In [1]:
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline

import warnings
warnings.filterwarnings("ignore")
```

In [2]:
```
#Loading the data:

data = pd.read_csv("C:/Users/Dell/Documents/Python Projects/netflix_titles.csv/netflix_titles.csv")
```

In [3]:
```
data.head(5)
```

Out[3]:

	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 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 amo...
4	s5	TV Show	Kota Factory	NaN	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...	India	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, Romantic TV Shows, TV ...	In a city of coaching centers known to train I...

In [ ]:
```
```

In [4]:
```
data.tail(5)
```

Out[4]:

	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 Singh	Vicky Kaushal, Sarah-Jane Dias, Raaghav Chanan...	India	March 2, 2019	2015	TV-14	111 min	Dramas, International Movies, Music & Musicals	A scrappy but poor boy worms his way into a ty...

In [5]:
```
data.shape
```

Out[5]:
```
(8807, 12)
```

In [6]:
```
data.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]:
```
data.describe()
```

Out[7]:

	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

In [8]:
```
data.columns
```

Out[8]:
```
Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added',
       'release_year', 'rating', 'duration', 'listed_in', 'description'],
      dtype='object')
```

Data cleaning:

In [9]:
```
data.isnull().sum()
```

Out[9]:
```
show_id           0
type              0
title             0
director       2634
cast            825
country         831
date_added       10
release_year      0
rating            4
duration          3
listed_in         0
description       0
dtype: int64
```

In [10]:
```
#get the unique values:

data.nunique()
```

Out[10]:
```
show_id         8807
type               2
title           8807
director        4528
cast            7692
country          748
date_added      1767
release_year      74
rating            17
duration         220
listed_in        514
description     8775
dtype: int64
```

In [ ]:
```

```

In [11]:
```
data['rating'].value_counts
```

Out[11]:
```
<bound method IndexOpsMixin.value_counts of 0       PG-13
1       TV-MA
2       TV-MA
3       TV-MA
4       TV-MA
        ...
8802        R
8803    TV-Y7
8804        R
8805       PG
8806    TV-14
Name: rating, Length: 8807, dtype: object>
```

In [12]:
```
# Handling the missing values:

#rating:

data['rating'].fillna('TV-MA',inplace=True)
```

In [13]:
```
data['director'].value_counts
```

Out[13]:
```
<bound method IndexOpsMixin.value_counts of 0       Kirsten Johnson
1                   NaN
2       Julien Leclercq
3                   NaN
4                   NaN
             ...
8802      David Fincher
8803                NaN
8804    Ruben Fleischer
8805       Peter Hewitt
8806        Mozez Singh
Name: director, Length: 8807, dtype: object>
```

In [14]:
```
# Maxmium values in director column is missing, then we fill the null values as 'Unknown'.

#Director:

data['director'].fillna('Unknown',inplace=True)
```

In [15]:
```
#cast

data['cast'].value_counts
```

Out[15]:
```
<bound method IndexOpsMixin.value_counts of 0                                                    NaN
1       Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...
2       Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...
3                                                     NaN
4       Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...
                              ...
8802    Mark Ruffalo, Jake Gyllenhaal, Robert Downey J...
8803                                                  NaN
8804    Jesse Eisenberg, Woody Harrelson, Emma Stone, ...
8805    Tim Allen, Courteney Cox, Chevy Chase, Kate Ma...
8806    Vicky Kaushal, Sarah-Jane Dias, Raaghav Chanan...
Name: cast, Length: 8807, dtype: object>
```

In [16]:
```
data['cast'].fillna('Unknown',inplace=True)
```

In [17]:
```
data['country'].value_counts
```

Out[17]:
```
<bound method IndexOpsMixin.value_counts of 0       United States
1        South Africa
2                 NaN
3                 NaN
4               India
            ...
8802    United States
8803              NaN
8804    United States
8805    United States
8806            India
Name: country, Length: 8807, dtype: object>
```

In [18]:
```
#Country:

data['country'].fillna(data['country'].mode()[0],inplace=True)
```

In [19]:
```
data['date_added'].isnull().sum()
```

Out[19]:
```
10
```

In [20]:
```
data['duration'].isnull().sum()
```

Out[20]:
```
3
```

In [21]:
```
#date_added:

data.dropna(subset=['date_added'],inplace=True)
```

In [22]:
```
data.dropna(subset=['duration'],inplace=True)
```

In [23]:
```
#checking for null values:

data.isnull().sum()
```

Out[23]:
```
show_id         0
type            0
title           0
director        0
cast            0
country         0
date_added      0
release_year    0
rating          0
duration        0
listed_in       0
description     0
dtype: int64
```

All missing values has been cleared.

In [24]:
```
data.dtypes
```

Out[24]:
```
show_id         object
type            object
title           object
director        object
cast            object
country         object
date_added      object
release_year     int64
rating          object
duration        object
listed_in       object
description     object
dtype: object
```

In [25]:
```
# changing the date datatype:

data['date_added'] = pd.to_datetime(data['date_added'])
```

In [26]:
```
# getting the month and year column:

data['month'] = pd.to_numeric(data['date_added'].dt.month, errors='coerce').astype('Int64')
```

In [27]:
```
data['year'] = pd.to_numeric(data['date_added'].dt.year, errors='coerce').astype('Int64')
```

In [28]:
```
data.head(5)
```

Out[28]:

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description	month	year
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown	United States	2021-09-25	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...	9	2021
1	s2	TV Show	Blood & Water	Unknown	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	2021-09-24	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...	9	2021
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	United States	2021-09-24	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lor...	9	2021
3	s4	TV Show	Jailbirds New Orleans	Unknown	Unknown	United States	2021-09-24	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo...	9	2021
4	s5	TV Show	Kota Factory	Unknown	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...	India	2021-09-24	2021	TV-MA	2 Seasons	International TV Shows, Romantic TV Shows, TV ...	In a city of coaching centers known to train I...	9	2021

In [29]:
```
#changing the column of Listed_on as Genre:

data = data.rename(columns = {'listed_in':'genre'})
```

In [30]:
```
data['genre'] = data['genre'].apply(lambda x: x.split(",")[0])
```

In [31]:
```
data.head(5)
```

Out[31]:

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	genre	description	month	year
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown	United States	2021-09-25	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...	9	2021
1	s2	TV Show	Blood & Water	Unknown	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	2021-09-24	2021	TV-MA	2 Seasons	International TV Shows	After crossing paths at a party, a Cape Town t...	9	2021
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	United States	2021-09-24	2021	TV-MA	1 Season	Crime TV Shows	To protect his family from a powerful drug lor...	9	2021
3	s4	TV Show	Jailbirds New Orleans	Unknown	Unknown	United States	2021-09-24	2021	TV-MA	1 Season	Docuseries	Feuds, flirtations and toilet talk go down amo...	9	2021
4	s5	TV Show	Kota Factory	Unknown	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...	India	2021-09-24	2021	TV-MA	2 Seasons	International TV Shows	In a city of coaching centers known to train I...	9	2021

