

Name : **Abdul Samad**

Date : **22-02-25**

Time : **14:00:00**

Course Instructor: **Sir Umair**

Ned Acadamey

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
import plotly.graph_objects as go

df=pd.read_csv(r"D:\Projects\Final Data Visualization Paper\"
netflix_titles.csv")
df.head(2)

      show_id      type          title    director \
0        s1    Movie   Dick Johnson Is Dead  Kirsten Johnson
1        s2  TV Show        Blood & Water           NaN

                                         cast      country \
0                           NaN  United States
1  Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...  South Africa

            date_added  release_year rating duration \
0  September 25, 2021        2020  PG-13     90 min
1  September 24, 2021        2021  TV-MA   2 Seasons

                                listed_in \
0                  Documentaries
1  International TV Shows, TV Dramas, TV Mysteries

                           description
0  As her father nears the end of his life, filmm...
1  After crossing paths at a party, a Cape Town t...
```

```
df.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8807 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column      Non-Null Count  Dtype  
--- 
 0   show_id     8807 non-null   object  
 1   type        8807 non-null   object  
 2   title       8807 non-null   object  
 3   director    6173 non-null   object  
 4   cast         7982 non-null   object  
 5   country     7976 non-null   object  
 6   date_added  8797 non-null   object  
 7   release_year 8807 non-null   int64  
 8   rating      8803 non-null   object  
 9   duration    8804 non-null   object  
 10  listed_in   8807 non-null   object  
 11  description 8807 non-null   object  
dtypes: int64(1), object(11)
memory usage: 825.8+ KB
```

```
df.isnull().sum()

show_id      0
type        0
title       0
director    2634
cast         825
country     831
date_added  10
release_year 0
rating       4
duration    3
listed_in   0
description 0
dtype: int64

df = df.dropna(subset=['date_added'])
df=df.dropna(subset=['director'])
df=df.dropna(subset=['cast'])
df=df.dropna(subset=['country'])
df=df.dropna(subset=['rating'])
df=df.dropna(subset=['duration'])
```

```
df.isnull().sum()

show_id      0
type        0
title       0
director    0
```



```

rating    duration                         listed_in
\ 
7  TV-MA     125 min  Dramas, Independent Movies, International Movies
8  TV-14   9 Seasons                      British TV Shows, Reality TV

                                         description
7  On a photo shoot in Ghana, an American model s...
8  A talented batch of amateur bakers face off in...

```

Yearly Analysis

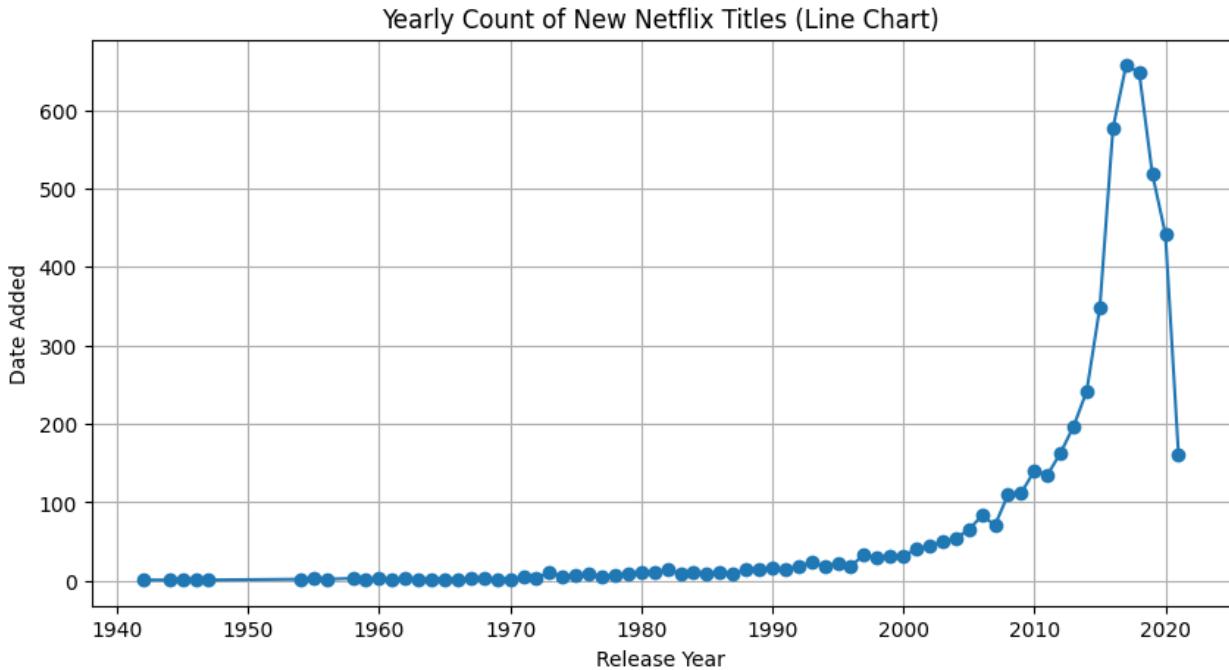
```

release_year_counts = df.groupby('release_year')['date_added'].count()
release_year_counts

release_year
1942      1
1944      1
1945      1
1946      1
1947      1
...
2017    657
2018    648
2019    519
2020    442
2021    161
Name: date_added, Length: 72, dtype: int64

plt.figure(figsize=(10, 5))
plt.plot(release_year_counts.index, release_year_counts.values,
marker='o')
plt.xlabel("Release Year")
plt.ylabel("Date Added")
plt.title("Yearly Count of New Netflix Titles (Line Chart)")
plt.grid()
plt.show()

```



