```
import mysql.connector
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np


cnx = mysql.connector.connect(
    host="localhost",
    port="3306",
    user="root",
    password="vikas"
)
query = "select  * from spotify.spotify;"
df = pd.read_sql(query, cnx)
cnx.close()



df = pd.read_csv("spotify_history.csv")
```

```
C:\Users\Vikas\AppData\Local\Temp\ipykernel_8332\2885205258.py:15:
UserWarning: pandas only supports SQLAlchemy connectable
(engine/connection) or database string URI or sqlite3 DBAPI2
connection. Other DBAPI2 objects are not tested. Please consider using
SQLAlchemy.
  df = pd.read_sql(query, cnx)
```

```
df.head()
```

```
        spotify_track_uri                    ts    platform  ms_played
\
0  2J3n32GeLmMjwuAzyhcSNe  2013-07-08 02:44:34  web player        3185

1  1oHxIPqJyvAYHy0PVrDU98  2013-07-08 02:45:37  web player       61865

2  487OPlneJNni3NWC8SYqhW  2013-07-08 02:50:24  web player      285386

3  5IyblF777jLZj1vGHG2UD3  2013-07-08 02:52:40  web player      134022

4  0GgAAB0ZMllFhbNc3mAodO  2013-07-08 03:17:52  web player           0


                                    track_name         artist_name  \
0                           Say It, Just Say It        The Mowgli's
1  Drinking from the Bottle (feat. Tinie Tempah)       Calvin Harris
2                                  Born To Die        Lana Del Rey
3                             Off To The Races        Lana Del Rey
4                                    Half Mast  Empire Of The Sun

                          album_name reason_start reason_end  shuffle
```

```
\
0                 Waiting For The Dawn     autoplay   clickrow    False

1                             18 Months     clickrow   clickrow    False

2  Born To Die - The Paradise Edition     clickrow    unknown    False

3  Born To Die - The Paradise Edition    trackdone   clickrow    False

4                   Walking On A Dream     clickrow    nextbtn    False


   skipped
0    False
1    False
2    False
3    False
4    False
```

```
df['seconds_played'] = df['ms_played'] / 1000

# Basic Summary
print("📊 Dataset Info:")
print(df.info())
print("\n📈 Statistical Summary:")
print(df.describe())

# Descriptive Stats
print("\n🎵 Mean Duration (seconds):", df['seconds_played'].mean())
print("🎵 Median Duration (seconds):", df['seconds_played'].median())
print("🎵 Mode of Duration (seconds):", df['seconds_played'].mode()[0])
print("🎵 Standard Deviation:", df['seconds_played'].std())
print("🎵 Total Tracks Played:", len(df))
print("🎵 Unique Artists:", df['artist_name'].nunique())
print("🎵 Unique Tracks:", df['track_name'].nunique())
```

