

```
# Importing required libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

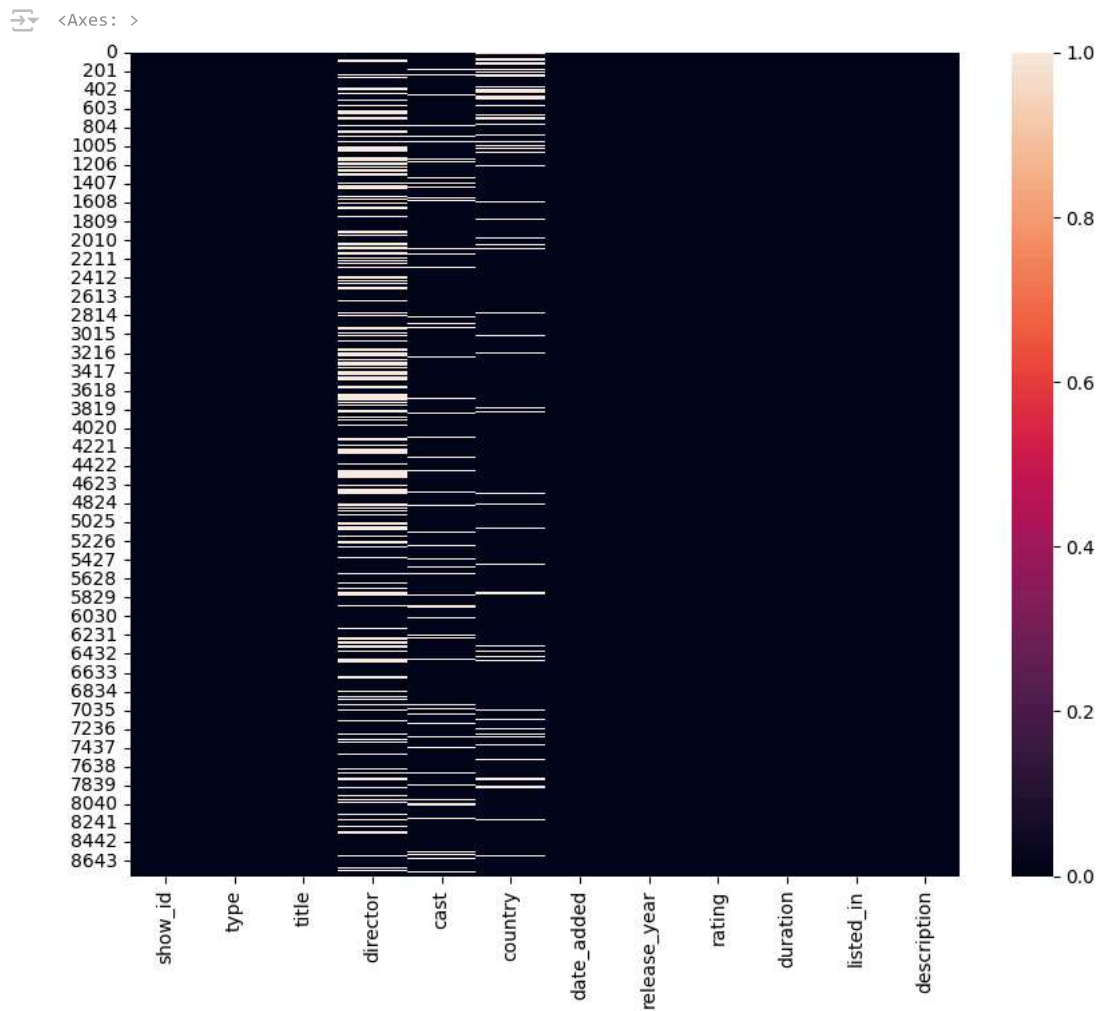
```
data = pd.read_csv('netflix.csv')
data.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel...	NaN	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV	To protect his family from a powerful drug lor...