EDA:

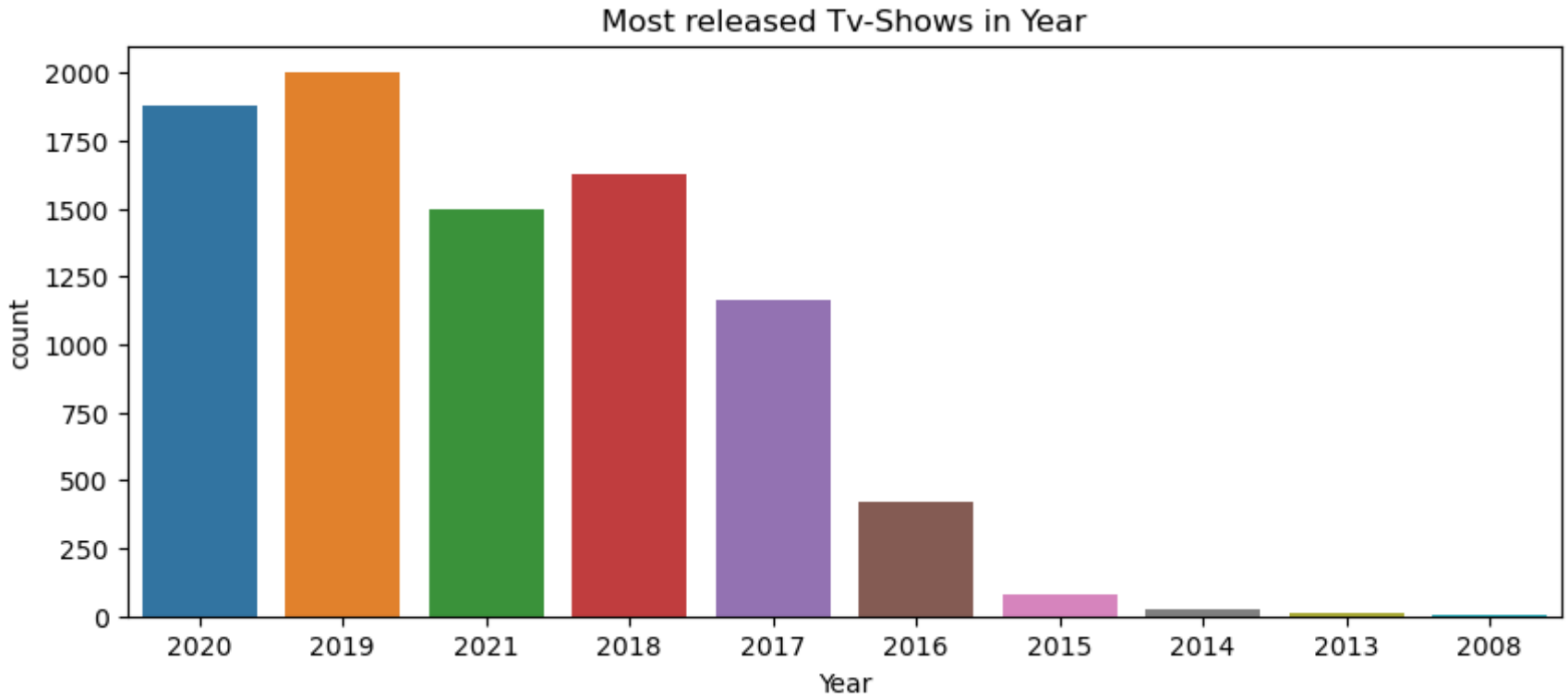
1. Which year has the maximum number of released TV shows and movies?

In [32]:
```
tv_shows= data[data['type']=='TV Show']
movies= data[data['type']=='Movie']
```

In [33]:
```
tv_shows['year'].value_counts()
plt.figure(figsize=(10,4))

sns.countplot(x = 'year', data = data, order = tv_shows['year'].value_counts().index)
plt.title("Most released Tv-Shows in Year")
plt.ylabel('count')
plt.xlabel('Year')
```