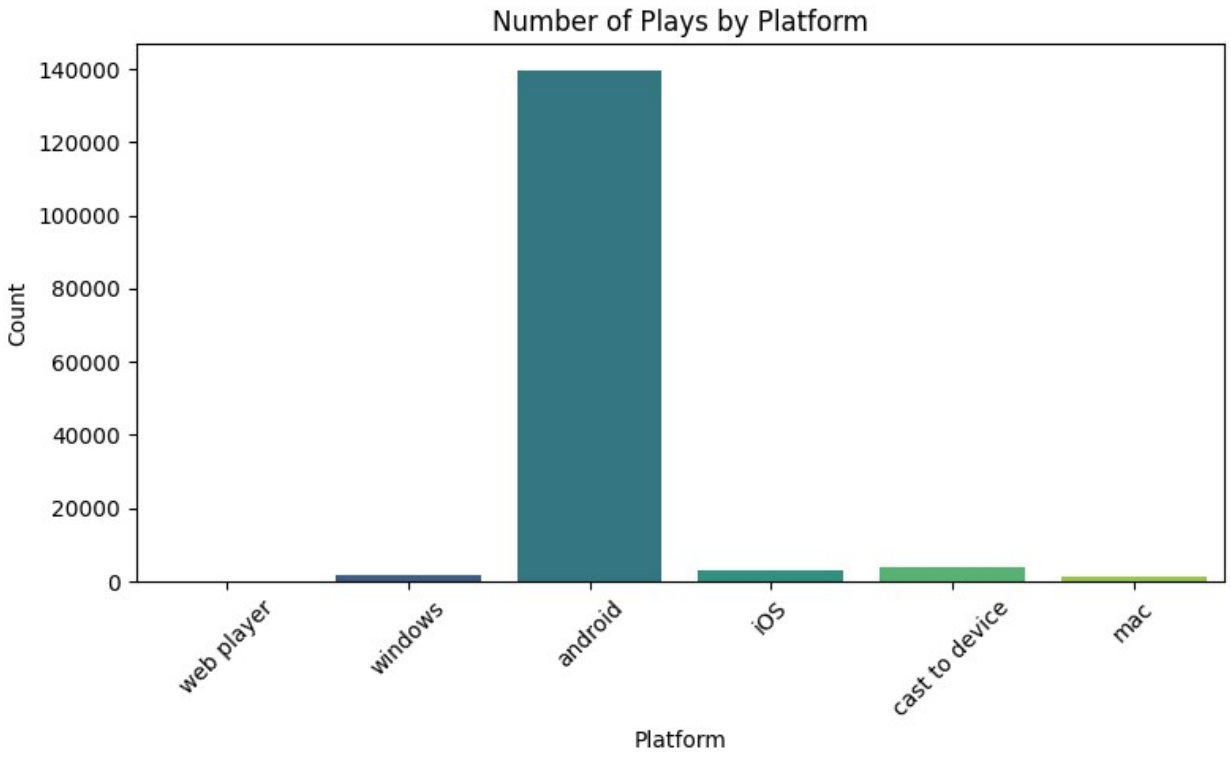
```
📊 Dataset Info:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 149860 entries, 0 to 149859
Data columns (total 12 columns):
 #   Column             Non-Null Count   Dtype 
---  ------             --------------   ----- 
 0   spotify_track_uri  149860 non-null  object
 1   ts                 149860 non-null  object
 2   platform           149860 non-null  object
 3   ms_played          149860 non-null  int64 
 4   track_name         149860 non-null  object
 5   artist_name        149860 non-null  object
 6   album_name         149860 non-null  object
 7   reason_start       149717 non-null  object
```

```
 8   reason_end         149743 non-null  object
 9   shuffle            149860 non-null  bool
 10  skipped            149860 non-null  bool
 11  seconds_played     149860 non-null  float64
dtypes: bool(2), float64(1), int64(1), object(8)
memory usage: 11.7+ MB
None

 Statistical Summary:
          ms_played  seconds_played
count  1.498600e+05   149860.000000
mean   1.283166e+05      128.316635
std    1.178401e+05      117.840060
min    0.000000e+00        0.000000
25%    2.795000e+03        2.795000
50%    1.388400e+05      138.840000
75%    2.185070e+05      218.507000
max    1.561125e+06     1561.125000

 Mean Duration (seconds): 128.31663509275324
 Median Duration (seconds): 138.84
 Mode of Duration (seconds): 0.0
 Standard Deviation: 117.84006033150152
 Total Tracks Played: 149860
 Unique Artists: 4113
 Unique Tracks: 13839
```

