In [2]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

About NETFLIX

Netflix is one of the most popular media and video streaming platforms. They have over 10000 movies or tv shows available on their platform, as of mid-2021, they have over 222M Subscribers globally. This tabular dataset consists of listings of all the movies and tv shows available on Netflix, along with details such as - cast, directors, ratings, release year, duration, etc.

Business Problem

Analyze the data and generate insights that could help Netflix in deciding which type of shows/movies to produce and how they can grow the business in different countries

In [3]:
```
df = pd.read_csv('netflix.csv')
df.head()
```

Out[3]:

	show_id	type	title	director	cast	country	date_added	release_year
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	NaN	September 24, 2021	2021
3	s4	TV Show	Jailbirds New Orleans	NaN	NaN	NaN	September 24, 2021	2021
4	s5	TV Show	Kota Factory	NaN	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...	India	September 24, 2021	2021

Basic EDA to understand the data

In [ ]:
```
# Dataset has 8807 data points and 12 features

df.shape
```

Out[ ]:
```
(8807, 12)
```

In [ ]:
```
# Dimension of the dataset

df.ndim
```

Out[ ]:
```
2
```

In [6]:
```
# Check the basic info datatype, name, total entries

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
```

In [7]:
```
# Check the unique directors

df['director'].nunique()
```

Out[7]: 4528

In [8]:
```
# Check how many Movies and TV shows

df['type'].value_counts()
```

Out[8]:
```
type
Movie      6131
TV Show    2676
Name: count, dtype: int64
```

In [ ]:
```
# check duplicate row present?

df.loc[df.duplicated()]
```

Out[ ]:

show_id	type	title	director	cast	country	date_added	release_year	rating	durati

In [ ]:
```
# Check how many countries data available

df['country'].nunique()

# 748 countries data available
```

Out[ ]: 748

In [11]:
```
# List of countries produced movies/tv shows

df['country'].value_counts()
```

Out[11]:
```
country
United States                                2818
India                                         972
United Kingdom                                419
Japan                                         245
South Korea                                   199
                                             ...
Russia, Spain                                   1
Croatia, Slovenia, Serbia, Montenegro           1
Japan, Canada                                   1
United States, France, South Korea, Indonesia   1
United Arab Emirates, Jordan                    1
Name: count, Length: 748, dtype: int64
```

In [12]:
```
# Check for how many years of data available

df['release_year'].min(), df['release_year'].max()
```

Out[12]:
```
(1925, 2021)
```

In [13]:
```
# Check how many genre available

df['listed_in'].nunique()
```

Out[13]:
```
514
```

In [ ]:
```

```

Un-nesting the data

In [14]:
```
df_new = df.copy(deep=True)
df_new.head()
```

Out[14]:

	show_id	type	title	director	cast	country	date_added	release_year
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	NaN	September 24, 2021	2021
3	s4	TV Show	Jailbirds New Orleans	NaN	NaN	NaN	September 24, 2021	2021
4	s5	TV Show	Kota Factory	NaN	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...	India	September 24, 2021	2021

In [15]:
```
df_new.rename(columns={'cast' : 'actor', 'listed_in':'genre'}, inplace=True)
df_new.head()
```

Out[15]:

	show_id	type	title	director	actor	country	date_added	release_year
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	NaN	September 24, 2021	2021
3	s4	TV Show	Jailbirds New Orleans	NaN	NaN	NaN	September 24, 2021	2021
4	s5	TV Show	Kota Factory	NaN	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...	India	September 24, 2021	2021

In [ ]:

```
# Un-nesting actor column

df_new['actor'] = df_new['actor'].str.split(', ')
df_new.head()
```

Out[ ]:

	show_id	type	title	director	actor	country	date_added	release_year
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020
1	s2	TV Show	Blood & Water	NaN	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	South Africa	September 24, 2021	2021
2	s3	TV Show	Ganglands	Julien Leclercq	[Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nab...	NaN	September 24, 2021	2021
3	s4	TV Show	Jailbirds New Orleans	NaN	NaN	NaN	September 24, 2021	2021
4	s5	TV Show	Kota Factory	NaN	[Mayur More, Jitendra Kumar, Ranjan Raj, Alam ...	India	September 24, 2021	2021

In [17]:
```
df_new = df_new.explode('actor')
df_new.head()
```

Out[17]:

	show_id	type	title	director	actor	country	date_added	release_year	rat
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Gail Mabalane	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Thabang Molaba	South Africa	September 24, 2021	2021	

In [18]:
```
df_new.shape
```

Out[18]:
```
(64951, 12)
```

In [ ]:
```
# Un-nesting director column

df_new['director'] = df_new['director'].str.split(', ')
df_new = df_new.explode('director')
df_new.head()
```

Out[ ]:

	show_id	type	title	director	actor	country	date_added	release_year	rat
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Gail Mabalane	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Thabang Molaba	South Africa	September 24, 2021	2021	

In [20]:
```
df_new.shape
```

Out[20]:
```
(70812, 12)
```

In [ ]:
```
# Un-nesting country column

df_new['country'] = df_new['country'].str.split(', ')
df_new = df_new.explode('country')
df_new.head()
```

Out[ ]:

	show_id	type	title	director	actor	country	date_added	release_year	rat
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Gail Mabalane	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Thabang Molaba	South Africa	September 24, 2021	2021	

In [22]:
```
df_new.shape
```

Out[22]:
```
(89382, 12)
```

In [ ]:
```
# Un-nesting genre column

df_new['genre'] = df_new['genre'].str.split(', ')
df_new = df_new.explode('genre')
df_new.head()
```

Out[ ]:

	show_id	type	title	director	actor	country	date_added	release_year	ratin
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-1
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV M
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV M
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV M
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	TV M

In [24]:
```
df_new.shape
```

Out[24]:
```
(201991, 12)
```

In [25]:
```
df_new['director'].str.contains(', ').sum()
```

Out[25]:
```
0
```

In [26]:
```
df_new['actor'].str.contains(', ').sum()
```

Out[26]:
```
0
```

In [27]:
```
df_new['genre'].str.contains(', ').sum()
```

Out[27]:
```
np.int64(0)
```

In [28]:
```
df_new['country'].str.contains(', ').sum()
```

Out[28]:
```
0
```

In [29]:
```
df_new.isna().sum()
```

Out[29]:
```
show_id            0
type               0
title              0
director       50643
actor           2146
country        11897
date_added       158
release_year       0
rating            67
duration           3
genre              0
description        0
dtype: int64
```

In [30]:
```
df_new.dropna(subset=['date_added', 'rating', 'duration'], inplace=True)
```

In [31]:
```
df_new.isna().sum()
```

Out[31]:
```
show_id            0
type               0
title              0
director       50425
actor           2146
country        11894
date_added         0
release_year       0
rating             0
duration           0
genre              0
description        0
dtype: int64
```

Imputing missing values

In [32]:
```
df_new.head(10)
```

Out[32]:

	show_id	type	title	director	actor	country	date_added	release_year	rat
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Gail Mabalane	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Gail Mabalane	South Africa	September 24, 2021	2021	

	show_id	type	title	director	actor	country	date_added	release_year	rat
1	s2	TV Show	Blood & Water	NaN	Gail Mabalane	South Africa	September 24, 2021	2021	

In [33]:
```
df_new['type'].value_counts()
```

Out[33]:
```
type
Movie      145831
TV Show     55932
Name: count, dtype: int64
```

In [34]:
```
df_new.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 201763 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column        Non-Null Count   Dtype
---  ------        --------------   -----
 0   show_id       201763 non-null  object
 1   type          201763 non-null  object
 2   title         201763 non-null  object
 3   director      151338 non-null  object
 4   actor         199617 non-null  object
 5   country       189869 non-null  object
 6   date_added    201763 non-null  object
 7   release_year  201763 non-null  int64
 8   rating        201763 non-null  object
 9   duration      201763 non-null  object
 10  genre         201763 non-null  object
 11  description   201763 non-null  object
dtypes: int64(1), object(11)
memory usage: 20.0+ MB
```

In [35]:
```
df_new['date_added_copy'] = pd.to_datetime(df_new['date_added'].str.strip(), for
```

In [36]:
```
df_new.head()
```

Out[36]:

	show_id	type	title	director	actor	country	date_added	release_year	ratin
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-1
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV M
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV M
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV M
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	TV M

Replacing NAN with unknown

In [37]:
```
df_new['director'] = df_new['director'].fillna('Unknown_director')
df_new.head()
```

Out[37]:

	show_id	type	title	director	actor	country	date_added	release_ye
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	20
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	20
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	20
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	20
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	20

In [38]:

```
df_new['actor'] = df_new['actor'].fillna('Unknown_actor')
df_new.head()
```

Out[38]:

	show_id	type	title	director	actor	country	date_added	rel
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown_actor	United States	September 25, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	

In [39]:

```
df_new['country'] = df_new['country'].fillna('Unknown_country')
df_new.head()
```

Out[39]:

	show_id	type	title	director	actor	country	date_added	rel
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown_actor	United States	September 25, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	

In [40]:
```
df_new.isna().sum()
```

Out[40]:
```
show_id           0
type              0
title             0
director          0
actor             0
country           0
date_added        0
release_year      0
rating            0
duration          0
genre             0
description       0
date_added_copy   0
dtype: int64
```

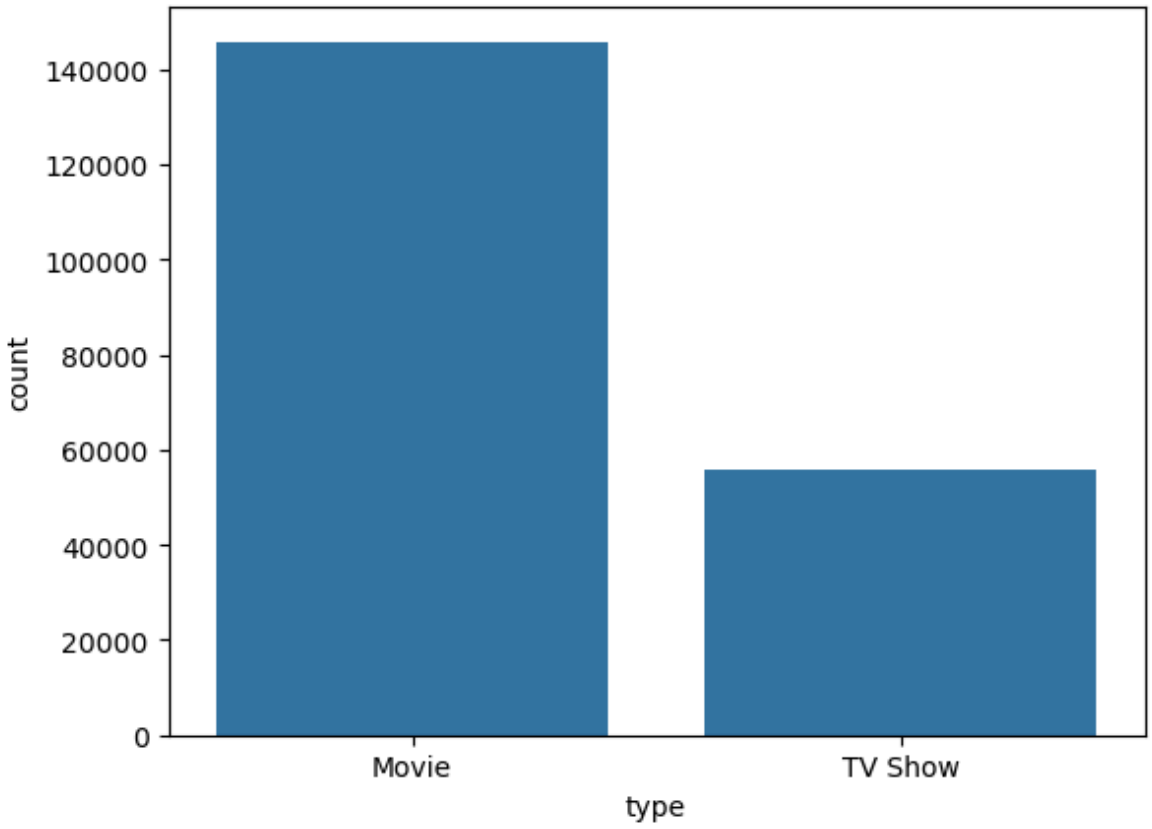
Exploratory Data Analysis(EDA) and Explanatory Data Analysis(ExDA)

1. Categorical variable graphical and non-graphical analysis ?

In [41]:
```
# This shows count of movies are more than tv shows - Non graphical
df_new['type'].value_counts()
```

Out[41]:
```
type
Movie      145831
TV Show     55932
Name: count, dtype: int64
```