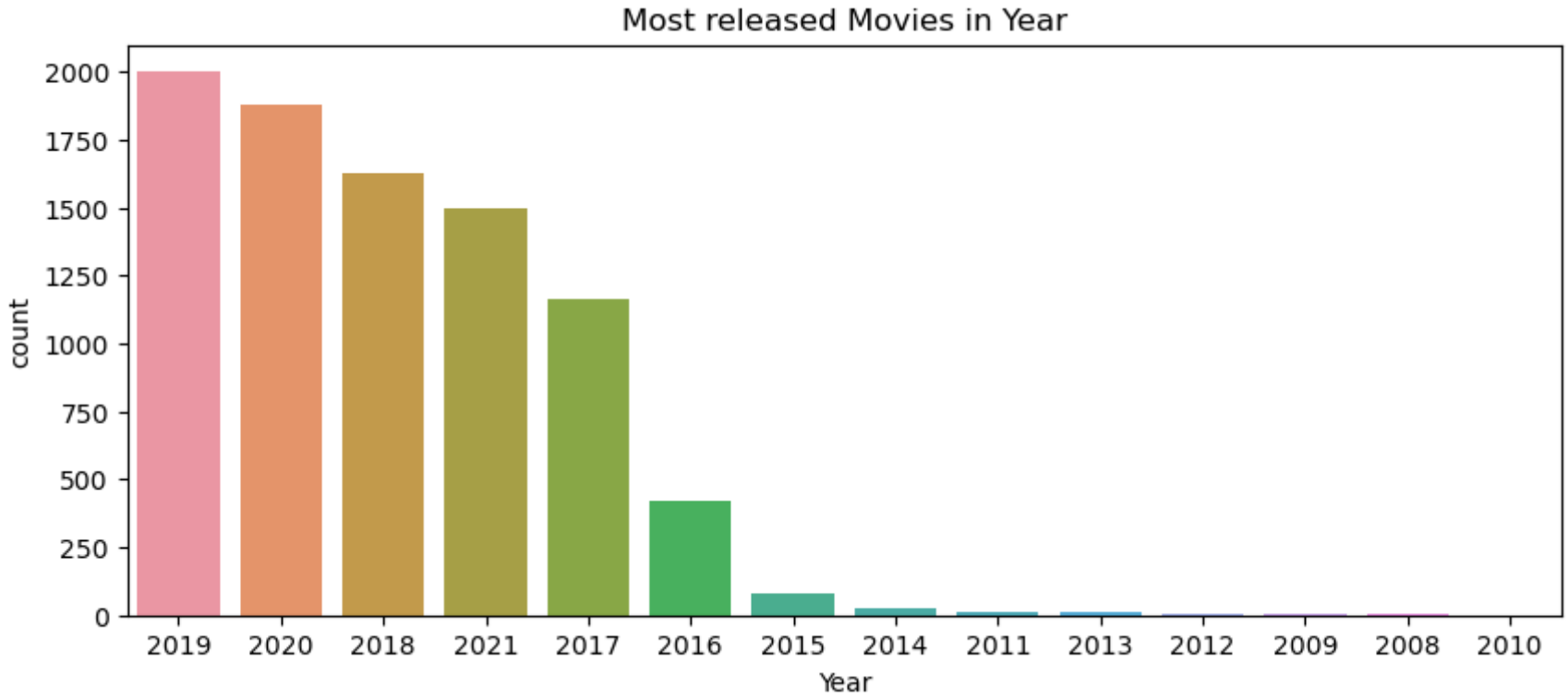
Out[33]:
```
Text(0.5, 0, 'Year')
```



In [34]:
```
movies['year'].value_counts()
plt.figure(figsize=(10,4))
```

```
sns.countplot(x = 'year', data = data, order = movies['year'].value_counts().index)
plt.title("Most released Movies in Year")
plt.ylabel('count')
plt.xlabel('Year')
```

Out[34]:
```
Text(0.5, 0, 'Year')
```



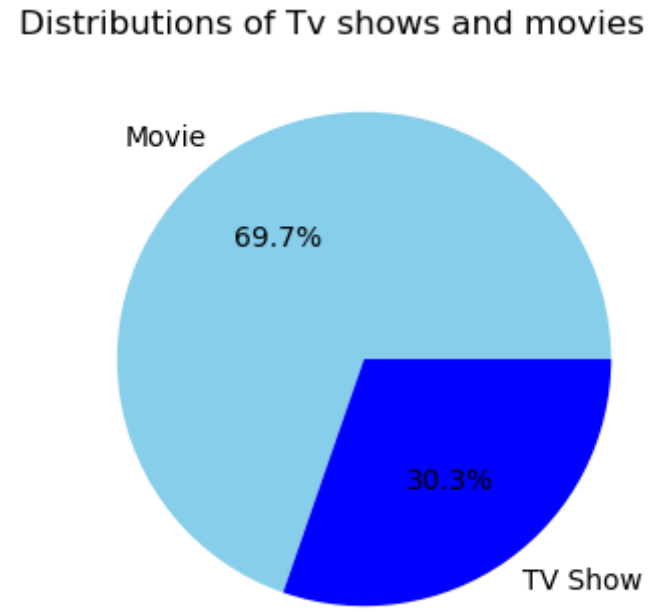
2. What is the distribution of content types (TV shows and movies) in the dataset?

In [35]:
```
data['type'].value_counts()
```

Out[35]:
```
Movie      6128
TV Show    2666
Name: type, dtype: int64
```

In [36]:
```
types = data['type'].value_counts()
plt.figure(figsize = (6,4))
```

```
plt.pie(types.values, labels=data['type'].value_counts().index, autopct='%1.1f%%', colors=['skyblue', 'blue'])
plt.title("Distributions of Tv shows and movies are")
plt.show()
```

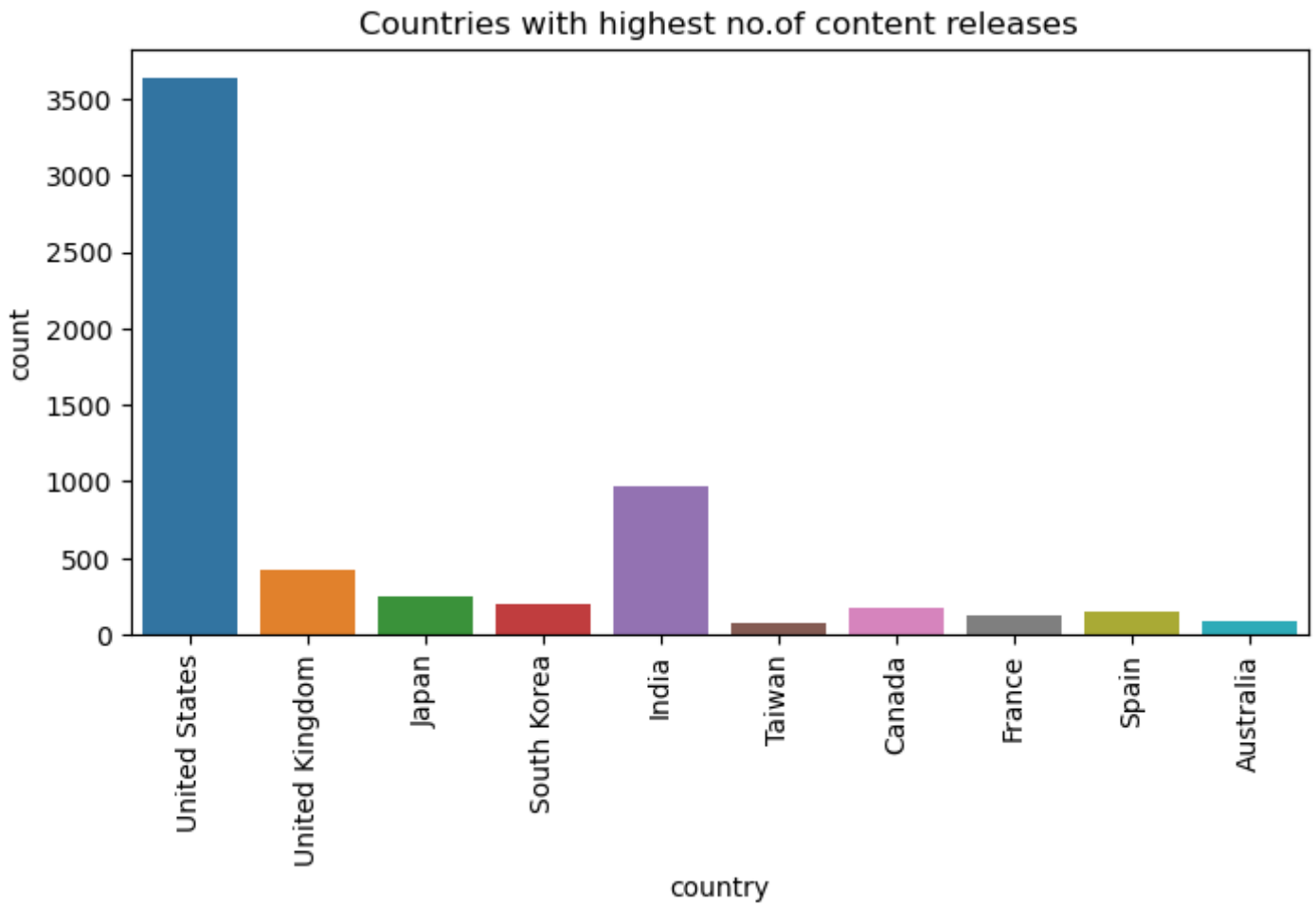


3. Which countries have the highest number of content releases Tv-shows and Movies?

In [37]:
```
tv_shows['country'].value_counts()
plt.figure(figsize=(8,4))

sns.countplot(x='country', data=data, order = tv_shows['country'].value_counts().iloc[:10].index)
plt.xticks(rotation=90)
plt.title("Countries with highest no.of content releases")
plt.xlabel("country")
plt.ylabel("count")
```