Next steps:

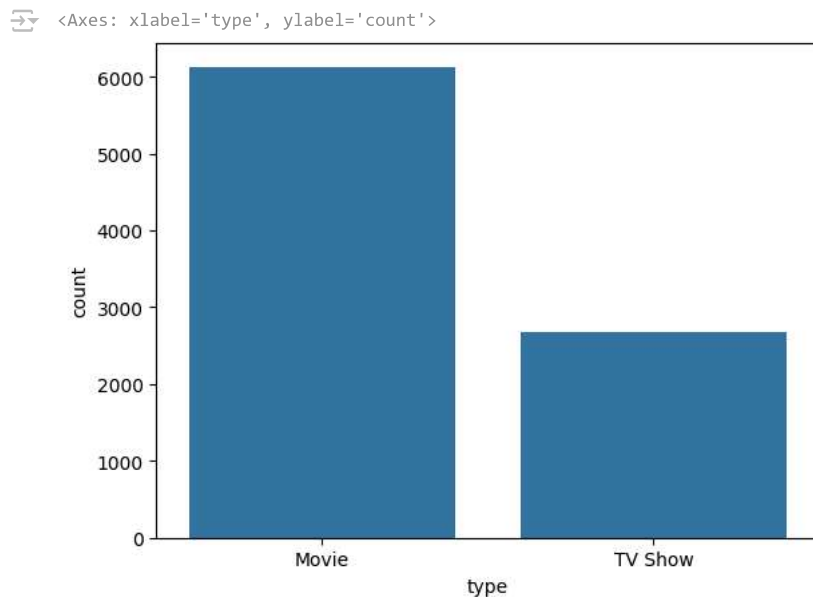
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```
#Checking the null values
plt.figure(figsize=(10,8))
sns.heatmap(data.isna())
```



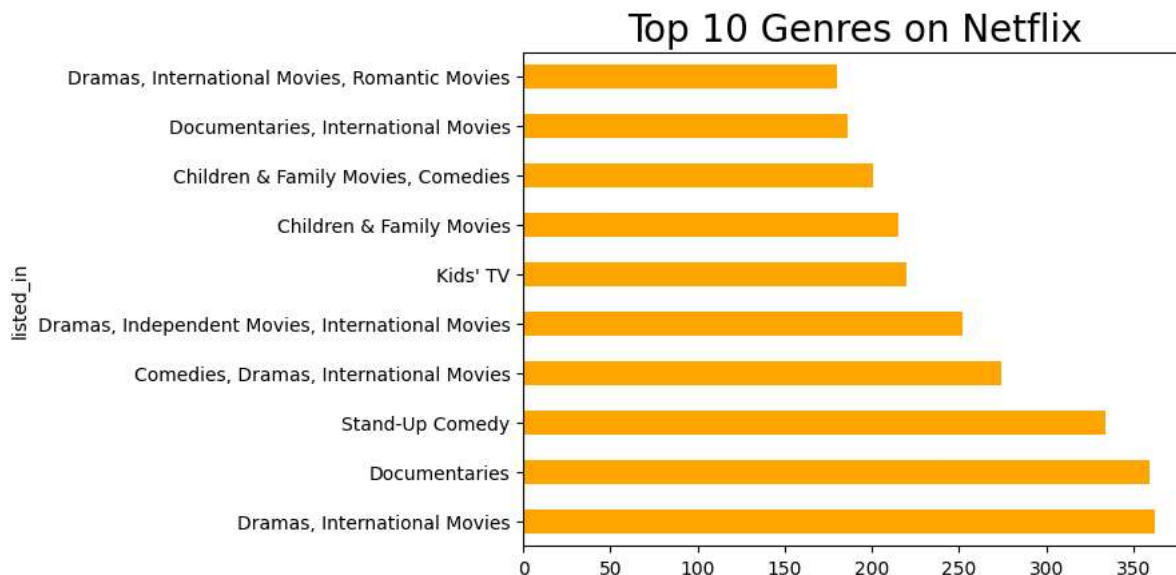
The Director, Cast, and Country fields in many of the data records are incomplete. The primary objective is to identify which television series and films performed the best, with the aim of increasing Netflix's revenue. The analysis begins by examining the distribution of the number of TV series and films available on Netflix. Subsequently, further details about those that received the highest ratings will be explored.

