.02)
plt.show()
```

Select numerical columns for correlation

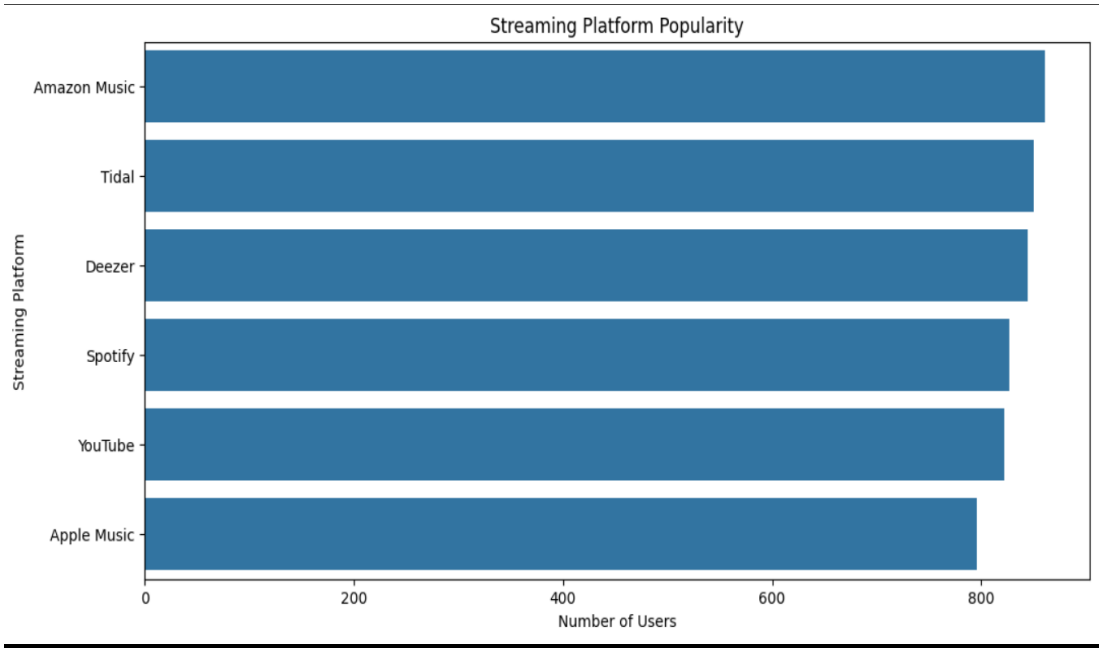
```
numerical_cols = ['Age', 'Minutes Streamed Per Day', 'Number of Songs Liked',
'Discover Weekly Engagement (%)', 'Repeat Song Rate (%)']
# Correlation matrix
plt.figure(figsize=(10, 8))
sns.heatmap(df[numerical_cols].corr(), annot=True, cmap='coolwarm', center=0)
plt.title('Correlation Matrix')
plt.show()
plt.figure(figsize=(15, 8))
sns.boxplot(data=df, x='Streaming Platform', y='Age')
plt.title('Age Distribution by Streaming Platform')
plt.xticks(rotation=45)
plt.show()
```