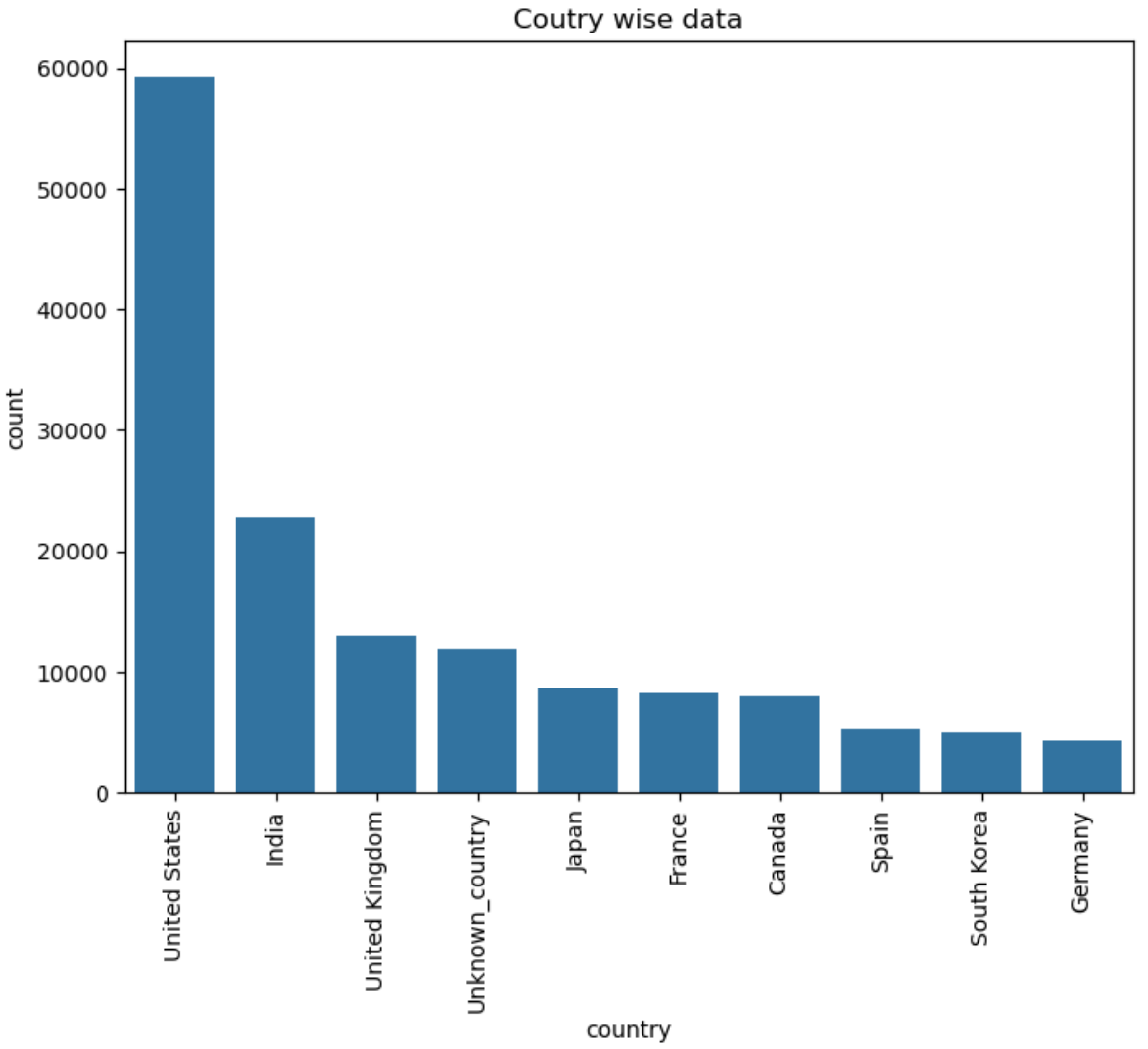
In [42]:
```
# Compare number of Movies v/s TV shows

x_bar = df_new['type'].index
y_bar = df_new['type']
sns.countplot(data = df_new, x='type')
plt.show()

# Movies are more directed than TV shows
```



In [43]:
```
# Count the number movies and tv shows done by each country

df_new['country'].value_counts()
```

Out[43]:
```
country
United States      59262
India              22814
United Kingdom     12918
Unknown_country    11894
Japan               8599
                   ...
Botswana               2
United States,         1
Nicaragua              1
Kazakhstan             1
Uganda                 1
Name: count, Length: 128, dtype: int64
```

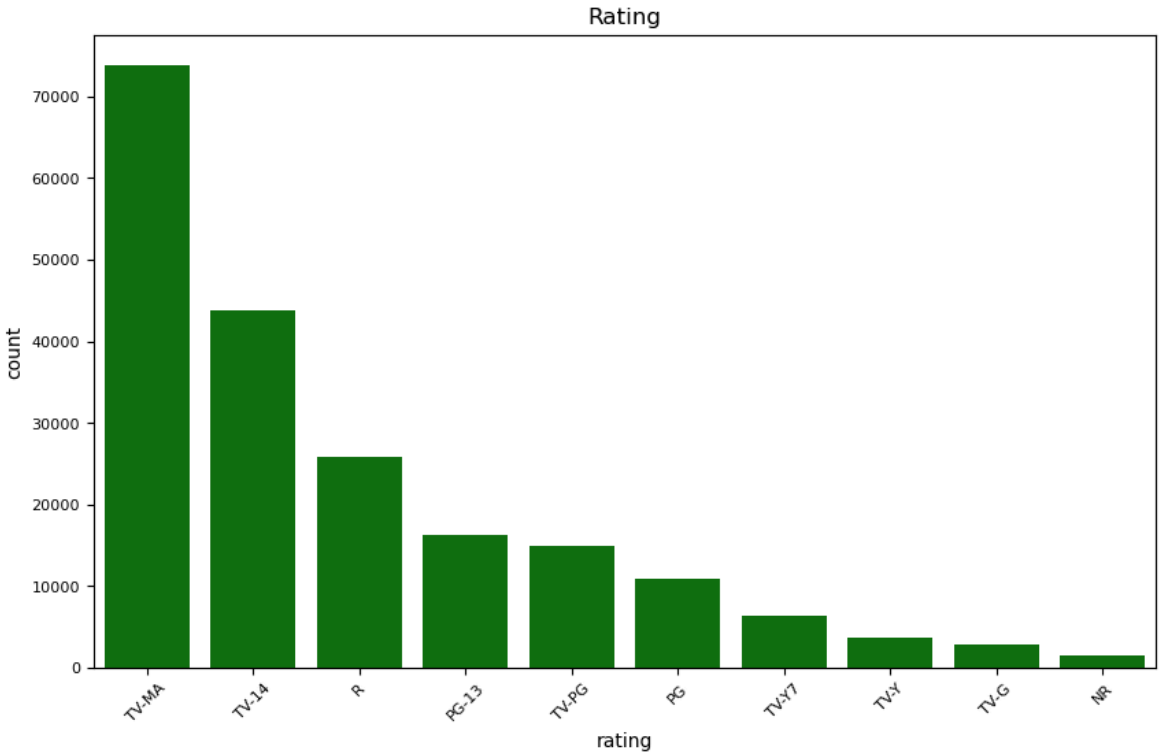
In [44]:
```
# Lets compare country which are directed movies/tvshows

plt.figure(figsize=(8, 6))
sns.barplot(data = df_new['country'].value_counts().head(10))
plt.title('Coutry wise data')
plt.xticks(rotation = 90)
plt.show()

# United states are the top country in producing movies/tv shows
```



In [45]:
```
# Count the number of each ratings

df_new['rating'].value_counts()
```

Out[45]:
```
rating
TV-MA       73835
TV-14       43859
R           25860
PG-13       16246
TV-PG       14913
PG          10919
TV-Y7        6294
TV-Y         3664
TV-G         2779
NR           1543
G            1530
NC-17         149
TV-Y7-FV       86
UR             86
Name: count, dtype: int64
```

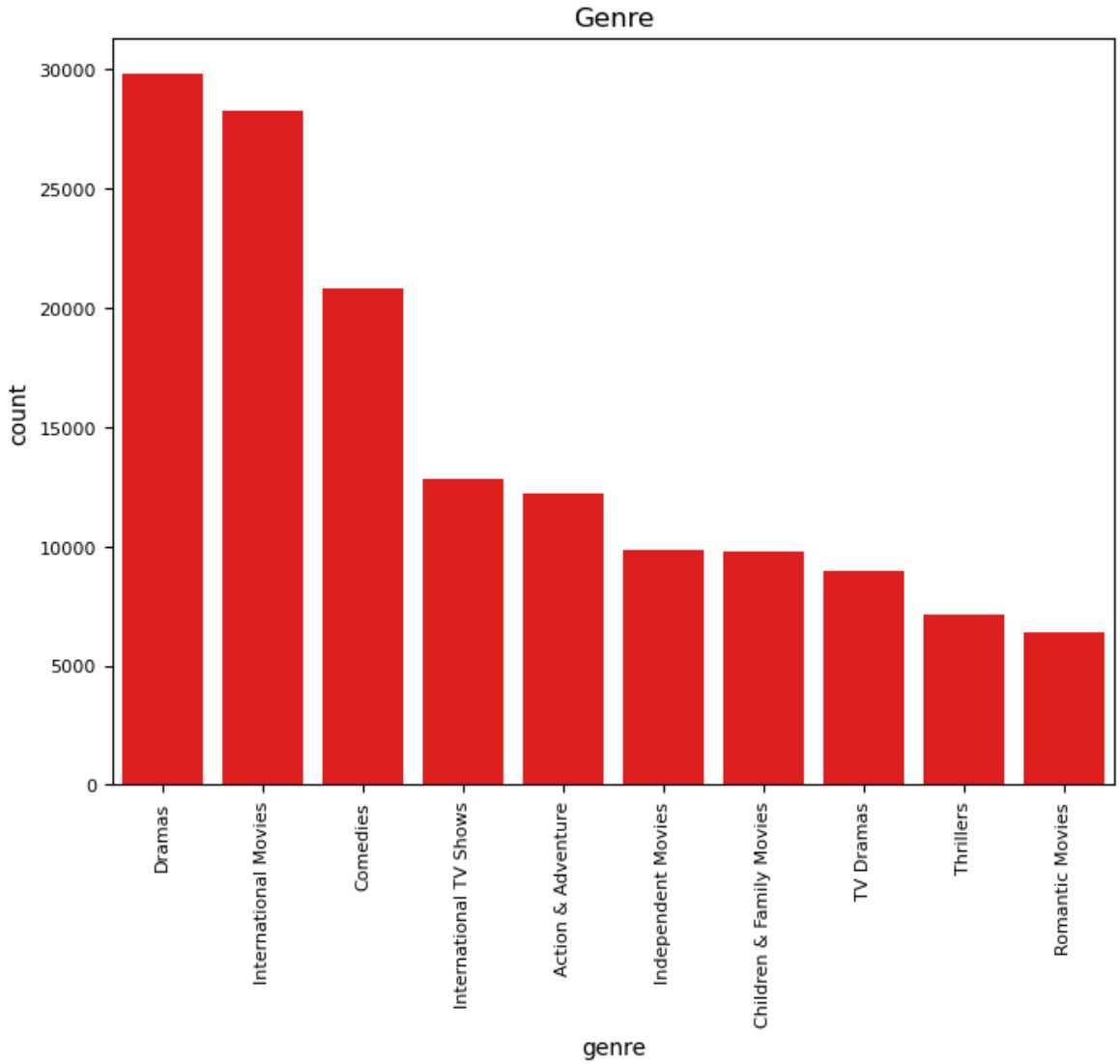
In [46]:
```
# Compare the ratings of different rating type

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

sns.barplot(data = df_new['rating'].value_counts().head(10), color='green')
plt.title('Rating')
plt.xticks(fontsize=8)
plt.yticks(fontsize=8)
plt.xticks(rotation = 45)
plt.show()

# Mature Audiance content is highly rated follows by 14+ etc
```



In [47]:
```
# Count which content type is more popular

df_new['genre'].value_counts()
```

Out[47]:
```
genre
Dramas                            29768
International Movies              28211
Comedies                          20829
International TV Shows            12815
Action & Adventure                12216
Independent Movies                 9834
Children & Family Movies           9771
TV Dramas                          8933
Thrillers                          7107
Romantic Movies                    6412
TV Comedies                        4907
Crime TV Shows                     4715
Horror Movies                      4571
Kids' TV                           4555
Sci-Fi & Fantasy                   4037
Music & Musicals                   3077
Romantic TV Shows                  3049
Documentaries                      2407
TV Action & Adventure              2278
Anime Series                       2273
Spanish-Language TV Shows          2118
British TV Shows                   1799
Sports Movies                      1531
Classic Movies                     1434
TV Mysteries                       1281
Korean TV Shows                    1122
Cult Movies                        1077
Anime Features                     1045
TV Sci-Fi & Fantasy                1035
TV Horror                           941
Docuseries                          844
LGBTQ Movies                        838
TV Thrillers                        768
Teen TV Shows                       742
Reality TV                          735
Faith & Spirituality                719
Stand-Up Comedy                     540
Movies                              407
TV Shows                            337
Stand-Up Comedy & Talk Shows        268
Classic & Cult TV                   260
Science & Nature TV                 157
Name: count, dtype: int64
```

In [48]:
```
# Dramas and International movies are more popular

plt.figure(figsize=(8, 6))

sns.barplot(data = df_new['genre'].value_counts().head(10), color='Red')
plt.title('Genre')
plt.xticks(rotation = 90, fontsize=8)
plt.yticks(fontsize=8)
plt.show()
```



In [ ]:

2. TV Shows v/s Movies comparision ?

In [49]:
```
df_new.head()
```

Out[49]:

	show_id	type	title	director	actor	country	date_added	rel
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown_actor	United States	September 25, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	

In [50]:

```
# Top 10 heighest Movies produced contries

df_new_movie = df_new.loc[df_new['type'] == 'Movie']
df_new_movie.head()
```