```
sns.countplot(x= 'type', data=data)
```



```
# plt.figure(figsize=(22,10))
data["listed_in"].value_counts()[:10].plot(kind="barh", color="orange")
```

```
plt.title("Top 10 Genres on Netflix",size=20);
```



There are significantly more movies compared to TV shows in the dataset. Therefore, the data will be split to ensure that the analysis remains unbiased. Prior to this, the data needs to be cleaned and preprocessed to obtain better insights.

✓ ANALYSIS FOR MOVIES

```
movies = data.copy()
movies = movies[movies['type'] == 'Movie']
```

```
movies.head()
```



	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
6	s7	Movie	My Little Pony: A New Generation	Robert Cullen, José Luis Ucha	Vanessa Hudgens, Kimiko Glenn, James Marsden, ...	NaN	September 24, 2021	2021	PG	91 min	Children & Family Movies	Equestria's divided. But a bright-eyed hero be...
7	s8	Movie	Sankofa	Haile Gerima	Kofi Ghanaba, Oyafunmike Ogunlano, Alexandra D...	United States, Ghana, Burkina Faso, United Kin...	September 24, 2021	1993	TV-MA	125 min	Dramas, Independent Movies, International Movies	On a photo shoot in Ghana, an American model s...

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As the Director and Cast columns contain limited values, they will be dropped from the dataset. However, the Country column will be retained, as it is one of the primary attributes for this case study.

```
movies.drop(['director', 'cast'], axis=1, inplace=True)
movies.head()
```

	show_id	type	title	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
6	s7	Movie	My Little Pony: A New Generation	NaN	September 24, 2021	2021	PG	91 min	Children & Family Movies	Equestria's divided. But a bright-eyed hero be...
7	s8	Movie	Sankofa	United States, Ghana, Burkina Faso, United Kin...	September 24, 2021	1993	TV-MA	125 min	Dramas, Independent Movies, International Movies	On a photo shoot in Ghana, an American model s...
9	s10	Movie	The Starling	United States	September	2021	PG-13	104 min	Comedies, Dramas	A woman adjusting to life after a loss

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Generate code with movies

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movies[movies['country'].isnull()]

	show_id	type	title	country	date_added	release_year	rating	duration	listed_in	description
6	s7	Movie	My Little Pony: A New Generation	NaN	September 24, 2021	2021	PG	91 min	Children & Family Movies	Equestria's divided. But a bright-eyed hero be...
13	s14	Movie	Confessions of an Invisible Girl	NaN	September 22, 2021	2021	TV-PG	91 min	Children & Family Movies, Comedies	When the clever but socially-awkward Tet� join...
16	s17	Movie	Europe's Most Dangerous Man: Otto Skorzeny in ...	NaN	September 22, 2021	2020	TV-MA	67 min	Documentaries, International Movies	Declassified documents reveal the post-WWII li...
18	s19	Movie	Intrusion	NaN	September 22, 2021	2021	TV-14	94 min	Thrillers	After a deadly home invasion at a couple's new...
22	s23	Movie	Avvai Shanmughi	NaN	September 21, 2021	1996	TV-PG	161 min	Comedies, International Movies	Newly divorced and denied visitation rights wi...
...
8585	s8586	Movie	Three-Quarters Decent	NaN	June 20, 2019	2010	TV-14	96 min	Comedies, Dramas, International Movies	Determined to fight corruption in his country,...
8602	s8603	Movie	Tom and Jerry: The Magic Ring	NaN	December 15, 2019	2001	TV-Y7	60 min	Children & Family Movies, Comedies	When a young wizard leaves Tom to guard his pr...
8622	s8623	Movie	Tremors 2: Aftershocks	NaN	January 1, 2020	1995	PG-13	100 min	Comedies, Horror Movies, Sci-Fi & Fantasy	A rag-tag team of survivalists and scientists ...

movies['country'] = movies['country'].ffill(axis=0)
movies[movies['country'].isnull()]

show_id	type	title	country	date_added	release_year	rating	duration	listed_in	description
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Checking for null rated movies
movies[movies['rating'].isnull()]

	show_id	type	title	country	date_added	release_year	rating	duration	listed_in	description
5989	s5990	Movie	13TH: A Conversation with Oprah Winfrey & Ava ...	United States	January 26, 2017	2017	NaN	37 min	Movies	Oprah Winfrey sits down with director Ava DuVe...
7537	s7538	Movie	My Honor Was Loyalty	Italy	March 1, 2017	2015	NaN	115 min	Dramas	Amid the chaos and horror of World War II, a

Given the small number of missing values, filling them manually using information available online is a practical and efficient approach.

