

1. Import Libraries

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

2. Load Dataset

```
df = pd.read_csv("Netflix Dataset.csv")
```

3. Dataset overview

```
df.shape
(7789, 11)

df.columns
Index(['Show_Id', 'Category', 'Title', 'Director', 'Cast', 'Country',
      'Release_Date', 'Rating', 'Duration', 'Type', 'Description'],
      dtype='object')
```

```
df.isna().sum()

Show_Id      0
Category      0
Title         0
Director    2388
Cast         718
Country      507
Release_Date  10
Rating        7
Duration      0
Type          0
Description   0
dtype: int64
```

```
df.dropna(inplace=True)

df.isna().sum()

Show_Id      0
Category      0
```

```
Title      0
Director   0
Cast       0
Country    0
Release_Date  0
Rating     0
Duration   0
Type       0
Description 0
dtype: int64
```

```
df.shape
```

```
(4811, 11)
```

```
df.describe()
```

	Show_Id	Category	Title	Director	Cast
\					
count	4811	4811	4811	4811	4811
unique	4809	2	4809	3614	4689
top	s684	Movie	Backfire	Raúl Campos, Jan Suter	Samuel West
freq	2	4675	2	18	10

	Country	Release_Date	Rating	Duration	\
count	4811	4811	4811	4811	
unique	544	1291	14	195	
top	United States	January 1, 2020	TV-MA	93 min	
freq	1655	100	1668	121	

	Type	\
count	4811	
unique	324	
top	Dramas, International Movies	
freq	306	

	Description
count	4811
unique	4804
top	When Elastigirl gets recruited for a high-prof...
freq	2

```
df.head(5)
```

	Show_Id	Category	Title	Director	\
1	s2	Movie	07:19	Jorge Michel Grau	
2	s3	Movie	23:59	Gilbert Chan	

3	s4	Movie	9	Shane Acker
4	s5	Movie	21	Robert Luketic
5	s6	TV Show	46	Serdar Akar

	Cast	Country	\
1	Demián Bichir, Héctor Bonilla, Oscar Serrano, ...	Mexico	
2	Tedd Chan, Stella Chung, Henley Hii, Lawrence ...	Singapore	
3	Elijah Wood, John C. Reilly, Jennifer Connelly...	United States	
4	Jim Sturgess, Kevin Spacey, Kate Bosworth, Aar...	United States	
5	Erdal Beşikçioğlu, Yasemin Allen, Melis Birkan...	Turkey	

	Release_Date	Rating	Duration	\
1	December 23, 2016	TV-MA	93 min	
2	December 20, 2018	R	78 min	
3	November 16, 2017	PG-13	80 min	
4	January 1, 2020	PG-13	123 min	
5	July 1, 2017	TV-MA	1 Season	

	Type	\
1	Dramas, International Movies	
2	Horror Movies, International Movies	
3	Action & Adventure, Independent Movies, Sci-Fi...	
4	Dramas	
5	International TV Shows, TV Dramas, TV Mysteries	

	Description
1	After a devastating earthquake hits Mexico Cit...
2	When an army recruit is found dead, his fellow...
3	In a postapocalyptic world, rag-doll robots hi...
4	A brilliant group of students become card-coun...
5	A genetics professor experiments with a treatm...

```
cols=['Show_Id', 'Category', 'Title', 'Director', 'Cast', 'Country',
      'Release_Date', 'Rating', 'Duration', 'Type', 'Description']
```

```
for col in cols:
    print(df[col].value_counts())
    print("----"*5)
```

```
Show_Id
s684      2
s6621     2
s9         1
s10        1
s7733      1
..
s7779      1
s7781      1
s7782      1
s7783      1
```

```
s7      1
Name: count, Length: 4809, dtype: int64
-----
```

```
Category
Movie      4675
TV Show     136
Name: count, dtype: int64
-----
```

```
Title
Backfire      2
The Lost Okoroshi  2
706           1
1920          1
You're My Boss  1
..
Zombieland    1
Zoo           1
Zoom          1
Zozo          1
122           1
Name: count, Length: 4809, dtype: int64
-----
```

```
Director
Raúl Campos, Jan Suter    18
Marcus Raboy             15
Jay Karas                 14
Cathy Garcia-Molina      13
Youssef Chahine           12
..
Liu Kuang-hui            1
Kenneth Gyang            1
Abu Bakr Shawky          1
Paul Greengrass          1
John Suits               1
Name: count, Length: 3614, dtype: int64
-----
```

```
Cast
Samuel West
10
Jeff Dunham
7
Kevin Hart
6
Jim Gaffigan
5
Bill Burr
5
```

```
..
```