```

fig=px.line(release_year_counts, x=release_year_counts.index,
y=release_year_counts.values,title="Yearly Count of New Netflix Titles
(Line Chart)")
fig.show()

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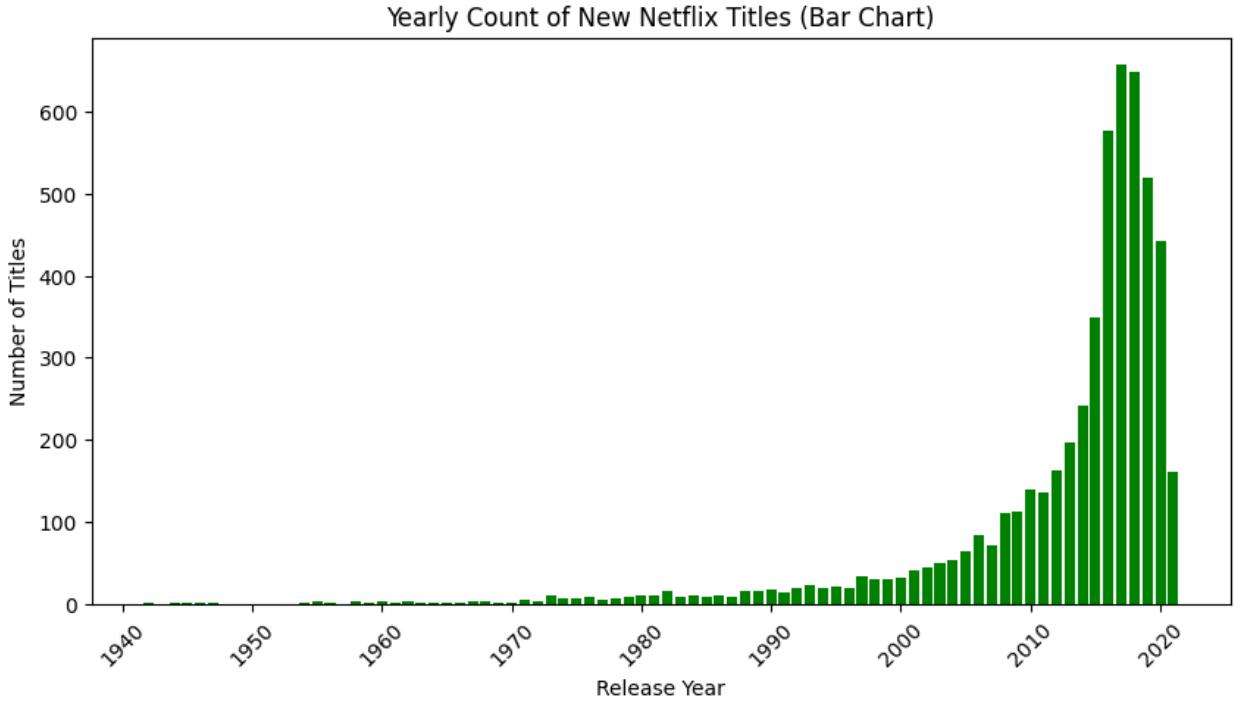
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plt.bar(release_year_counts.index, release_year_counts.values,  
        color='green')  
plt.xlabel("Release Year")  
plt.ylabel("Number of Titles")  
plt.title("Yearly Count of New Netflix Titles (Bar Chart)")  
plt.xticks(rotation=45)  
plt.show()

```



```

fig=px.bar(release_year_counts, x=release_year_counts.index,
y=release_year_counts.values,title="Yearly Count of New Netflix Titles
(Bar Chart)")
fig.show()

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Key points for your storytelling:

Line Chart Strengths: Better for trend detection, smooth visualization of fluctuations.

Bar Chart Strengths: Clearer for individual yearly comparisons.

Best for Forecasting: The line chart is typically better for identifying trends and predicting future changes.

Frequunecy of Top Genre

```

df.head(2)

  show_id      type              title        director \
7      s8     Movie            Sankofa      Haile Gerima
8      s9  TV Show  The Great British Baking Show  Andy Devonshire

                                         cast \
7  Kofi Ghanaba, Oyafunmike Ogunlano, Alexandra D...
8  Mel Giedroyc, Sue Perkins, Mary Berry, Paul Ho...

```

```
country date_added
release_year \
7 United States, Ghana, Burkina Faso, United Kin... 2021-09-24
1993
8
2021

rating duration listed_in
\
7 TV-MA 125 min Dramas, Independent Movies, International Movies
8 TV-14 9 Seasons British TV Shows, Reality TV

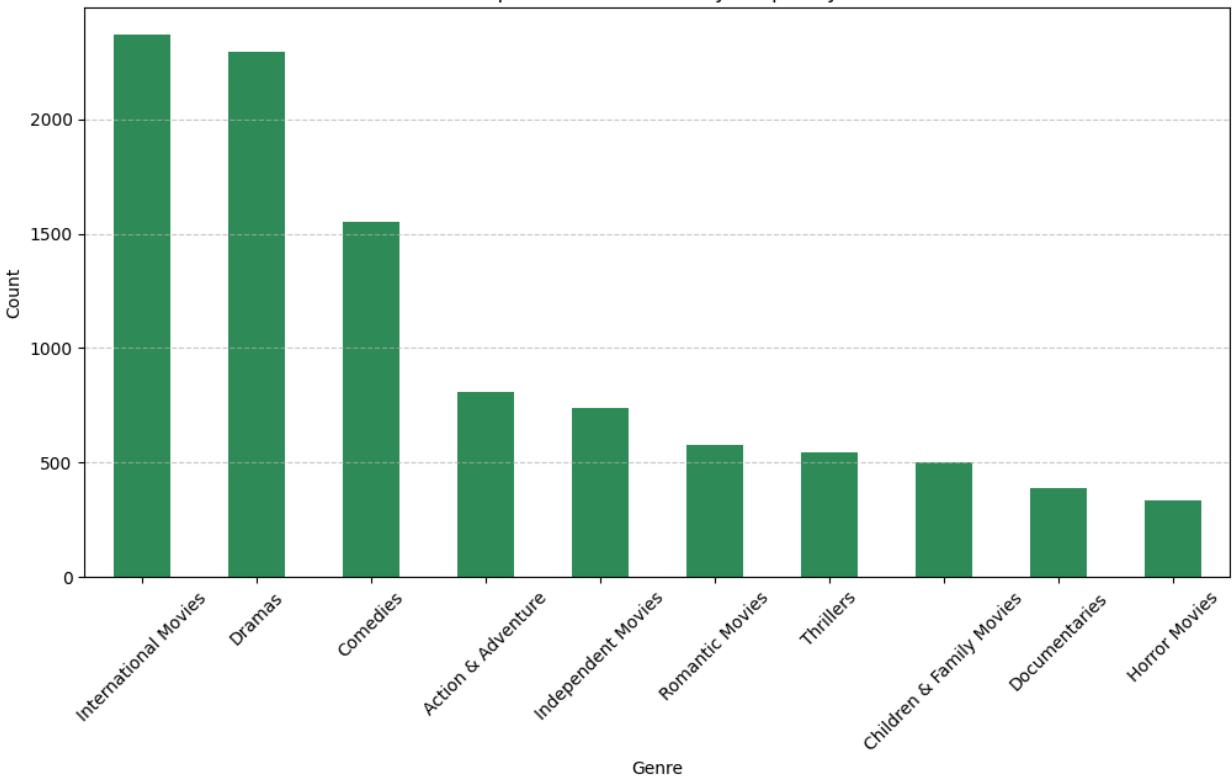
description
7 On a photo shoot in Ghana, an American model s...
8 A talented batch of amateur bakers face off in...

df['listed_in'] = df['listed_in'].str.split(',')
df_exploded = df.explode('listed_in')
genre_counts = df_exploded['listed_in'].value_counts()

Top_Genre=genre_counts.sort_values(ascending=False).head(10)

plt.figure(figsize=(12, 6))
Top_Genre.plot(kind='bar', color='seagreen')
plt.xlabel("Genre")
plt.ylabel("Count")
plt.title("Top 10 Netflix Genres by Frequency")
plt.xticks(rotation=45)
plt.grid(axis='y', linestyle='--', alpha=0.7)
plt.show()
```

Top 10 Netflix Genres by Frequency



```
fig=px.bar(Top_Genre, x=Top_Genre.index, y=Top_Genre.values, title="Top 10 Netflix Genres by Frequency")
fig.show()
```

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# pie chart  

plt.figure(figsize=(10, 6))  

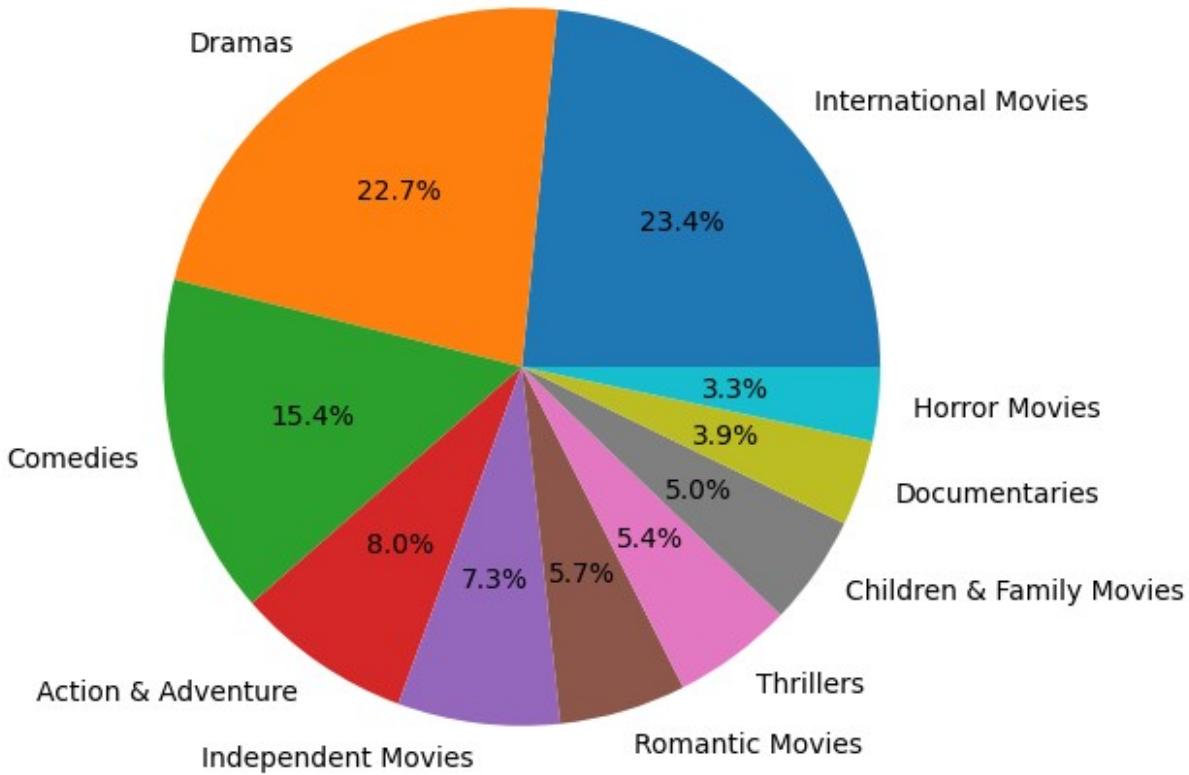
plt.pie(Top_Genre, labels = Top_Genre.index, autopct='%1.1f%%')  

plt.title('Top 10 Netflix Genres')  

plt.show()

```

Top 10 Netflix Genres



```
# pie chart by plotly
import plotly.graph_objects as go

fig=px.pie(Top_Genre, values=Top_Genre.values, names=Top_Genre.index,
           title='Top 10 Netflix Genres')
fig.show()

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```

Conclusion:

The bar chart is better for analyzing genre trends since it allows precise comparisons and can accommodate more genres without becoming cluttered.

```

df.info()

<class 'pandas.core.frame.DataFrame'>
Index: 5332 entries, 7 to 8806
Data columns (total 12 columns):
 #   Column      Non-Null Count  Dtype  
--- 
 0   show_id     5332 non-null   object 
 1   type        5332 non-null   object 
 2   title       5332 non-null   object 
 3   director    5332 non-null   object 
 4   cast        5332 non-null   object 
 5   country     5332 non-null   object 
 6   date_added  5332 non-null   datetime64[ns]
 7   release_year 5332 non-null   int64 

```

```

8   rating      5332 non-null  object
9   duration     5332 non-null  object
10  listed_in    5332 non-null  object
11  description   5332 non-null  object
dtypes: datetime64[ns](1), int64(1), object(10)
memory usage: 541.5+ KB

```

Focus on Country Column

```

df.head(2)

show_id      type          title          director \
7      s8      Movie        Sankofa       Haile Gerima
8      s9  TV Show  The Great British Baking Show  Andy Devonshire

                                         cast \
7  Kofi Ghanaba, Oyafunmike Ogunlano, Alexandra D...
8  Mel Giedroyc, Sue Perkins, Mary Berry, Paul Ho...

                                         country date_added
release_year \
7  United States, Ghana, Burkina Faso, United Kin...  2021-09-24
1993
8                               United Kingdom 2021-09-24
2021

rating      duration          listed_in
\
7  TV-MA      125 min  [Dramas, Independent Movies, International Mov...
8  TV-14  9 Seasons  [British TV Shows, Reality TV]

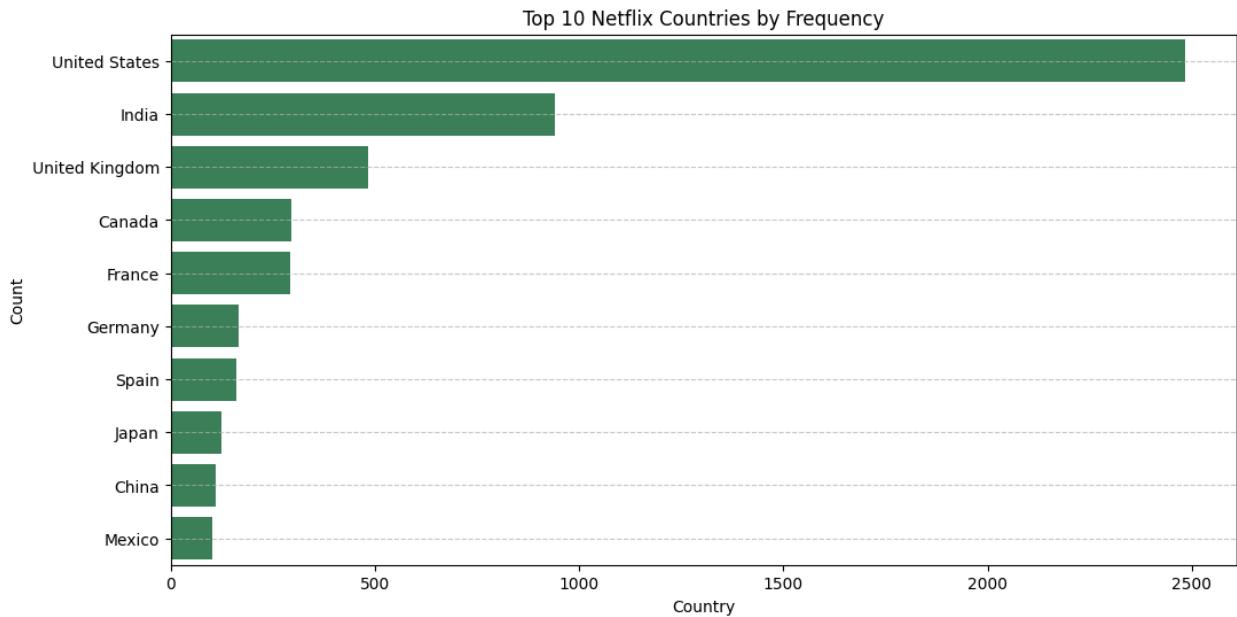
                                         description
7  On a photo shoot in Ghana, an American model s...
8  A talented batch of amateur bakers face off in...

df['country']=df['country'].str.split(', ')
df_exploded = df.explode('country')
country_counts =
df_exploded['country'].value_counts().sort_values(ascending=False)
country_counts=country_counts.head(10)

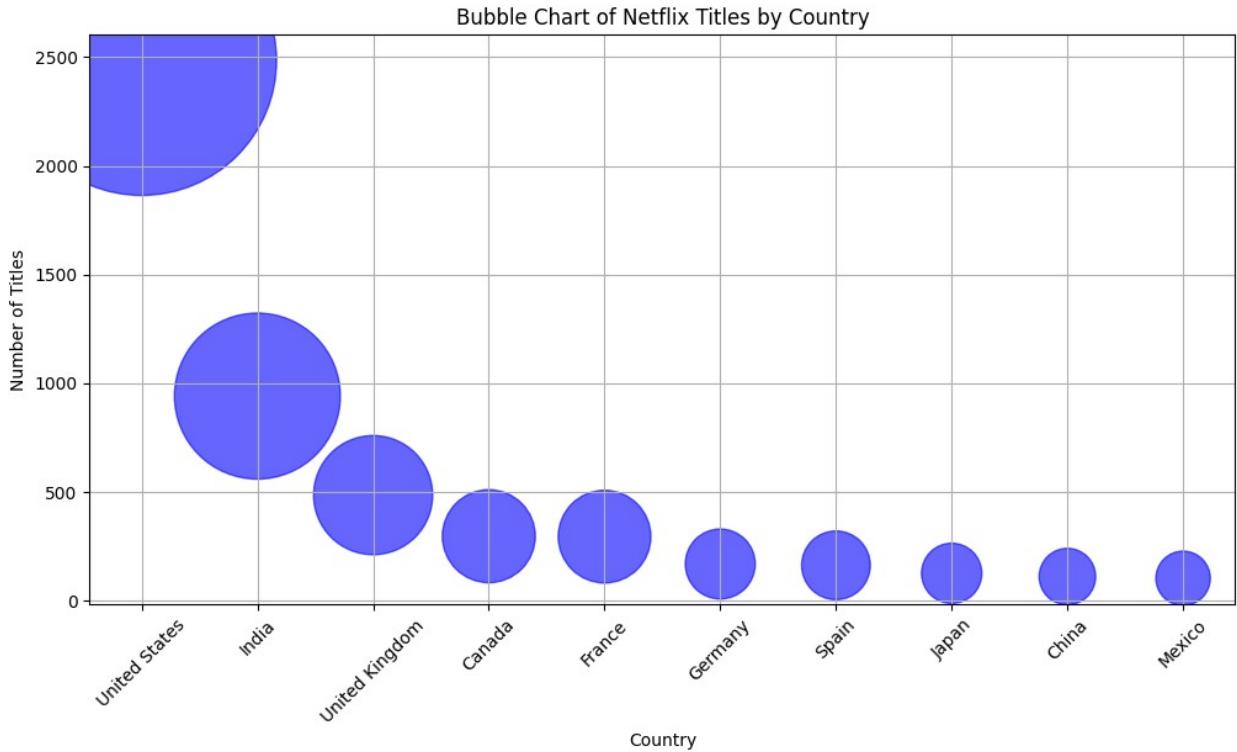
plt.figure(figsize=(12, 6))
sns.barplot(x=country_counts.values,y= country_counts.index,
color='seagreen')
plt.xlabel("Country")
plt.ylabel("Count")
plt.title("Top 10 Netflix Countries by Frequency")

```

```
plt.grid(axis='y', linestyle='--', alpha=0.7)
plt.show()
```



```
plt.figure(figsize=(12, 6))
plt.scatter(country_counts.index, country_counts.values,
           s=country_counts.values * 10, alpha=0.6, color='blue')
plt.xlabel("Country")
plt.ylabel("Number of Titles")
plt.title("Bubble Chart of Netflix Titles by Country")
plt.xticks(rotation=45)
plt.grid()
plt.show()
```



```

plt.figure(figsize=(12, 6))
fig=px.scatter(country_counts, x=country_counts.index,
y=country_counts.values, size=country_counts.values*1000,
title="Bubble chart of Netflix Countries")
fig.show()

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```

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```

Conclusion:

The Bubble chart is better for understanding global distribution, while the bar chart is better for direct country-wise ranking.

Q4

```
df.head(2)
```

```
7 [United States, Ghana, Burkina Faso, United Ki... 2021-09-24
1993
8 [United Kingdom] 2021-09-24
2021

rating duration listed_in
\
7 TV-MA 125 min [Dramas, Independent Movies, International Mov...
8 TV-14 9 Seasons [British TV Shows, Reality TV]

description
7 On a photo shoot in Ghana, an American model s...
8 A talented batch of amateur bakers face off in...

pip install wordcloud

Requirement already satisfied: wordcloud in c:\users\abdul-samad\appdata\local\programs\python\python313\lib\site-packages (1.9.4)
Requirement already satisfied: numpy>=1.6.1 in c:\users\abdul-samad\appdata\local\programs\python\python313\lib\site-packages (from wordcloud) (2.2.1)
Requirement already satisfied: pillow in c:\users\abdul-samad\appdata\local\programs\python\python313\lib\site-packages (from wordcloud) (10.4.0)
Requirement already satisfied: matplotlib in c:\users\abdul-samad\appdata\roaming\python\python313\site-packages (from wordcloud) (3.9.2)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\abdul-samad\appdata\roaming\python\python313\site-packages (from matplotlib>wordcloud) (1.3.0)
Requirement already satisfied: cycler>=0.10 in c:\users\abdul-samad\appdata\roaming\python\python313\site-packages (from matplotlib>wordcloud) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\abdul-samad\appdata\roaming\python\python313\site-packages (from matplotlib>wordcloud) (4.54.1)
Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\abdul-samad\appdata\roaming\python\python313\site-packages (from matplotlib>wordcloud) (1.4.7)
Requirement already satisfied: packaging>=20.0 in c:\users\abdul-samad\appdata\roaming\python\python313\site-packages (from matplotlib>wordcloud) (24.1)
Requirement already satisfied: pyparsing>=2.3.1 in c:\users\abdul-samad\appdata\roaming\python\python313\site-packages (from matplotlib>wordcloud) (3.2.0)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\abdul-samad\appdata\roaming\python\python313\site-packages (from matplotlib>wordcloud) (2.9.0.post0)
```

Requirement already satisfied: six>=1.5 in c:\users\abdul-samad\appdata\roaming\python\python313\site-packages (from python-datautil>=3.7 >matplotlib>wordcloud) (1.16.0)

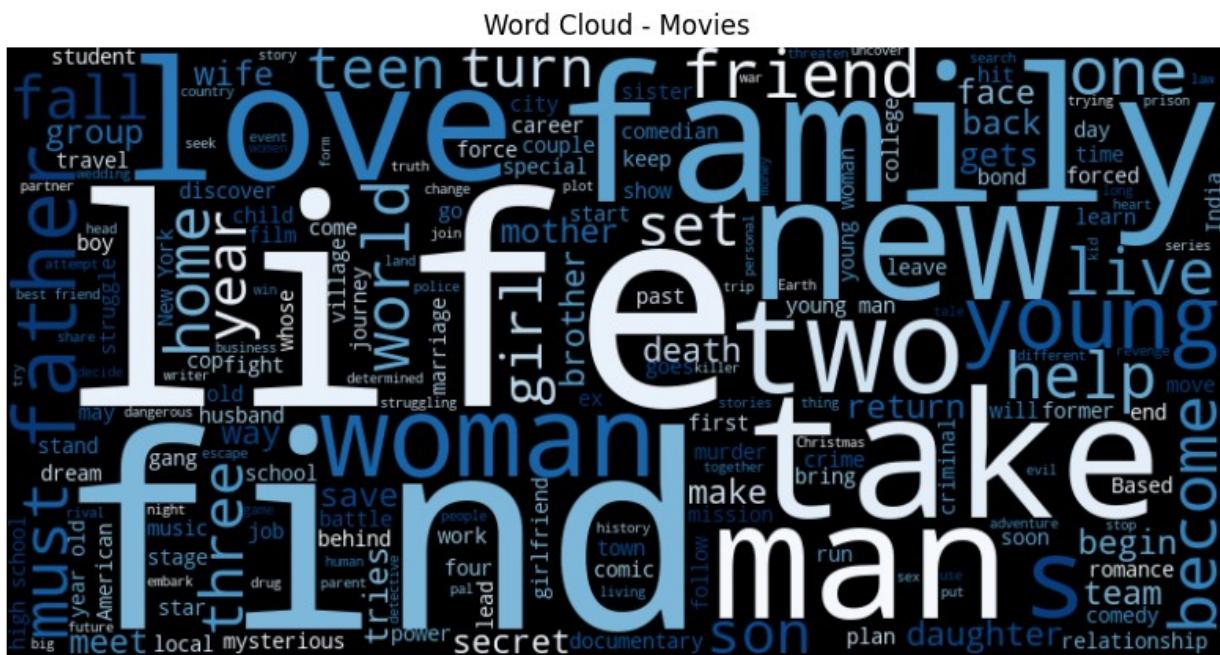
Note: You may need to restart the kernel to use updated packages

```
[notice] A new release of pip is available: 24.3.1 -> 25.0.1
[notice] To update, run: python.exe -m pip install --upgrade pip

from wordcloud import WordCloud

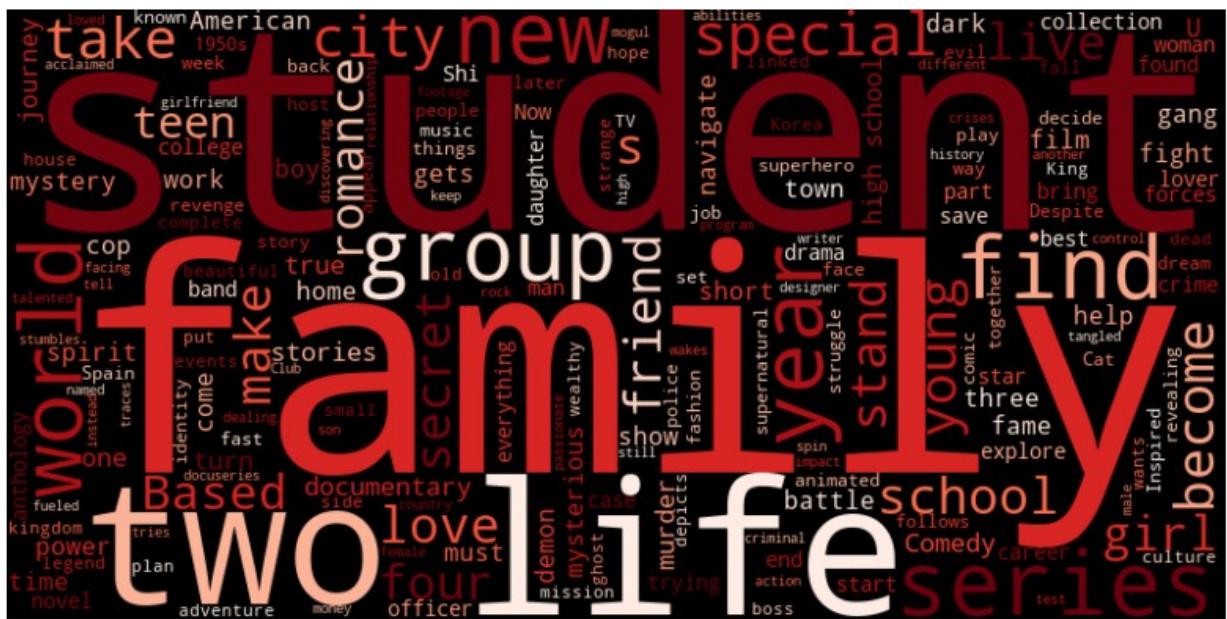
movies_desc = " ".join(df[df['type'] == 'Movie']['description'])
tvshows_desc = " ".join(df[df['type'] == 'TV Show']['description'])