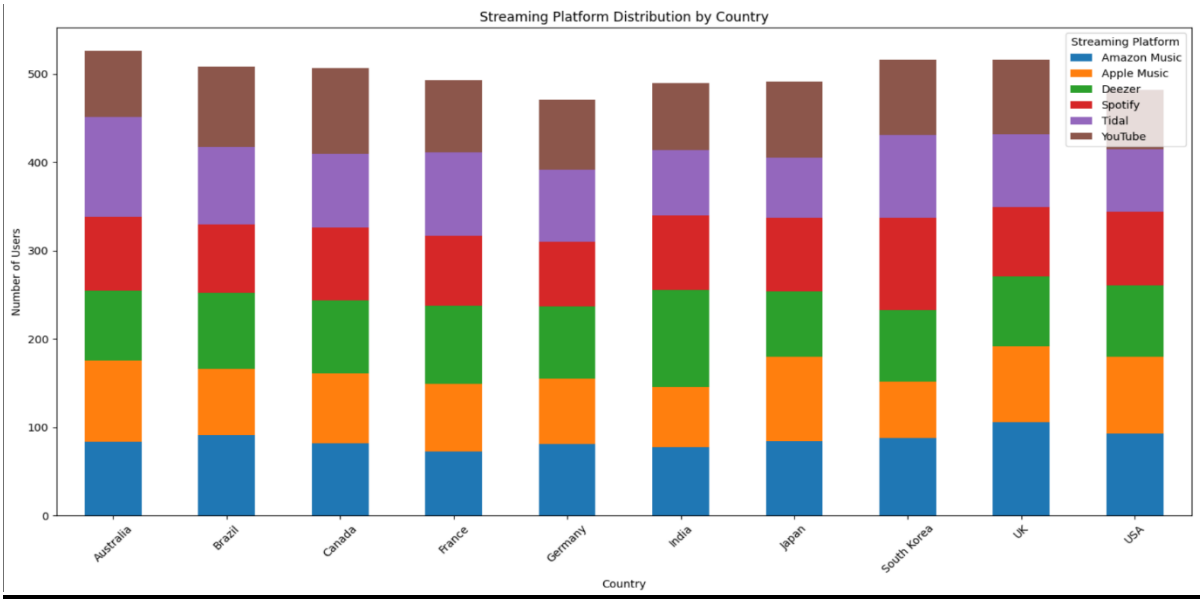
- **CHECKING THE FUTURE OF ENGLISH SONG IN INDIA**

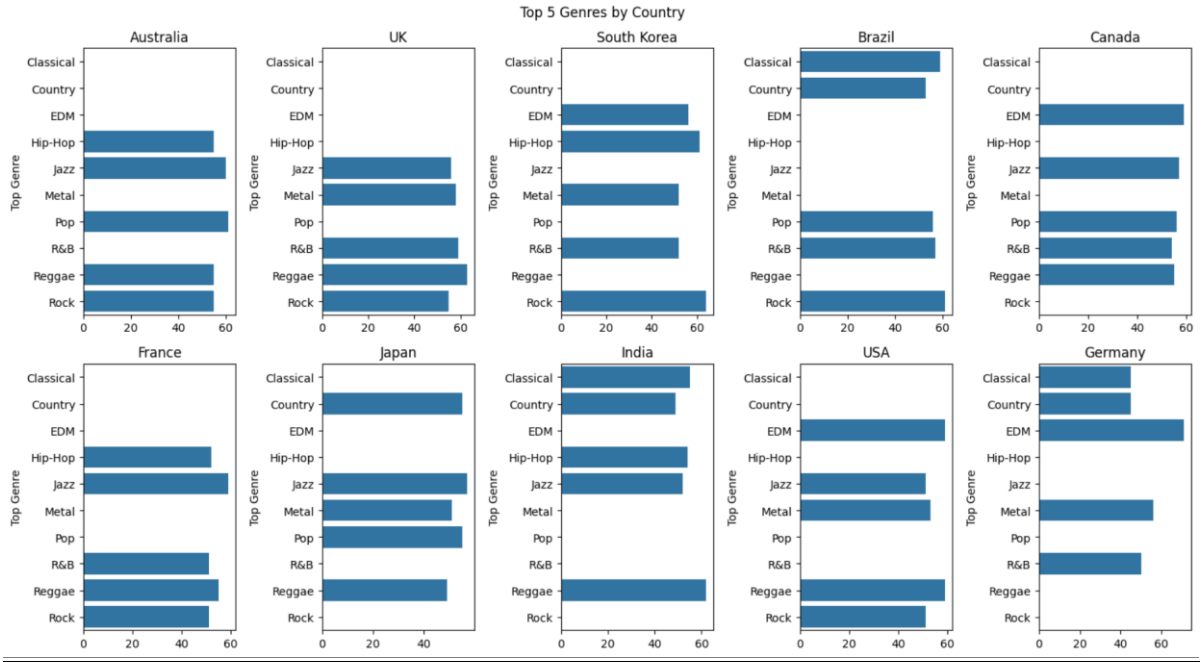
Convert categorical columns

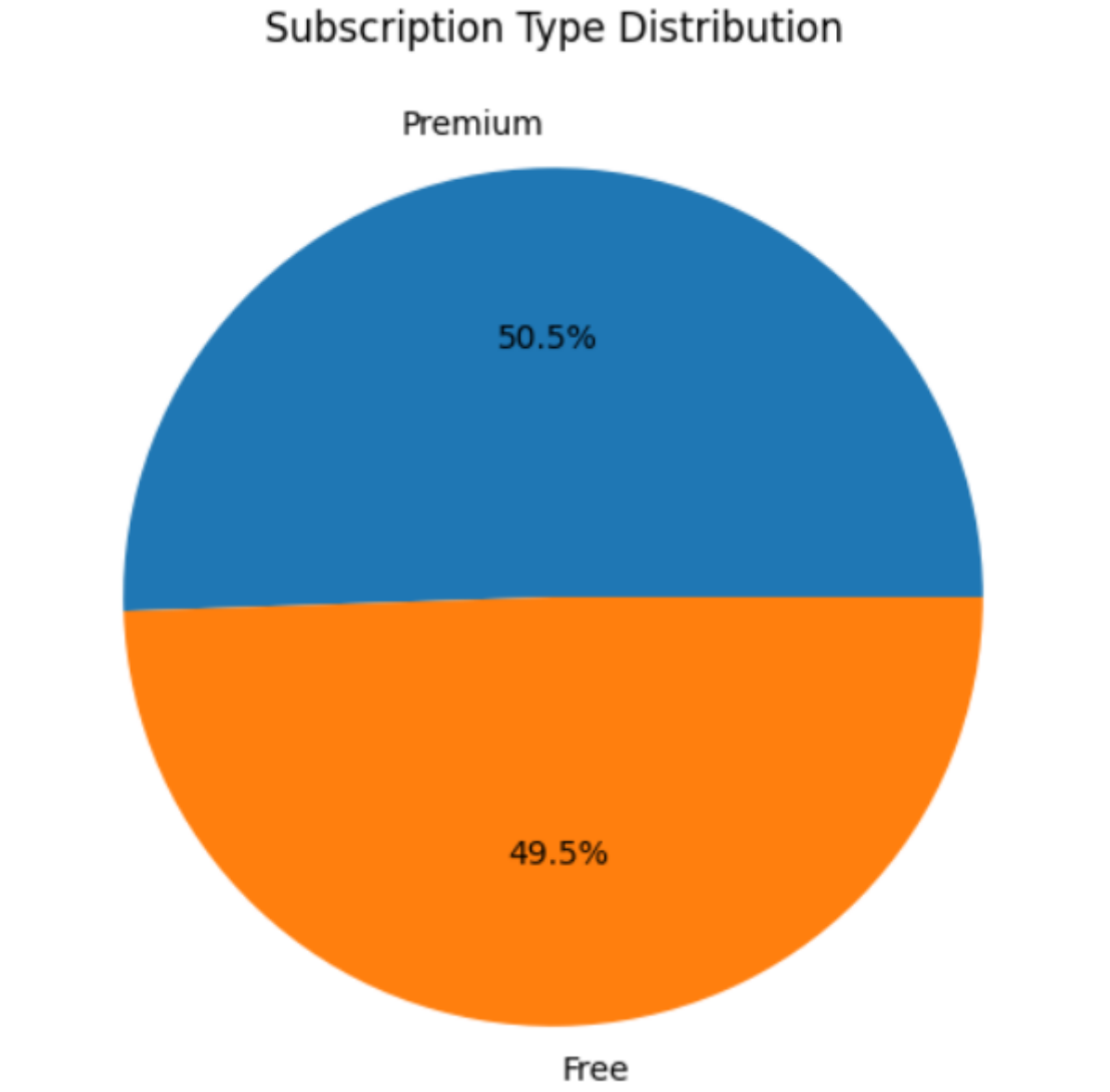
```
categorical_cols = ['Country', 'Streaming Platform', 'Top Genre', 'Most Played Artist',
                    'Subscription Type', 'Listening Time (Morning/Afternoon/Night)']
for col in categorical_cols:
    df[col] = df[col].astype('category')


                  Convert percentages to decimals
percentage_cols = ['Discover Weekly Engagement (%)', 'Repeat Song Rate (%)']