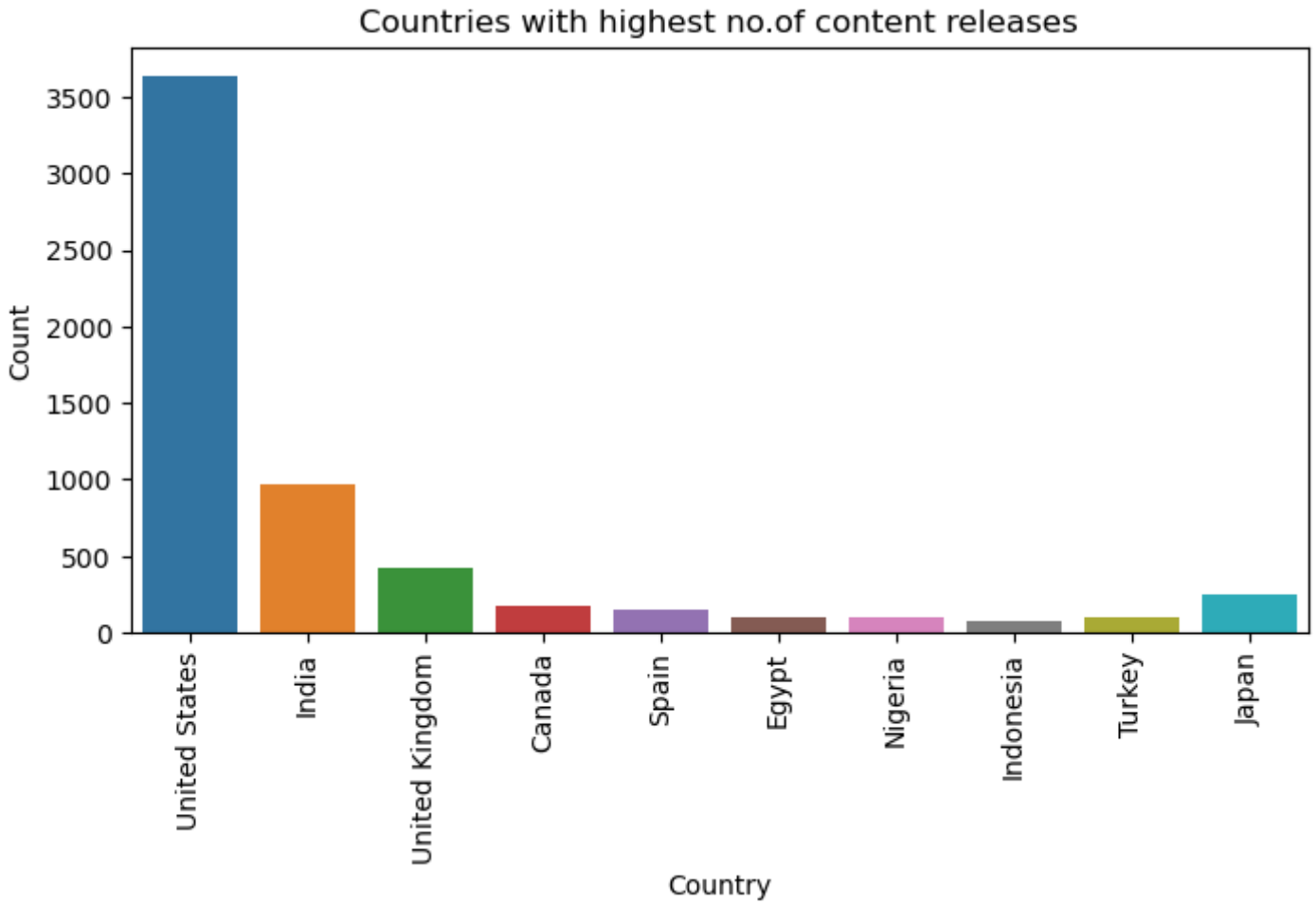
Out[37]:
```
Text(0, 0.5, 'count')
```



In [38]:
```
movies['country'].value_counts()
plt.figure(figsize=(8,4))

sns.countplot(x='country', data=data, order = movies['country'].value_counts().iloc[:10].index)
plt.xticks(rotation=90)
plt.title("Countries with highest no.of content releases")
plt.xlabel("Country")
plt.ylabel("Count")
```

Out[38]:
```
Text(0, 0.5, 'Count')
```



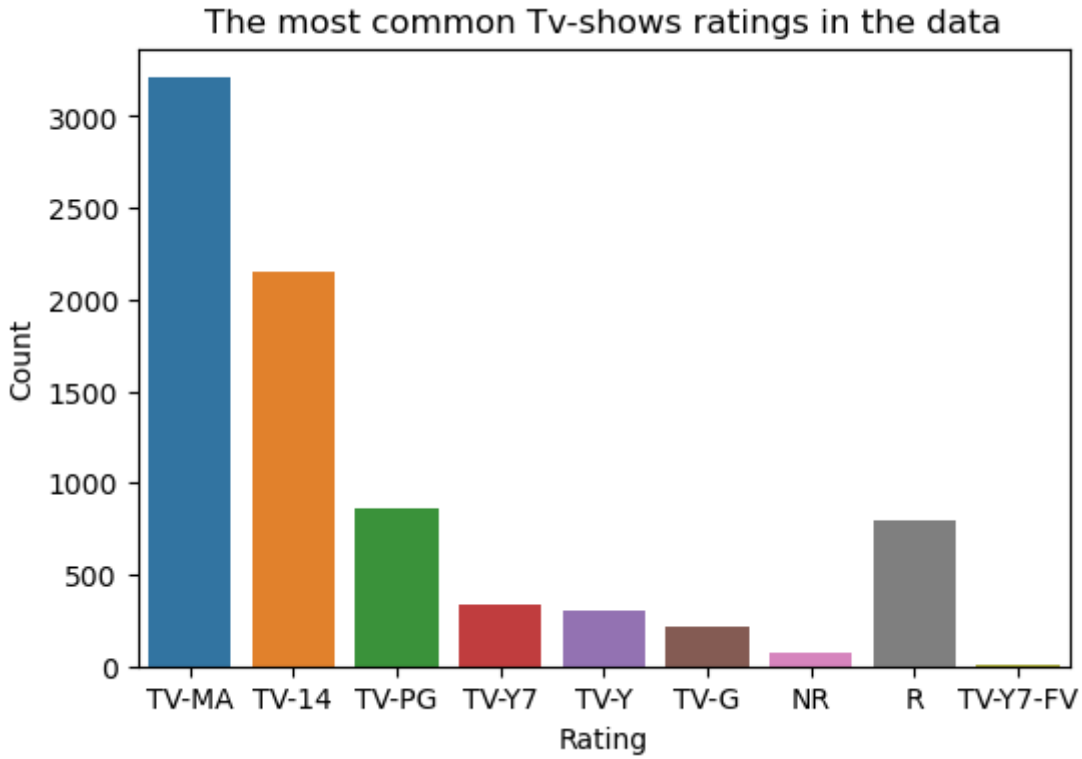
- Countries with highest no.of content releases on Tv-shows and movies are United States.