Out[50]:

	show_id	type	title	director	actor	country	date_added
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown_actor	United States	September 25, 2021
6	s7	Movie	My Little Pony: A New Generation	Robert Cullen	Vanessa Hudgens	Unknown_country	September 24, 2021
6	s7	Movie	My Little Pony: A New Generation	José Luis Ucha	Vanessa Hudgens	Unknown_country	September 24, 2021
6	s7	Movie	My Little Pony: A New Generation	Robert Cullen	Kimiko Glenn	Unknown_country	September 24, 2021
6	s7	Movie	My Little Pony: A New Generation	José Luis Ucha	Kimiko Glenn	Unknown_country	September 24, 2021

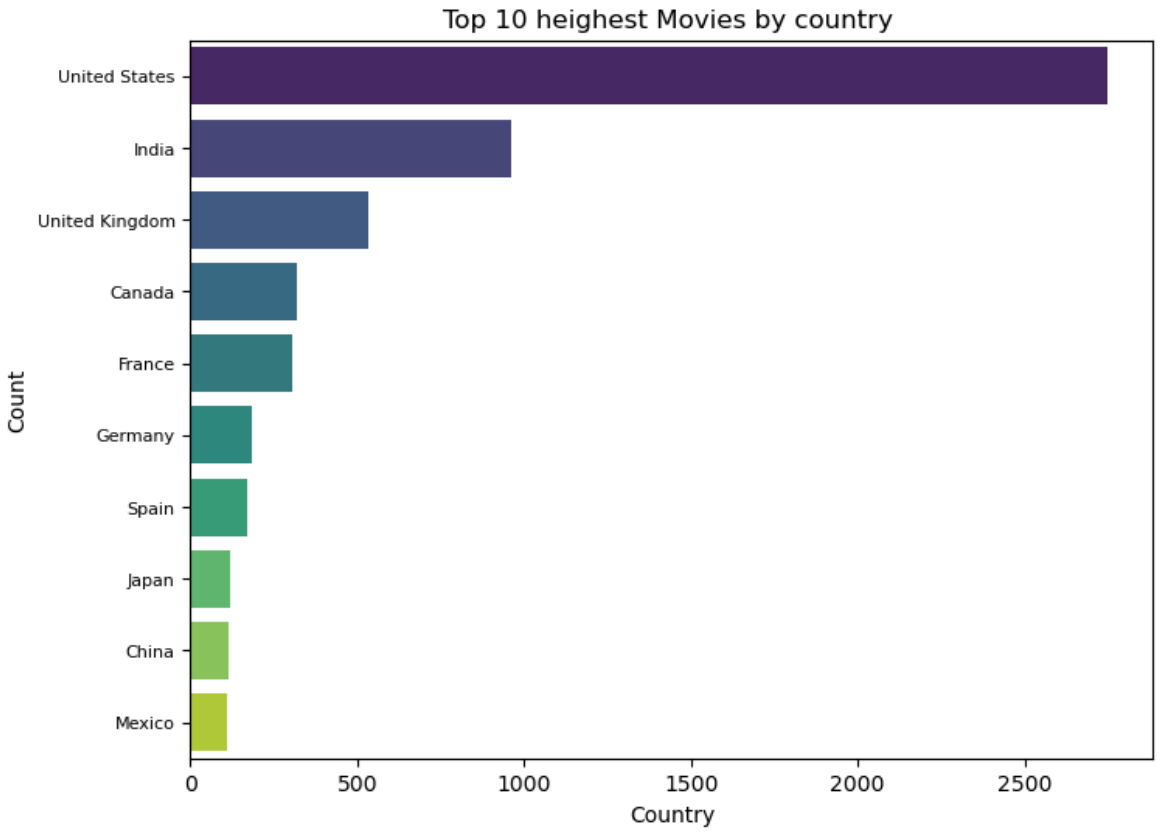
In [51]:
```
filtered_df_new_movie = df_new_movie[df_new_movie['country'] != 'Unknown_country
count_df_new_movie = filtered_df_new_movie.groupby('country')['title'].nunique()
count_df_new_movie
```

Out[51]:
```
country
                 1
Afghanistan      1
Albania          1
Algeria          3
Angola           1
                ..
Vatican City     1
Venezuela        4
Vietnam          7
West Germany     3
Zimbabwe         3
Name: title, Length: 122, dtype: int64
```

In [52]:
```
count_df_new_movie.sort_values(ascending=False).head(10)
```

Out[52]:
```
country
United States     2748
India              962
United Kingdom     532
Canada             319
France             303
Germany            182
Spain              171
Japan              119
China              114
Mexico             111
Name: title, dtype: int64
```

In [53]:
```
plt.figure(figsize=(8, 6))

data_count_df_new_movie = count_df_new_movie.sort_values(ascending=False).head(1
sns.barplot(x = data_count_df_new_movie.values, y=data_count_df_new_movie.index,
plt.title('Top 10 heighest Movies by country ')
plt.xlabel('Country')
plt.ylabel('Count')
plt.yticks(fontsize=8)
plt.show()
```



- Movies: USA, India, UK, Canada, and France lead the way.

In [ ]:
```
```

In [54]:
```
# Top 10 heighest TV Shows produced contries

df_new_tvshow = df_new.loc[df_new['type'] == 'TV Show']
df_new_tvshow.head()
```

Out[54]:

	show_id	type	title	director	actor	country	date_added	release_year
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	2021
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	2021
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	2021
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	2021
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	2021

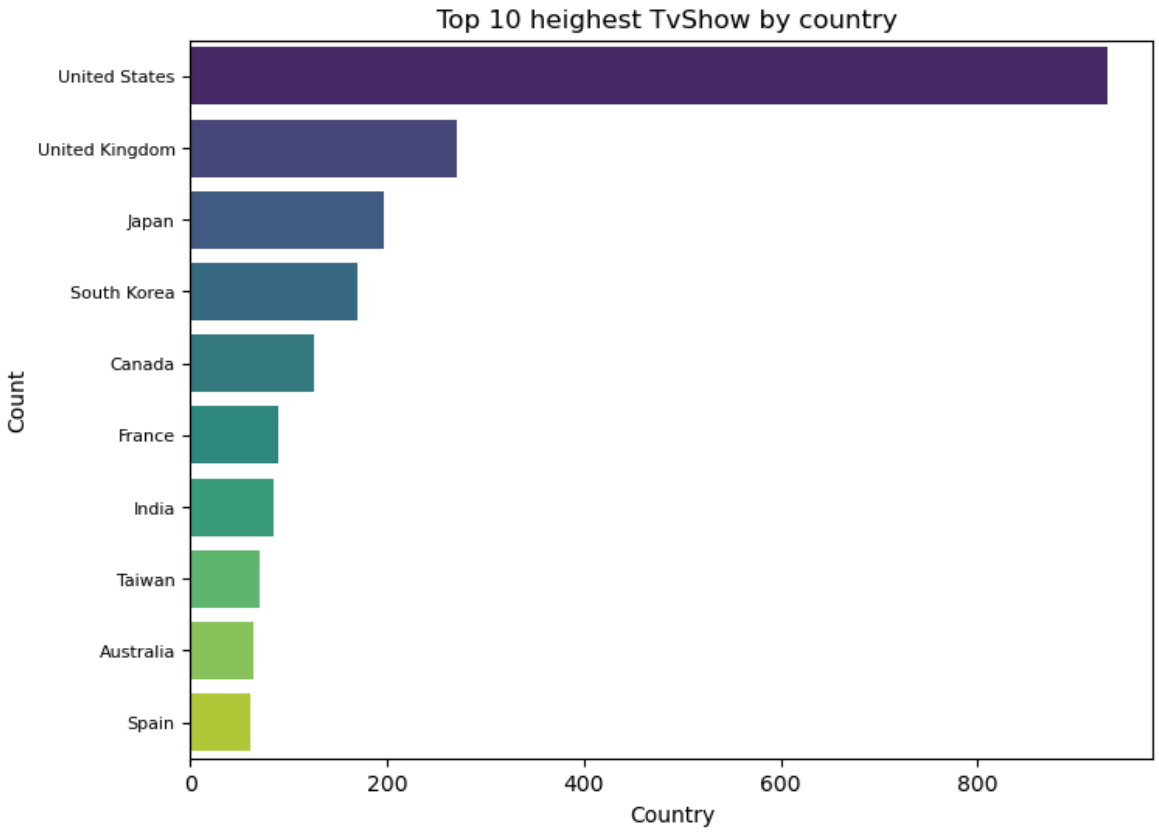
In [55]:
```
filtered_df_new_tvshow = df_new_tvshow[df_new_tvshow['country'] != 'Unknown_coun

count_df_new_tvshow = filtered_df_new_tvshow.groupby('country')['title'].nunique
count_df_new_tvshow
```

Out[55]:
```
country
                        1
Argentina              20
Australia              64
Austria                 1
Azerbaijan              1
                     ...
United Arab Emirates    1
United Kingdom        271
United States         932
Uruguay                 1
West Germany            2
Name: title, Length: 66, dtype: int64
```

In [56]:
```
count_df_new_tvshow.sort_values(ascending=False).head(10)
```

Out[56]:
```
country
United States     932
United Kingdom    271
Japan             197
South Korea       170
Canada            126
France             90
India              84
Taiwan             70
Australia          64
Spain              61
Name: title, dtype: int64
```

In [57]:
```
plt.figure(figsize=(8, 6))

data_count_df_new_tvshow = count_df_new_tvshow.sort_values(ascending=False).head

sns.barplot(x = data_count_df_new_tvshow.values, y=data_count_df_new_tvshow.inde
plt.title('Top 10 heighest TvShow by country ')
plt.xlabel('Country')
plt.ylabel('Count')
plt.yticks(fontsize=8)
plt.show()
```



- TV Shows: USA and UK dominate, followed by Japan and South Korea

In [ ]:
```

```

3. Best time to launch Movies and TV show ?

In [58]:
```
df_new['type'].value_counts()
```

Out[58]:
```
type
Movie      145831
TV Show     55932
Name: count, dtype: int64
```

In [59]:
```
df_new.head()
```

Out[59]:

	show_id	type	title	director	actor	country	date_added	rel
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown_actor	United States	September 25, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	

In [60]:
```
df_new['week_number'] = df_new['date_added_copy'].dt.isocalendar().week
```

In [61]:
```
movies = df_new[df_new['type'] == 'Movie']
tv_shows = df_new[df_new['type'] == 'TV Show']
```

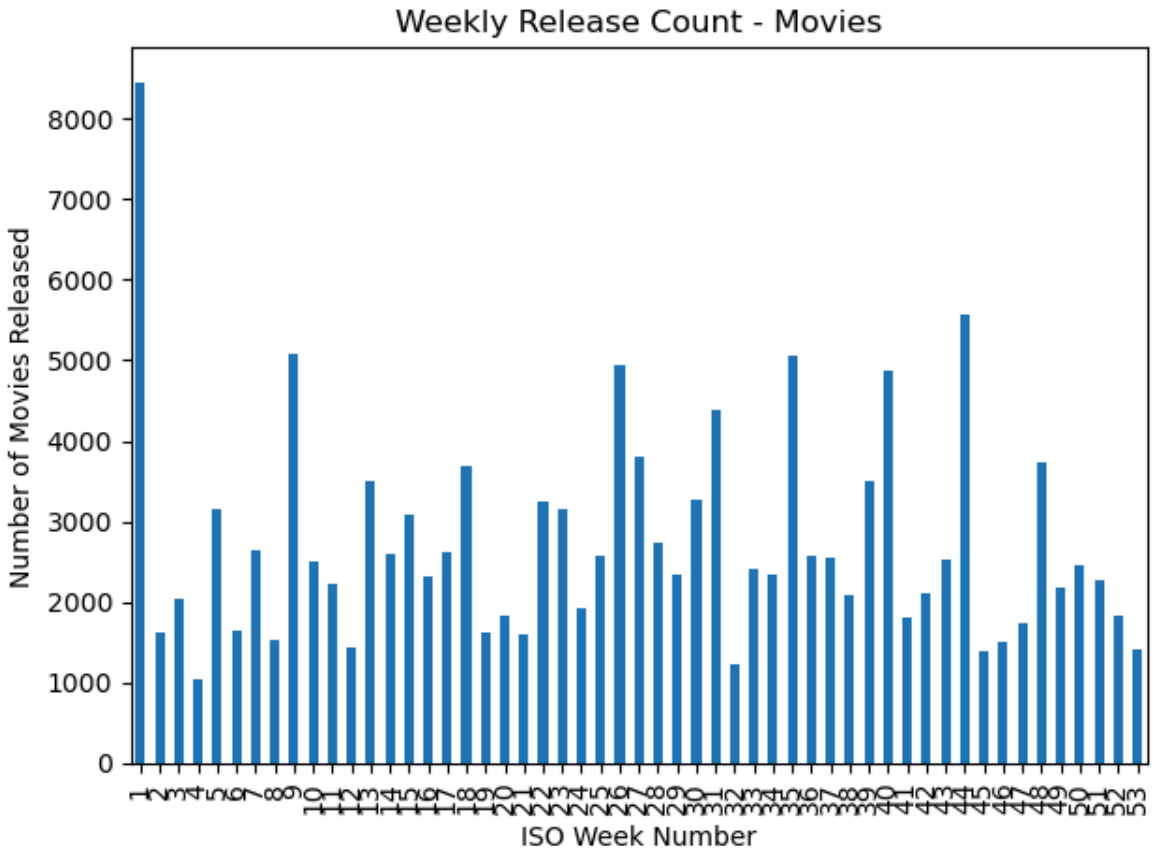
In [62]:
```
df_new.head(5)
```

Out[62]:

	show_id	type	title	director	actor	country	date_added	rel
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown_actor	United States	September 25, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	