Jesse Eisenberg, Woody Harrelson, Emma Stone, Abigail Breslin, Amber Heard, Bill Murray, Derek Graf

1

Shashank Arora, Shweta Tripathi, Rahul Kumar, Gopal K. Singh, Yogesh Kurme, Prince Daniel

1

Tim Allen, Courteney Cox, Chevy Chase, Kate Mara, Ryan Newman, Michael Cassidy, Spencer Breslin, Rip Torn, Kevin Zegers

1

Imad Creidi, Antoinette Turk, Elias Gergi, Carmen Lebbos, Viktor Axelsson, Charbel Iskandar, Yasmine Awad

1

Adil Hussain, Mona Singh, K.K. Raina, Sanjay Mishra, Anil Rastogi, Ravi Jhankal, Kulbhushan Kharbanda, Ekavali Khanna, Mukesh Tiwari, Vinod Acharya

1

Name: count, Length: 4689, dtype: int64

Country	
United States	1655
India	832
United Kingdom	174
Canada	104
Egypt	87

...

Switzerland, United Kingdom, United States	1
United Kingdom, Germany, United Arab Emirates, New Zealand	1
United Kingdom, Egypt, United States	1
United States, France, Canada, Belgium	1
United States, Belgium, Canada	1

Name: count, Length: 544, dtype: int64

Release_Date	
January 1, 2020	100
November 1, 2019	70
March 1, 2018	67
December 31, 2019	64
October 1, 2018	61

...

October 25, 2015	1
April 2, 2020	1
July 24, 2017	1
February 25, 2018	1
August 14, 2019	1

Name: count, Length: 1291, dtype: int64

Rating	
TV-MA	1668
TV-14	1133
R	654

TV-PG	413
PG-13	375
PG	238
TV-G	80
TV-Y	71
TV-Y7	69
NR	62
G	38
UR	5
TV-Y7-FV	3
NC-17	2

Name: count, dtype: int64

Duration

93 min	121
94 min	120
90 min	114
95 min	111
97 min	108

...

253 min	1
190 min	1
17 min	1
203 min	1
191 min	1

Name: count, Length: 195, dtype: int64

Type

Dramas, International Movies	306
Stand-Up Comedy	276
Comedies, Dramas, International Movies	237
Dramas, Independent Movies, International Movies	213
Children & Family Movies, Comedies	158

...

Crime TV Shows, TV Action & Adventure, TV Sci-Fi & Fantasy	1
Anime Series, International TV Shows, Spanish-Language TV Shows	1
LGBTQ Movies, Thrillers	1
Action & Adventure, Sports Movies	1
Crime TV Shows, Romantic TV Shows, TV Dramas	1

Name: count, Length: 324, dtype: int64

Description

When Elastigirl gets recruited for a high-profile crime-fighting mission, Mr. Incredible takes on his toughest assignment ever: full-time parenting. 2

When two would-be robbers accidentally kill a made man, they find themselves on the run from the South Philly Italian mob. 2

A scheming matriarch plots to cut off her disabled stepson and his

```

wife from the family fortune, creating a division within the clan.
2
When pretty new neighbor Seema falls for their shy roommate Sid,
jealous womanizers Omi and Jai plot to break up the new lovebirds.
2
Secrets bubble to the surface after a sensual encounter and an
unforeseen crime entangle two friends and a woman caught between them.
2
..
Looking to survive in a world taken over by zombies, a dorky college
student teams with an urban roughneck and a pair of grifter sisters.
1
A drug dealer starts having doubts about his trade as his brother, his
client, and two rappers from the slums each battle their own secret
addictions.      1
Dragged from civilian life, a former superhero must train a new crop
of youthful saviors when the military preps for an attack by a
familiar villain.      1
When Lebanon's Civil War deprives Zozo of his family, he's left with
grief and little means as he escapes to Sweden in search of his
grandparents.      1
As a grisly virus rampages a city, a lone man stays locked inside his
apartment, digitally cut off from seeking help and desperate to find a
way out.      1
Name: count, Length: 4804, dtype: int64
-----