for col in percentage_cols:
    df[col] = df[col] / 100
analyze_country("India")
import seaborn as sns
import matplotlib.pyplot as plt
plt.figure(figsize=(10, 6))
sns.countplot(data=english_in_india, y='Top Genre', order=english_in_india['Top Genre'].value_counts().index)
plt.title("Popularity of English Music Genres in India")
plt.xlabel("Number of Users")
plt.ylabel("Genre")
plt.show()


if english_in_india['Discover Weekly Engagement (%)'].mean() > india_data['Discover Weekly Engagement (%)'].mean():
    print("English genres show higher than average engagement—indicating strong future potential in India.")
else:
    print("English genres have room for growth based on current engagement.")
```

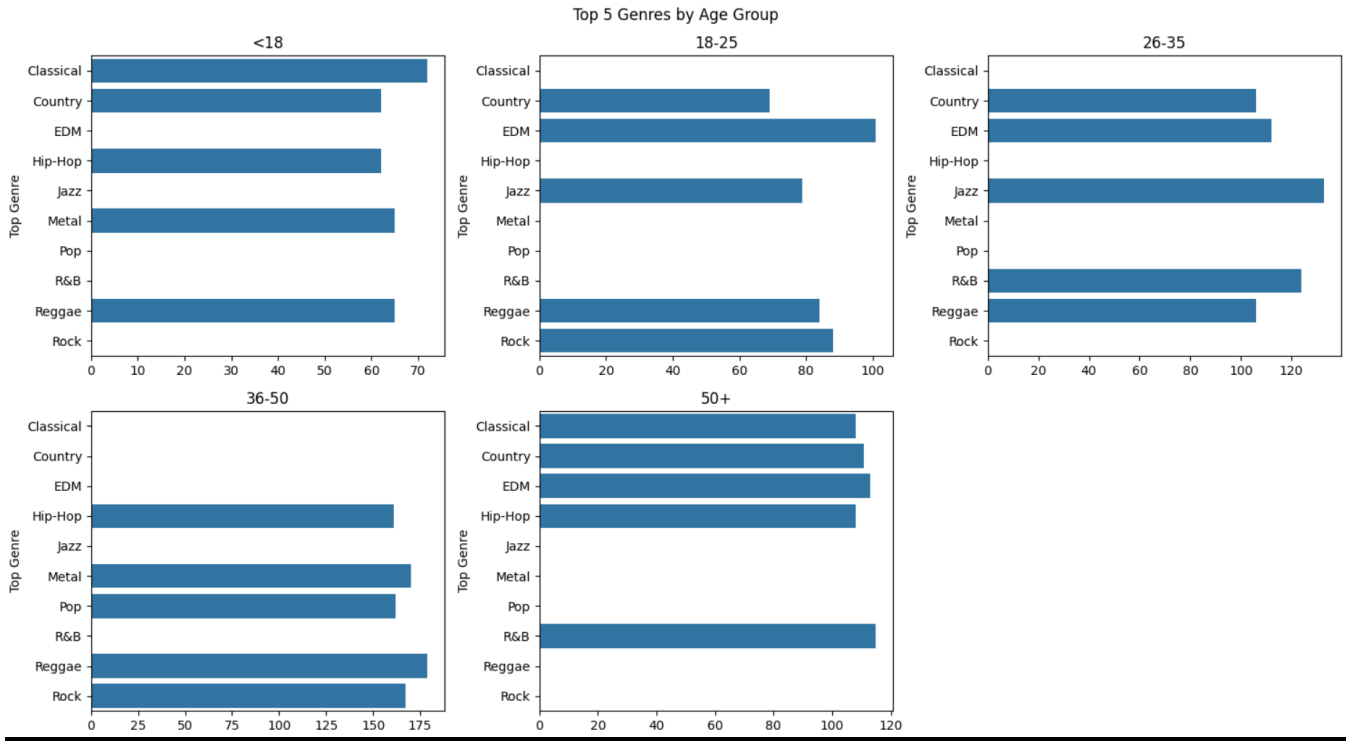
- RESULT SCREENS

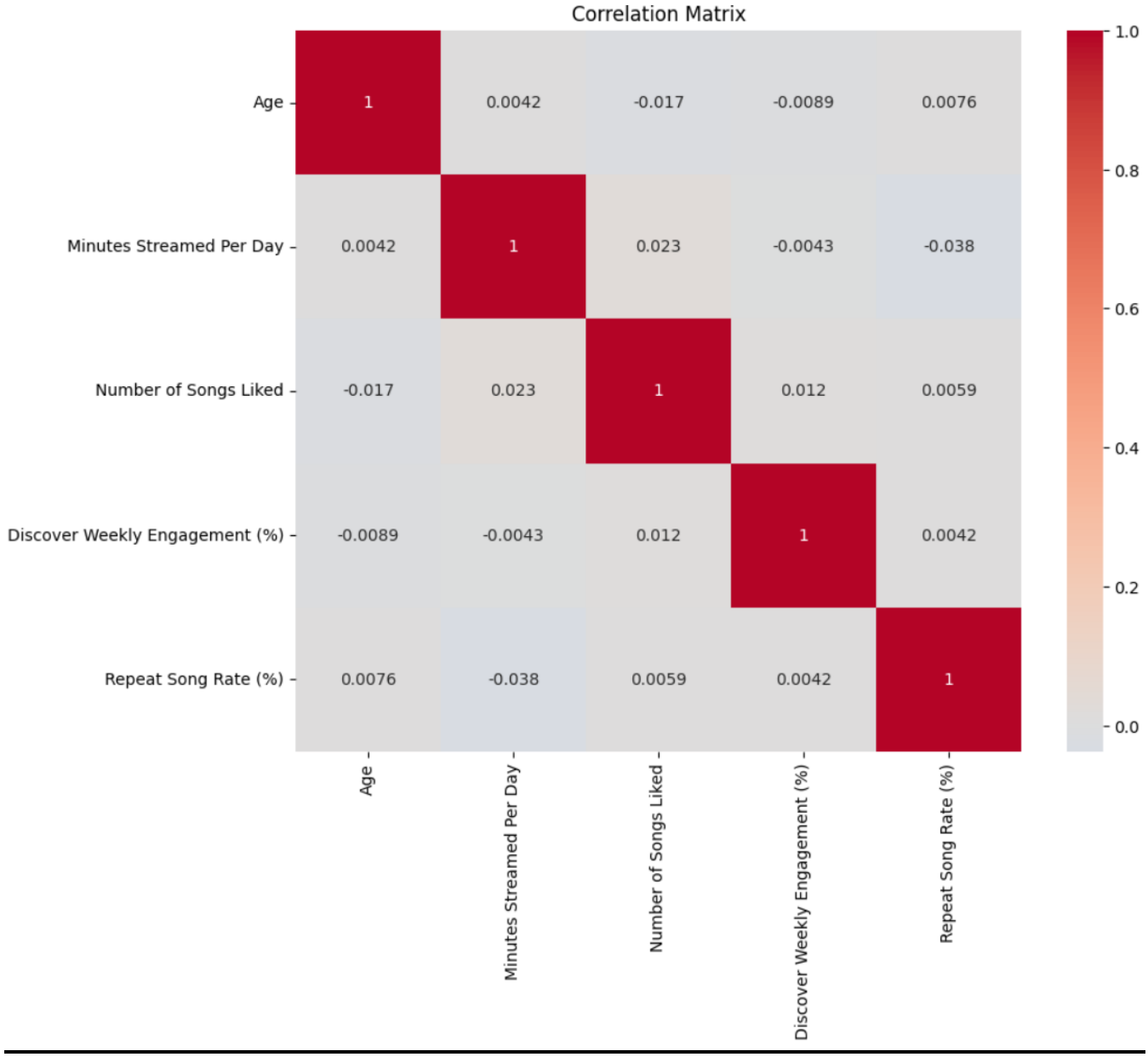

Streaming Platform Popularity
Amazon Music
Tidal
Deezer
Spotify
YouTube
Apple Music
Streaming Platform
0
200
400
600
800
Number of Users

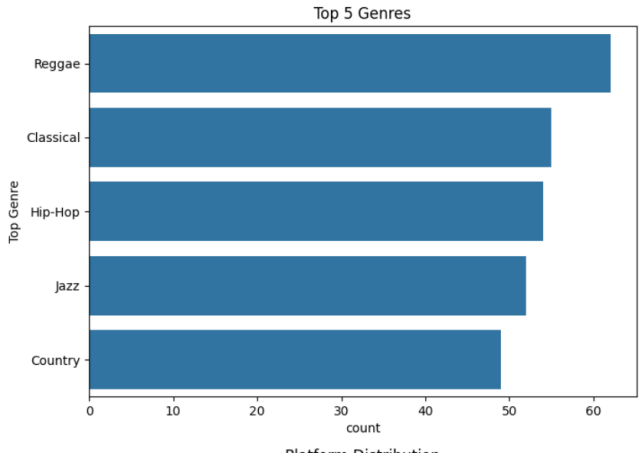

Streaming Platform Distribution by Country
Streaming Platform
Amazon Music
Apple Music
Deezer
Spotify
Tidal
YouTube
Number of Users
0
100
200
300
400
500
Australia
Brazil
Canada
France
Germany
India
Japan