```
# Defining the missing values manually
movies.loc[5989, 'rating'] = 'TV-PG'
movies.loc[7537, 'rating'] = 'TV-MA'
```

```
movies[movies['rating'].isnull()]
```




show_id	type	title	country	date_added	release_year	rating	duration	listed_in	description
---------	------	-------	---------	------------	--------------	--------	----------	-----------	-------------





As observed, the Country column contains multiple values representing the countries where the content was displayed. Assuming that the first country listed is the primary source of the content, it will be used for further analysis.


```
movies['primary_country'] = movies['country'].apply(lambda x: x.split(',')[0])
movies
```



	show_id	type	title	country	date_added	release_year	rating	duration	listed_in	description	primary_country	
	0	s1	Movie	Dick Johnson Is Dead	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...	United States
	6	s7	Movie	My Little Pony: A New Generation	United States	September 24, 2021	2021	PG	91 min	Children & Family Movies	Equestria's divided. But a bright-eyed hero be...	United States
	7	s8	Movie	Sankofa	United States, Ghana, Burkina Faso, United Kin...	September 24, 2021	1993	TV-MA	125 min	Dramas, Independent Movies, International Movies	On a photo shoot in Ghana, an American model s...	United States
	9	s10	Movie	The Starling	United States	September 24, 2021	2021	PG-13	104 min	Comedies, Dramas	A woman adjusting to life after a loss contend...	United States
	12	s13	Movie	Je Suis Karl	Germany, Czech Republic	September 23, 2021	2021	TV-MA	127 min	Dramas, International Movies	After most of her family is murdered in a terr...	Germany
	
	8801	s8802	Movie	Zinzana	United Arab Emirates, Jordan	March 9, 2016	2015	TV-MA	96 min	Dramas, International Movies, Thrillers	Recovering alcoholic Talal wakes up inside a s...	United Arab Emirates
				United	November				Cult Movies,	A political cartoonist, a		







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Generate code with movies

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The analysis for the problem statement will begin by dividing the data based on the top 10 main countries identified. The data will then be grouped by genres and ratings. This approach will provide insights into which types of content received the best reviews in each country, based on the top genres. With this information, the development of similar content can be promoted in the future.

```
# Top 10 countries with maximum content
top_countries = movies.groupby('primary_country').count().sort_values('type', ascending=False)[:10]
top_countries
```

	show_id	type	title	country	date_added	release_year	rating	duration	listed_in	description	
primary_country											
	United States	2541	2541	2541	2541	2541	2541	2538	2541	2541	
	India	998	998	998	998	998	998	998	998	998	
	United Kingdom	410	410	410	410	410	410	410	410	410	
	Canada	196	196	196	196	196	196	196	196	196	
	France	159	159	159	159	159	159	159	159	159	
	Spain	133	133	133	133	133	133	133	133	133	
	Nigeria	111	111	111	111	111	111	111	111	111	
	Egypt	106	106	106	106	106	106	106	106	106	
	Mexico	95	95	95	95	95	95	95	95	95	
	Japan	94	94	94	94	94	94	94	94	94	

Next steps:

Generate code with top_countries

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```
# Top 10 genres with maximum content
top_genres = movies.groupby('listed_in').count().sort_values('type', ascending=False)[:10]
top_genres
```

	show_id	type	title	country	date_added	release_year	rating	duration	description	primary_country	
listed_in											
	Dramas, International Movies		362	362	362	362	362	362	362	362	362
	Documentaries		359	359	359	359	359	359	359	359	359
	Stand-Up Comedy		334	334	334	334	334	334	334	334	334
	Comedies, Dramas, International Movies		274	274	274	274	274	274	274	274	274
	Dramas, Independent Movies, International Movies		252	252	252	252	252	252	252	252	252
	Children & Family Movies		215	215	215	215	215	215	215	215	215
	Children & Family Movies, Comedies		201	201	201	201	201	201	201	201	201
	Documentaries, International Movies		186	186	186	186	186	186	186	186	186

Next steps:


Generate code with top_genres

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```
# Filtering the data for top 10 genres
movies = movies[movies['listed_in'].isin(list(top_genres.index))]