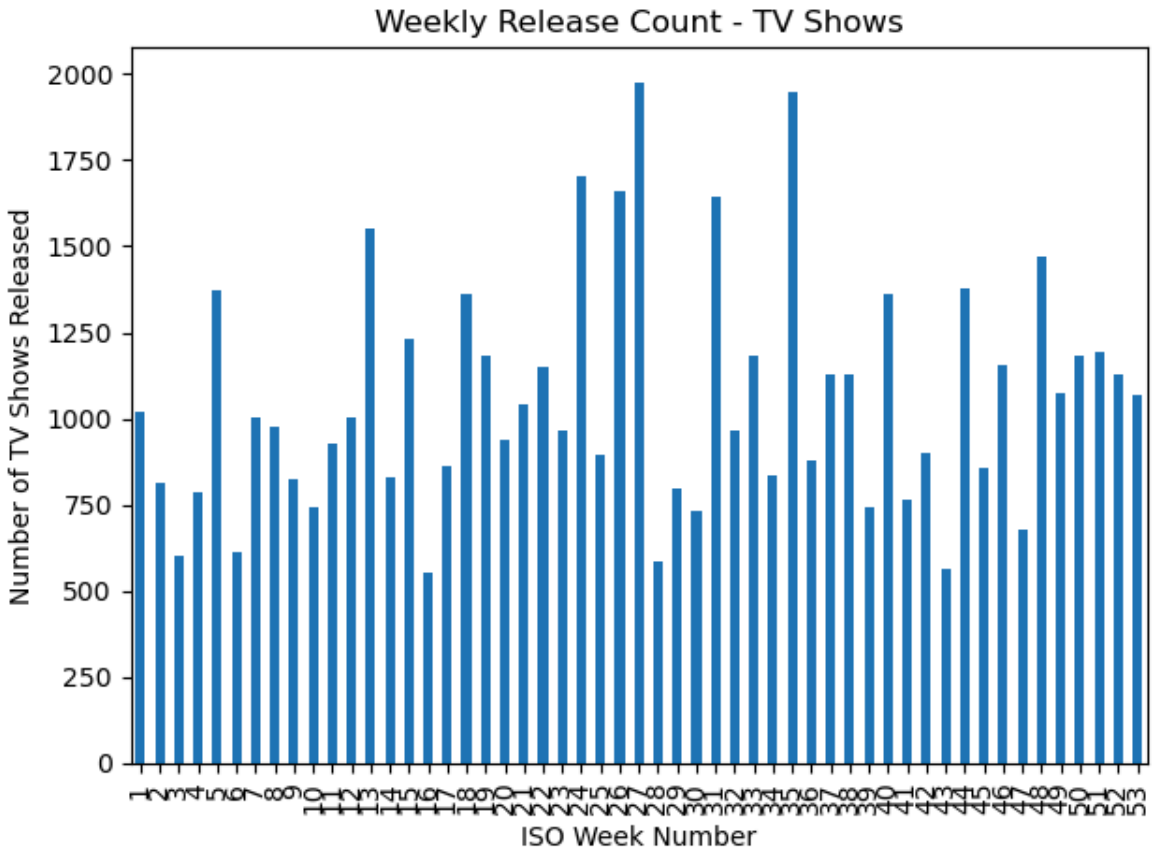
In [63]:
```
movies_week_counts = movies.groupby('week_number')['show_id'].count().sort_value
tv_week_counts = tv_shows.groupby('week_number')['show_id'].count().sort_values(
```

In [64]:
```
plt.figure()
movies_week_counts.sort_index().plot(kind='bar')
plt.title('Weekly Release Count - Movies')
plt.xlabel('ISO Week Number')
plt.ylabel('Number of Movies Released')
plt.tight_layout()
plt.show()
```



- Week 1 is the most movies release and between week 1 and week 9 would be the prime time to release movie to Netflix

In [65]:
```
plt.figure()
tv_week_counts.sort_index().plot(kind='bar')
plt.title('Weekly Release Count - TV Shows')
plt.xlabel('ISO Week Number')
plt.ylabel('Number of TV Shows Released')
plt.tight_layout()
plt.show()
```



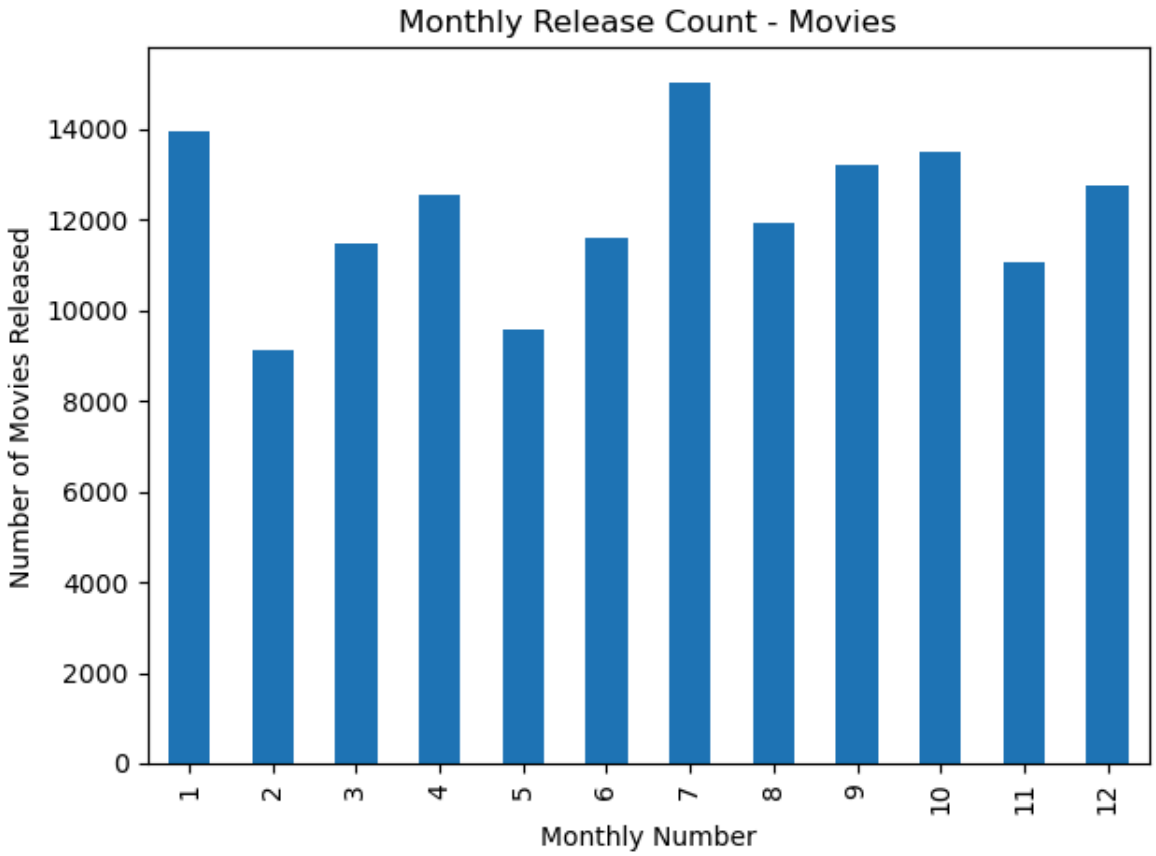
- Week 27 and week 35 is the prime time to release TV shows to the Netflix platform

In [66]:
```
# Monthly ananlysis

df_new['month_number'] = df_new['date_added_copy'].dt.month
```

In [67]:
```
movies = df_new[df_new['type'] == 'Movie']
tv_shows = df_new[df_new['type'] == 'TV Show']
```

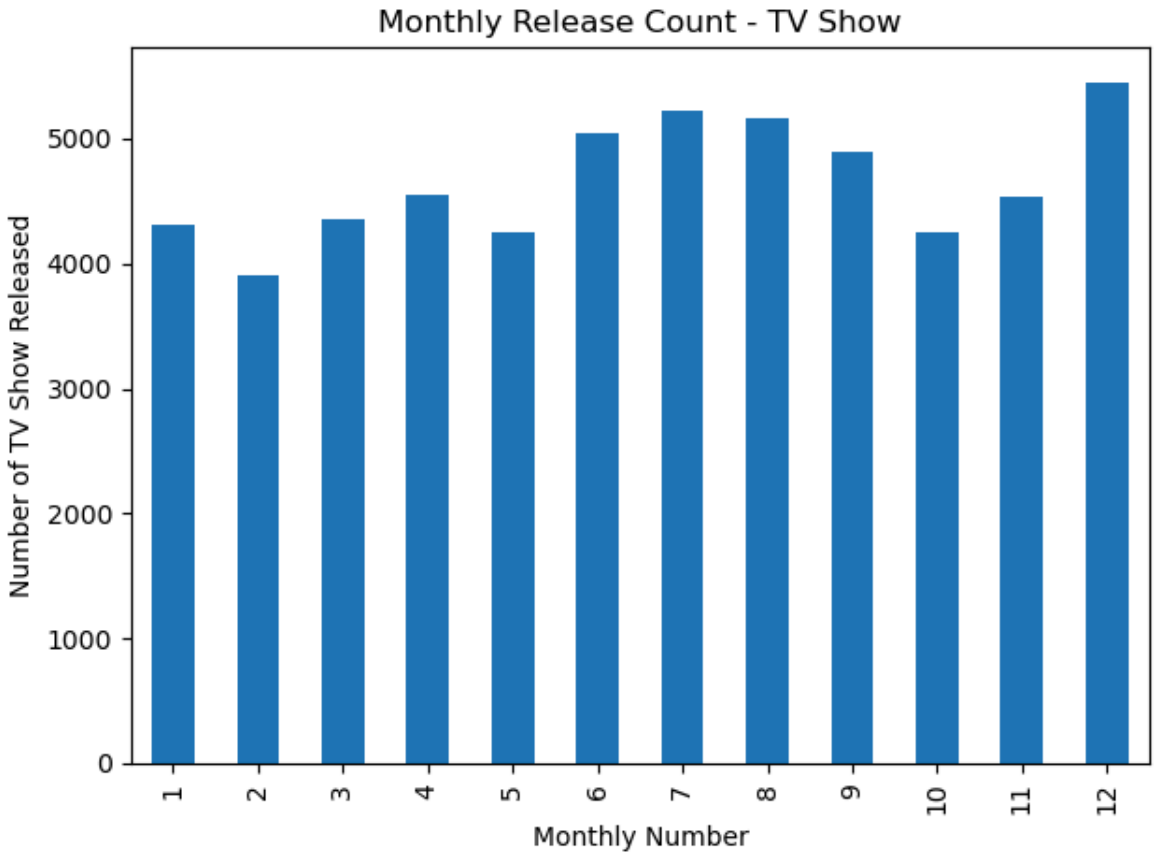
In [68]:
```
movies_month_counts = movies.groupby('month_number')['show_id'].count().sort_val
tv_month_counts = tv_shows.groupby('month_number')['show_id'].count().sort_value
```

In [69]:
```
plt.figure()
movies_month_counts.sort_index().plot(kind='bar')
plt.title('Monthly Release Count - Movies')
plt.xlabel('Monthly Number')
plt.ylabel('Number of Movies Released')
plt.tight_layout()
plt.show()
```



- In the month of January and July has more Movies launched hence this provides information about the best time to launch the content to Netflix platform

In [70]:
```
plt.figure()
tv_month_counts.sort_index().plot(kind='bar')
plt.title('Monthly Release Count - TV Show')
plt.xlabel('Monthly Number')
plt.ylabel('Number of TV Show Released')
plt.tight_layout()
plt.show()
```



- In the month of July and December has more TV Show released hence this provides information about the best time to launch the content to Netflix platform

In [ ]:

4. Analysis of actors/directors of different types of shows/movies.

In [71]:
```
df_new.head()
```

Out[71]:

	show_id	type	title	director	actor	country	date_added	rel
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown_actor	United States	September 25, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	

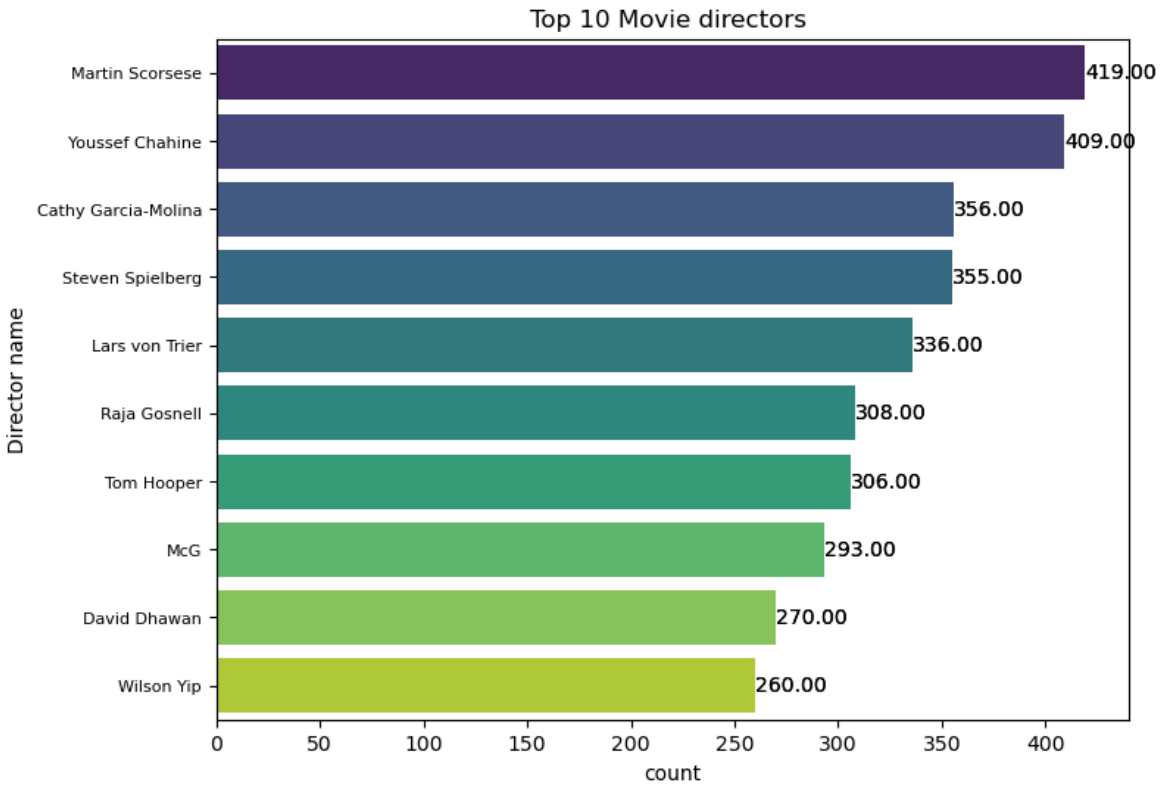
In [72]:
```
df_new_filtered = df_new[df_new['director'] != 'Unknown_director'].copy()
movies = df_new_filtered[df_new_filtered['type'] == 'Movie']
tv_shows = df_new_filtered[df_new_filtered['type'] == 'TV Show']
```