Plays by Platform

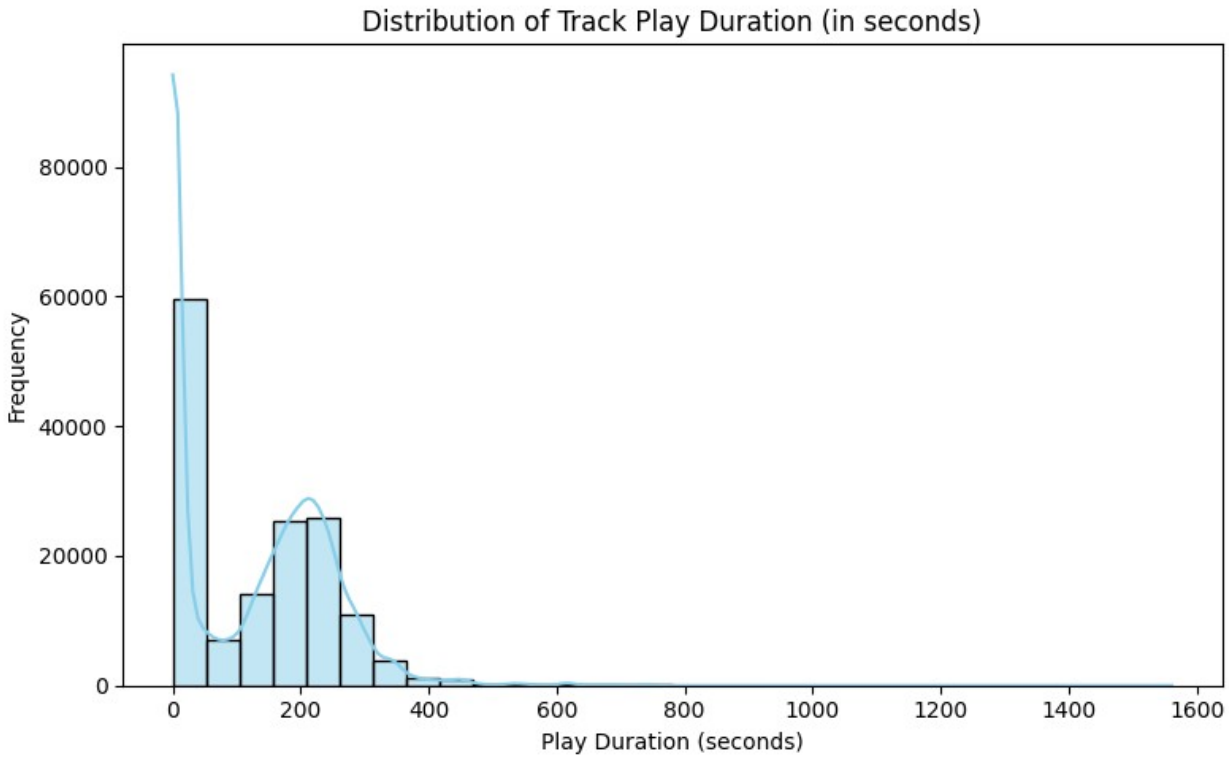
```
plt.figure(figsize=(8, 5))
sns.countplot(data=df, x='platform', palette='viridis')
plt.title('Number of Plays by Platform')
plt.xlabel('Platform')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

```
C:\Users\Vikas\AppData\Local\Temp\ipykernel_8332\3290150373.py:2:
FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  sns.countplot(data=df, x='platform', palette='viridis')
```



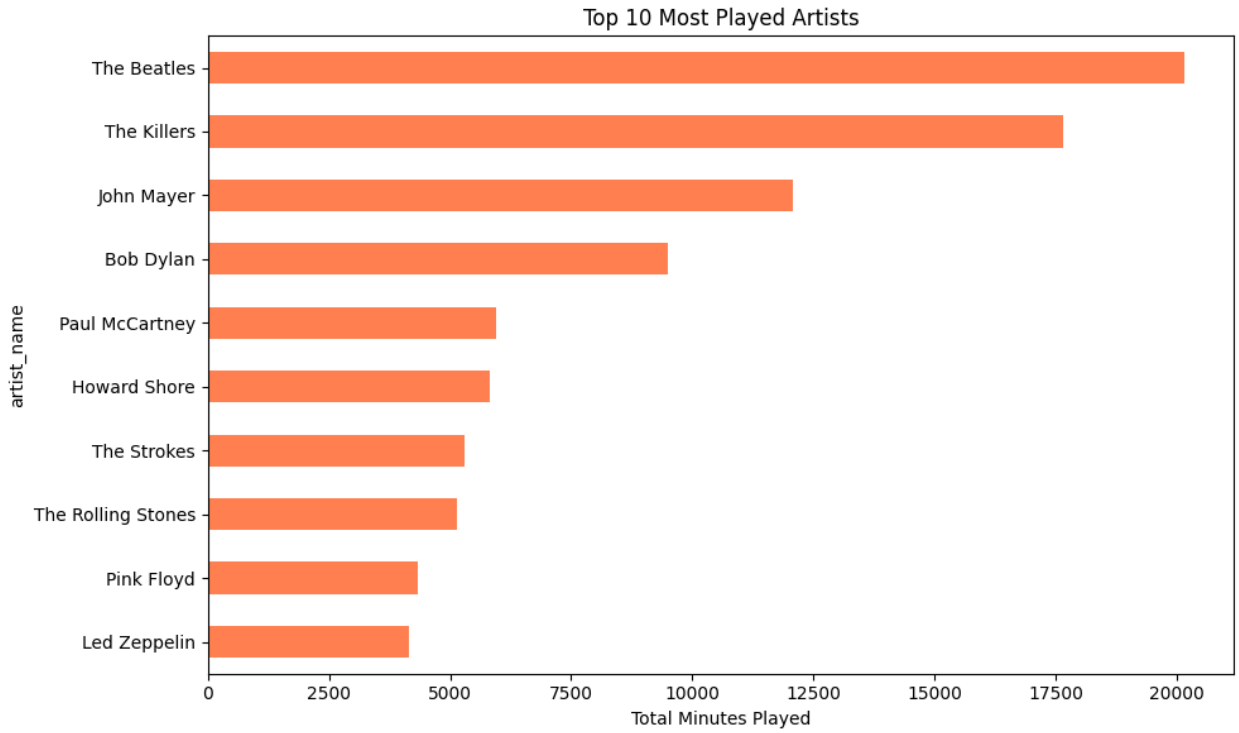
Distribution of Song Duration (ms_played)