```

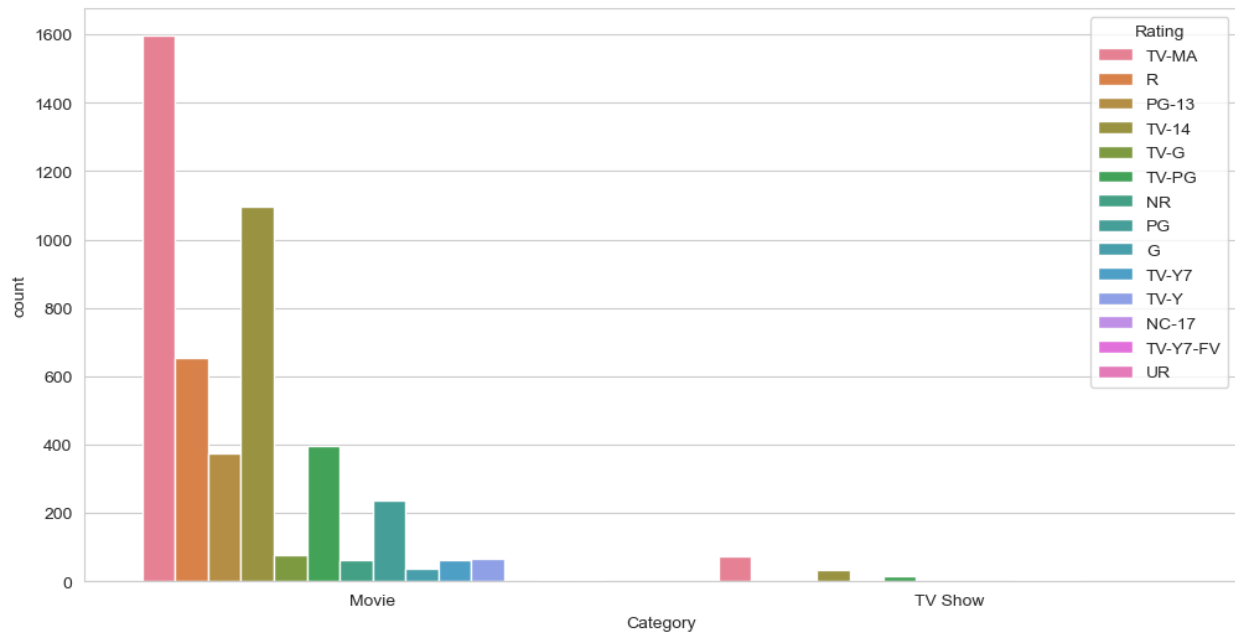
4.data visualization

```

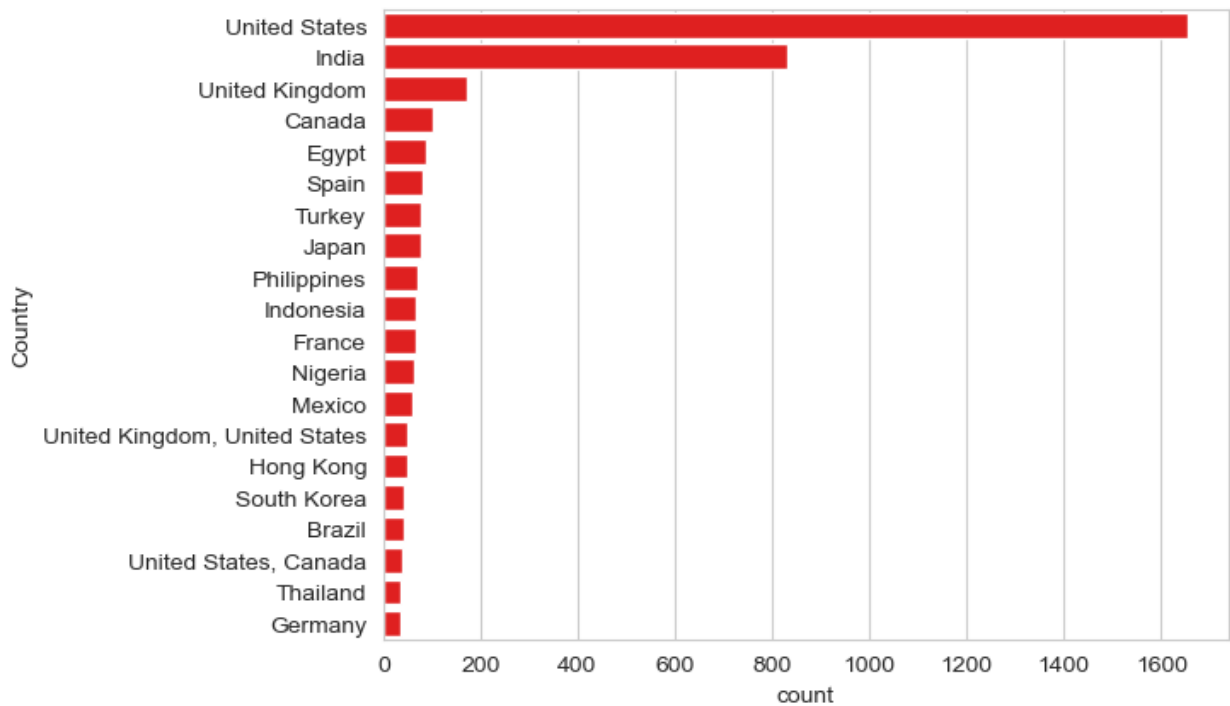
plt.figure(figsize=(12,6))
sns.countplot(x=df['Category'],hue=df['Rating'])

<Axes: xlabel='Category', ylabel='count'>