In [73]:
```
movies.groupby('director')['show_id'].count().sort_values(ascending=False).head(
```

Out[73]:
```
director
Martin Scorsese         419
Youssef Chahine         409
Cathy Garcia-Molina     356
Steven Spielberg        355
Lars von Trier          336
Raja Gosnell            308
Tom Hooper              306
McG                     293
David Dhawan            270
Wilson Yip              260
Name: show_id, dtype: int64
```

In [74]:
```
plt.figure(figsize=(8, 6))

top_movies_director = movies.groupby('director')['show_id'].count().sort_values(
```

```
sns.barplot(x = top_movies_director.values, y=top_movies_director.index, hue=top
plt.title('Top 10 Movie directors ')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_movies_director.values, y=top_movies_director.index, hu

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```

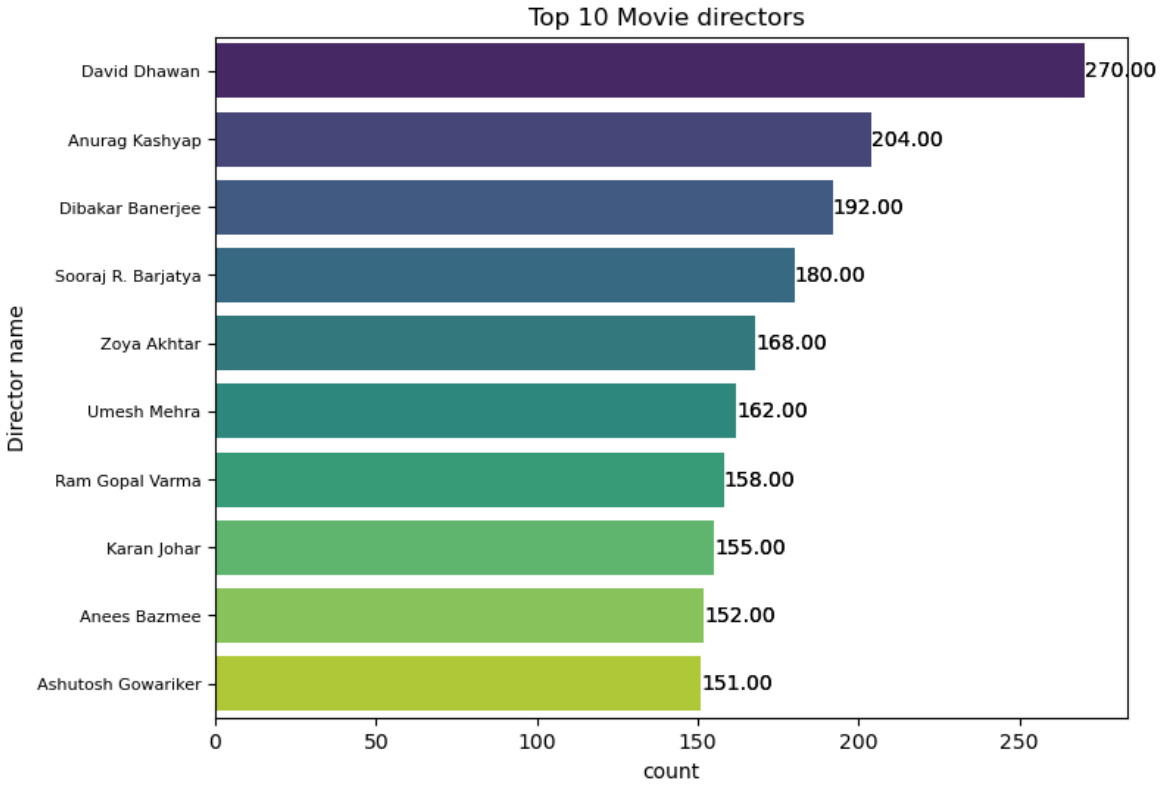


- Martin Scorsese, Youssef Chahine, Cathy Garcia-Molina are the most popular international directors

Top 10 Movie Directors in India

In [75]:
```
plt.figure(figsize=(8, 6))

top_movies_director = movies[movies['country'] == 'India'].groupby('director')['

sns.barplot(x = top_movies_director.values, y=top_movies_director.index, hue=top
plt.title('Top 10 Movie directors ')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_movies_director.values, y=top_movies_director.index, hu

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')
```

```
plt.show()
```



- David Dhawan, Anurag Kashyap, Dibakar Banerjee are the most popular directors in India

In [76]:
```
movies['genre'].value_counts()
```

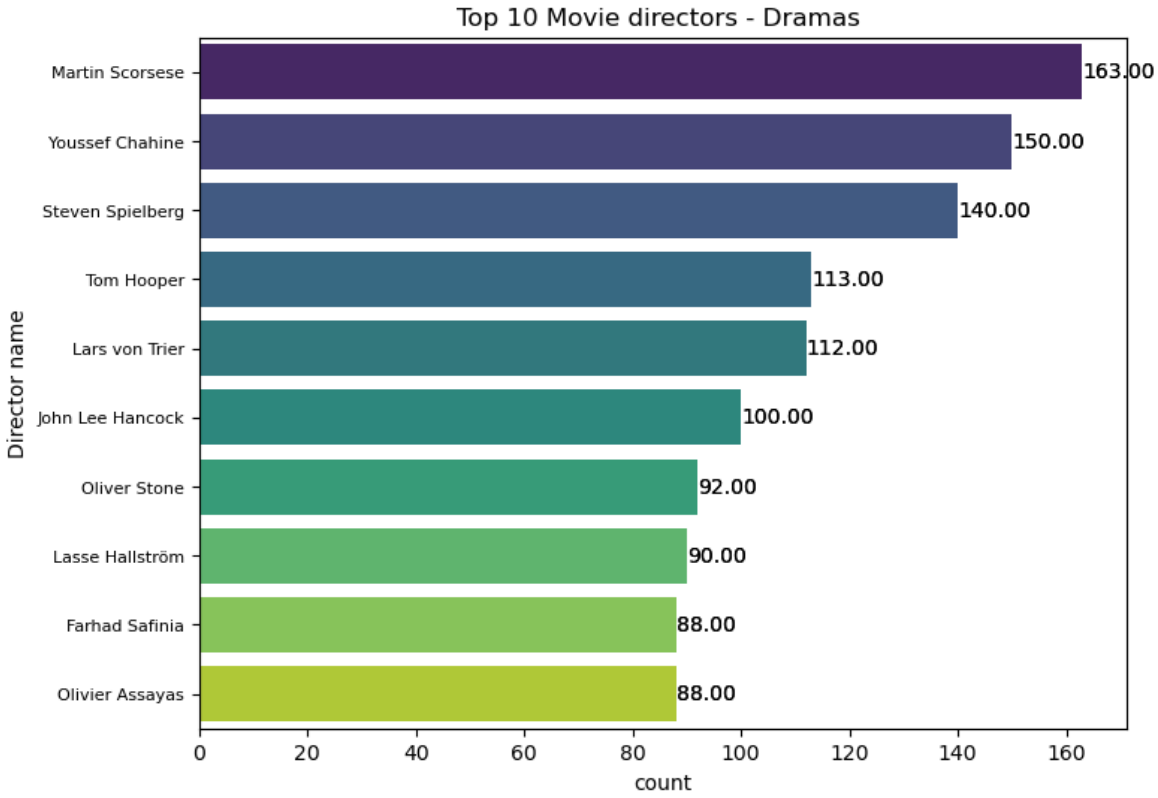
Out[76]:
```
genre
Dramas                      29634
International Movies        28056
Comedies                    20587
Action & Adventure          12179
Independent Movies           9820
Children & Family Movies     9535
Thrillers                    7103
Romantic Movies              6365
Horror Movies                4563
Sci-Fi & Fantasy             4001
Music & Musicals             3018
Documentaries                2288
Sports Movies                1521
Classic Movies               1434
Cult Movies                  1077
Anime Features               1044
LGBTQ Movies                  823
Faith & Spirituality          719
Stand-Up Comedy               476
Movies                        305
Name: count, dtype: int64
```

In [77]:
```
tv_shows['genre'].value_counts()
```

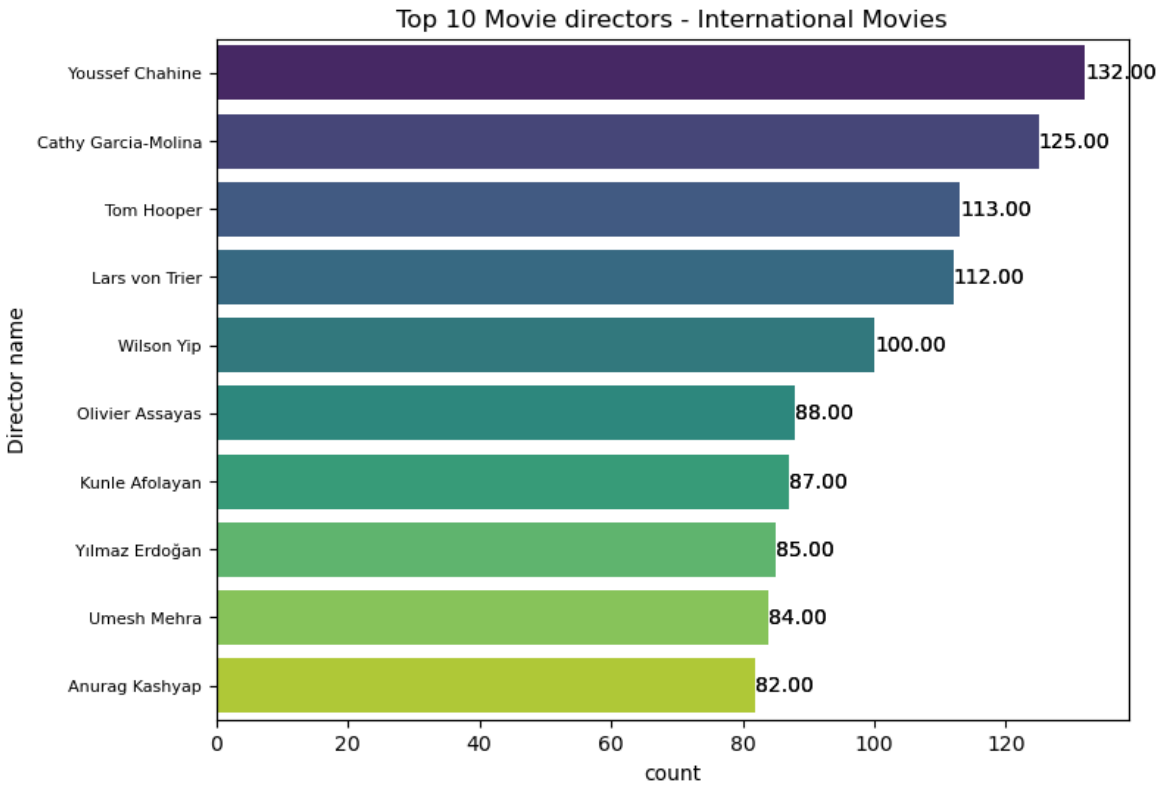
Out[77]:
```
genre
International TV Shows          1781
TV Dramas                       1215
Crime TV Shows                   667
TV Comedies                      401
TV Action & Adventure            353
TV Shows                         332
Romantic TV Shows                306
Kids' TV                         242
British TV Shows                 231
TV Mysteries                     213
Spanish-Language TV Shows        194
Docuseries                       189
TV Horror                        146
Anime Series                     131
Korean TV Shows                  111
TV Thrillers                      78
TV Sci-Fi & Fantasy               62
Teen TV Shows                     48
Classic & Cult TV                 38
Stand-Up Comedy & Talk Shows      31
Reality TV                        11
Science & Nature TV               10
Name: count, dtype: int64
```

Analyse different movie type each(Dramas, Internationl Movies, Comedies, Action & Adventure)

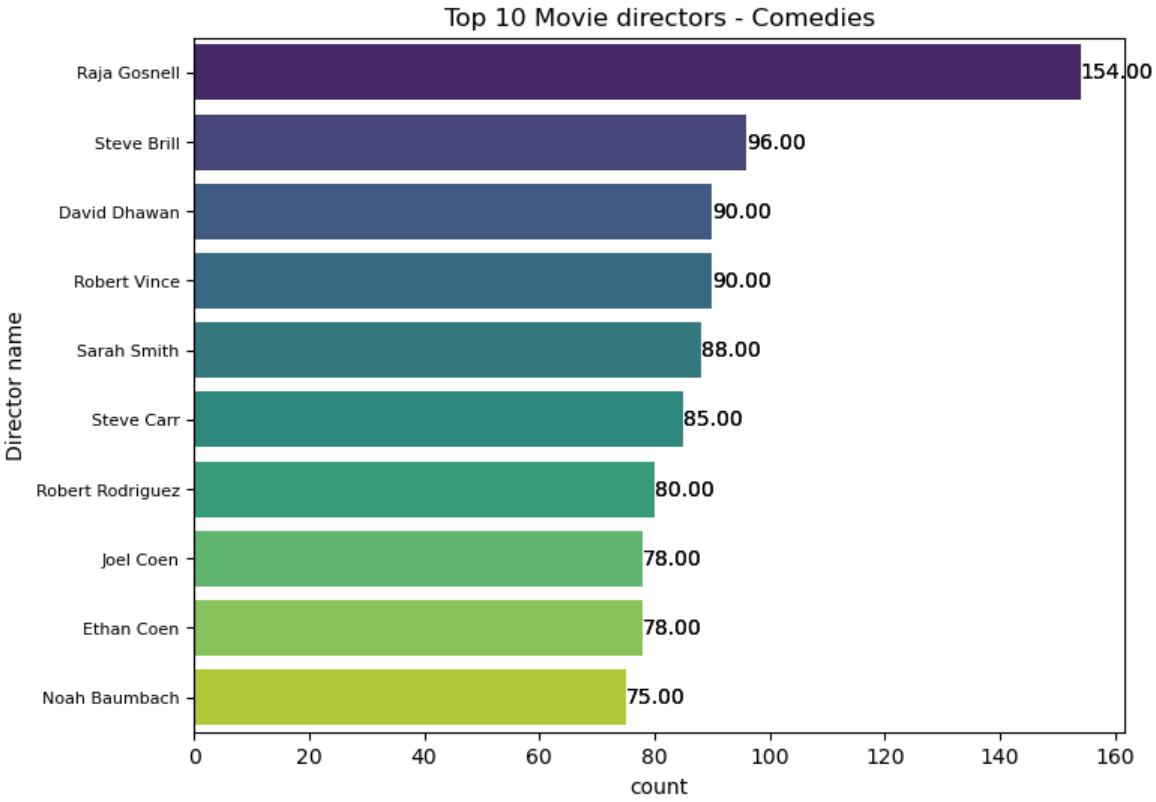
In [78]:
```
# Dramas analysis