# Filtering the data for top 10 countries
movies = movies[movies['primary_country'].isin(list(top_countries.index))]
movies
```



	show_id	type	title	country	date_added	release_year	rating	duration	listed_in	description	primary_country
0	s1	Movie	Dick Johnson Is Dead	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...	United States
6	s7	Movie	My Little Pony: A New Generation	United States	September 24, 2021	2021	PG	91 min	Children & Family Movies	Equestria's divided. But a bright-eyed hero be...	United States
7	s8	Movie	Sankofa	United States, Ghana, Burkina Faso, United Kin...	September 24, 2021	1993	TV-MA	125 min	Dramas, Independent Movies, International Movies	On a photo shoot in Ghana, an American model s...	United States
30	s31	Movie	Ankahi Kahaniya	United States, India, France	September 17, 2021	2021	TV-14	111 min	Dramas, Independent Movies, International Movies	As big city life buzzes around them, lonely so...	United States
45	s46	Movie	My Heroes Were Cowboys	United States	September 16, 2021	2021	PG	23 min	Documentaries	Robin Wiltshire's painful childhood was rescue...	United States
...
8793	s8794	Movie	Yours, Mine and Ours	United States	November 20, 2019	2005	PG	88 min	Children & Family Movies, Comedies	When a father of eight and a mother of 10 prep...	United States
8794	s8795	Movie	اشتباك	Egypt, France	October 11, 2018	2016	TV-14	98 min	Dramas, Independent Movies,	Amid the tumult following	Egypt

Next steps:

Generate code with movies

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```
ratings=[]
for rate in movies['rating'].unique():
    ratings.append(rate)

countries = movies['primary_country'].unique()

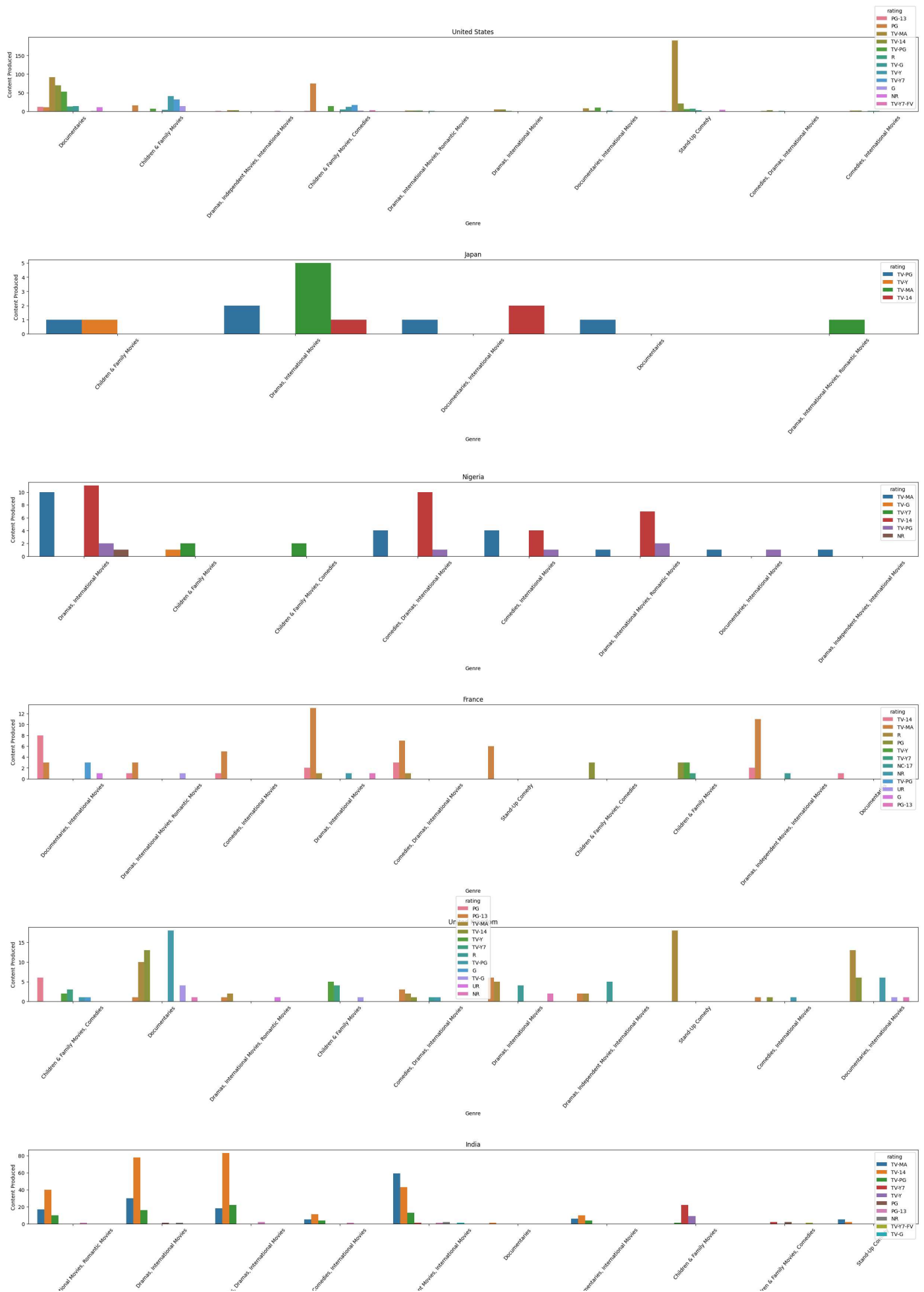
listing = movies['listed_in'].unique()
```