```
plt.figure(figsize=(8, 5))
sns.histplot(df['ms_played'] / 1000, bins=30, kde=True,
color='skyblue')
plt.title('Distribution of Track Play Duration (in seconds)')
plt.xlabel('Play Duration (seconds)')
plt.ylabel('Frequency')
plt.tight_layout()
plt.show()
```



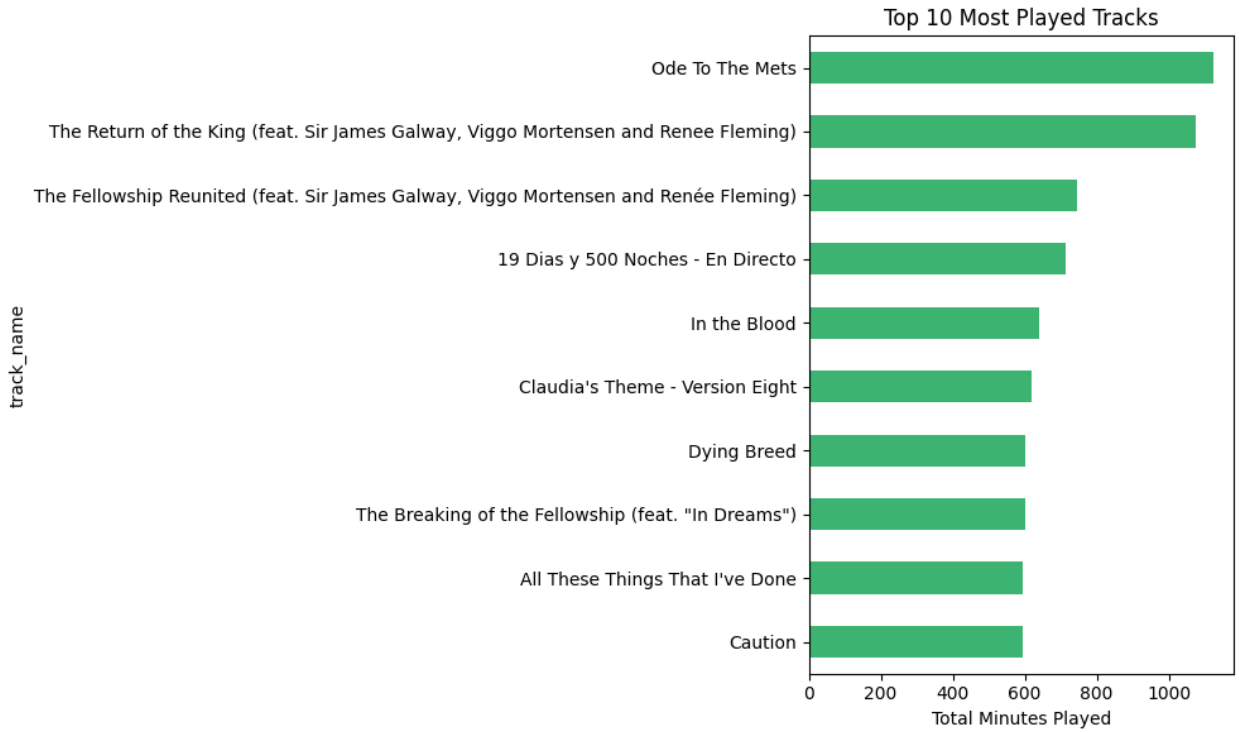
Top 10 Most Played Artists

```
top_artists = df.groupby('artist_name')
['ms_played'].sum().sort_values(ascending=False).head(10) / 60000

plt.figure(figsize=(10, 6))
top_artists.plot(kind='barh', color='coral')
plt.xlabel('Total Minutes Played')
plt.title('Top 10 Most Played Artists')
plt.gca().invert_yaxis()
plt.tight_layout()
plt.show()
```



Top 10 Most Played Tracks