```



```
top_cats = df['Country'].value_counts().head(20).index
sns.countplot(y='Country', data=df[df['Country'].isin(top_cats)],
order=top_cats,color='red')
plt.show()
```



```
df['Duration_num'] = df['Duration'].astype(str).str.extract('(\d+)', expand=False).astype(float)
```



```

mean_duration = df.loc[df['Duration'].str.contains('min', na=False),
'Duration_num'].mean()
def convert_duration(x):
    if pd.isna(x):
        return np.nan
    x = str(x)
    if 'min' in x:
        return int(x.replace('min', '').strip())
    elif 'Season' in x:
        # Extract the number before 'Season(s)' (default 1 if not
        present)
        n_seasons = int(''.join(filter(str.isdigit, x)) or 1)
        return n_seasons * mean_duration
    else:
        return np.nan
df['Duration_final'] = df['Duration'].apply(convert_duration)
df = df.dropna(subset=['Duration_final']).reset_index(drop=True)
print(df[['Duration', 'Duration_final']])

```

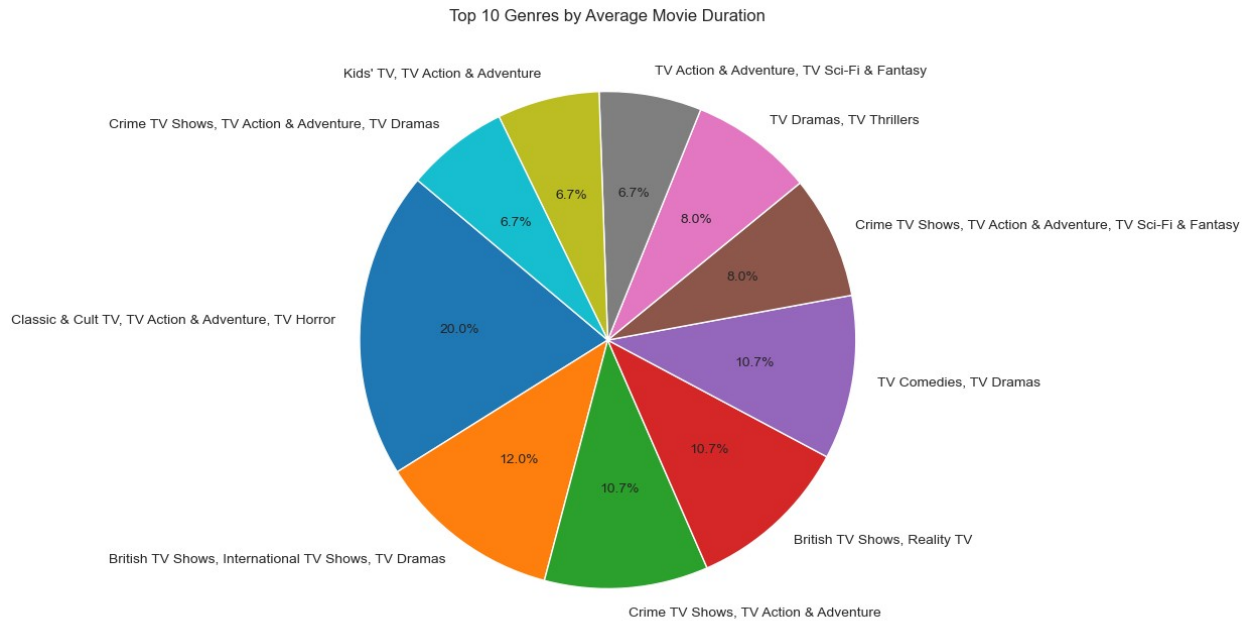
	Duration	Duration_final
0	93 min	93.000000
1	78 min	78.000000
2	80 min	80.000000
3	123 min	123.000000
4	1 Season	102.396791
...
4806	88 min	88.000000
4807	94 min	94.000000
4808	88 min	88.000000
4809	99 min	99.000000
4810	111 min	111.000000