✓ The top content based on genres and the highest ratings within each genre across different countries.

```
fig = plt.figure(figsize=(30,40))

for i, name in enumerate(countries):
    frame = movies[movies['primary_country'] == str(name)]
    ax = fig.add_subplot(len(countries),1,i+1)
    topic = name
    sns.countplot(x='listed_in', data= frame[frame['listed_in'].isin(listing)], hue='rating')
    ax.set_title(topic)
    plt.subplots_adjust(left=0.1,
                        bottom=0.1,
                        right=0.9,
                        top=1.5,
                        wspace=0.5,
                        hspace=2.0)

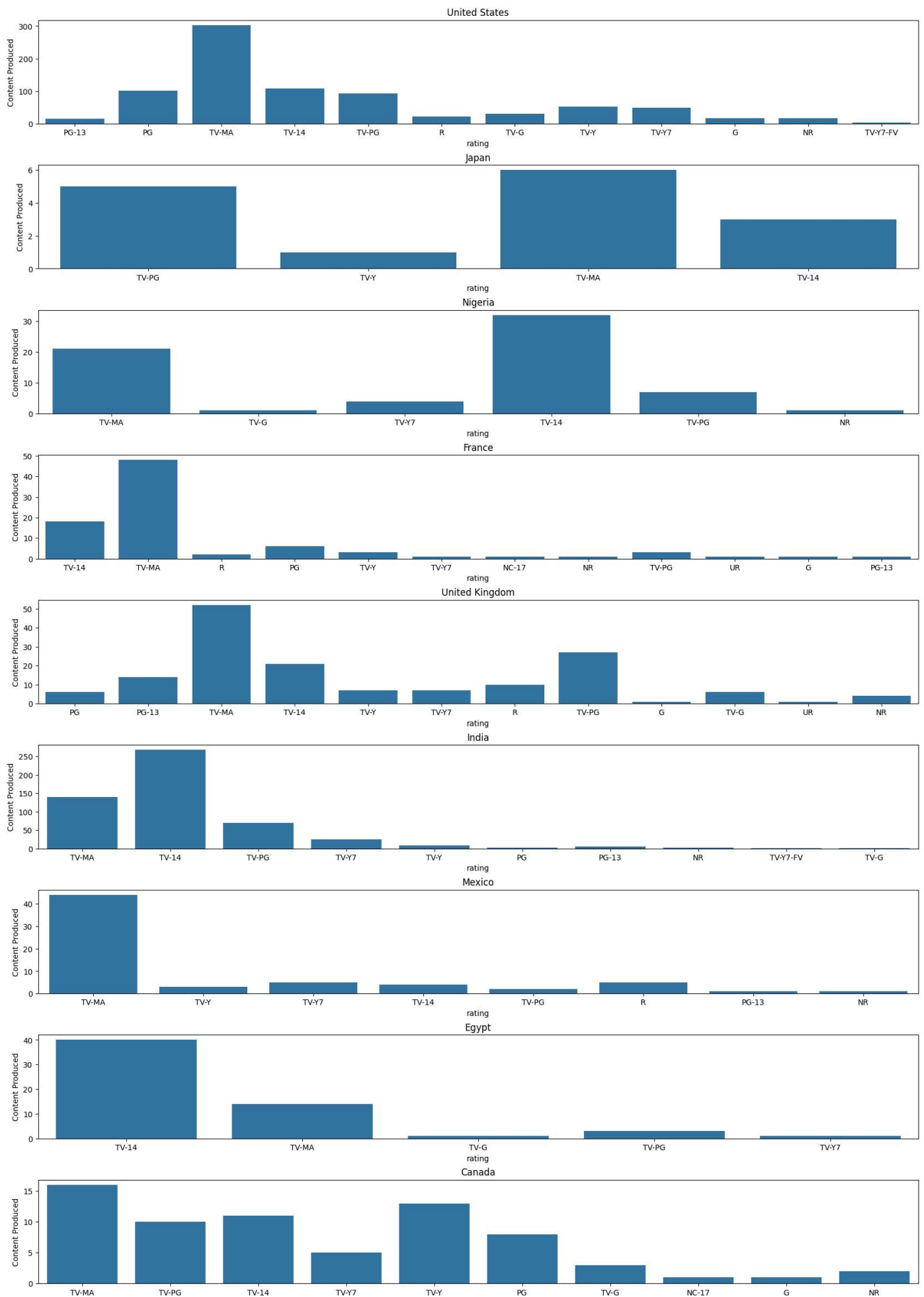
plt.xlabel('Genre')
plt.xticks(rotation = 50)
ax.set(ylabel='Content Produced')
```

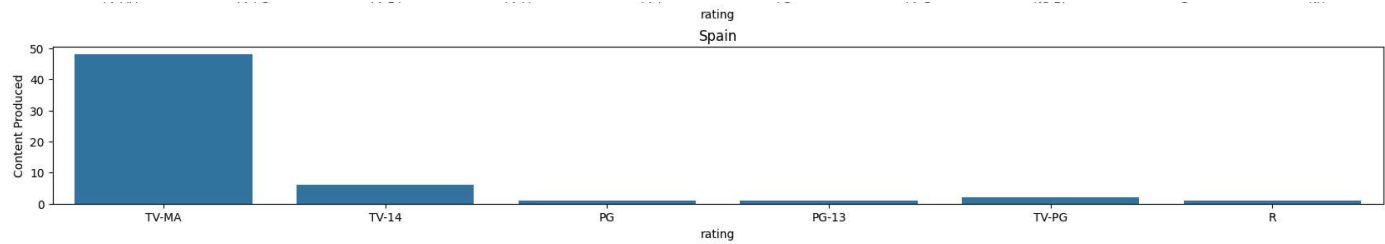





```
fig0 = plt.figure(figsize=(20,32))

for i, name in enumerate(countries):
    frame = movies[movies['primary_country'] == str(name)]
    ax = fig0.add_subplot(len(countries),1,i+1)
    topic = name
    sns.countplot(x='rating', data= frame[frame['rating'].isin(ratings)])
    ax.set_title(topic)
    plt.subplots_adjust(left=0.1,
                        bottom=0.1,
                        right=0.9,
                        top=0.9,
                        wspace=0.4,
                        hspace=0.4)
    ax.set(ylabel='Content Produced')
```





The graph above clearly illustrates the types of content and ratings that are most appealing to audiences in the top 10 countries.

Note: The top 10 genres were selected for displaying this data.

All the steps and analysis done for Movies is repeated for TV Shows as well and conclusions are drawn from them on a similar basis

✓ ANALYSIS ON TV SHOWS

```
tv = data.copy()
tv = tv[tv['type'] == 'TV Show']

tv.head()
```

show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
1	s2 TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3 TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	NaN	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lor...
3	s4 TV Show	Jailbirds New Orleans	NaN	NaN	NaN	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down an...

Next steps:

Generate code with tv

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```
tv.drop(['director', 'cast'], axis=1, inplace=True)
tv.head()
```