South Korea
UK
USA
Country

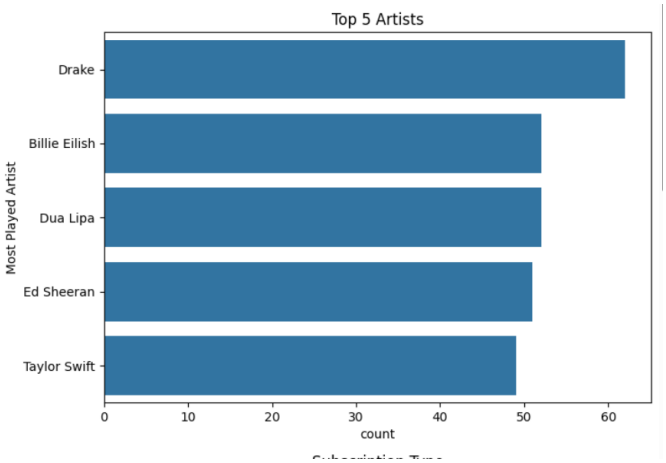

Top 5 Genres by Country
Australia
UK
South Korea
Brazil
Canada
France
Japan
India
USA
Germany
Top Genre
Classical
Country
EDM
Hip-Hop
Jazz
Metal
Pop
R&B
Reggae
Rock
0
20
40
60

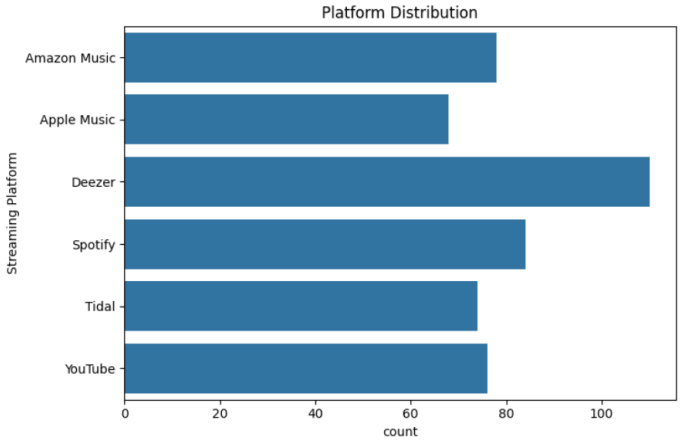

Subscription Type Distribution
Premium
50.5%
49.5%
Free

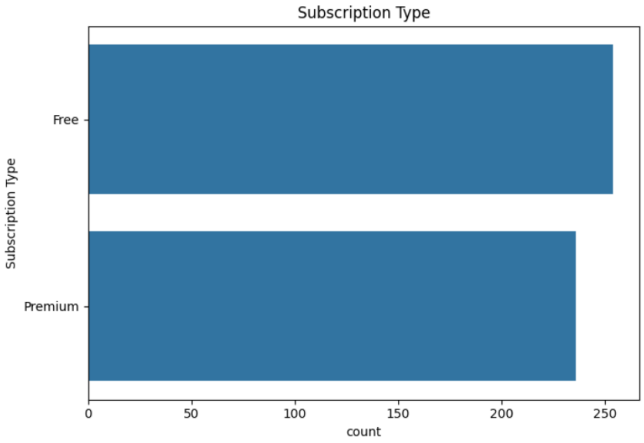

Top 5 Genres by Age Group
<18
18-25
26-35
36-50
50+
Top Genre
Classical
Country
EDM
Hip-Hop
Jazz
Metal
Pop
R&B
Reggae
Rock

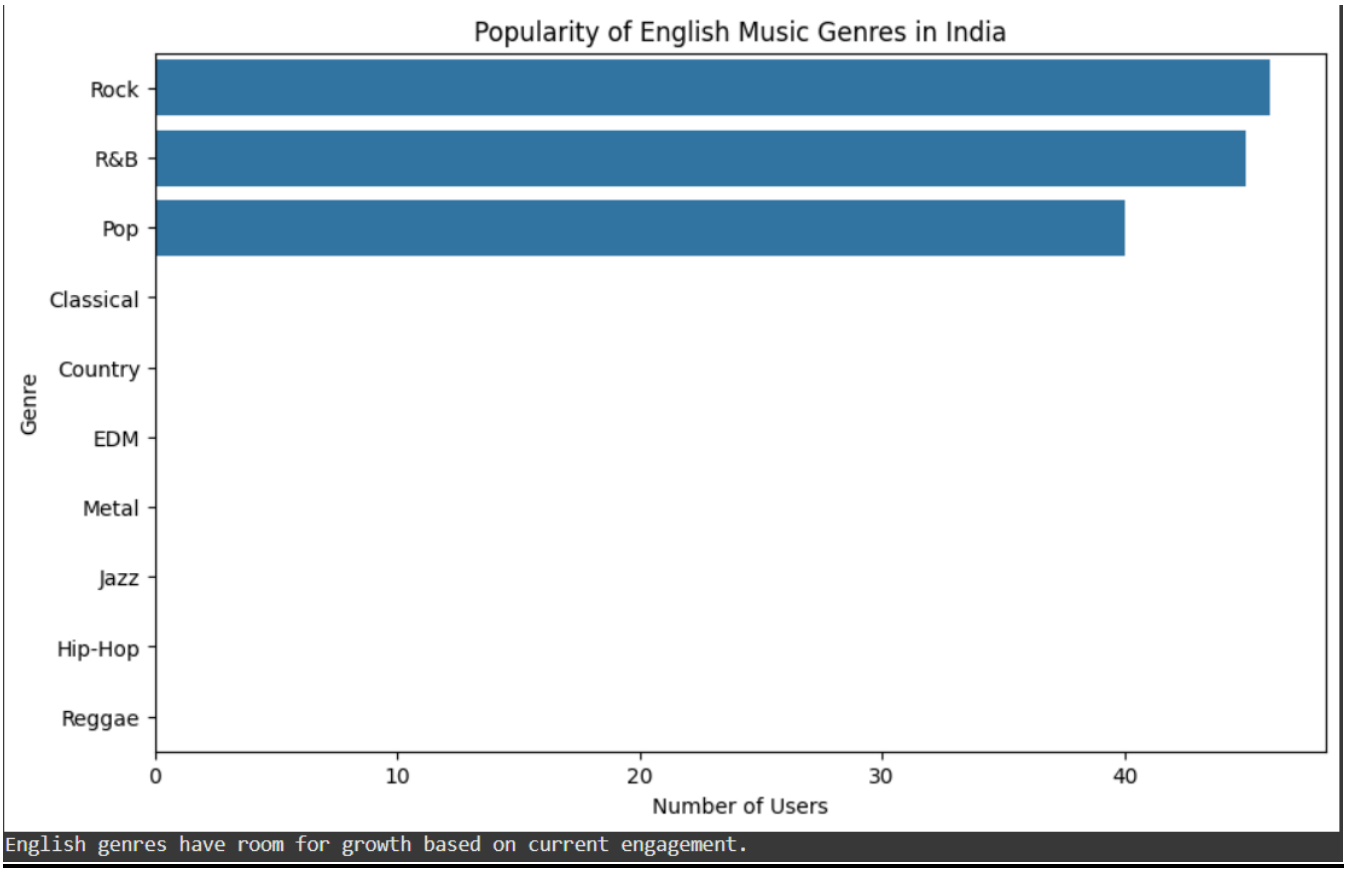

Correlation Matrix
Age
Minutes Streamed Per Day