```
top_tracks = df.groupby('track_name')
['ms_played'].sum().sort_values(ascending=False).head(10) / 60000

plt.figure(figsize=(10, 6))
top_tracks.plot(kind='barh', color='mediumseagreen')
plt.xlabel('Total Minutes Played')
plt.title('Top 10 Most Played Tracks')
plt.gca().invert_yaxis()
plt.tight_layout()
plt.show()
```



Listening Trend Over Time

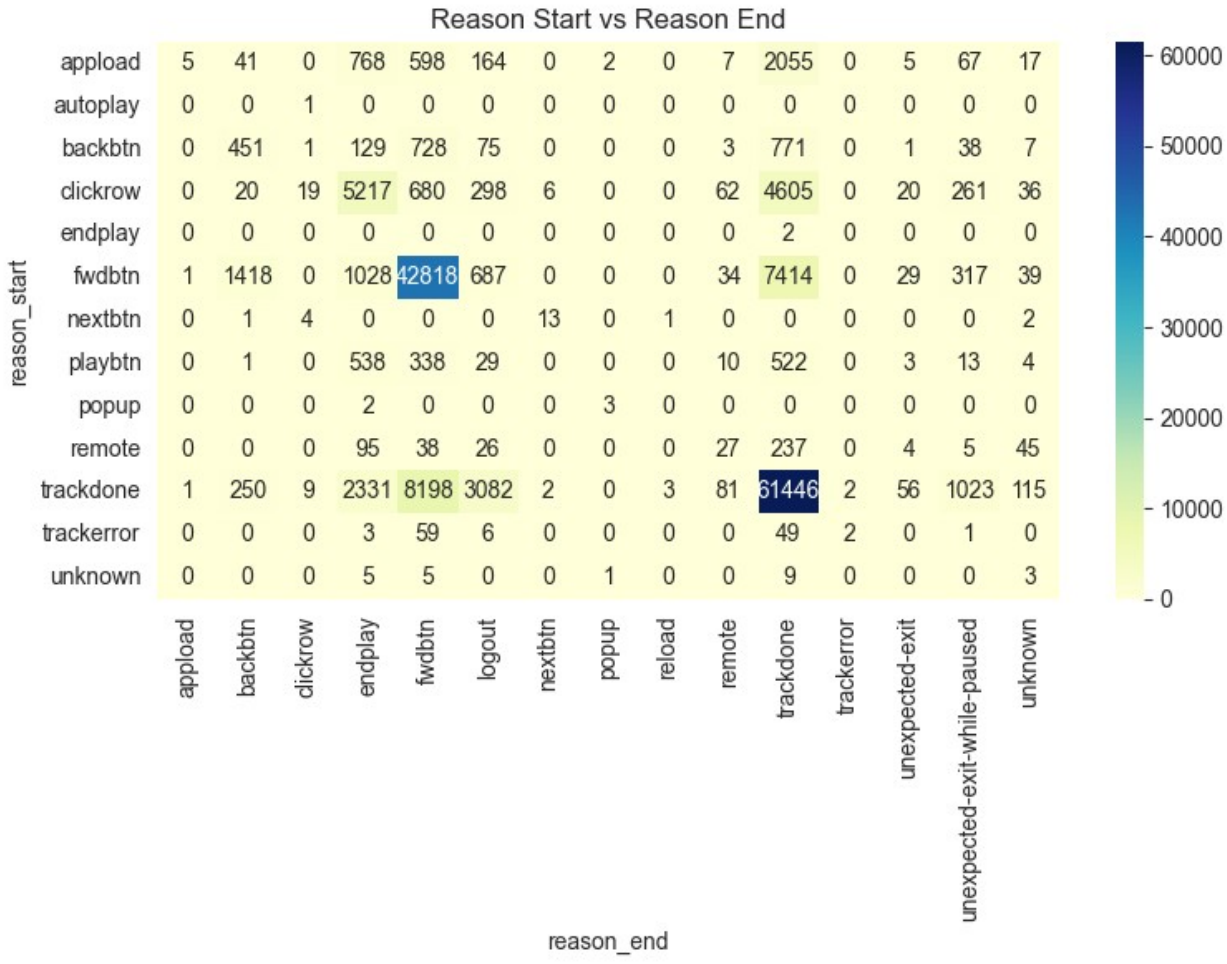
```
plt.figure(figsize=(14, 6))
plt.fill_between(daily_playtime.index, daily_playtime.values,
color="skyblue", alpha=0.4)
plt.plot(daily_playtime.index, daily_playtime.values, color="blue")

plt.title("□ Daily Listening Area Chart")
plt.xlabel("Date")
plt.ylabel("Minutes Played")
plt.xticks(rotation=45)
plt.grid(True)
plt.tight_layout()
plt.show()
```