[4811 rows x 2 columns]

```

avg_duration = df.groupby('Type')['Duration_final'].mean()
top_n = 10
avg_duration = avg_duration.sort_values(ascending=False).head(top_n)
plt.figure(figsize=(8, 8))
plt.pie(avg_duration, labels=avg_duration.index, autopct='%1.1f%%',
startangle=140)
plt.title(f'Top {top_n} Genres by Average Movie Duration')
plt.show()

```



```
top_country=df.groupby('Category')['Country']
top_country.value_counts()
```

```
Category Country
```

```
Movie United States
1628
```

```
India
```

```
827
```

```
United Kingdom
```

```
155
```

```
Canada
```

```
101
```

```
Egypt
```

```
87
```

```
...
```

```
TV Show United Kingdom, Germany, United States, France
```

```
1
```

```
United Kingdom, Ireland, United States
```

```
1
```

```
United Kingdom, United States, Spain, Germany, Greece,
```

```
Canada
```

```
1
```

```
United States, Ireland
```

```
1
```

```
United States, Israel, Italy, South Africa
```

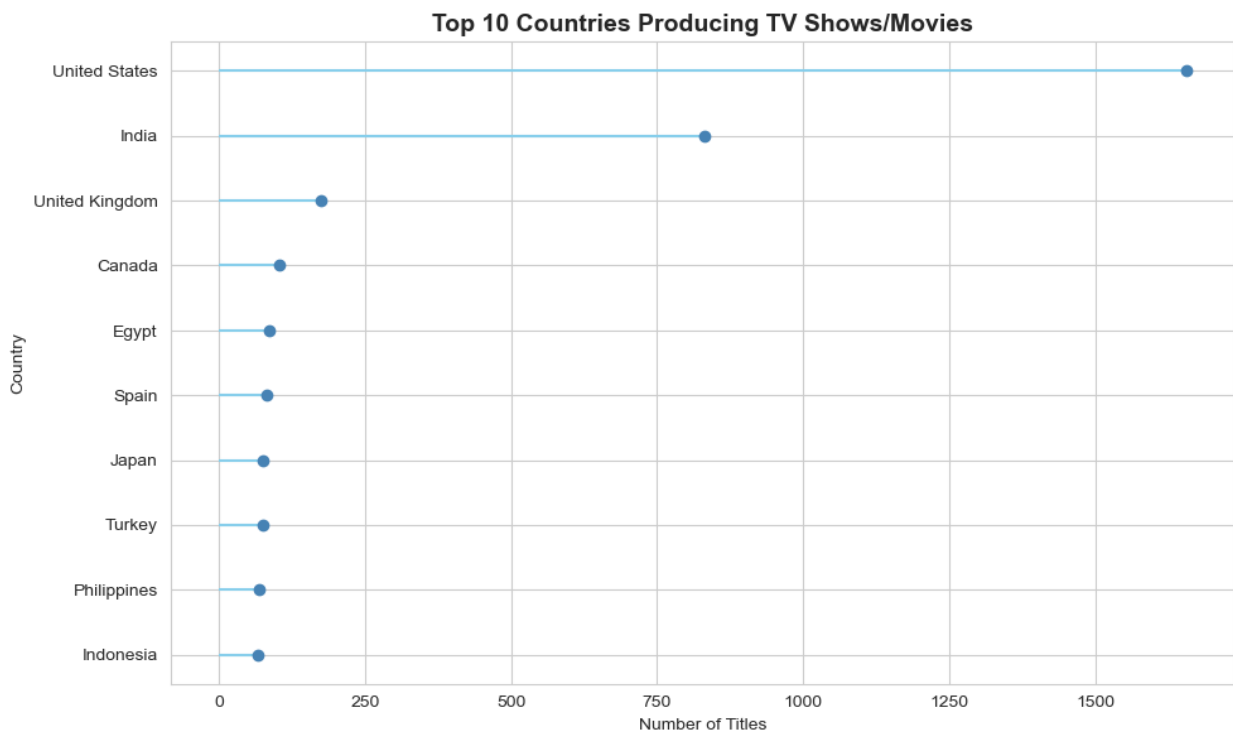
```
1
```

```
Name: count, Length: 576, dtype: int64
```

```

country_count = df['Country'].value_counts().head(10).reset_index()
country_count.columns = ['Country', 'Count']
plt.figure(figsize=(10,6))
sns.set_style("whitegrid")
country_count = country_count.sort_values('Count')
plt.hlines(y=country_count['Country'], xmin=0,
xmax=country_count['Count'], color='skyblue')
plt.plot(country_count['Count'], country_count['Country'], "o",
color='steelblue')
plt.title("Top 10 Countries Producing TV Shows/Movies", fontsize=14,
weight='bold')
plt.xlabel("Number of Titles")
plt.ylabel("Country")
plt.tight_layout()
plt.show()

