```
!gdown https://d2beiqkhq929f0.cloudfront.net/public_assets/assets/000/000/940/original/netflix.csv
```

```
Downloading...
From: https://d2beiqkhq929f0.cloudfront.net/public_assets/assets/000/000/940/original/netflix.csv
To: /content/netflix.csv
100% 3.40M/3.40M [00:00<00:00, 43.6MB/s]
```

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

```
df=pd.read_csv('netflix.csv')
data=df.copy(deep=True)
```

```
Start coding or generate with AI.
```

```
df.shape
```

```
(8807, 12)
```

```
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.describe()
```

	release_year
count	8807.000000
mean	2014.180198
std	8.819312
min	1925.000000
25%	2013.000000
50%	2017.000000
75%	2019.000000
max	2021.000000

```
df.tail()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
8802	s8803	Movie	Zodiac	David Fincher	Mark Ruffalo, Jake Gyllenhaal, Robert Downey J...	United States	November 20, 2019	2007	R	158 min	Cult Movies, Dramas, Thrillers	A political cartoonist, a crime reporter and a...
8803	s8804	TV Show	Zombie Dumb	NaN	NaN	NaN	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town, a young g...
8804	s8805	Movie	Zombieland	Ruben Fleischer	Jesse Eisenberg, Woody Harrelson, Emma Stone, ...	United States	November 1, 2019	2009	R	88 min	Comedies, Horror Movies	Looking to survive in a world taken over by zo...
8805	s8806	Movie	Zoom	Peter Hewitt	Tim Allen, Courteney Cox, Chevy Chase, Kate Ma...	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero...
8806	s8807	Movie	Zubaan	Mozez	Vicky Kaushal, Sarah-	India	March 2,	2015	TV-14	111 min	Dramas, International Movies	A scrappy but poor boy worms his

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

```
8807
```

Un-nesting the columns that contain comma separated values

```
Start coding or generate with AI.
```

```
df.columns
```

```
Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added',
       'release_year', 'rating', 'duration', 'listed_in', 'description'],
      dtype='object')
```

```
df.tail()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
8802	s8803	Movie	Zodiac	David Fincher	Mark Ruffalo, Jake Gyllenhaal, Robert Downey J...	United States	November 20, 2019	2007	R	158 min	Cult Movies, Dramas, Thrillers	A political cartoonist, a crime reporter and a...
8803	s8804	TV Show	Zombie Dumb	NaN	NaN	NaN	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town, a young g...
8804	s8805	Movie	Zombieland	Ruben Fleischer	Jesse Eisenberg, Woody Harrelson, Emma Stone, ...	United States	November 1, 2019	2009	R	88 min	Comedies, Horror Movies	Looking to survive in a world taken over by zo...
8805	s8806	Movie	Zoom	Peter Hewitt	Tim Allen, Courteney Cox, Chevy Chase, Kate Ma...	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero...
8806	s8807	Movie	Zubaan	Mozez	Vicky Kaushal, Sarah-	India	March 2,	2015	TV-14	111 min	Dramas, International Movies,	A scrappy but poor boy worms his

These columns contain comma that i want to separate and make one row for each value

```
columns=df.columns[[3,4,5,10]]
columns
```

```
Index(['director', 'cast', 'country', 'listed_in'], dtype='object')
```

```
for i in columns:
  print(i)
  df[i]=df[i].str.split(',')
  df=df.explode(i)
```

```
director
cast
country
listed_in
```

all comma separated values are un-nested

```
df
```

	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	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows	After crossing paths at a party, a Cape Town t...
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	TV Dramas	After crossing paths at a party, a Cape Town t...
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	TV Mysteries	After crossing paths at a party, a Cape Town t...
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows	After crossing paths at a party, a Cape Town t...
...	...	...	...	...	...	...	...	...	...	...	...	...
8806	s8807	Movie	Zubaan	Mozez Singh	Anita Shabdish	India	March 2, 2019	2015	TV-14	111 min	International Movies	A scrappy but poor boy worms his way into a ty...
8806	s8807	Movie	Zubaan	Mozez Singh	Anita Shabdish	India	March 2, 2019	2015	TV-14	111 min	Music & Musicals	A scrappy but poor boy worms his way into a ty...
8806	s8807	Movie	Zubaan	Mozez Singh	Chittaranjan Tripathy	India	March 2, 2019	2015	TV-14	111 min	Dramas	A scrappy but poor boy worms his way into a ty...

```
df.shape,data.shape
```

```
((202065, 12), (8807, 12))
```

**Handling null values **

Which coulumns has how many null values

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

	0
show_id	0
type	0
title	0
director	50643
cast	2149
country	11897
date_added	158
release_year	0
rating	67
duration	3
listed_in	0
description	0

dtype: int64

```
for i in df.columns:
    null_rate = df[i].isna().sum() / len(df) * 100
    if null_rate > 0 :
        print("{} null rate: {}%".format(i,round(null_rate,2)))
```

```
director null rate: 25.06%
cast null rate: 1.06%
country null rate: 5.89%
date_added null rate: 0.08%
rating null rate: 0.03%
duration null rate: 0.0%
```

```
df.fillna({'director':'Unknown Director',
           'country':'Unknown Country',
           'cast':'Unknown Actor',
           'rating':'Unknown Rating',
           'duration':'Unknown Duration'
           },inplace=True)
```

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

	0
show_id	0
type	0
title	0
director	0
cast	0
country	0
date_added	158
release_year	0
rating	0
duration	0
listed_in	0
description	0

dtype: int64

Convert date_added column from object to datetime[ns]

```
df['date_added']=df['date_added'].astype('datetime64[ns]')
```

```
Start coding or generate with AI.
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 202065 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column        Non-Null Count   Dtype         
---  ------        --------------   -----         
 0   show_id       202065 non-null  object        
 1   type          202065 non-null  object        
 2   title         202065 non-null  object        
 3   director      202065 non-null  object        
 4   cast          202065 non-null  object        
 5   country       202065 non-null  object        
 6   date_added    201907 non-null  datetime64[ns]
 7   release_year  202065 non-null  int64         
 8   rating        202065 non-null  object        
 9   duration      202065 non-null  object        
 10  listed_in     202065 non-null  object        
 11  description   202065 non-null  object        
dtypes: datetime64[ns](1), int64(1), object(10)
memory usage: 20.0+ MB
```

```
df.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	Unknown Actor	United States	2021-09-25	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata	South Africa	2021-09-24	2021	TV-MA	2 Seasons	International TV Shows	After crossing paths at a party, a Cape Town t...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata	South Africa	2021-09-24	2021	TV-MA	2 Seasons	TV Dramas	After crossing paths at a party, a Cape Town t...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata	South Africa	2021-09-24	2021	TV-MA	2 Seasons	TV Mysteries	After crossing paths at a party, a Cape Town t...

```
movies=df[df['type']=='Movie']
tv_shows=df[df['type']=='TV Show']
```

```
movies.nunique()
```

	0
show_id	6131
type	1
title	6131
director	4887
cast	27880
country	188
date_added	1533
release_year	73
rating	18
duration	206
listed_in	37
description	6105

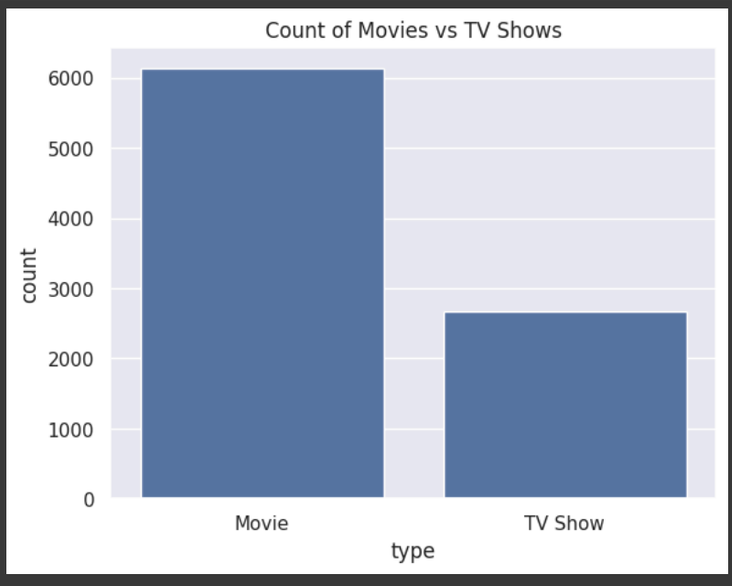
dtype: int64

```
tv_shows.nunique()
```

	0
show_id	2676
type	1
title	2676
director	301
cast	15502
country	103
date_added	1012
release_year	46
rating	10
duration	15
listed_in	36
description	2672

dtype: int64

```
sns.set(style="darkgrid")
sns.countplot(data=data,x='type')
plt.title('Count of Movies vs TV Shows')
plt.show()
```

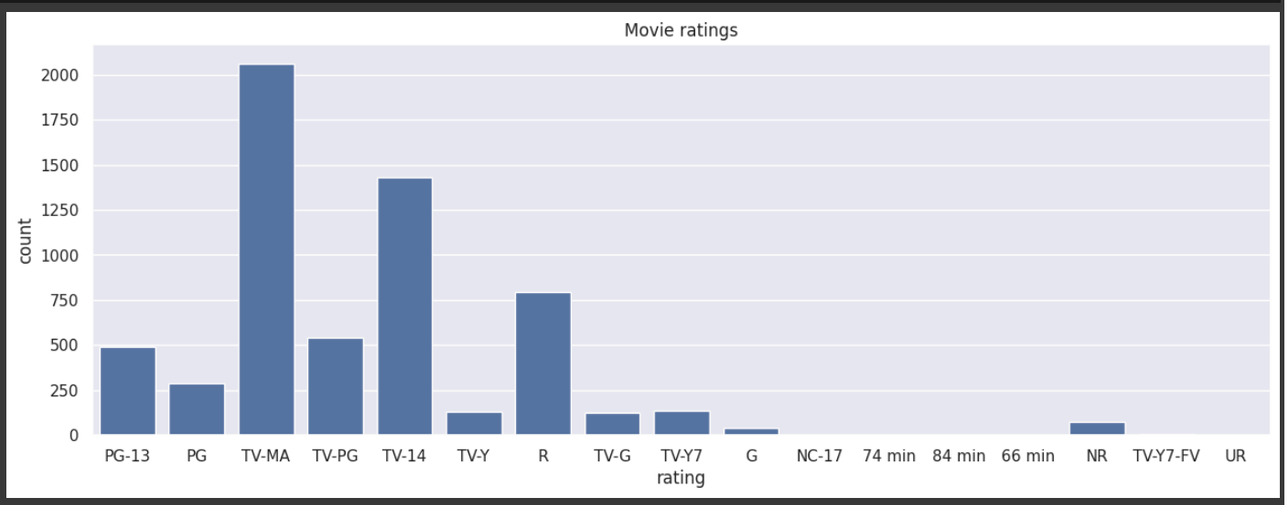



```
data[data['type']=='Movie']['rating'].value_counts()
```

rating	count
TV-MA	2062
TV-14	1427
R	797
TV-PG	540
PG-13	490
PG	287
TV-Y7	139
TV-Y	131
TV-G	126
NR	75
G	41
TV-Y7-FV	5
NC-17	3
UR	3
74 min	1
84 min	1
66 min	1

dtype: int64

```
plt.figure(figsize=(15,5))
sns.set(style="darkgrid")
plt.title('Movie ratings')
sns.countplot(data=data[data['type']=='Movie'],x='rating')
plt.show()
```

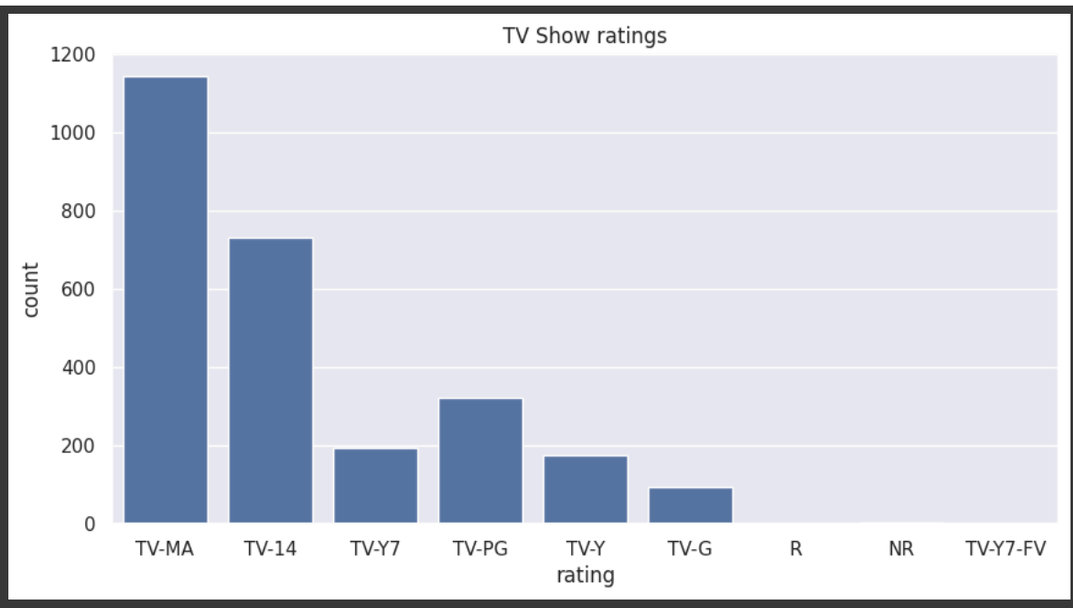



```
data[data['type']=='TV Show']['rating'].value_counts()
```

rating	count
TV-MA	1145
TV-14	733
TV-PG	323
TV-Y7	195
TV-Y	176
TV-G	94
NR	5
R	2
TV-Y7-FV	1

dtype: int64

```
plt.figure(figsize=(10,5))
sns.set(style="darkgrid")
plt.title('TV Show ratings')
sns.countplot(data=data[data['type']=='TV Show'],x='rating')
plt.show()
```

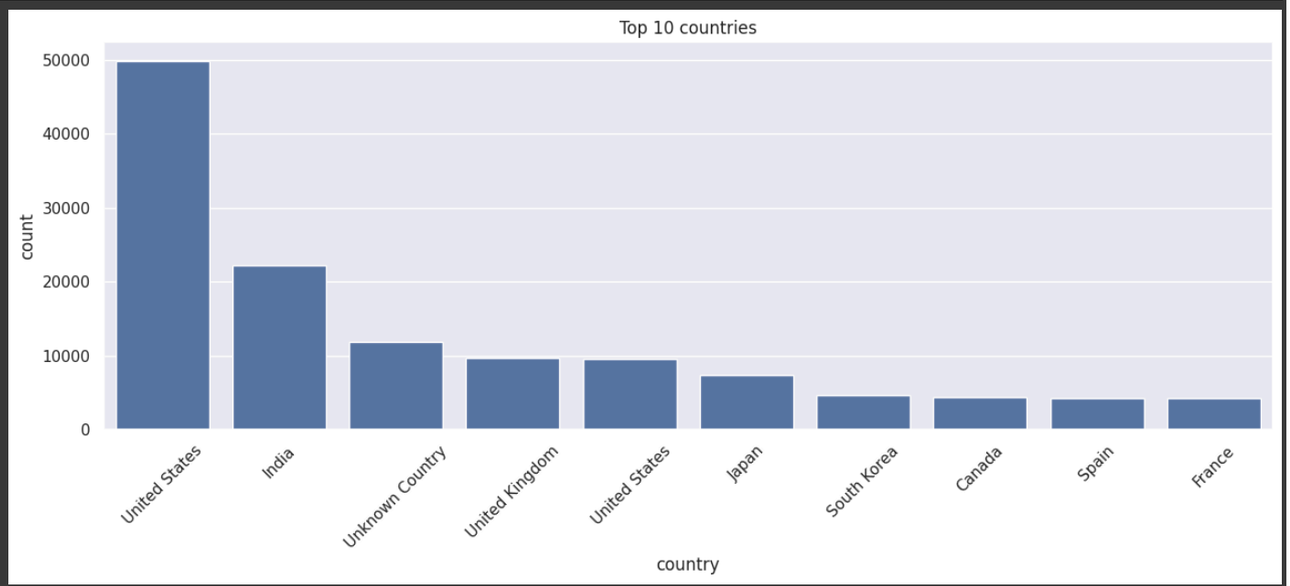



```
df['country'].value_counts().head(10)
```

country	count
United States	49868
India	22139
Unknown Country	11897
United Kingdom	9733
United States	9482
Japan	7317
South Korea	4628
Canada	4395
Spain	4255
France	4182

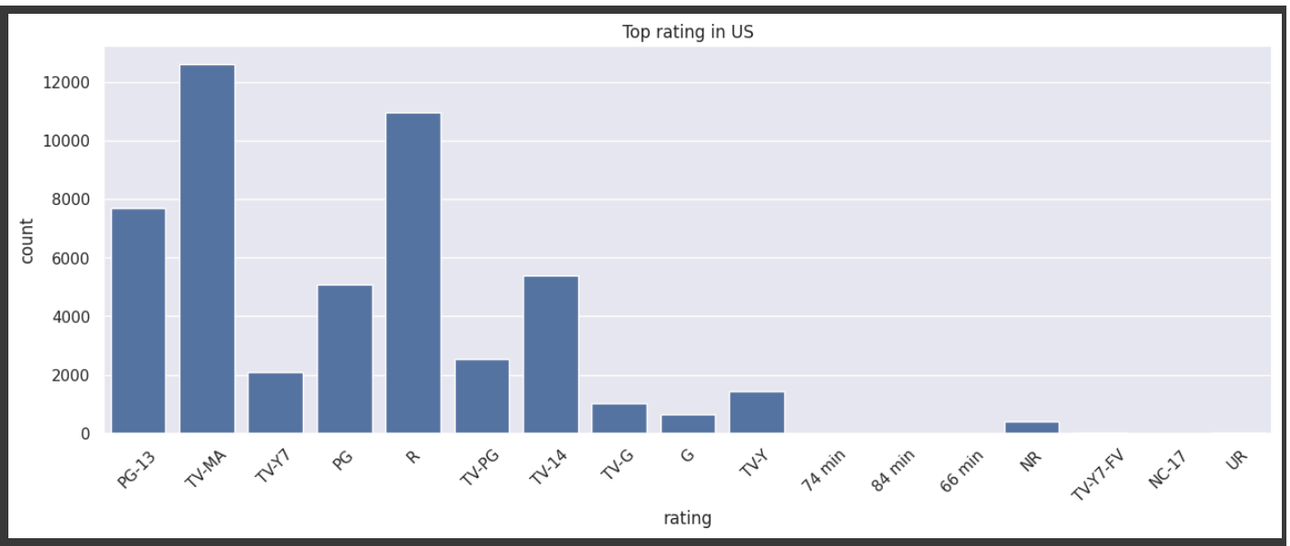
dtype: int64

```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
plt.title('Top 10 countries')
sns.set(style="darkgrid")
sns.barplot(data=df['country'].value_counts().head(10).reset_index(),x='country',y='count')
plt.show()
```

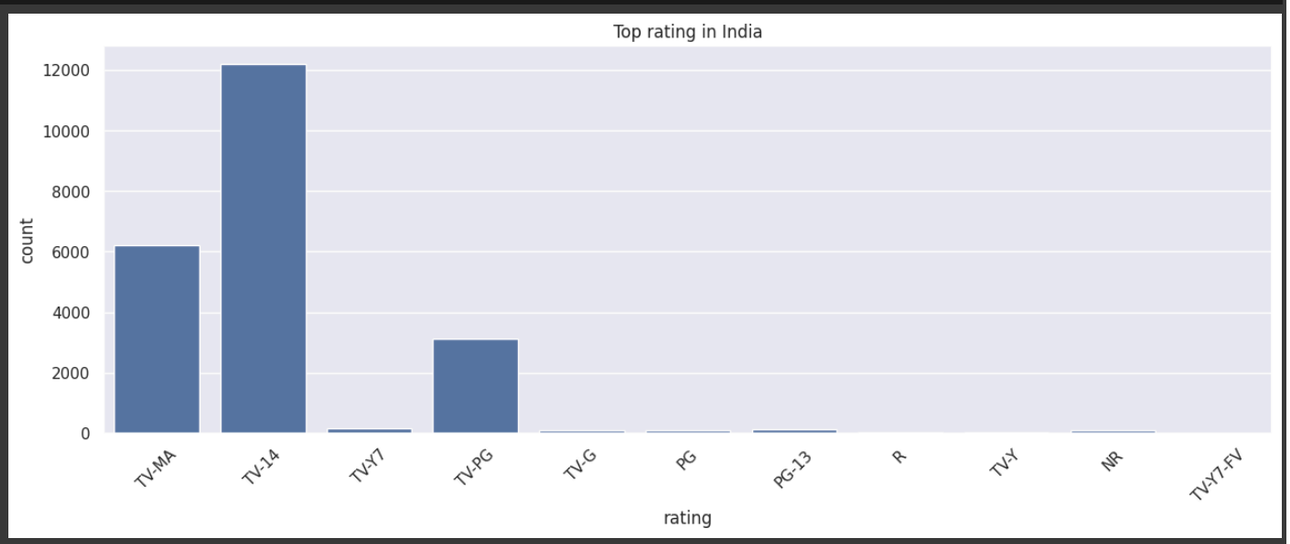



```
US_data=df[df['country']=='United States']
IN_data=df[df['country']=='India']
```

```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
plt.title('Top rating in US')
sns.set(style="darkgrid")
sns.countplot(data=US_data,x='rating')
plt.show()
```



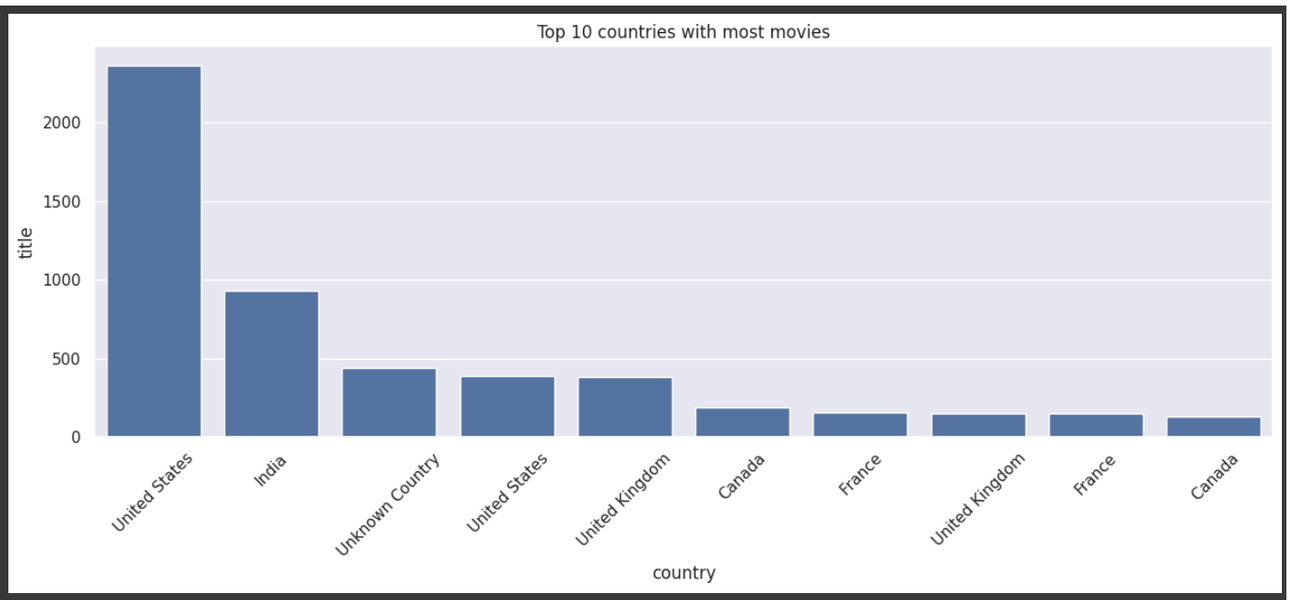

```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
plt.title('Top rating in India')
sns.countplot(data=IN_data,x='rating')
plt.show()
```




```
movies.groupby('country')['title'].nunique().sort_values(ascending=False).head(10)
```

```
country
United States          2364
India                   927
Unknown Country         440
United States           388
United Kingdom          382
Canada                  187
France                  155
United Kingdom          152
France                  148
Canada                  132
Name: title, dtype: int64
```

```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
plt.title('Top 10 countries with most movies')
sns.barplot(data=movies.groupby('country')['title'].nunique().sort_values(ascending=False).head(10).reset_index(),x='country',y='title')
plt.show()
```

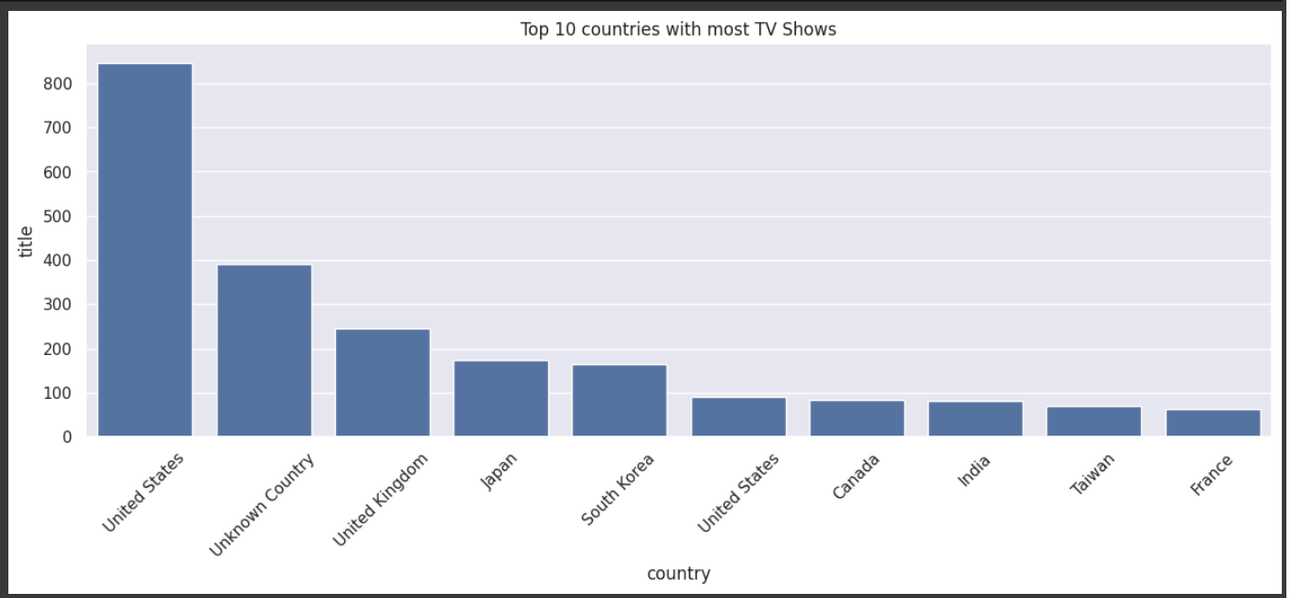



```
tv_shows.groupby('country')['title'].nunique().sort_values(ascending=False).head(10)
```

country	title
United States	847
Unknown Country	391
United Kingdom	246
Japan	174
South Korea	164
United States	91
Canada	84
India	81
Taiwan	70
France	64

dtype: int64

```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
plt.title('Top 10 countries with most TV Shows')
sns.barplot(data=tv_shows.groupby('country')['title'].nunique().sort_values(ascending=False).head(10).reset_index(),x='country',y='title')
plt.show()
```




```
Start coding or generate with AI.
```

```
data['date_added']=data['date_added'].astype('datetime64[ns]')
```

```
data['month']=data['date_added'].dt.month_name()
data['year']=data['date_added'].dt.year
data['date']=data['date_added'].dt.day
data['day']=data['date_added'].dt.day_name()
data['week']=data['date_added'].dt.isocalendar().week
```

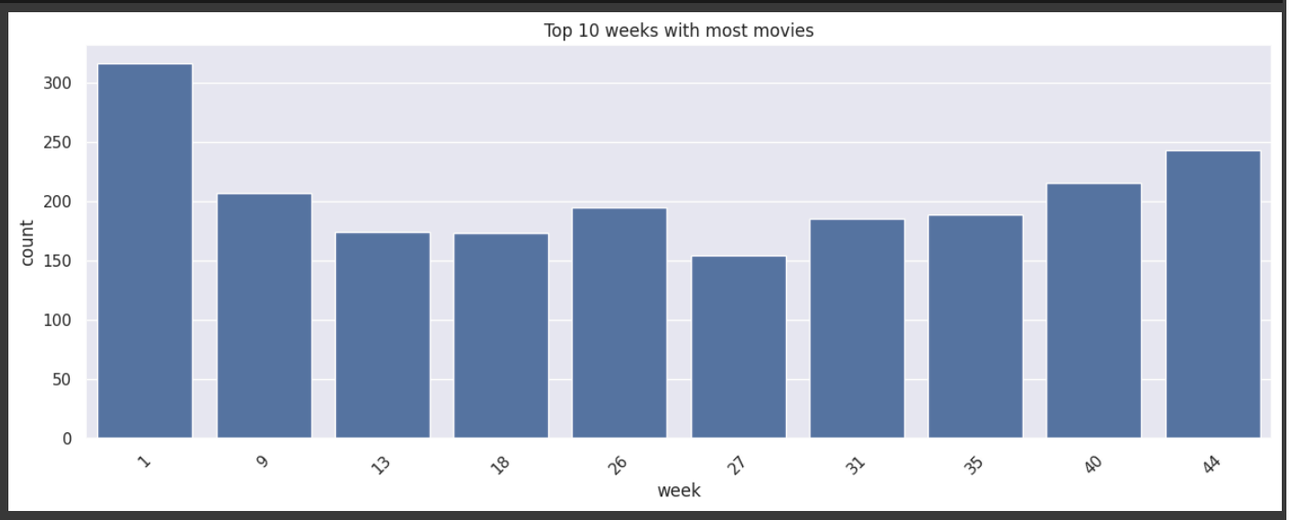
```
Start coding or generate with AI.
```

```
data[data['type']=='Movie']['week'].value_counts().head(10)
```

week	count
1	316
44	243
40	215
9	207
26	195
35	189
31	185
13	174
18	173
27	154

dtype: int64

```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
plt.title('Top 10 weeks with most movies')
sns.barplot(data=data[data['type']=='Movie']['week'].value_counts().head(10).reset_index(),x='week',y='count')
plt.show()
```

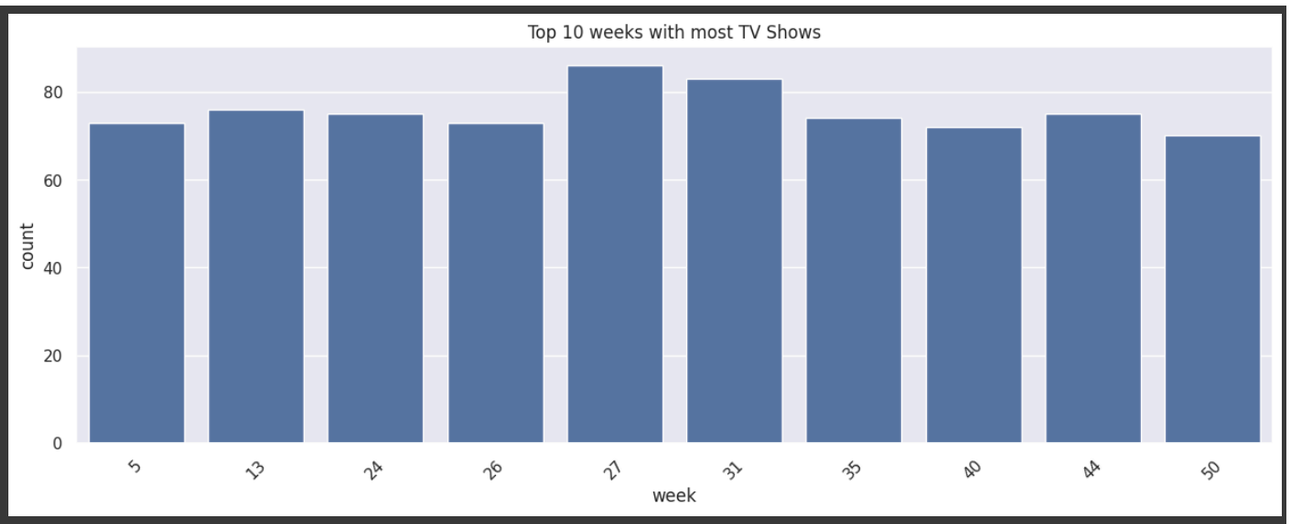



```
data[data['type']=='TV Show']['week'].value_counts().head(10)
```

week	count
27	86
31	83
13	76
44	75
24	75
35	74
5	73
26	73
40	72
50	70

dtype: int64

```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
plt.title('Top 10 weeks with most TV Shows')
sns.barplot(data=data[data['type']=='TV Show']['week'].value_counts().head(10).reset_index(),x='week',y='count')
plt.show()
```

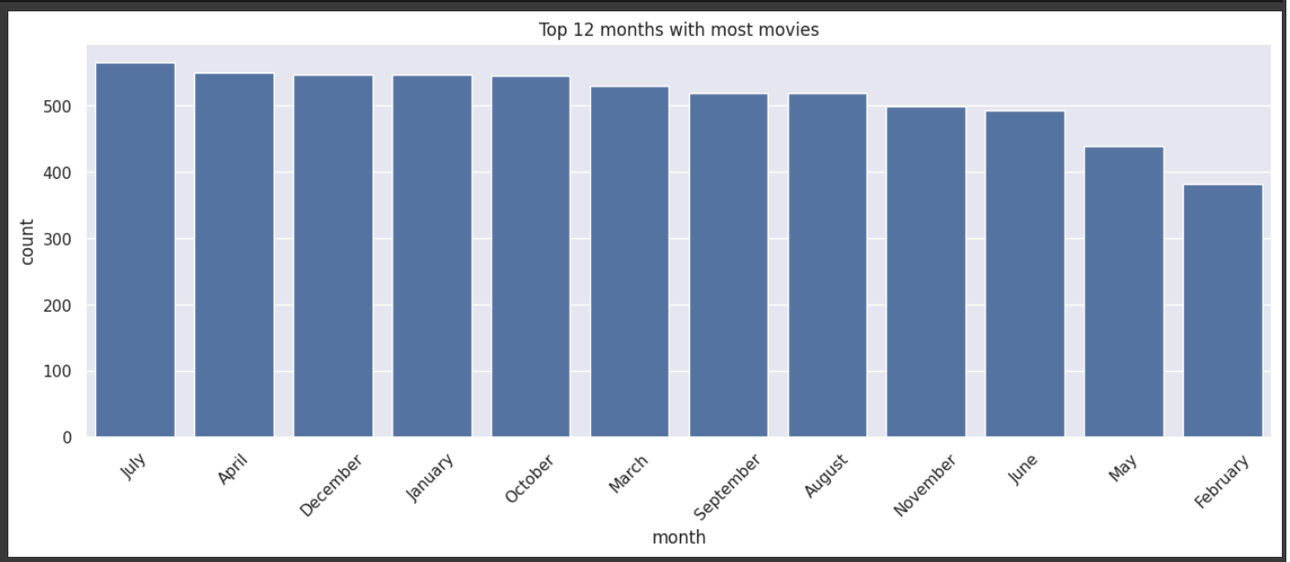



```
data[data['type']=='Movie']['month'].value_counts().head(12)
```

month	count
July	565
April	550
December	547
January	546
October	545
March	529
September	519
August	519
November	498
June	492
May	439
February	382

dtype: int64

```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
plt.title('Top 12 months with most movies')
sns.barplot(data=data[data['type']=='Movie']['month'].value_counts().head(12).reset_index(),x='month',y='count')
plt.show()
```

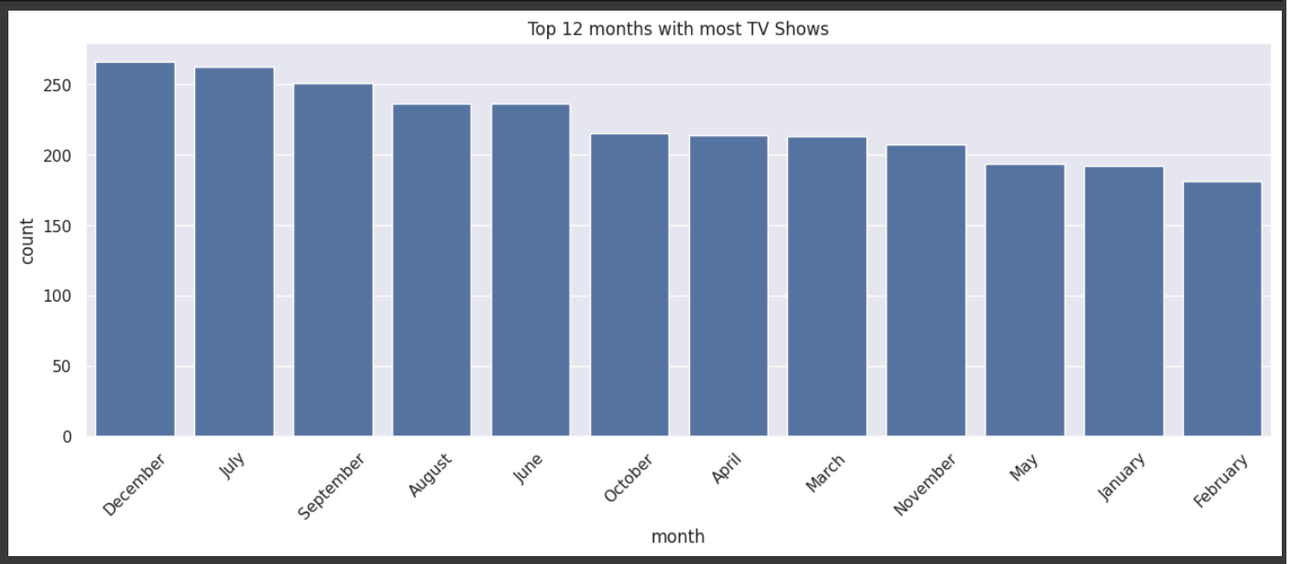



```
data[data['type']=='TV Show']['month'].value_counts().head(12)
```

month	count
December	266
July	262
September	251
August	236
June	236
October	215
April	214
March	213
November	207
May	193
January	192
February	181

dtype: int64

```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
plt.title('Top 12 months with most TV Shows')
sns.barplot(data=data[data['type']=='TV Show']['month'].value_counts().head(12).reset_index(),x='month',y='count')
plt.show()
```




```
data['director'].value_counts().head(10)
```

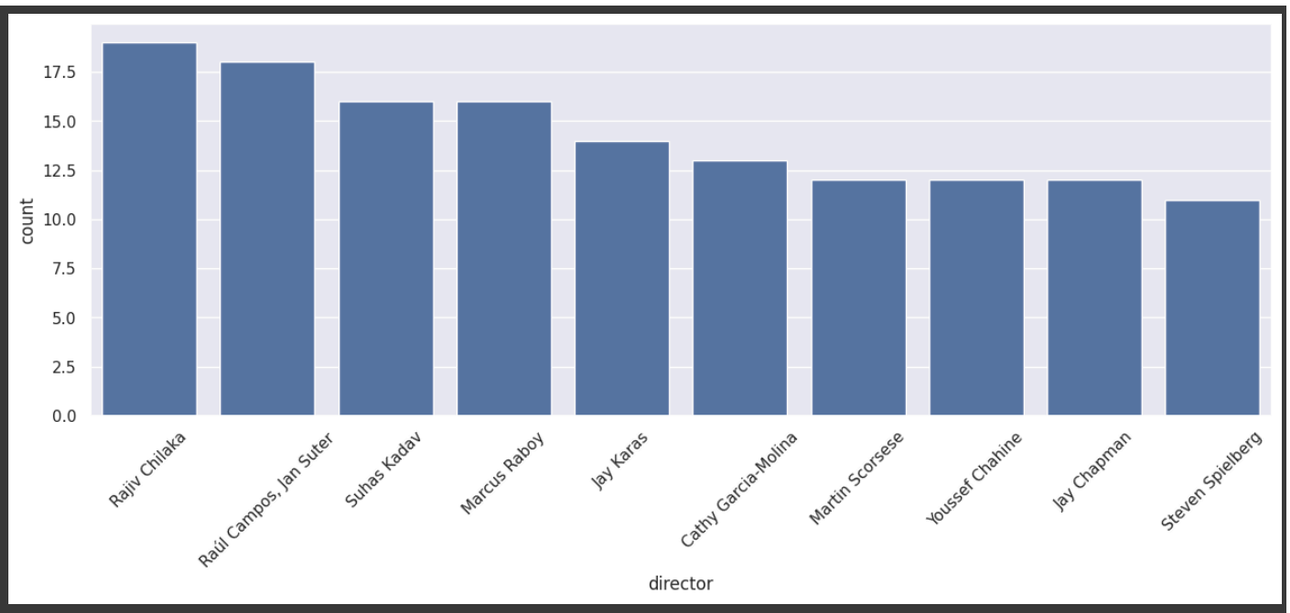
director	count
Rajiv Chilaka	19
Raúl Campos, Jan Suter	18
Suhas Kadav	16
Marcus Raboy	16
Jay Karas	14
Cathy Garcia-Molina	13
Martin Scorsese	12
Youssef Chahine	12
Jay Chapman	12
Steven Spielberg	11

dtype: int64

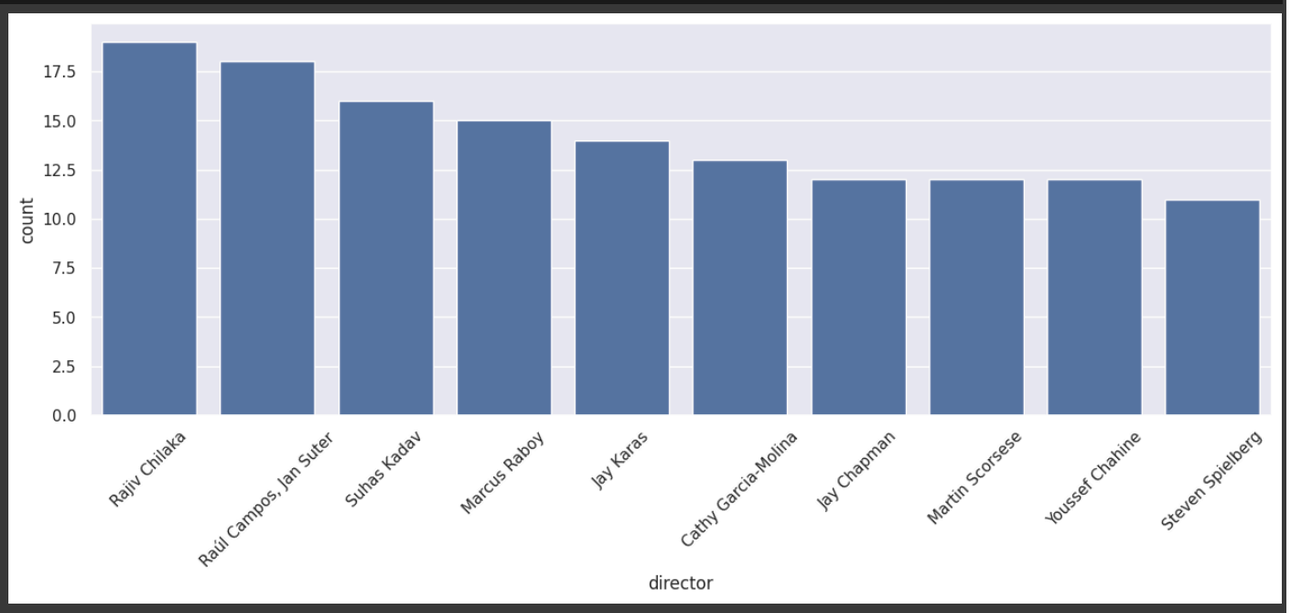
```
Start coding or generate with AI.
```

```
Start coding or generate with AI.
```

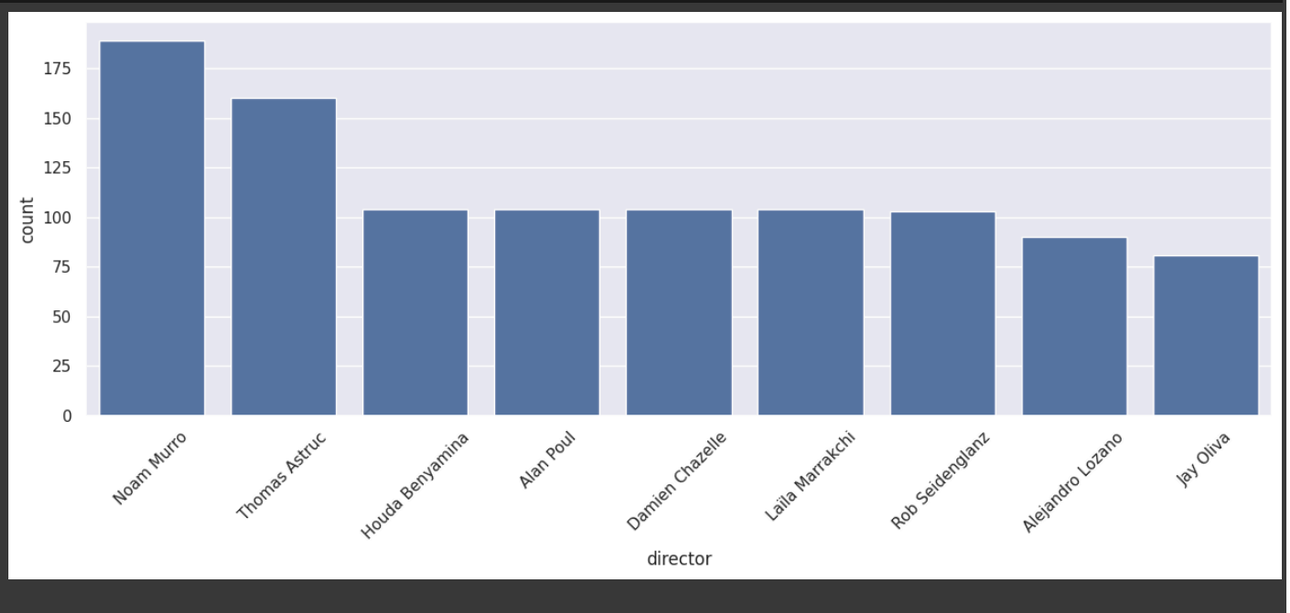
```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
sns.barplot(data=data['director'].value_counts().head(10).reset_index(),x='director',y='count')
plt.show()
```




```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
sns.barplot(data=data[data['type']=='Movie']['director'].value_counts().head(10).reset_index(),x='director',y='count')
plt.show()
```




```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
sns.set(style="darkgrid")
sns.barplot(data=df[df['type']=='TV Show']['director'].value_counts().head(10).reset_index().iloc[1:,:],x='director',y='count')
plt.show()
```

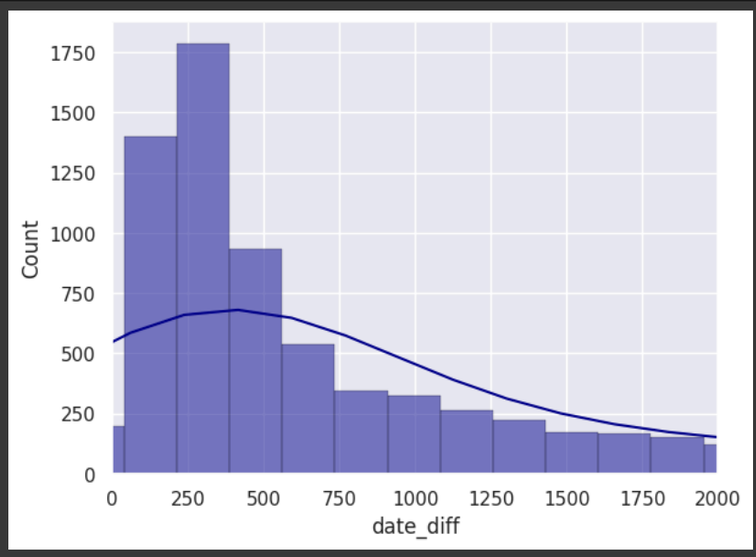



```
plt.figure(figsize=(15,5))
plt.xticks(rotation=45)
```

```
sns.set(style="darkgrid")
sns.barplot(data=data['rating'].value_counts().head(10).reset_index(),x='rating',y='count')
plt.show()
```


```
data['date_diff']=(data['date_added']-pd.to_datetime(data['release_year'],format="%Y")).dt.days
```

```
sns.set(style="darkgrid")
sns.histplot(data['date_diff'],color='darkblue', edgecolor='black',kde=True)
plt.xlim(0,2000)
plt.show()
```



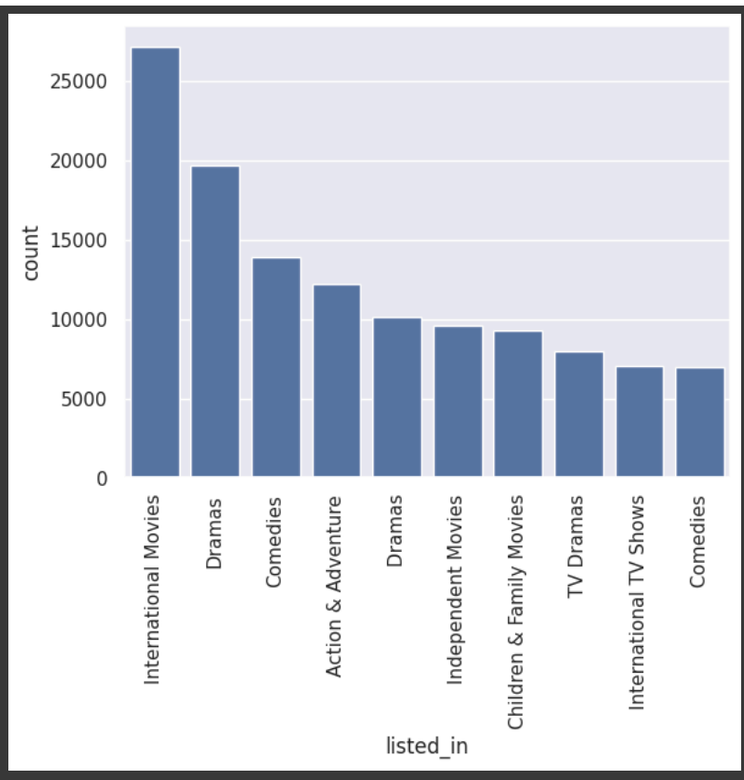

```
df.columns
```

```
Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added',
       'release_year', 'rating', 'duration', 'listed_in', 'description'],
      dtype='object')
```

```
df['listed_in'].value_counts().reset_index().head(10)
```

	listed_in	count
0	International Movies	27141
1	Dramas	19657
2	Comedies	13894
3	Action & Adventure	12216
4	Dramas	10149
5	Independent Movies	9564
6	Children & Family Movies	9294
7	TV Dramas	7956
8	International TV Shows	7065
9	Comedies	6935

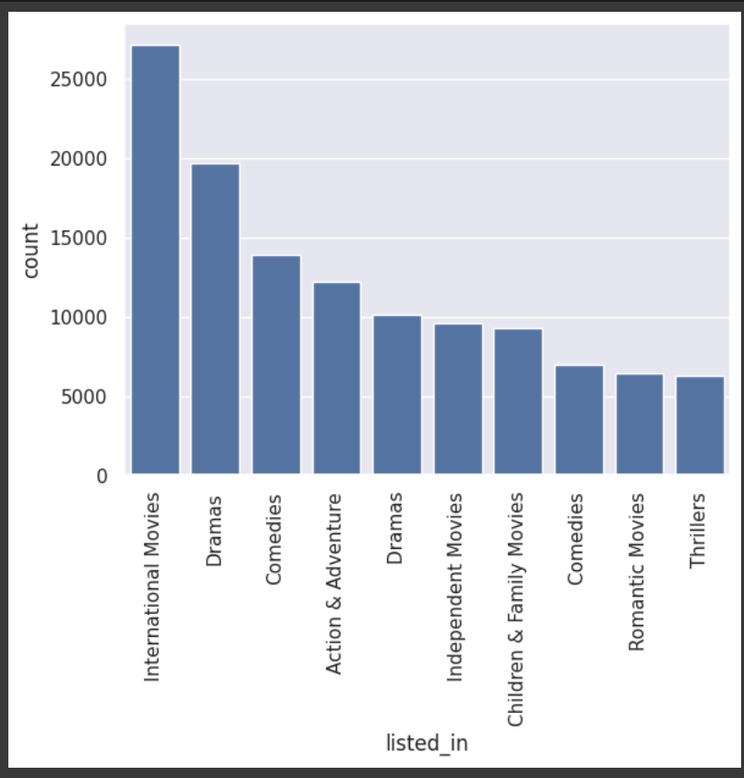
```
sns.barplot(data=df['listed_in'].value_counts().reset_index().head(10),x='listed_in',y='count')
plt.xticks(rotation=90)
plt.show()
```




```
df[df['type']=='Movie']['listed_in'].value_counts().reset_index().head(10)
```

	listed_in	count
0	International Movies	27141
1	Dramas	19657
2	Comedies	13894
3	Action & Adventure	12216
4	Dramas	10149
5	Independent Movies	9564
6	Children & Family Movies	9294
7	Comedies	6935
8	Romantic Movies	6392
9	Thrillers	6283

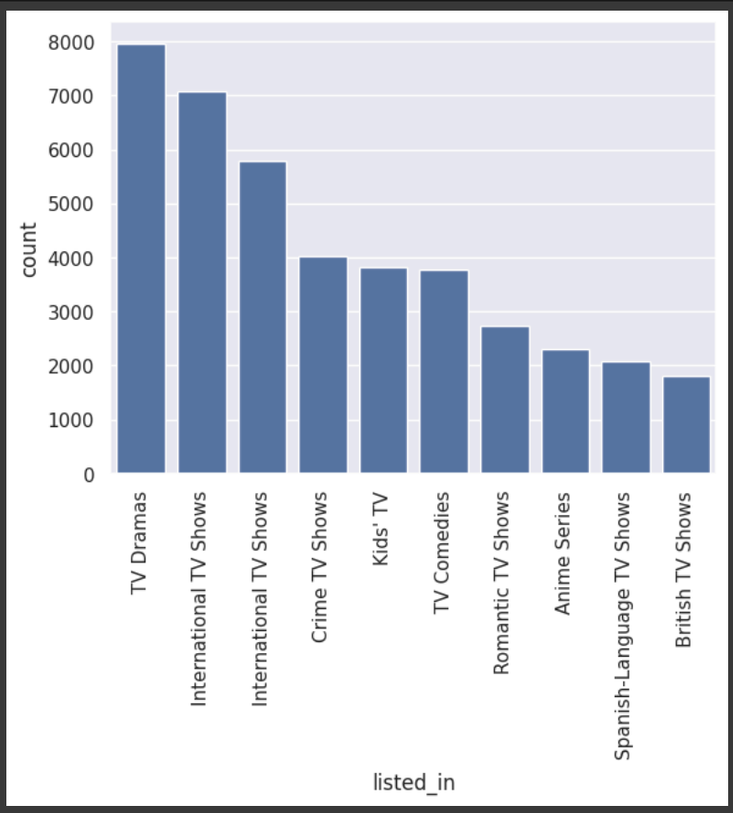
```
sns.barplot(data=df[df['type']=='Movie']['listed_in'].value_counts().reset_index().head(10),x='listed_in',y='count')
plt.xticks(rotation=90)
plt.show()
```




```
df[df['type']=='TV Show']['listed_in'].value_counts().reset_index().head(10)
```

	listed_in	count
0	TV Dramas	7956
1	International TV Shows	7065
2	International TV Shows	5780
3	Crime TV Shows	4020
4	Kids' TV	3809
5	TV Comedies	3768
6	Romantic TV Shows	2729
7	Anime Series	2313
8	Spanish-Language TV Shows	2088
9	British TV Shows	1808

```
sns.barplot(data=df[df['type']=='TV Show']['listed_in'].value_counts().reset_index().head(10),x='listed_in',y='count')
plt.xticks(rotation=90)
plt.show()
```




```
data.columns
```

```
Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added',
       'release_year', 'rating', 'duration', 'listed_in', 'description',
       'month', 'year', 'date', 'day', 'week', 'date_diff'],
      dtype='object')
```

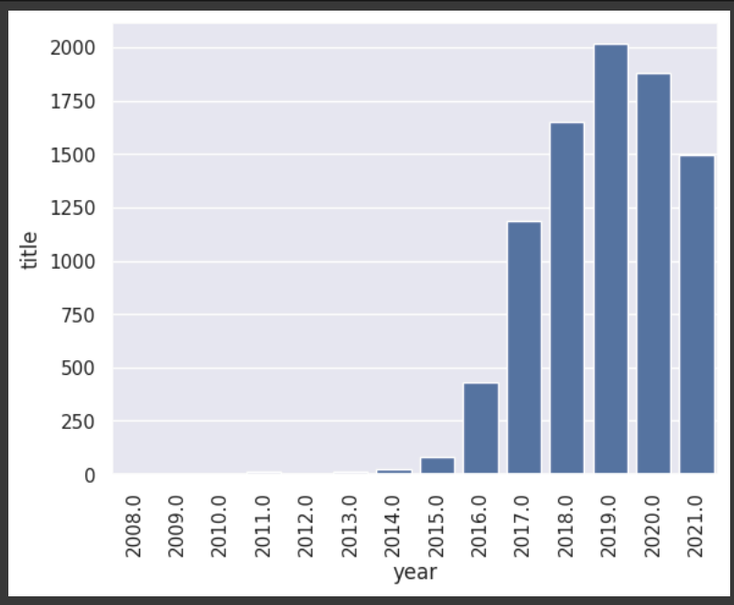
```
data.year.min(),data.year.max()
```

```
(2008.0, 2021.0)
```

```
data.groupby('year')['title'].count().reset_index()
```

	year	title
0	2008.0	2
1	2009.0	2
2	2010.0	1
3	2011.0	13
4	2012.0	3
5	2013.0	11
6	2014.0	24
7	2015.0	82
8	2016.0	429
9	2017.0	1188
10	2018.0	1649
11	2019.0	2016
12	2020.0	1879
13	2021.0	1498

```
sns.barplot(data=data.groupby('year')['title'].count().reset_index(),x='year',y='title')
plt.xticks(rotation=90)
plt.show()
```




```
data[data['type']=='Movie'].groupby('year')['title'].count().reset_index()
```

	year	title
0	2008.0	1
1	2009.0	2
2	2010.0	1
3	2011.0	13
4	2012.0	3
5	2013.0	6
6	2014.0	19
7	2015.0	56
8	2016.0	253
9	2017.0	839
10	2018.0	1237
11	2019.0	1424
12	2020.0	1284
13	2021.0	993

```
sns.barplot(data=data[data['type']=='Movie'].groupby('year')['title'].count().reset_index(),x='year',y='title')
plt.xticks(rotation=90)
plt.show()
```