plt.figure(figsize=(8, 6))

top_movies_director_dramas = movies[movies['genre'] == 'Dramas'].groupby('direct

sns.barplot(x = top_movies_director_dramas.values, y=top_movies_director_dramas.
plt.title('Top 10 Movie directors - Dramas ')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_movies_director_dramas.values, y=top_movies_director_dr

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



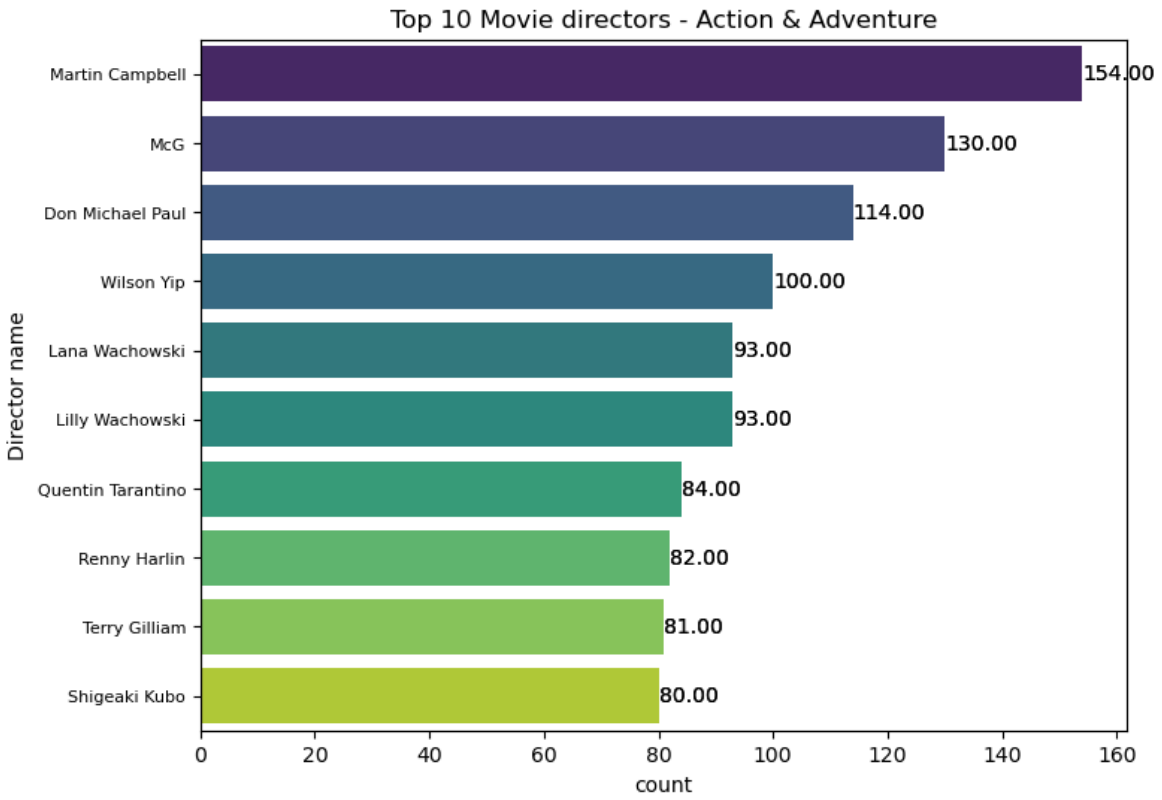
In [79]:
```
# International Movies analysis

plt.figure(figsize=(8, 6))

top_movies_director_International_Movies = movies[movies['genre'] == 'Internatio

sns.barplot(x = top_movies_director_International_Movies.values, y=top_movies_di
plt.title('Top 10 Movie directors - International Movies')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_movies_director_International_Movies.values, y=top_movi

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



In [80]:
```
# Comedies analysis

plt.figure(figsize=(8, 6))

top_movies_director_Comedies = movies[movies['genre'] == 'Comedies'].groupby('di

sns.barplot(x = top_movies_director_Comedies.values, y=top_movies_director_Comed
plt.title('Top 10 Movie directors - Comedies')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_movies_director_Comedies.values, y=top_movies_director_

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



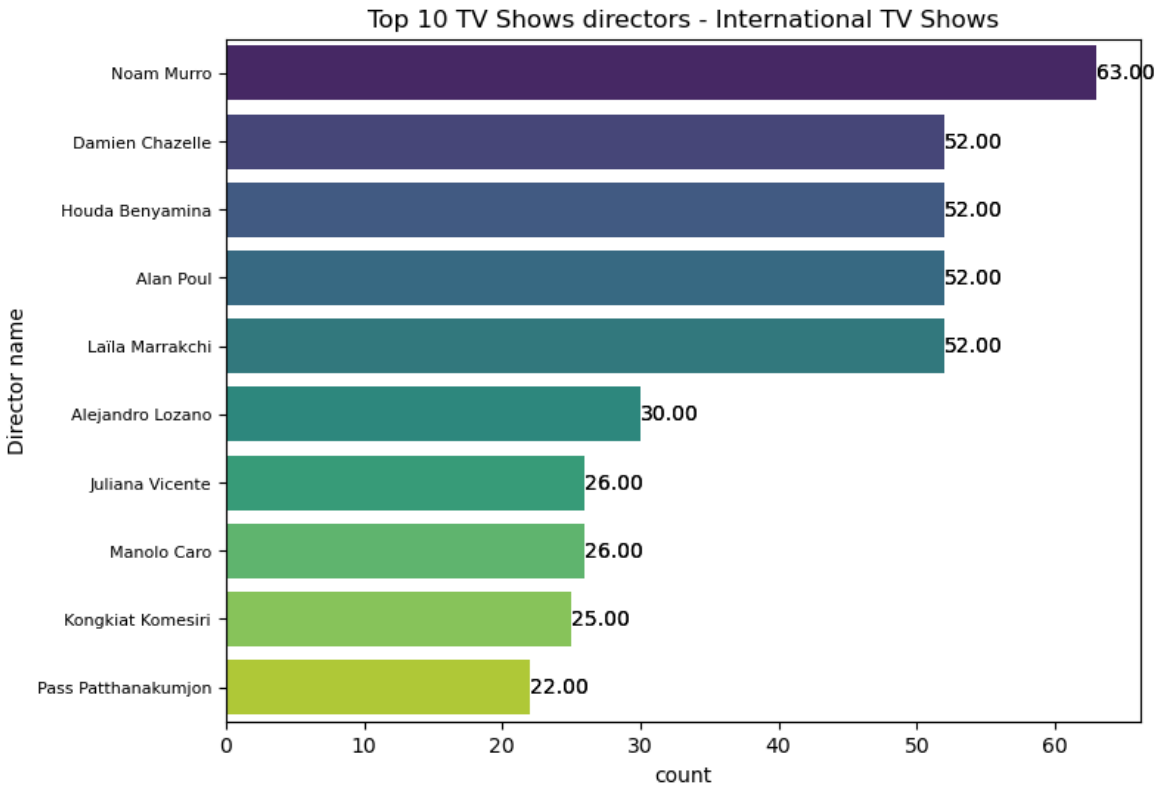
In [81]:
```
# Action & Adventure  analysis

plt.figure(figsize=(8, 6))

top_movies_director_Action_Adventure = movies[movies['genre'] == 'Action & Adven

sns.barplot(x = top_movies_director_Action_Adventure.values, y=top_movies_direct
plt.title('Top 10 Movie directors - Action & Adventure')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_movies_director_Action_Adventure.values, y=top_movies_d

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



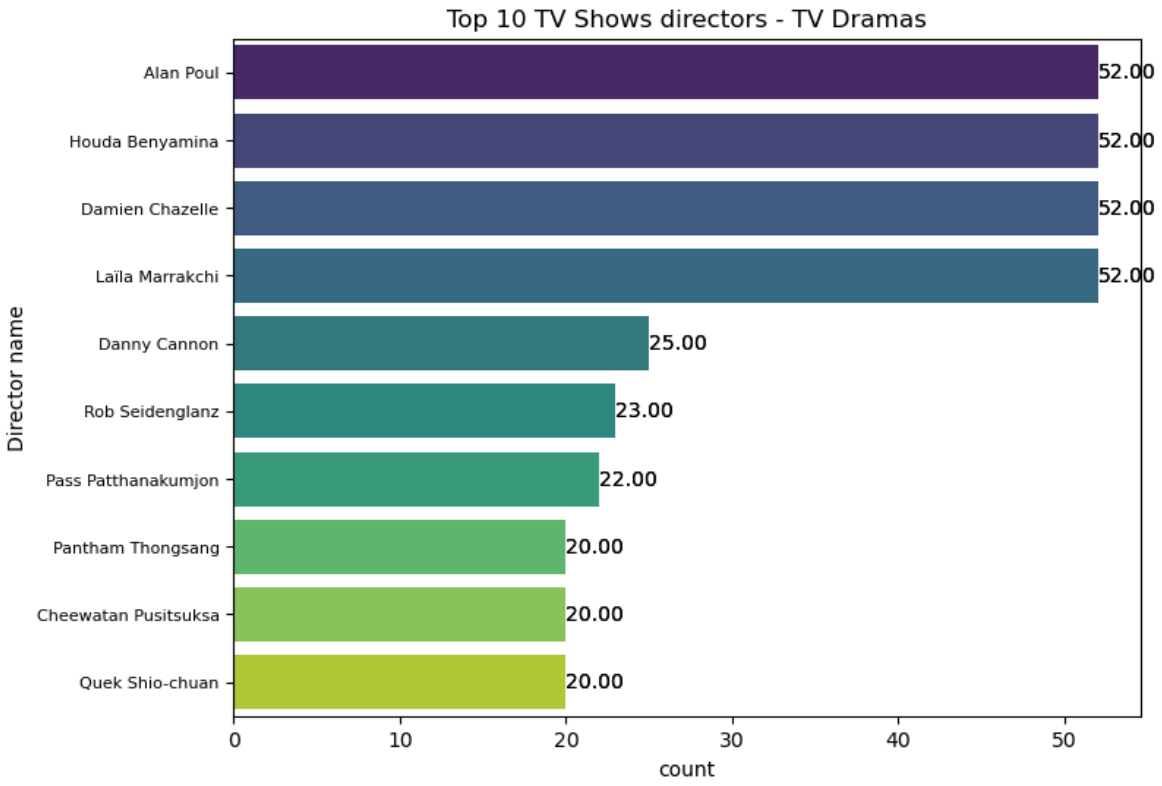
In [ ]:

Analyse different TV Shows of type (International TV Shows, TV Dramas, Crime TV Shows , TV Comedies, TV Action & Adventure)

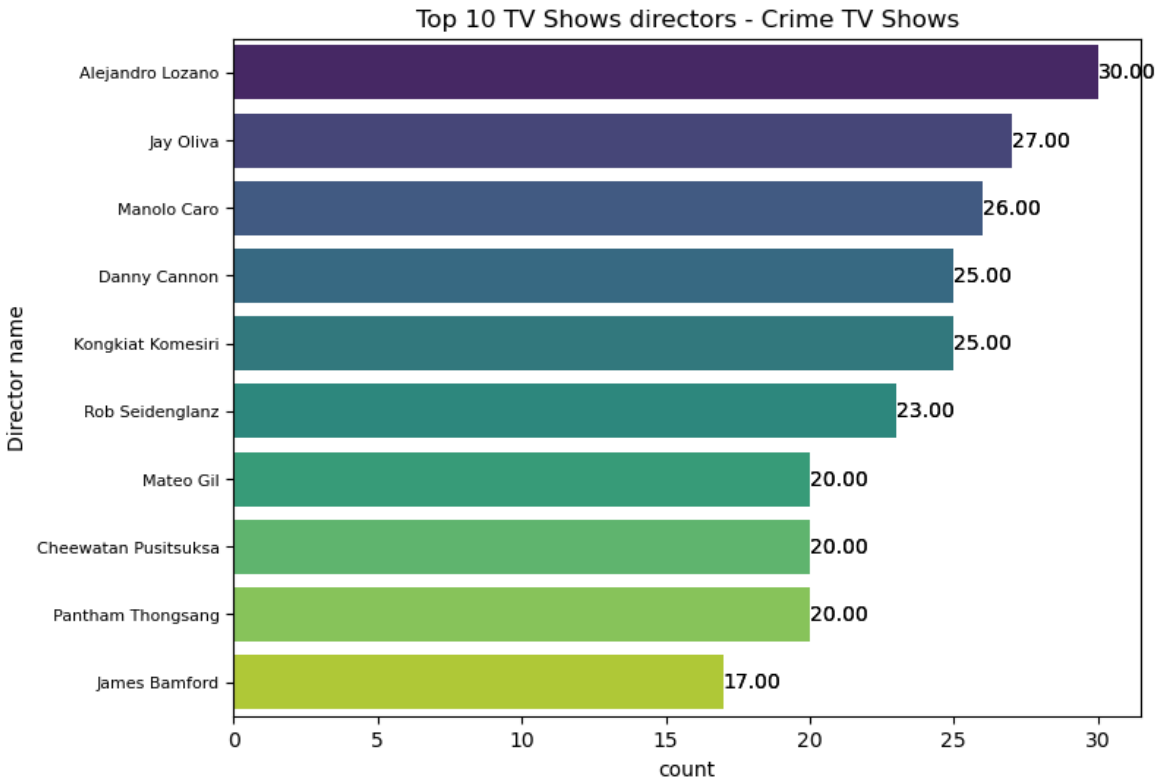
In [82]:
```
# International TV Shows   analysis