4. What are the most common content ratings in the dataset?

In [39]:
```
tv_shows['rating'].value_counts()
plt.figure(figsize=(6,4))

sns.countplot(x='rating', data=data, order=tv_shows['rating'].value_counts().index)
plt.title("The most common Tv-shows ratings in the data")
plt.xlabel("Rating")
plt.ylabel("Count")
```

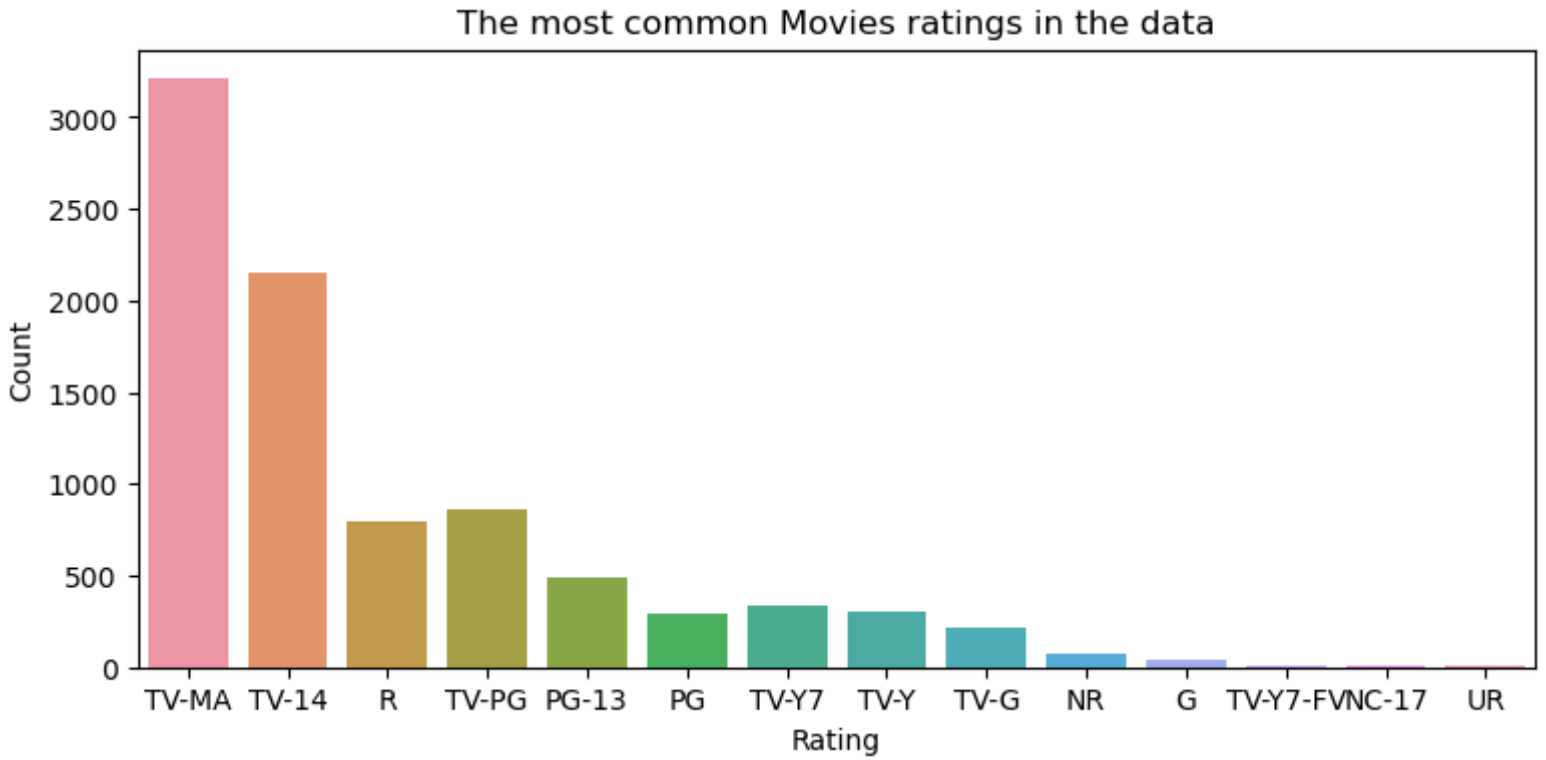
Out[39]: Text(0, 0.5, 'Count')



In [40]:
```
movies['rating'].value_counts()
plt.figure(figsize=(9,4))

sns.countplot(x='rating', data=data, order=movies['rating'].value_counts().index)
plt.title("The most common Movies ratings in the data")
plt.xlabel("Rating")
plt.ylabel("Count")
```

Out[40]: Text(0, 0.5, 'Count')