```

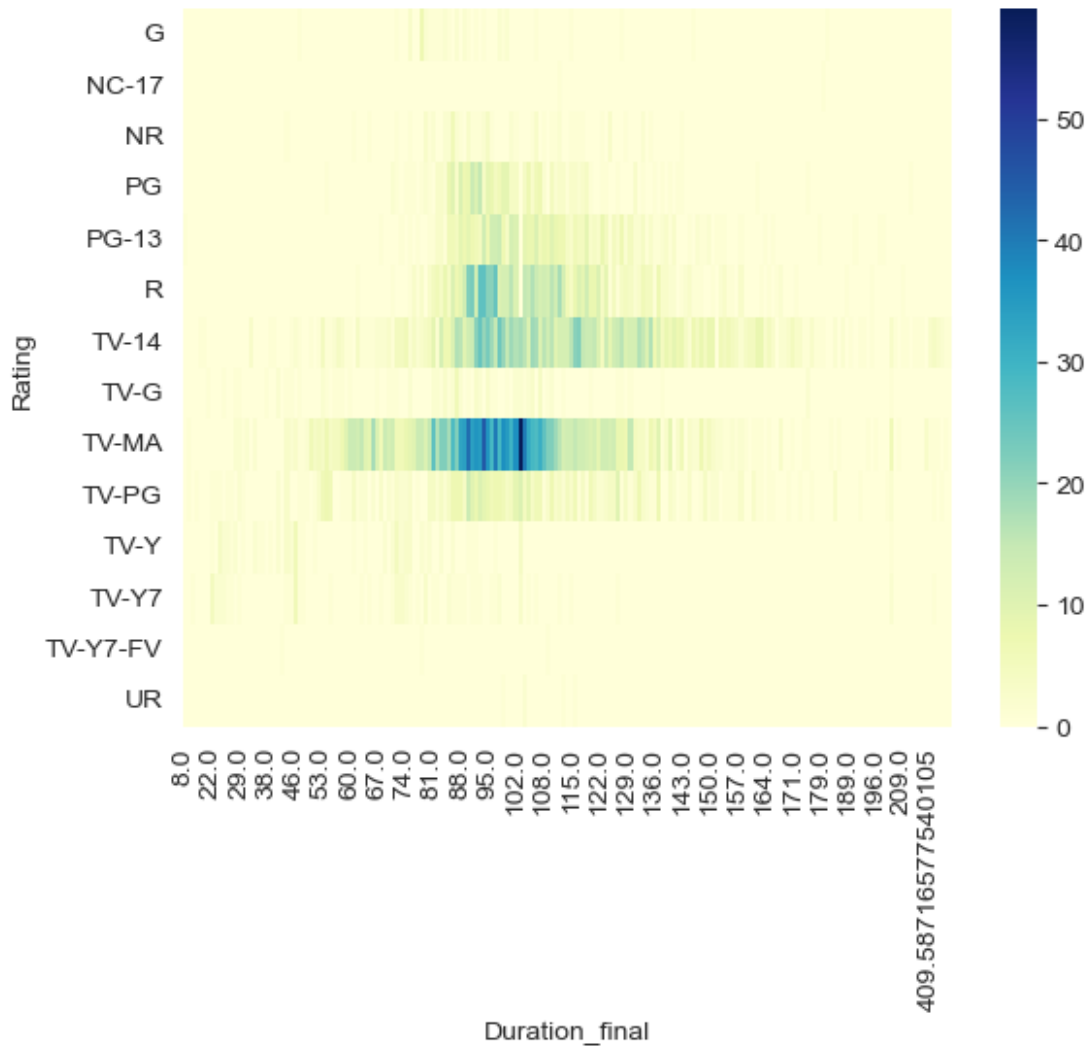


```

heat_data =
df.groupby(['Rating', 'Duration_final']).size().unstack(fill_value=0)
sns.heatmap(heat_data, cmap='YlGnBu')

<Axes: xlabel='Duration_final', ylabel='Rating'>

```



```
df['Release_Date'] = pd.to_datetime(df['Release_Date'], format='%B %d, %Y', errors='coerce')

# Extract year
df['Year'] = df['Release_Date'].dt.year

# Drop rows where Year couldn't be parsed
df = df.dropna(subset=['Year'])

# Group and count titles per year and type
yearly = df.groupby(['Year', 'Type']).size().reset_index(name='Count')

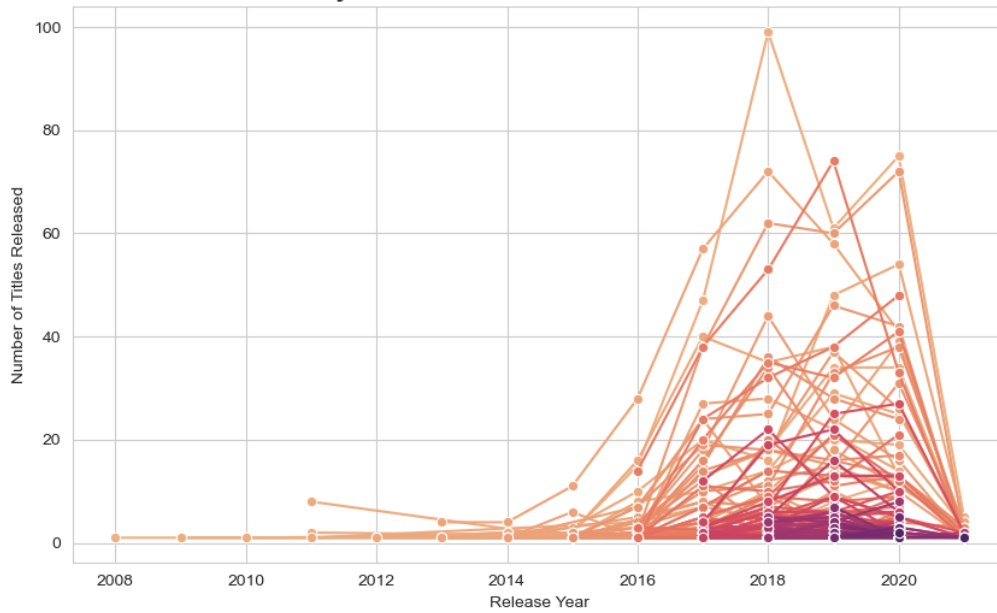
# Plot
plt.figure(figsize=(10,6))
sns.set_style("whitegrid")

sns.lineplot(
    data=yearly,
```

```
x='Year',
y='Count',
hue='Type',
marker='o',
palette='flare'
)

plt.title("Yearly Trend of Movies vs TV Shows on Netflix",
          fontsize=14, weight='bold')
plt.xlabel("Release Year")
plt.ylabel("Number of Titles Released")
plt.legend(
    title='Type',
    loc='upper center',          # Centered horizontally
    bbox_to_anchor=(0.5, -0.15), # Move below the plot
    ncol=2,                     # Two columns (Movies | TV Shows)
    frameon=False
)
plt.tight_layout()
plt.show()
```