```
---------------------------------------------------------------------------
-----
NameError                                 Traceback (most recent call
last)
Cell In[31], line 2
      1 plt.figure(figsize=(14, 6))
----> 2 plt.fill_between(daily_playtime.index, daily_playtime.values,
color="skyblue", alpha=0.4)
      3 plt.plot(daily_playtime.index, daily_playtime.values,
color="blue")
      5 plt.title("□ Daily Listening Area Chart")
```

```
NameError: name 'daily_playtime' is not defined

<Figure size 1400x600 with 0 Axes>
```

Reason Start vs Reason End (Heatmap)

```
pivot = pd.crosstab(df['reason_start'], df['reason_end'])

plt.figure(figsize=(8, 6))
sns.heatmap(pivot, annot=True, fmt='d', cmap='YlGnBu')
plt.title('Reason Start vs Reason End')
plt.tight_layout()
plt.show()
```

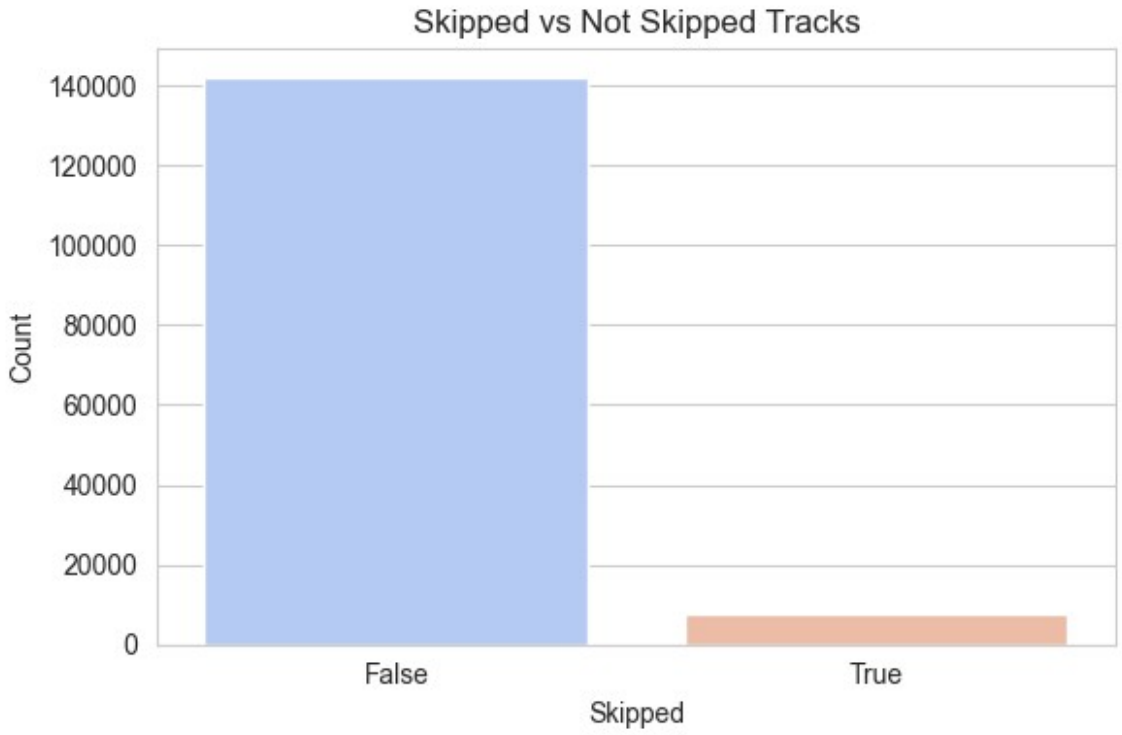


Skipped vs Non-Skipped Tracks

```
plt.figure(figsize=(6, 4))
sns.countplot(data=df, x='skipped', palette='coolwarm')
plt.title('Skipped vs Not Skipped Tracks')
```

```
plt.xlabel('Skipped')
plt.ylabel('Count')
plt.tight_layout()
plt.show()
```

```
C:\Users\Vikas\AppData\Local\Temp\ipykernel_9264\1198717300.py:2:
FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  sns.countplot(data=df, x='skipped', palette='coolwarm')
```



Thank You