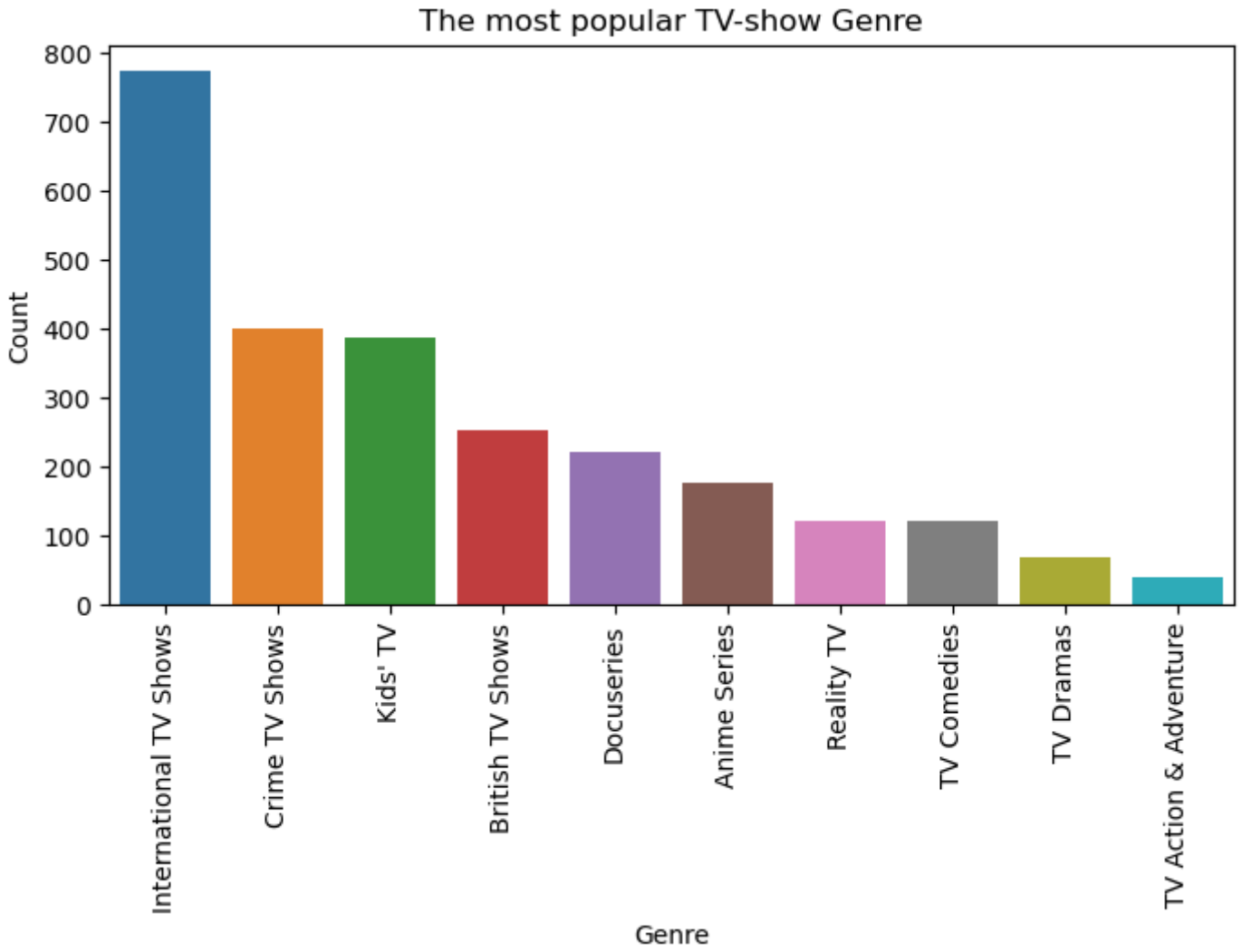


5. Which genres are the most popular in terms of content type [Tv-show and Movies] count?

In [41]:
```
tv_shows['genre'].value_counts()
plt.figure(figsize=(8,4))

sns.countplot(x='genre', data=data, order=tv_shows['genre'].value_counts().iloc[:10].index)
plt.xticks(rotation=90)
plt.title("The most popular TV-show Genre")
plt.xlabel('Genre')
plt.ylabel('Count')
```

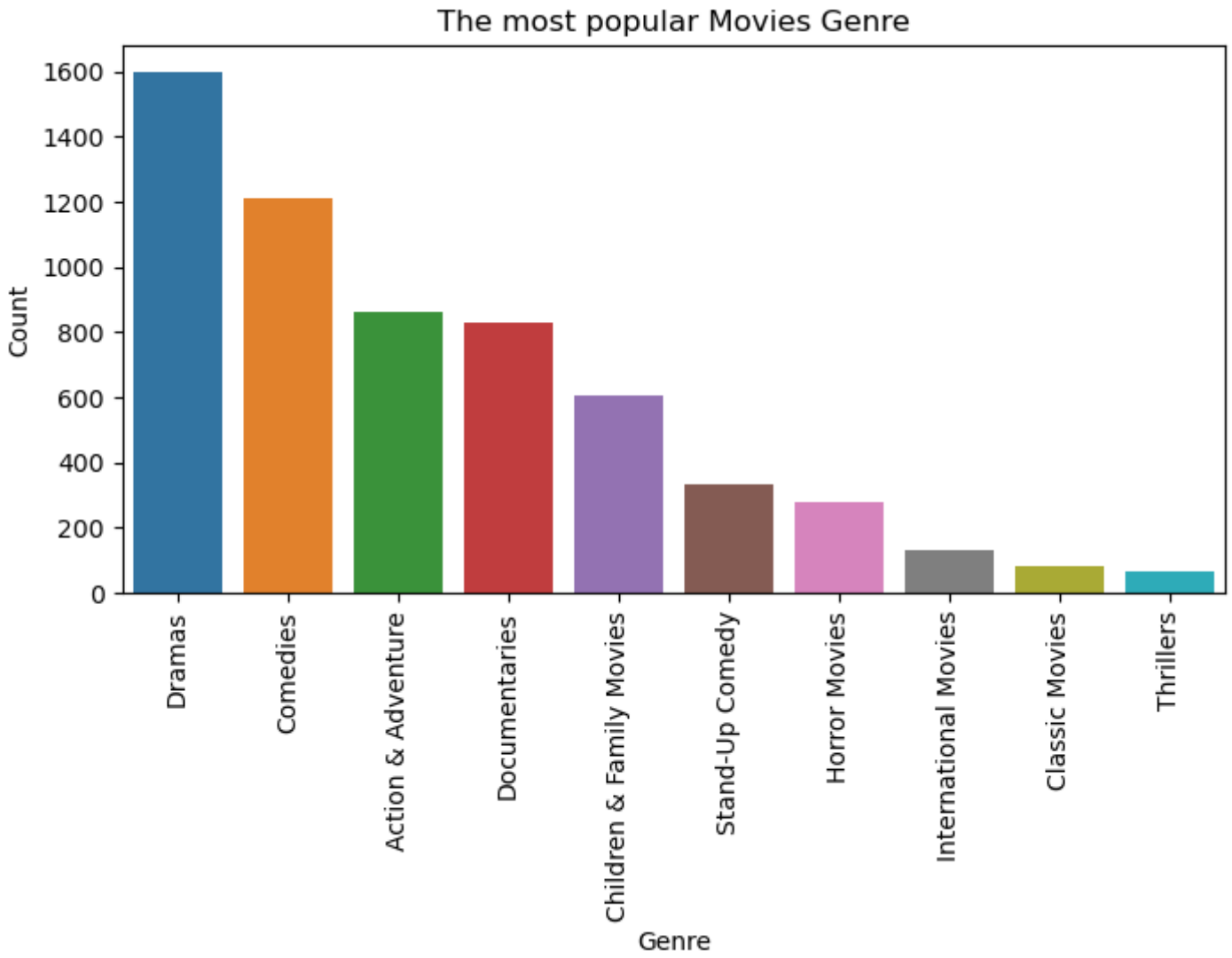
Out[41]:
```
Text(0, 0.5, 'Count')
```



In [42]:
```
movies['genre'].value_counts()
plt.figure(figsize=(8,4))

sns.countplot(x='genre', data=data, order=movies['genre'].value_counts().iloc[:10].index)
plt.xticks(rotation=90)
plt.title("The most popular Movies Genre")
plt.xlabel('Genre')
plt.ylabel('Count')
```