Yearly Trend of Movies vs TV Shows on Netflix



- Dramas, Independent Movies, Thrillers
- Dramas, International Movies
- Horror Movies
- Cult Movies, Horror Movies
- Children & Family Movies, Dramas, Faith & Spirituality
- Dramas
- Dramas, Sports Movies
- Dramas, Thrillers
- Children & Family Movies, Comedies
- Comedies
- Documentaries
- Children & Family Movies, Comedies, Music & Musicals
- Children & Family Movies, Documentaries, Sports Movies
- Crime TV Shows, International TV Shows, TV Dramas
- Stand-Up Comedy
- Action & Adventure, Sci-Fi & Fantasy
- Children & Family Movies
- Children & Family Movies, Sci-Fi & Fantasy
- Documentaries, International Movies
- Documentaries, Sports Movies
- Movies
- Action & Adventure, Comedies
- Action & Adventure, Dramas, International Movies
- British TV Shows, Docuseries, International TV Shows
- Children & Family Movies, Comedies, Sports Movies
- Children & Family Movies, Music & Musicals
- Comedies, Dramas, Independent Movies
- Comedies, Dramas, International Movies
- Comedies, Dramas, LGBTQ Movies
- Comedies, Independent Movies
- Comedies, International Movies
- Comedies, Music & Musicals
- Documentaries, Music & Musicals
- Documentaries, Stand-Up Comedy
- Dramas, Independent Movies
- Dramas, Independent Movies, Romantic Movies
- Dramas, Independent Movies, Sci-Fi & Fantasy
- Dramas, International Movies, Thrillers
- Horror Movies, Independent Movies, Thrillers
- TV Horror, TV Mysteries, TV Thrillers
- Action & Adventure
- Action & Adventure, Anime Features, International Movies
- Action & Adventure, Anime Features, Sci-Fi & Fantasy

Type

- Action & Adventure, Comedies, Horror Movies
- Action & Adventure, Comedies, Sci-Fi & Fantasy
- Action & Adventure, Cult Movies, Sci-Fi & Fantasy
- Action & Adventure, Dramas
- Action & Adventure, Dramas, Faith & Spirituality
- Action & Adventure, Dramas, Sci-Fi & Fantasy
- Action & Adventure, Faith & Spirituality, Sci-Fi & Fantasy
- Action & Adventure, Horror Movies
- Action & Adventure, Horror Movies, Independent Movies
- Action & Adventure, Horror Movies, Sci-Fi & Fantasy
- Action & Adventure, International Movies, Sports Movies
- Anime Features, Children & Family Movies, International Movies
- Anime Features, International Movies, Romantic Movies
- Anime Series, International TV Shows, TV Horror
- British TV Shows, International TV Shows, Stand-Up Comedy & Talk Shows
- British TV Shows, Kids' TV
- Children & Family Movies, Comedies, Dramas
- Children & Family Movies, Comedies, Sci-Fi & Fantasy
- Children & Family Movies, Dramas, Independent Movies
- Children & Family Movies, Dramas, International Movies
- Children & Family Movies, Faith & Spirituality
- Classic Movies, Comedies, Cult Movies
- Comedies, Cult Movies
- Comedies, Cult Movies, Horror Movies
- Comedies, Cult Movies, International Movies
- Comedies, Documentaries
- Comedies, Faith & Spirituality, International Movies
- Crime TV Shows, Docuseries
- Cult Movies, Horror Movies, Independent Movies
- Cult Movies, Independent Movies, Thrillers
- Documentaries, Faith & Spirituality
- Documentaries, LGBTQ Movies
- Dramas, Faith & Spirituality, Independent Movies
- Dramas, Faith & Spirituality, International Movies
- Dramas, Independent Movies, Music & Musicals
- Dramas, Independent Movies, Sports Movies
- Dramas, International Movies, Sci-Fi & Fantasy
- Dramas, Music & Musicals, Sports Movies
- Dramas, Romantic Movies, Sci-Fi & Fantasy
- Dramas, Sci-Fi & Fantasy
- Dramas, Sci-Fi & Fantasy, Thrillers
- Horror Movies, Independent Movies, Sci-Fi & Fantasy
- Horror Movies, International Movies, Sci-Fi & Fantasy

```
sns.catplot(data=df, x='Rating', kind='count', hue='Type',  
            col='Country', col_wrap=3, height=3, aspect=1.2,  
            palette='crest')
```