plt.figure(figsize=(10, 6))
wc_movies = WordCloud(width=800, height=400, background_color="black",
                      colormap="Blues").generate(movies_desc)
plt.imshow(wc_movies, interpolation="bilinear")
plt.axis("off")
plt.title("Word Cloud - Movies")
plt.show()
```



```
plt.figure(figsize=(10, 6))
wc_tvshows = WordCloud(width=800, height=400,
background_color="black", colormap="Reds").generate(tvshows_desc)
plt.imshow(wc_tvshows, interpolation="bilinear")
plt.axis("off")
plt.title("Word Cloud - TV Shows")
plt.show()
```

Word Cloud - TV Shows



Write the Narrative

Movies Word Cloud Insights:

Likely to emphasize themes like "thrilling," "adventure," "romantic," and "drama."

Can highlight key storytelling elements and genres.

TV Shows Word Cloud Insights:

Might show words like "seasons," "episodes," "family," "comedy," and "series."

Useful for identifying common show structures and recurring themes.

Comparison:

Movies: Likely to have more varied themes.

TV Shows: May emphasize long-term engagement (e.g., series, characters).

Conclusion:

The movies word cloud might reveal genre trends, while the TV shows word cloud could highlight series-based themes. Both provide valuable insights into content descriptions.

Q5

```
df.head(2)

  show_id      type                  title        director \
7      s8    Movie            Sankofa     Haile Gerima
8      s9  TV Show  The Great British Baking Show  Andy Devonshire

                                         cast \
7  Kofi Ghanaba, Oyafunmi Ogunlana, Alexandra D...
8  Mel Giedroyc, Sue Perkins, Mary Berry, Paul Ho...

                                country date_added
release_year \
7  [United States, Ghana, Burkina Faso, United Ki... 2021-09-24
1993
8                               [United Kingdom] 2021-09-24
2021

  rating   duration           listed_in
\
7  TV-MA    125 min  [Dramas, Independent Movies, International Mov...
8  TV-14    9 Seasons  [British TV Shows, Reality TV]

                           description
7  On a photo shoot in Ghana, an American model s...
8  A talented batch of amateur bakers face off in...

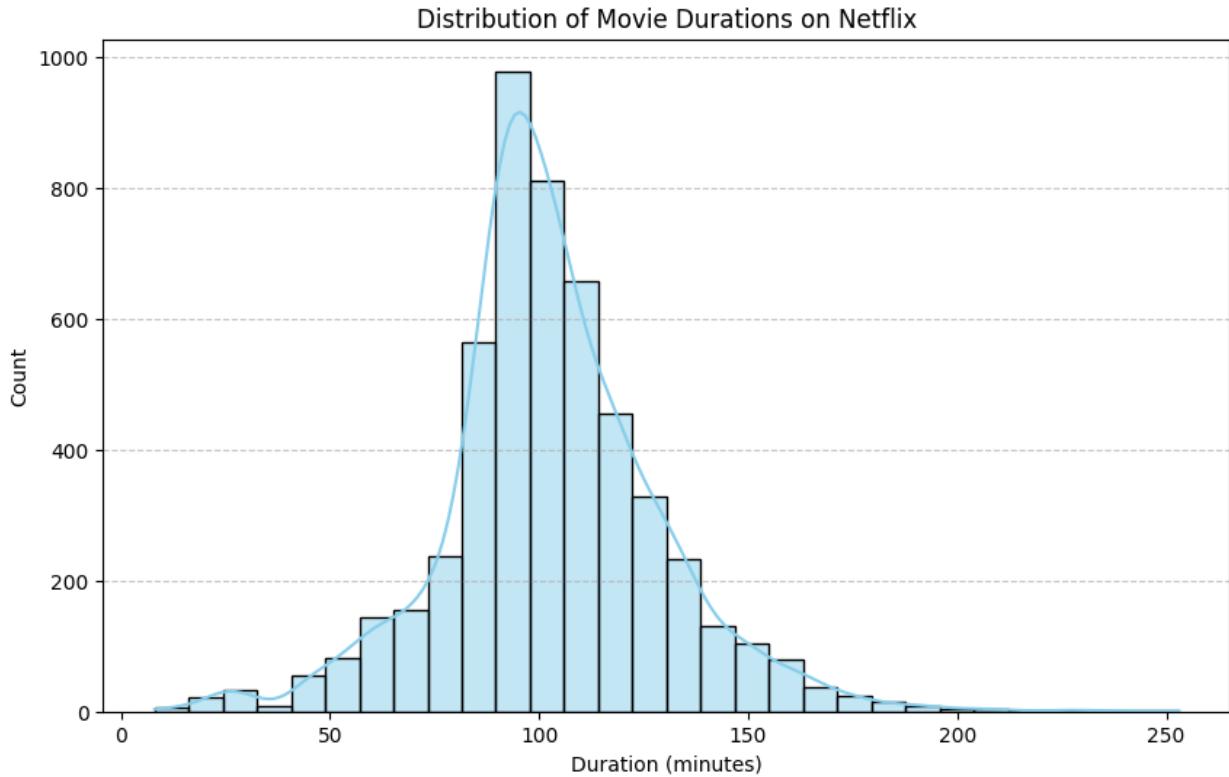
df_movies = df[df['type'] == 'Movie']
df_movies['duration'] = df_movies['duration'].str.replace(' min', '',
regex=True).astype(float)
df_movies = df_movies.dropna(subset=['duration'])

C:\Users\Abdul-Samad\AppData\Local\Temp\
ipykernel_1196\3835132891.py:2: SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
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See the caveats in the documentation:  
https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#returning-a-view-versus-a-copy
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df_movies.head(2)  
show_id      type        title      director \\\n7      s8  Movie      Sankofa    Haile Gerima  
9      s10  Movie  The Starling  Theodore Melfi  
  
                                         cast \\\n7  Kofi Ghanaba, Oyafunmike Ogunlano, Alexandra D...  
9  Melissa McCarthy, Chris O'Dowd, Kevin Kline, T...  
  
                                         country date_added  
release_year \\  
7  [United States, Ghana, Burkina Faso, United Ki... 2021-09-24  
1993  
9  [United States] 2021-09-24  
2021  
  
rating  duration                      listed_in  
\  
7  TV-MA      125.0  [Dramas, Independent Movies, International Mov...  
9  PG-13      104.0  [Comedies, Dramas]  
  
                                         description  
7  On a photo shoot in Ghana, an American model s...  
9  A woman adjusting to life after a loss contend...  
  
plt.figure(figsize=(10, 6))  
sns.histplot(df_movies['duration'], bins=30, kde=True,  
color='skyblue')  
plt.xlabel("Duration (minutes)")  
plt.ylabel("Count")  
plt.title("Distribution of Movie Durations on Netflix")  
plt.grid(axis='y', linestyle='--', alpha=0.7)  
plt.show()
```



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fig=px.histogram(df_movies, x="duration", nbins=30,
title="Distribution of Movie Durations on Netflix")
fig.show()

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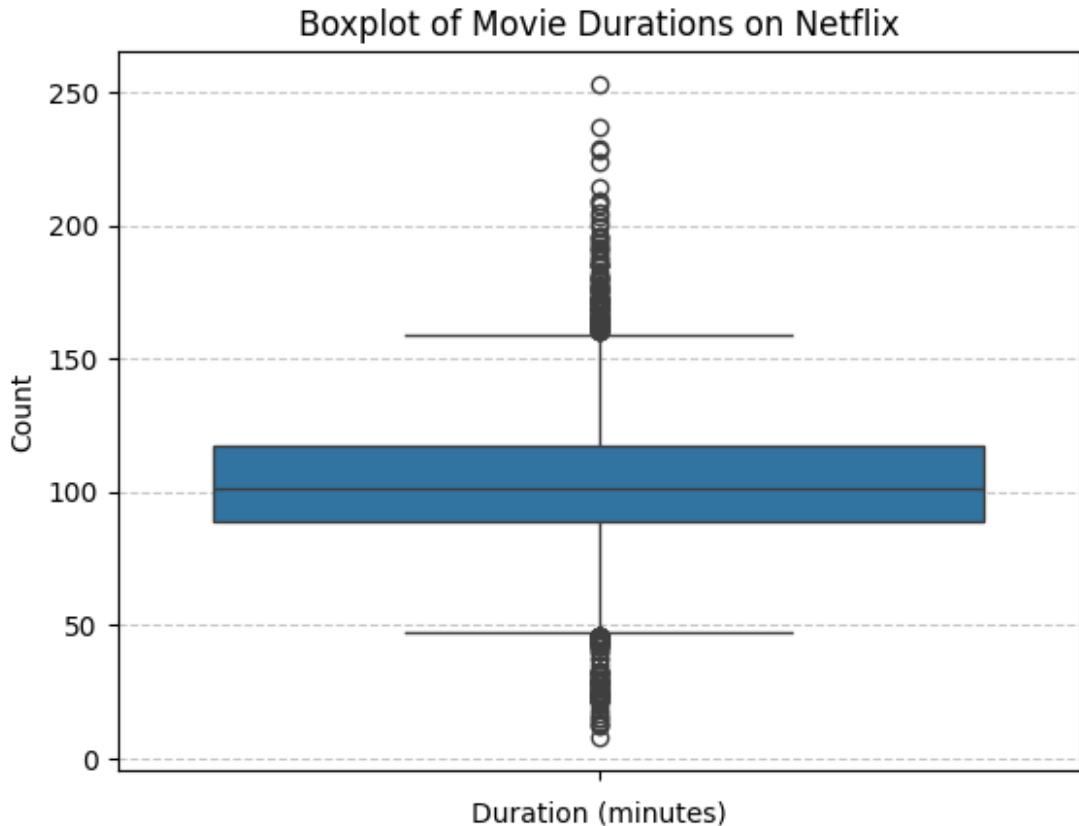
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Histogram Insights:

Shows the overall distribution of movie durations.

KDE (Kernel Density Estimate) curve helps identify the most common durations.

Highlights whether the data is skewed (e.g., more short movies vs. longer movies).

Box Plot Insights:

Clearly shows the median (central tendency) and interquartile range (IQR).

Helps identify outliers (e.g., extremely long or short movies).

Useful for detecting unusual trends in the dataset.

Comparison & Conclusion:

The histogram is better for understanding overall distribution and common movie lengths.

The box plot is more effective for spotting anomalies and outliers in duration.

If we want to predict the average movie length, the histogram is more useful.

If we want to detect extreme durations, the box plot is preferable.