Data Loading

Let's start by loading the data from the CSV file and inspecting it.PANDAS and SQL are used for cleaning and visualization of data

```
import matplotlib.pyplot as plt
import pandas as pd

# Load the data
file_path ='/kaggle/input/spotify-dataset-for-playing-around-with-sql/spotify_tracks.csv'
data = pd.read_csv(file_path)

# Display the first few rows of the dataframe
data.head()
```

```
                       id
name  \
0  7kr3xZk4yb3YSZ4VFtg2Qt
Acoustic
1  1kJygfS4eoVziBBI93MSYp
Acoustic
2  6lynns69p4zTCRxmmiSY1x                  Here Comes the Sun -
Acoustic
3  1RC9slv335IfLce5vt9KTW                                    Acoustic
#3
4  5o9L8xBuILoVjLECSBi7Vo  My Love Mine All Mine - Acoustic
Instrumental

      genre                          artists  \
0  acoustic                    Billy Raffoul
1  acoustic                    Billy Raffoul
2  acoustic  Molly Hocking, Bailey Rushlow
3  acoustic               The Goo Goo Dolls
4  acoustic  Guus Dielissen, Casper Esmann

                                          album  popularity
duration_ms  \
0                                          1975          58
172199
1                        A Few More Hours at YYZ          57
172202
2                  Here Comes the Sun (Acoustic)          42
144786
3                              Dizzy up the Girl          46
116573
4  My Love Mine All Mine (Acoustic Instrumental)          33
```

```
133922

   explicit
0     False
1     False
2     False
3     False
4     False
```

Data Cleaning

Let's start by importing the required library and performing the SQL queries.

```
import pandasql as ps

# Define a query to clean the data
query = """
SELECT DISTINCT *
FROM data
WHERE id IS NOT NULL
AND name IS NOT NULL
AND genre IS NOT NULL
AND artists IS NOT NULL
AND album IS NOT NULL
AND popularity IS NOT NULL
AND duration_ms IS NOT NULL
AND explicit IS NOT NULL
"""
# Apply the query
cleaned_data = ps.sqldf(query, locals())

# Display the first few rows of the cleaned dataframe
cleaned_data.head()

                       id
name  \
0  7kr3xZk4yb3YSZ4VFtg2Qt
Acoustic
1  1kJygfS4eoVziBBI93MSYp
Acoustic
2  6lynns69p4zTCRxmmiSY1x                  Here Comes the Sun -
Acoustic
3  1RC9slv335IfLce5vt9KTW                                    Acoustic
#3
4  5o9L8xBuILoVjLECSBi7Vo  My Love Mine All Mine - Acoustic
Instrumental

      genre                         artists  \
```

```
0  acoustic                  Billy Raffoul
1  acoustic                  Billy Raffoul
2  acoustic  Molly Hocking, Bailey Rushlow
3  acoustic              The Goo Goo Dolls
4  acoustic  Guus Dielissen, Casper Esmann

                                          album  popularity
duration_ms  \
0                                          1975          58
172199
1                        A Few More Hours at YYZ          57
172202
2                  Here Comes the Sun (Acoustic)          42
144786
3                              Dizzy up the Girl          46
116573
4  My Love Mine All Mine (Acoustic Instrumental)          33
133922

   explicit
0         0
1         0
2         0
3         0
4         0
```

Exploratory Data Analysis

Summary Statistics

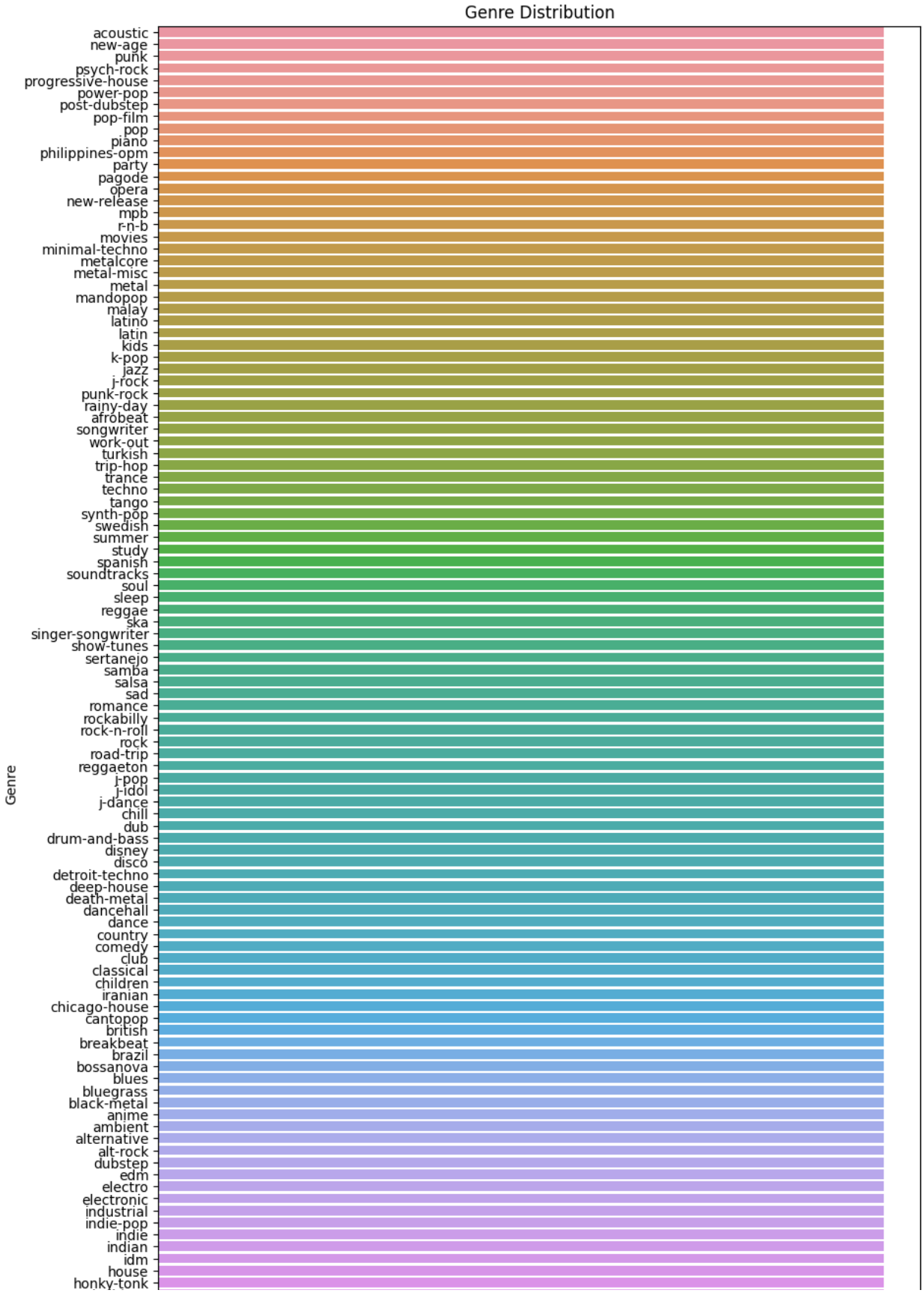
```
summary_stats = cleaned_data.describe()
print(summary_stats)
popularity_stats = cleaned_data['popularity'].describe()
print("Popularity Summary Statistics:\n", popularity_stats)

duration_stats = cleaned_data['duration_ms'].describe()
print("Duration Summary Statistics:\n", duration_stats)
```

```
        popularity   duration_ms     explicit
count  6300.000000  6.300000e+03  6300.000000
mean     30.754762  2.028477e+05     0.189524
std      19.948991  1.210299e+05     0.391955
min       0.000000  3.006000e+04     0.000000
25%      16.000000  1.476870e+05     0.000000
50%      29.000000  1.916070e+05     0.000000
75%      45.000000  2.369625e+05     0.000000
max      90.000000  3.601658e+06     1.000000
Popularity Summary Statistics:
```

```
 count    6300.000000
mean       30.754762
std        19.948991
min         0.000000
25%        16.000000
50%        29.000000
75%        45.000000
max        90.000000
Name: popularity, dtype: float64
Duration Summary Statistics:
 count    6.300000e+03
mean     2.028477e+05
std      1.210299e+05
min      3.006000e+04
25%      1.476870e+05
50%      1.916070e+05
75%      2.369625e+05
max      3.601658e+06
Name: duration_ms, dtype: float64
```

Genre Distribution

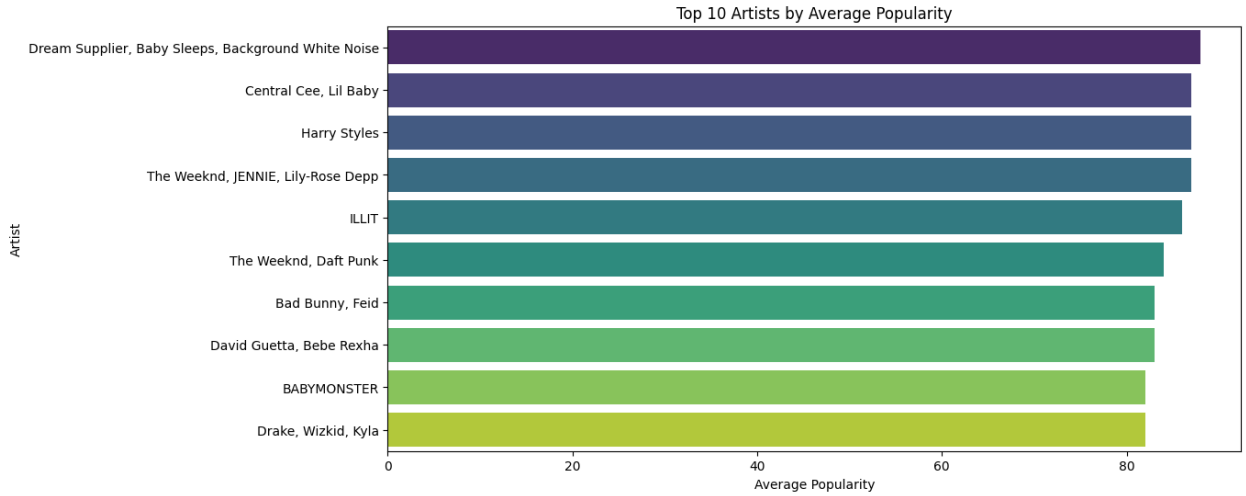
```
import seaborn as sns
# Plot genre distribution
plt.figure(figsize=(10, 20))
sns.countplot(data=cleaned_data, y='genre',
order=cleaned_data['genre'].value_counts().index)
plt.title('Genre Distribution')
plt.xlabel('Count')
plt.ylabel('Genre')
plt.show()
```


Genre Distribution
Genre
acoustic
new-age
punk
psych-rock
progressive-house
power-pop
post-dubstep
pop-film
pop
piano
philippines-opm
party
pagode
opera
new-release
mpb
r-n-b
movies
minimal-techno
metalcore
metal-misc
metal
mandopop
malay
latino
latin
kids
k-pop
jazz
j-rock
punk-rock
rainy-day
afrobeat
songwriter
work-out
turkish
trip-hop
trance
techno
tango
synth-pop
swedish
summer
study
spanish
soundtracks
soul
sleep
reggae
ska
singer-songwriter
show-tunes
sertanejo
samba
salsa
sad
romance
rockabilly
rock-n-roll
rock
road-trip
reggaeton
j-pop
j-idol
j-dance
chill
dub
drum-and-bass
disney
disco
detroit-techno
deep-house
death-metal
dancehall
dance
country
comedy
club
classical
children
iranian
chicago-house
cantopop
british
breakbeat
brazil
bossanova
blues
bluegrass
black-metal
anime
ambient
alternative
alt-rock
dubstep
edm
electro
electronic
industrial
indie-pop
indie
indian
idm
house
honky-tonk

Trends with respect to time

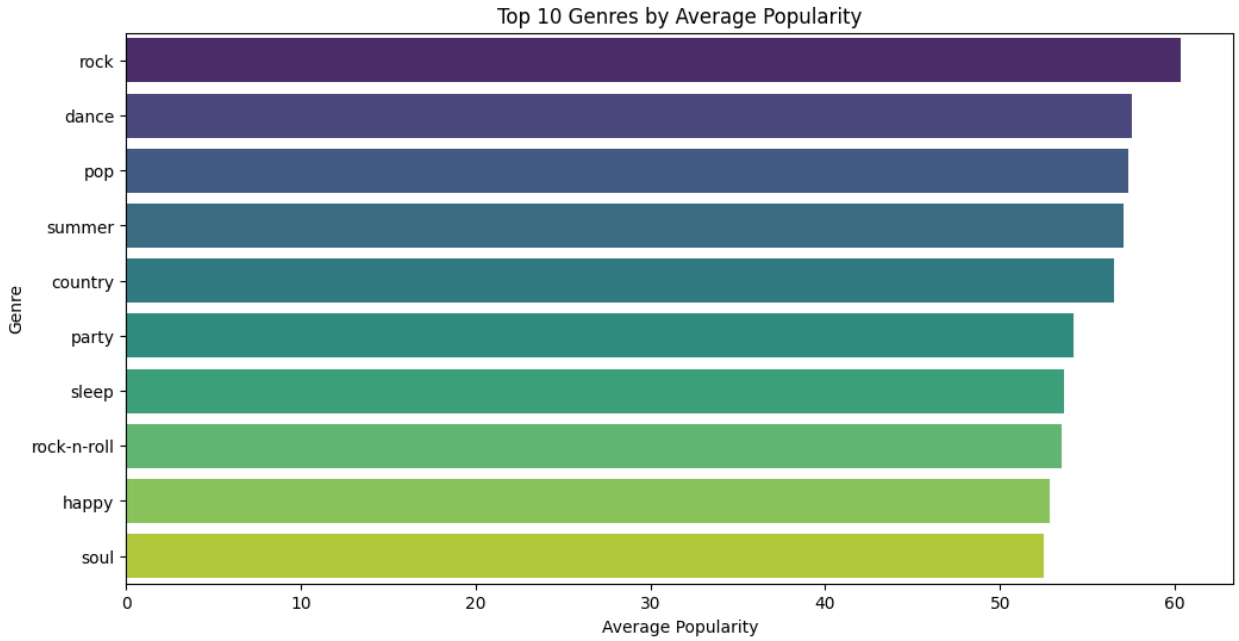
Top Artists by Average Popularity

```
# Top 10 artists by average popularity
top_artists = cleaned_data.groupby('artists')
['popularity'].mean().nlargest(10).reset_index()

plt.figure(figsize=(12, 6))
sns.barplot(data=top_artists, x='popularity', y='artists',
palette='viridis')
plt.title('Top 10 Artists by Average Popularity')
plt.xlabel('Average Popularity')
plt.ylabel('Artist')
plt.show()
```



Top Genres by Popularity

```
# Top 10 genres by average popularity
top_genres = cleaned_data.groupby('genre')
['popularity'].mean().nlargest(10).reset_index()

plt.figure(figsize=(12, 6))
sns.barplot(data=top_genres, x='popularity', y='genre',
palette='viridis')
plt.title('Top 10 Genres by Average Popularity')
plt.xlabel('Average Popularity')
plt.ylabel('Genre')
plt.show()
```



Saving the cleaned data

```
cleaned_data.to_csv('cleaned_spotify_tracks.csv', index=False)
```

Summary

- Dream Supplier,Baby sleeps,Background White Noise have the most popularity
- Rock is the most popular genre followed by dance and pop