plt.figure(figsize=(8, 6))

top_tvshow_International_TV_Shows = tv_shows[tv_shows['genre'] == 'International

sns.barplot(x = top_tvshow_International_TV_Shows.values, y=top_tvshow_Internati
plt.title('Top 10 TV Shows directors - International TV Shows')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_tvshow_International_TV_Shows.values, y=top_tvshow_Inte

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



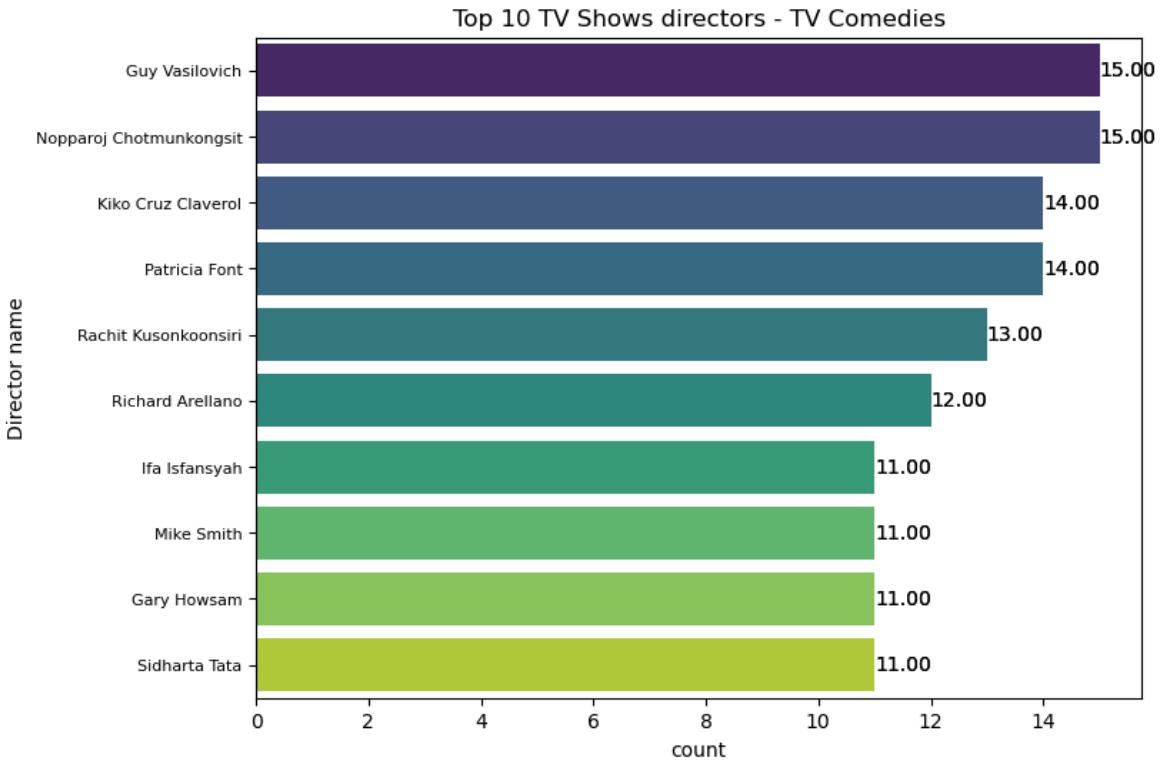
In [83]:
```
# TV Dramas analysis

plt.figure(figsize=(8, 6))

top_tvshow_TV_Dramas = tv_shows[tv_shows['genre'] == 'TV Dramas'].groupby('direc

sns.barplot(x = top_tvshow_TV_Dramas.values, y=top_tvshow_TV_Dramas.index, hue=t
plt.title('Top 10 TV Shows directors - TV Dramas')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_tvshow_TV_Dramas.values, y=top_tvshow_TV_Dramas.index,

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



In [84]:
```
# Crime TV Shows analysis

plt.figure(figsize=(8, 6))

top_tvshow_Crime_TV_Shows = tv_shows[tv_shows['genre'] == 'Crime TV Shows'].grou

sns.barplot(x = top_tvshow_Crime_TV_Shows.values, y=top_tvshow_Crime_TV_Shows.in
plt.title('Top 10 TV Shows directors - Crime TV Shows')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_tvshow_Crime_TV_Shows.values, y=top_tvshow_Crime_TV_Sho

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```

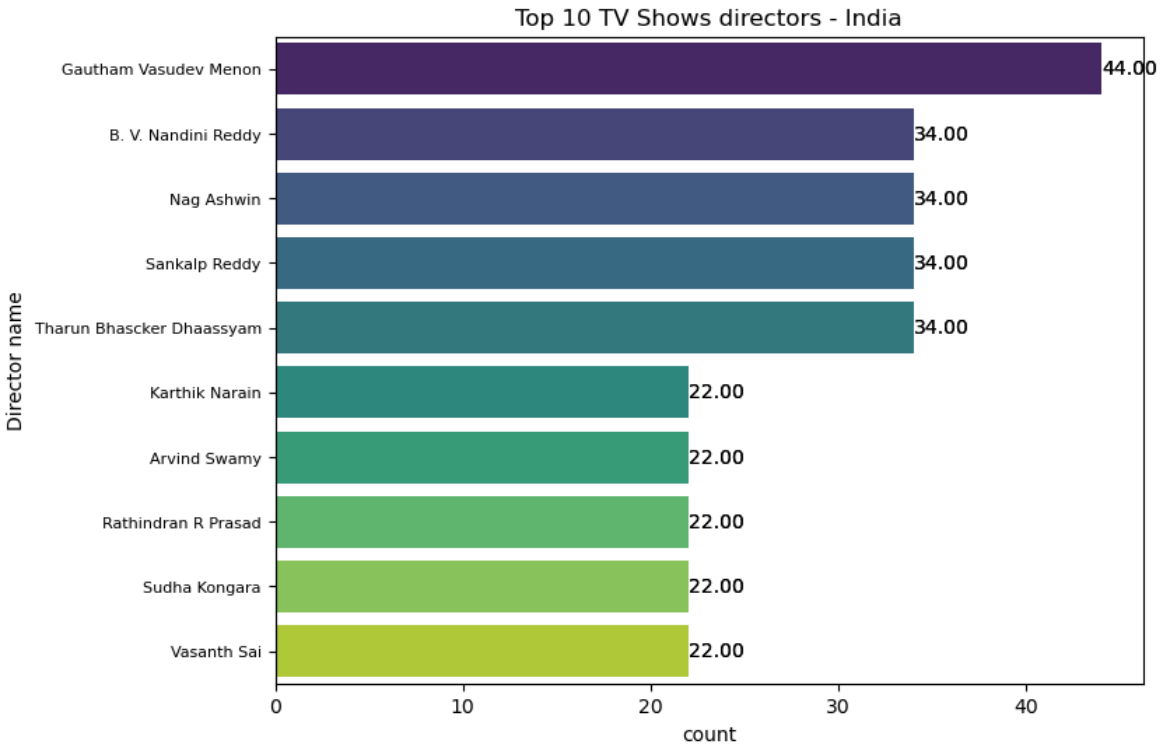


In [85]:
```
# TV Comedies analysis

plt.figure(figsize=(8, 6))

top_tvshow_TV_Comedies = tv_shows[tv_shows['genre'] == 'TV Comedies'].groupby('d

sns.barplot(x = top_tvshow_TV_Comedies.values, y=top_tvshow_TV_Comedies.index, h
plt.title('Top 10 TV Shows directors - TV Comedies')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_tvshow_TV_Comedies.values, y=top_tvshow_TV_Comedies.ind

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



Top 10 TV Shows directors - India

In [86]:
```
plt.figure(figsize=(8, 6))

top_tvshow_India = tv_shows[tv_shows['country'] == 'India'].groupby('director')[

sns.barplot(x = top_tvshow_India.values, y=top_tvshow_India.index, hue=top_tvsho
plt.title('Top 10 TV Shows directors - India')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_tvshow_India.values, y=top_tvshow_India.index, hue=top_

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```

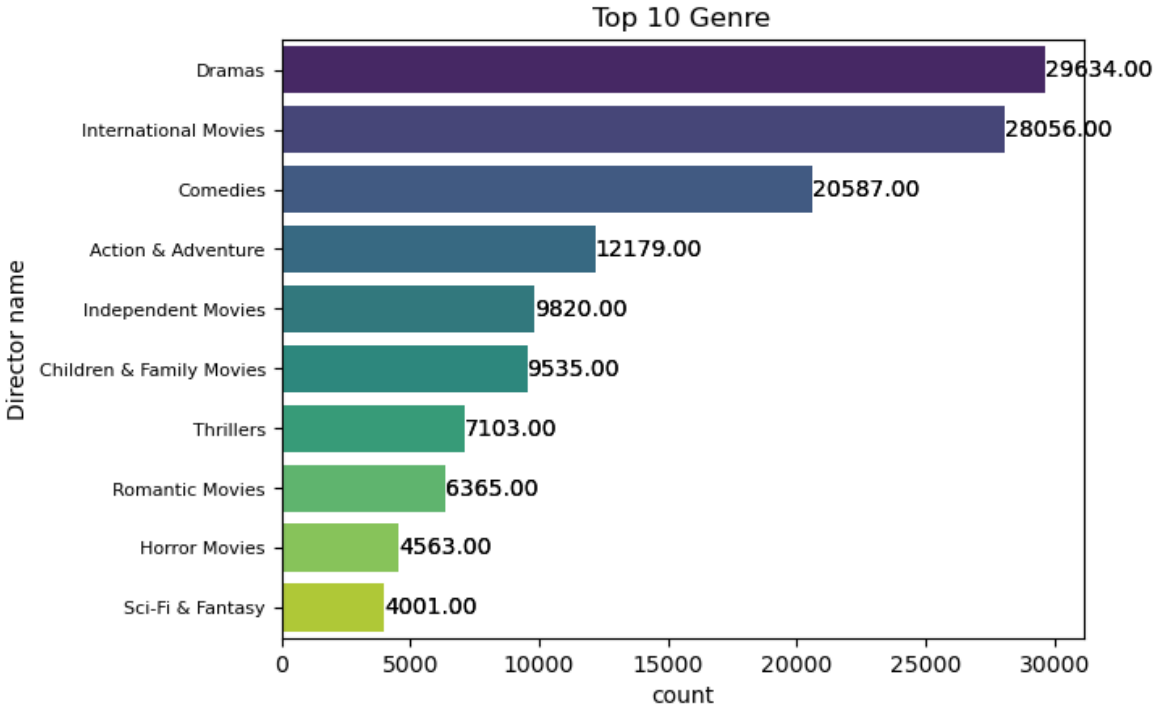


In [ ]:

5. Top Genre movies to produce for or popular more

Top 10 popular genre

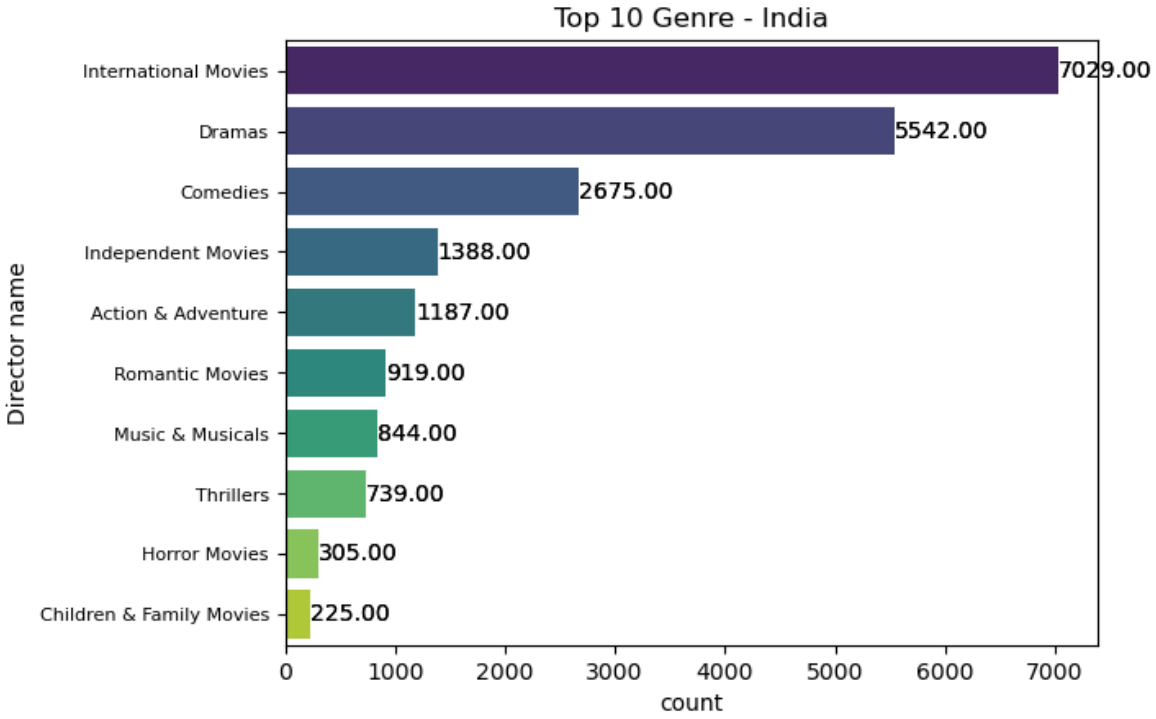
In [87]:
```
top_popular_genre = movies['genre'].value_counts().head(10)

sns.barplot(x = top_popular_genre.values, y=top_popular_genre.index, hue=top_pop
plt.title('Top 10 Genre')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_popular_genre.values, y=top_popular_genre.index, hue=to

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



- Dramas genre type are the most popular movie type and recomended movie type to produce

Top 10 popular genre - India

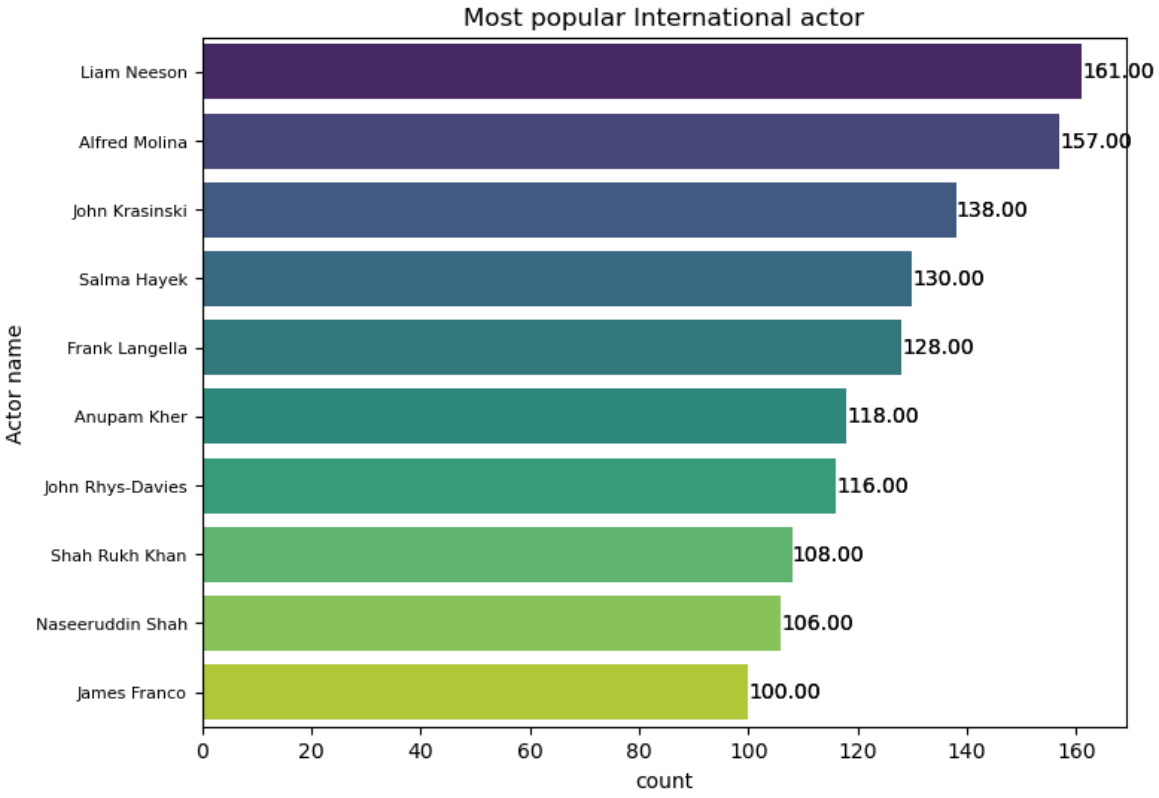
In [88]:
```
movies_india = movies[movies['country'] == 'India']
top_popular_genre_india = movies_india['genre'].value_counts().head(10)


sns.barplot(x = top_popular_genre_india.values, y=top_popular_genre_india.index,
plt.title('Top 10 Genre - India')
plt.xlabel('count')
plt.ylabel('Director name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_popular_genre_india.values, y=top_popular_genre_india.i

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



- International Movies genre type are the most popular movie type in India and recomended movie type to produce

Most popular International actor

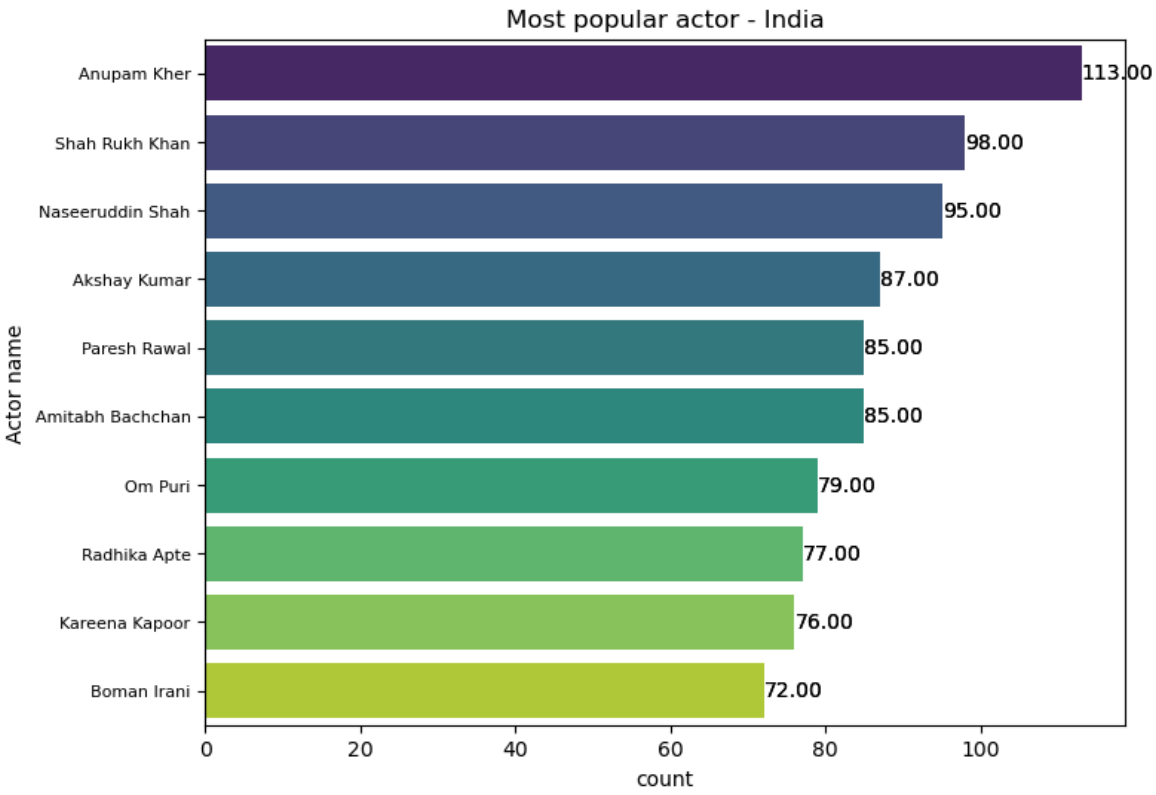
In [89]:
```
plt.figure(figsize=(8, 6))

df_new_filtered = df_new[df_new['actor'] != 'Unknown_actor'].copy()
movies_actor = df_new_filtered[df_new_filtered['type'] == 'Movie']
tv_shows_actor = df_new_filtered[df_new_filtered['type'] == 'TV Show']

top_Actor = movies_actor.groupby('actor')['show_id'].count().sort_values(ascendi

sns.barplot(x = top_Actor.values, y=top_Actor.index, hue=top_Actor.index, palett
plt.title('Most popular International actor')
plt.xlabel('count')
plt.ylabel('Actor name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_Actor.values, y=top_Actor.index, hue=top_Actor.index, p

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



- Liam Neeson, Alfreen Molina, John Krasinski are the most popular international actor

Most popular actor - India

In [90]:
```
plt.figure(figsize=(8, 6))

top_India_Actor = movies[movies['country'] == 'India'].groupby('actor')['show_id

sns.barplot(x = top_India_Actor.values, y=top_India_Actor.index, hue=top_India_A
plt.title('Most popular actor - India')
plt.xlabel('count')
plt.ylabel('Actor name')
plt.yticks(fontsize=8)

ax = sns.barplot(x = top_India_Actor.values, y=top_India_Actor.index, hue=top_In

for container in ax.containers:
    ax.bar_label(container, fmt='%.2f')

plt.show()
```



- Anupam Kher, Shah Rukh Khan, Naseeruddhin Shan, Akshay Kumar are the most popular actors in India

6. After how many days movies will be added after the release of the movie

In [91]:
```
df_new['year_number'] = df_new['date_added_copy'].dt.year
```

In [92]:
```
df_new.head()
```

Out[92]:

	show_id	type	title	director	actor	country	date_added	rel
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown_actor	United States	September 25, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Ama Qamata	South Africa	September 24, 2021	
1	s2	TV Show	Blood & Water	Unknown_director	Khosi Ngema	South Africa	September 24, 2021	

In [93]:
```
difference_date = df_new['year_number'] - df_new['release_year']
difference_date
```

Out[93]:
```
0       1
1       0
1       0
1       0
1       0
       ..
8806    4
8806    4
8806    4
8806    4
8806    4
Length: 201763, dtype: int64
```

In [94]:
```
difference_date.mode()
```

Out[94]:
```
0    0
dtype: int64
```

- Most of the movies/TV shows were added within and year, hence would recomend to add withing an year of release date

In [ ]:

📊 Netflix Case Study – Summary

By: Nishanth Gowda

This analysis explores patterns and insights from Netflix's catalog of movies and TV shows. The dataset includes ~8800 titles, with metadata like release year, cast, country, genre, and more. Key takeaways:

🔍 Key Insights:

1. Content Type:
    - Majority of the content on Netflix consists of Movies (~70%).
2. Top Producing Countries:
    - Movies: USA, India, UK, Canada, and France lead the way.
    - TV Shows: USA and UK dominate, followed by Japan and South Korea.
3. Best Time to Launch:
    - Movies are most often added on Fridays and during the summer (July–August).
    - TV Shows are frequently added on Thursdays and during October–December.
4. Top Directors & Actors:
    - Directors like Martin Scorsese, Youssef Chahine, Cathy Garcia-Molina are the most popular international directors.
    - David Dhawan, Anurag Kashyap, Dibakar Banerjee are the most popular directors in India
    - Actors like Liam Neeson, Alfreen Molina, John Krasinski are the most popular international actor.
    - Actors like Anupam Kher, Shah Rukh Khan, Naseeruddhin Shan, Akshay Kumar are the most popular actors in India.
5. Popular Genres:
    - Common genres include International Movies, Dramas, and Comedies, as highlighted via a word cloud.
6. Release Delay:
    - On average, content appears on Netflix about 242 days after its original release that is within an year.