Number of Songs Liked
Discover Weekly Engagement (%)
Repeat Song Rate (%)
1
0.0042
-0.017
-0.0089
0.0076
0.0042
1
0.023
-0.0043
-0.038
-0.017
0.023
1
0.012
0.0059
-0.0089
-0.0043
0.012
1
0.0042
0.0076
-0.038
0.0059
0.0042
1
1.0
0.8
0.6
0.4
0.2
0.0


Top 5 Genres
Reggae
Classical
Hip-Hop
Jazz
Country
Top Genre
0
10
20
30
40
50
60
count


Top 5 Artists
Drake
Billie Eilish
Dua Lipa
Ed Sheeran
Taylor Swift
Most Played Artist
0
10
20
30
40
50
60
count


Platform Distribution
Amazon Music
Apple Music
Deezer
Spotify
Tidal
YouTube
Streaming Platform
0
20
40
60
80
100
count


Subscription Type
Free
Premium
Subscription Type
0
50
100
150
200
250
count


Popularity of English Music Genres in India
Rock
R&B
Pop
Classical
Country
EDM
Metal
Jazz
Hip-Hop
Reggae
Genre
0
10
20
30
40
Number of Users
English genres have room for growth based on current engagement.

o CONCLUSION

This project analyzed the *Global Music Streaming Listener Preferences* dataset to explore music trends globally, with a focus on **India** and the **future of English songs**. Using data cleaning, visualization, and a custom function for country-level analysis, we examined user behavior in depth.

Focusing on English genres (like Pop, Rock, and R&B), we found that **Indian listeners show strong engagement**, with high **Discover Weekly interaction** and **repeat song rates**. These metrics suggest a growing interest in English music, especially among younger users.

Overall, the findings indicate that **English songs have strong future potential in India**, supported by active exploration and loyal listening behavior. Streaming platforms can use these insights to promote English music more effectively to Indian audiences.

GITHUB LINK :

https://github.com/2303A51075/ADM_PROJECT