Out[42]: Text(0, 0.5, 'Count')



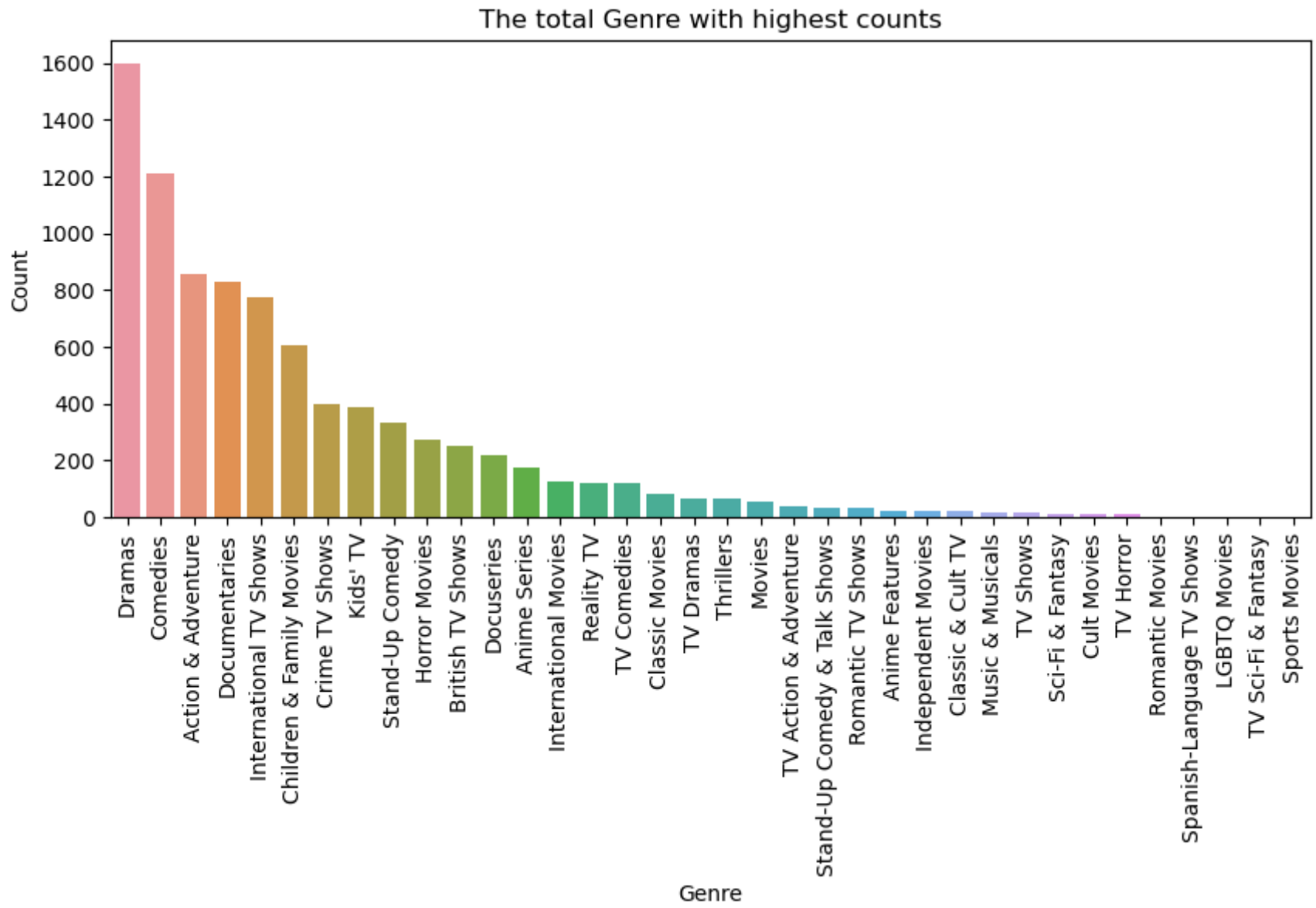
6. Which genre has highest number of counts in the dataset?

In [43]:
```
data['genre'].value_counts()
plt.figure(figsize=(10,4))

sns.countplot(x='genre', data=data, order= data['genre'].value_counts().index)
```

```
plt.xticks(rotation=90)
plt.title("The total Genre with highest counts")
plt.xlabel('Genre')
plt.ylabel('Count')
```

Out[43]: Text(0, 0.5, 'Count')

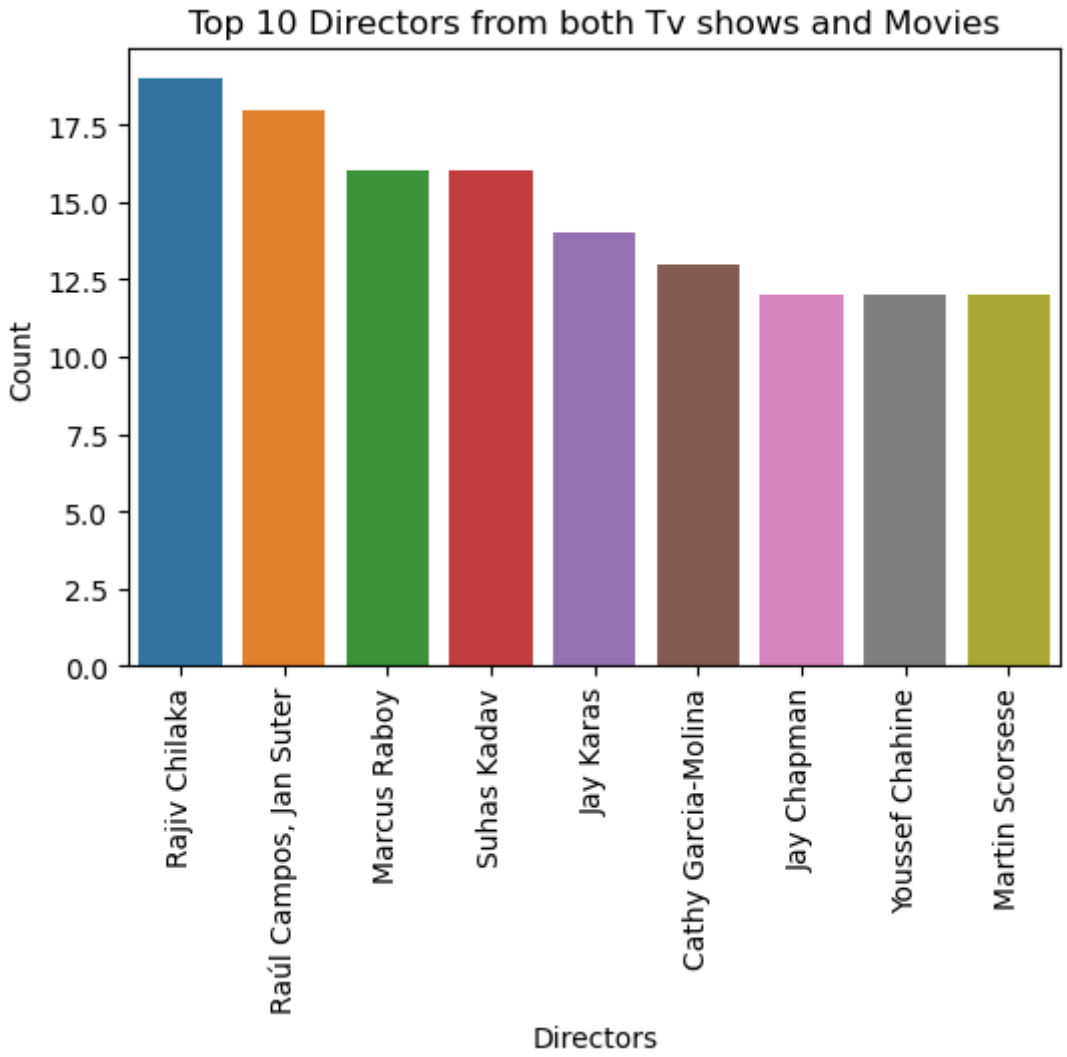


7. List the top 10 directors in the Netflix dataset, considering both TV shows and movies.

In [44]:
```
data['director'].value_counts()
plt.figure(figsize=(6,4))

sns.countplot(x='director', data=data, order= data['director'].value_counts().iloc[1:10].index)
plt.xticks(rotation=90)
plt.title("Top 10 Directors from both Tv shows and Movies")
plt.xlabel("Directors")
plt.ylabel("Count")
```

Out[44]:
```
Text(0, 0.5, 'Count')
```

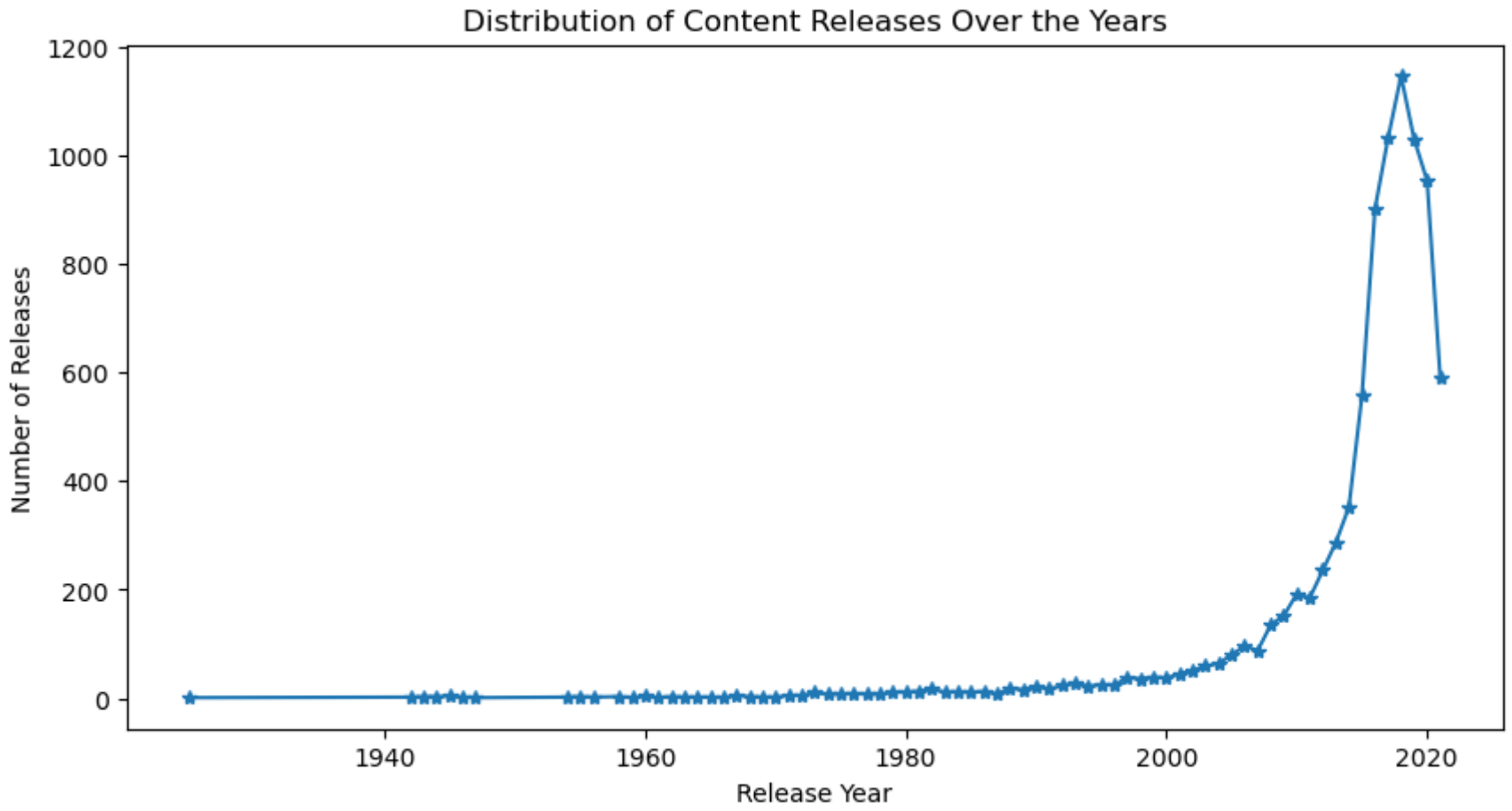


8. How has the distribution of content releases changed over the years?

In [46]:
```
counts = data['release_year'].value_counts().sort_index()
plt.figure(figsize=(10,5))

plt.plot(counts.index, counts.values, marker='*')
plt.xlabel('Release Year')
plt.ylabel('Number of Releases')
```

```
plt.title('Distribution of Content Releases Over the Years')
plt.show()
```



In [ ]: