netflix-analysis(2)

April 25, 2022

[1]:
```
import numpy as np
import pandas as pd

from IPython.display import display, Markdown
from matplotlib import pyplot as plt

import warnings
warnings.filterwarnings("ignore")

import seaborn as sns
sns.set(style="darkgrid")
plt.style.use('dark_background')
```

1 Interesting Task Ideas

1. Understanding what content is available in different countries
2. Identifying similar content by matching text-based features
3. Network analysis of Actors / Directors and find interesting insights
4. Does Netflix has more focus on TV Shows than movies in recent years.

2 NetFlix Dataset Say, what kind of thing people like to watch

NetFlix make that kind of Content again & again...

[2]:
```
netflix_data=pd.read_csv('../input/netflix-shows/netflix_titles.csv')
display(Markdown('#### head 2'))
display(netflix_data.head(2))
display(Markdown('#### tail 2'))
display(netflix_data.tail(2))
```

head 2

	show_id	type	title	director	\
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	
1	s2	TV Show	Blood & Water	NaN	

```
                                                cast        country  \
0                                                NaN  United States
1  Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban…   South Africa

          date_added  release_year rating   duration  \
0  September 25, 2021          2020  PG-13     90 min
1  September 24, 2021          2021  TV-MA  2 Seasons

                                     listed_in  \
0                                Documentaries
1  International TV Shows, TV Dramas, TV Mysteries

                                     description
0  As her father nears the end of his life, filmm…
1  After crossing paths at a party, a Cape Town t…
```

tail 2

```
     show_id   type   title      director  \
8805   s8806  Movie    Zoom  Peter Hewitt
8806   s8807  Movie  Zubaan   Mozez Singh

                                                cast        country  \
8805  Tim Allen, Courteney Cox, Chevy Chase, Kate Ma…  United States
8806  Vicky Kaushal, Sarah-Jane Dias, Raaghav Chanan…          India

            date_added  release_year rating duration  \
8805  January 11, 2020          2006     PG   88 min
8806     March 2, 2019          2015  TV-14  111 min

                                       listed_in  \
8805              Children & Family Movies, Comedies
8806  Dramas, International Movies, Music & Musicals

                                       description
8805  Dragged from civilian life, a former superhero…
8806  A scrappy but poor boy worms his way into a ty…
```

[3]:
```
netflix_data.shape
```

[3]:
```
(8807, 12)
```

[4]:
```
netflix_data.info(show_counts=True)
```

```
<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
```

this dataset have null values let's check it out

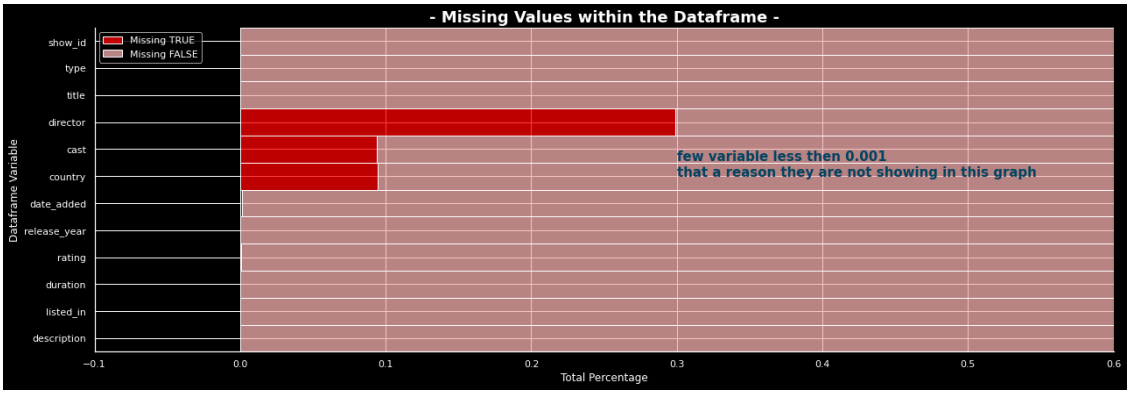
[5]:
```
print('column name    number null')
print(netflix_data.isnull().sum())
print('---------------how many null rate in columnes-----------------')
for i in netflix_data.columns:
    null_percenta=(netflix_data[i].isnull().sum()/len(netflix_data))*100
    if null_percenta>0:
        print(f'{i} null rate {round(null_percenta,2)}%')

print('=='*20,'duplicate values',f'\nduplicate rate ==> {(netflix_data.
 ↪duplicated().sum()/len(netflix_data))*100 } % ')  # you can check that␣
 ↪column have or not dublicat value , through just uncommenting
# netflix_data.drop_duplicates(inplace=True)
```

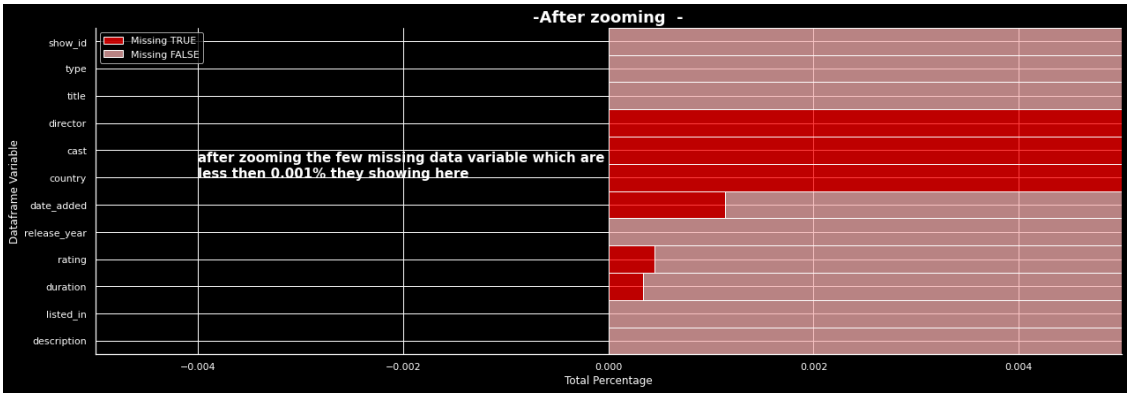
```
column name    number null
show_id            0
type               0
title              0
director        2634
cast             825
country          831
date_added        10
release_year       0
rating             4
duration           3
listed_in          0
description        0
dtype: int64
---------------how many null rate in columnes-----------------
director null rate 29.91%
cast null rate 9.37%
```

```
country null rate 9.44%
date_added null rate 0.11%
rating null rate 0.05%
duration null rate 0.03%
======================================== duplicate values
duplicate rate ==> 0.0 %
```

we can lock also in parcentage

[6]:
```
sns.displot(
    data=netflix_data.isnull().melt(value_name="missing"),
    y="variable",
    hue="missing"  ,   # catgorige columne come
    multiple="fill",

    aspect=3,
    height=6,
    # Change colors
    palette=['#f7b0b0','#ff0000'],
    legend=False)
plt.xlim([-0.1,0.6])
plt.title("- Missing Values within the Dataframe -", size=18, weight="bold")
plt.xlabel("Total Percentage")
plt.ylabel("Dataframe Variable")
plt.text(x=0.3,y=5,s='\nfew variable less then 0.001\nthat a reason they are␣
 ↪not showing in this graph',color='#004461',fontsize=15,fontweight='bold')
plt.legend(["Missing TRUE", "Missing FALSE"]);


sns.displot(
    data=netflix_data.isnull().melt(value_name="missing"),
    y="variable",
    hue="missing"  ,   # catgorige columne come
    multiple="fill",
    aspect=3,
    height=6,
    # Change colors
    palette=['#f7b0b0','#ff0000'],
    legend=False,)
plt.xlim([-0.005,0.005])
plt.title("-After zooming  -", size=18, weight="bold")
plt.xlabel("Total Percentage")
plt.ylabel("Dataframe Variable")
plt.text(x=-0.004,y=5,s='\nafter zooming the few missing data variable which␣
 ↪are\nless then 0.001% they showing␣
 ↪here',color='w',fontsize=15,fontweight='bold')
plt.legend(["Missing TRUE", "Missing FALSE"]);
```





3 Cleaning Data

[7]:
```
netflix_data.dropna(axis=0,inplace=True)
netflix_data.drop_duplicates(inplace=True)
```

4 Features Engineering

- `date_added` feature which dtype is `objective` convert into `datetime` dtype
- `date_added` feature extrecting `month, month_name, year, day`

[8]:
```
netflix_data['date_added']=pd.to_datetime(netflix_data['date_added'])
netflix_data['date_added_month']=netflix_data['date_added'].dt.month
netflix_data['date_added_month_name']=netflix_data['date_added'].dt.month_name()
netflix_data['date_added_year']=netflix_data['date_added'].dt.year
netflix_data['date_added_day']=netflix_data['date_added'].dt.day
```

[9]:
```
netflix_date=netflix_data['date_added'].dropna(axis=0)
# netflix_date['date_added'].apply(lambda x:x.split())
```

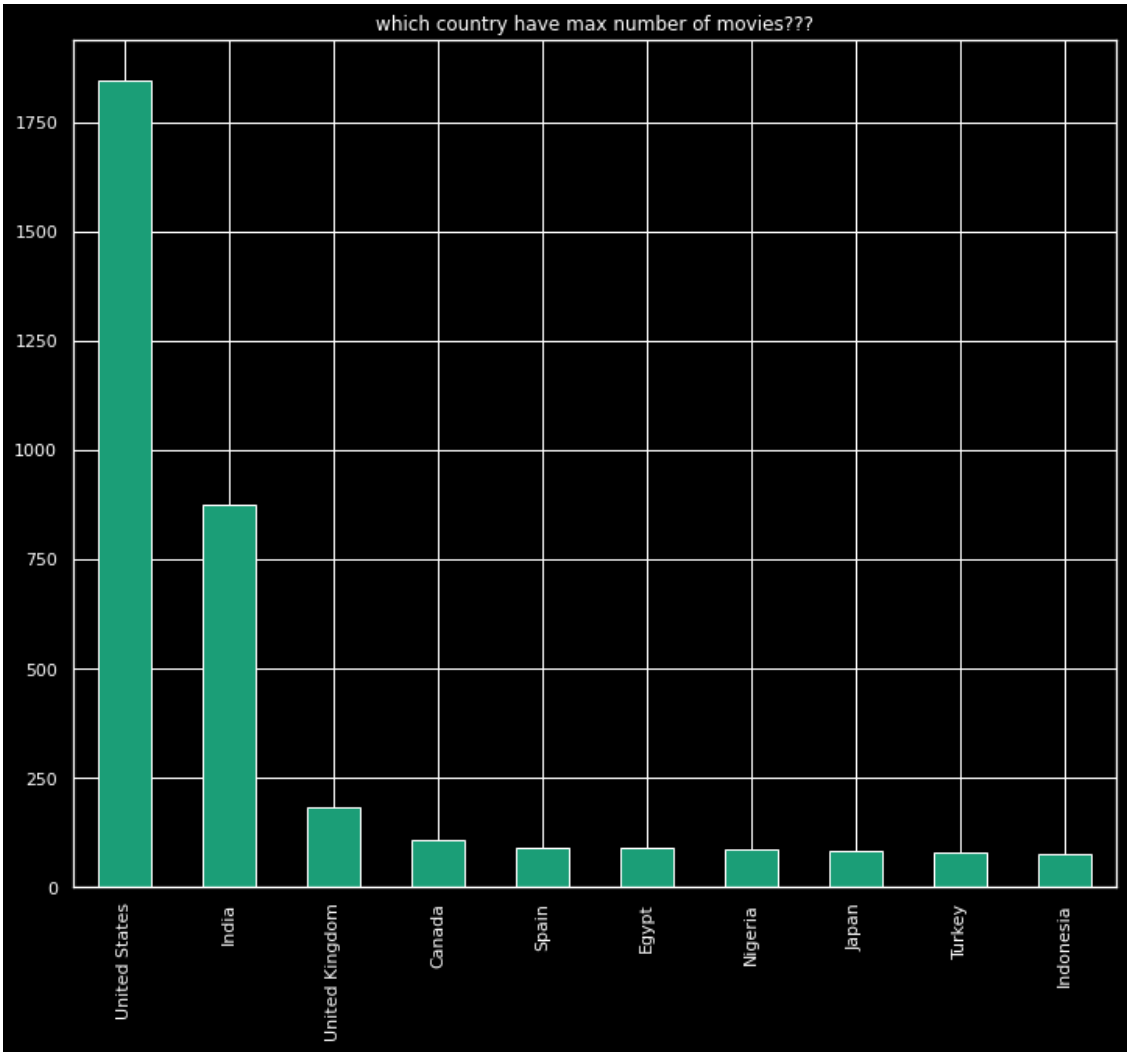
5 Data Visualization

let's asking question to dataset...

Answer is in two way `raw Data summary` and `data visualization`... # which country have Maximum number of movies???

[10]:
```
print(netflix_data.country.value_counts()[:10])
plt.figure(figsize=(12,10))
netflix_data.country.value_counts()[:10].plot.bar(colormap='Dark2',)
plt.title('which country have max number of movies???')
plt.show()
```

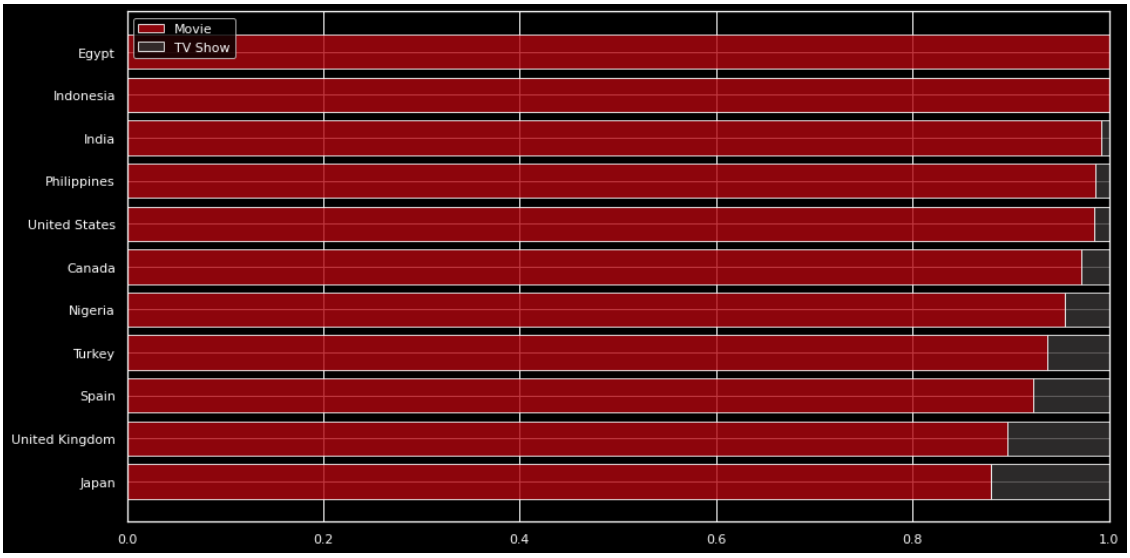
```
United States     1846
India              875
United Kingdom     183
Canada             107
Spain               91
Egypt               90
Nigeria             88
Japan               83
Turkey              79
Indonesia           76
Name: country, dtype: int64
```



6 In Country how many Movies Lovers & how many TV Shows lovers???

[11]:
```
country_order = netflix_data['country'].value_counts()[:11].index
data_q2q3 = netflix_data[['type', 'country']].groupby('country')['type'].
 ↪value_counts().unstack().loc[country_order]
data_q2q3['sum'] = data_q2q3.sum(axis=1)
data_q2q3_ratio = (data_q2q3.T / data_q2q3['sum']).T[['Movie', 'TV Show']].
 ↪sort_values(by='Movie',ascending=False)[::-1]



##
```

```
fig, ax = plt.subplots(1,1,figsize=(15, 8),)

ax.barh(data_q2q3_ratio.index, data_q2q3_ratio['Movie'],
        color='#b20710', alpha=0.8, label='Movie')
ax.barh(data_q2q3_ratio.index, data_q2q3_ratio['TV Show'],␣
 ↪left=data_q2q3_ratio['Movie'],
        color='#383535', alpha=0.8, label='TV Show')
plt.legend(loc='upper left')
plt.show()
print('most of contry like to watch movie but few country still like to watch␣
 ↪TV Show like japan, UK, spain Etc.')
```

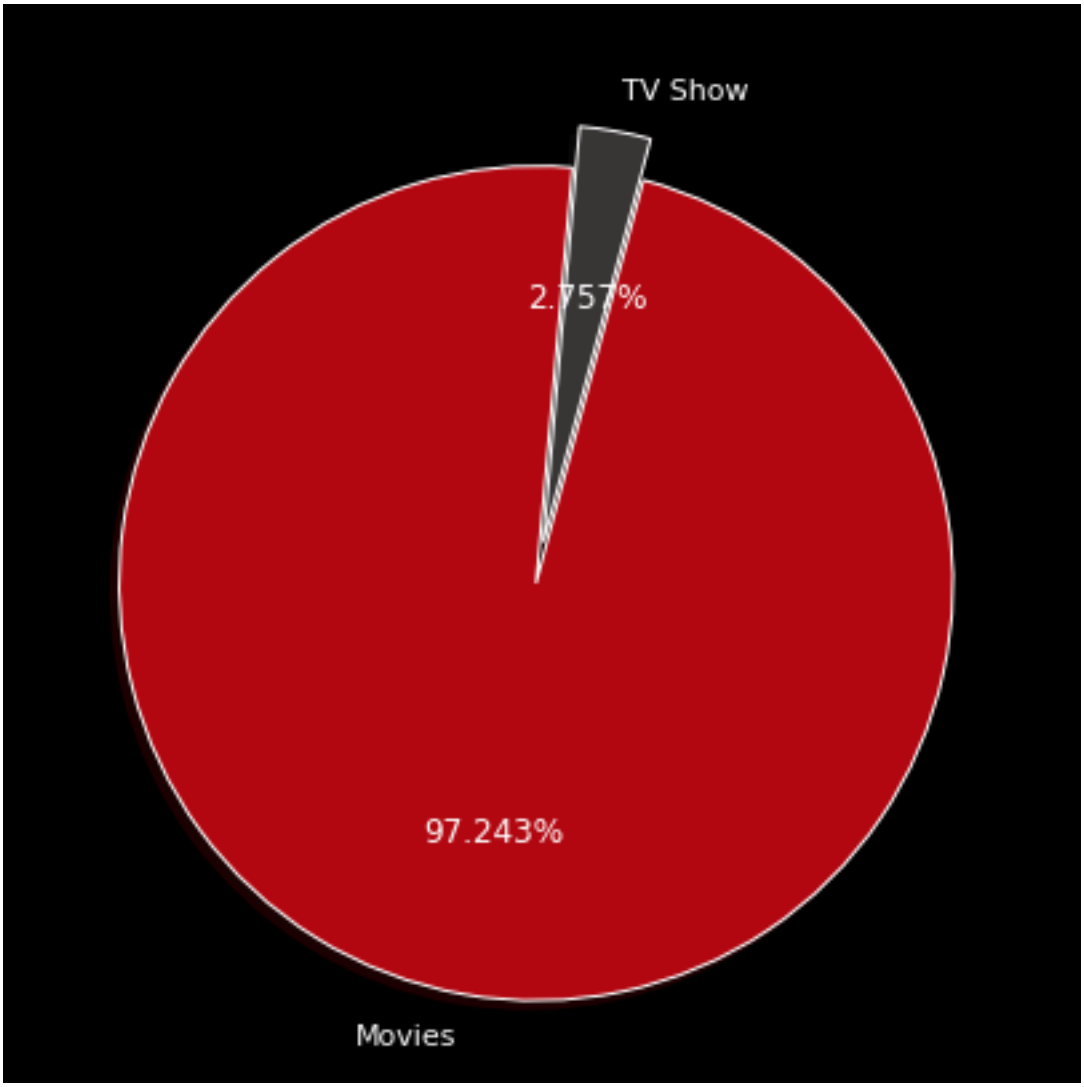



```
most of contry like to watch movie but few country still like to watch TV Show
like japan, UK, spain Etc.
```

7 which type of thing people like to watch Movie/TV Show?

[12]:
```
plt.figure(figsize=(7,9))
print(netflix_data['type'].value_counts())
plt.pie(netflix_data['type'].value_counts(),labels=['Movies','TV␣
 ↪Show'],shadow=True,autopct='%1.3f%%',explode =[0.
 ↪1,0],startangle=85,colors=['#b20710','#383535'])
plt.show()
```

```
Movie      5185
TV Show     147
Name: type, dtype: int64
```



[13]:
```
# let's check out number of unique values inside the columnns
for i in netflix_data.columns:
    print(f'{i}  ====> {netflix_data[i].nunique()}')

print('This Lettle process help in over Visualization!!!')
```

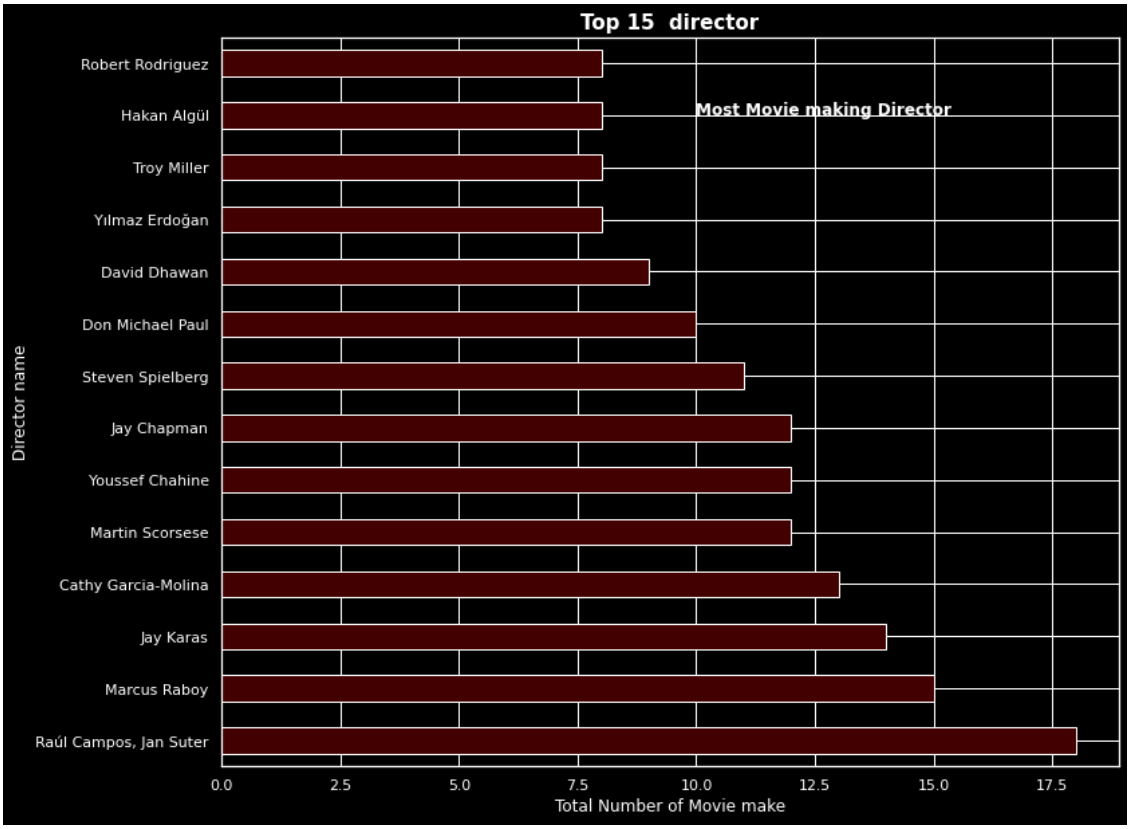
```
show_id  ====> 5332
type  ====> 2
title  ====> 5332
director  ====> 3945
cast  ====> 5200
country  ====> 604
date_added  ====> 1450
release_year  ====> 72
```

```
rating  ====> 14
duration  ====> 198
listed_in  ====> 335
description  ====> 5321
date_added_month  ====> 12
date_added_month_name  ====> 12
date_added_year  ====> 14
date_added_day  ====> 31
This Lettle process help in over Visualization!!!
```

8 Top 15 most Movies Makeing Directors?

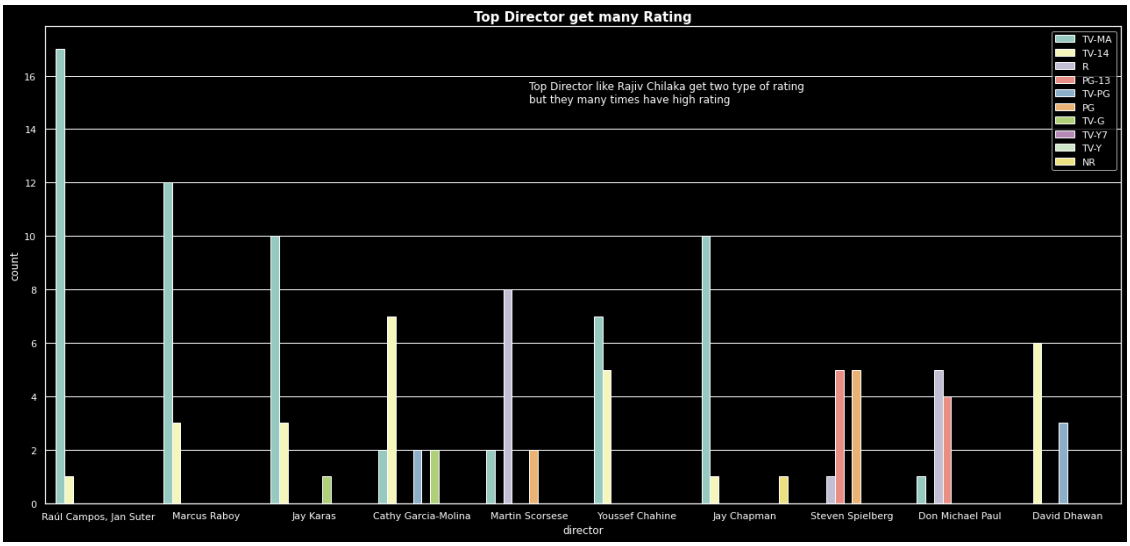
[14]:
```
plt.figure(figsize=(12,10))
print(netflix_data.director.value_counts()[:14])
netflix_data.director.value_counts()[:14].plot.
 ↪barh(colormap='pink',color='#420000')

plt.text(x=10,y=12,s='Most Movie making␣
 ↪Director',fontweight='bold',fontsize=12,fontfamily='sans-serif')

plt.title('Top 15  director',fontsize=15,fontweight='extra bold')
plt.xlabel('Total Number of Movie make')
plt.ylabel('Director name')
plt.show()
```

```
Raúl Campos, Jan Suter    18
Marcus Raboy              15
Jay Karas                 14
Cathy Garcia-Molina       13
Martin Scorsese           12
Youssef Chahine           12
Jay Chapman               12
Steven Spielberg          11
Don Michael Paul          10
David Dhawan               9
Yılmaz Erdoğan             8
Troy Miller                8
Hakan Algül                8
Robert Rodriguez           8
Name: director, dtype: int64
```



9 Top 15 Director get many rating...

[15]:
```
plt.figure(figsize=(22,10))

sns.countplot(hue='rating',␣
 ↪x='director',data=netflix_data,order=netflix_data['director'].value_counts().
 ↪index[0:10],hue_order=netflix_data['rating'].value_counts().index[0:10],)
plt.legend(loc='upper right')
plt.title('Top Director get many Rating', fontsize= 15, fontweight='bold')
plt.text(x=4,y=15,s='Top Director like Rajiv Chilaka get two type of␣
 ↪rating\nbut they many times have high rating')
plt.show()
```



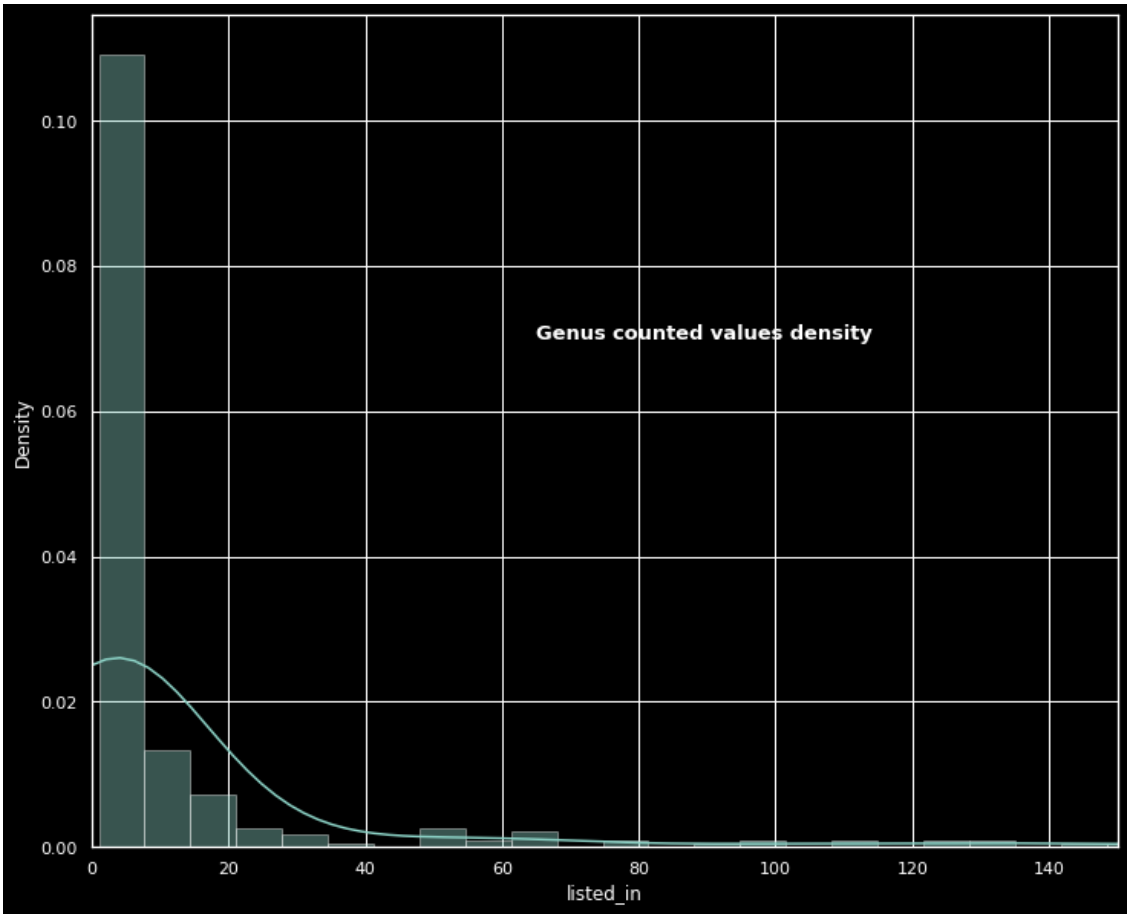
10 what type of Genos people like to interset

[16]:
```
netflix_data.listed_in.value_counts().describe()
```

[16]:
```
count    335.000000
mean      15.916418
std       40.762701
min        1.000000
25%        1.000000
50%        3.000000
75%        8.000000
max      336.000000
Name: listed_in, dtype: float64
```

above `75 percentile` over target, that mean 25% percentage of movie type **people like to watch** over was skewed std so far away to mean

[17]:
```
plt.figure(figsize=(12,10))
sns.distplot(netflix_data.listed_in.value_counts())
plt.xlim(0,150)
plt.text(x=65,y=0.07,s='Genus counted values␣
  ↪density',fontweight='bold',fontsize=13)
plt.show()
```

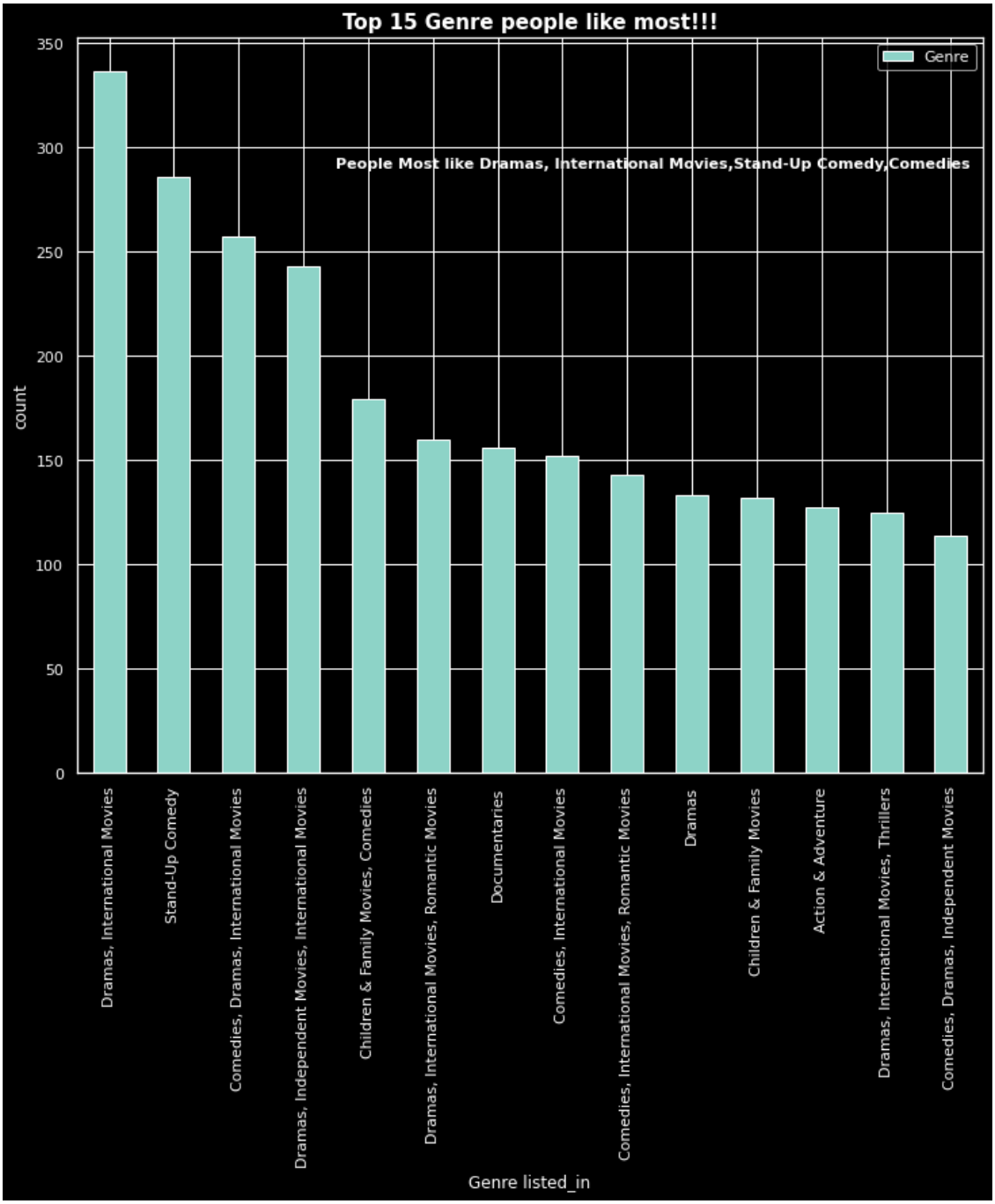


11 According to Data 15 Cetgories/Genres people like to most

[18]:
```
# plt.pcolor(netflix_data, cmap='afmhot_r')
plt.figure(figsize=(12,10))
print(netflix_data.listed_in.value_counts()[:14])
netflix_data.listed_in.value_counts()[:14].plot.bar()
plt.title('Top 15 Genre people like most!!!',fontweight='bold',fontsize=15)
plt.legend(['Genre'])
plt.text(x=3.5,y=290,s='People Most like Dramas, International Movies,Stand-Up␣
↪Comedy,Comedies ',fontweight='bold',fontsize=11)
plt.xlabel('Genre listed_in')
plt.ylabel('count')
plt.show()
```

```
Dramas, International Movies                        336
Stand-Up Comedy                                     286
Comedies, Dramas, International Movies              257
Dramas, Independent Movies, International Movies    243
```

```
Children & Family Movies, Comedies                  179
Dramas, International Movies, Romantic Movies       160
Documentaries                                       156
Comedies, International Movies                      152
Comedies, International Movies, Romantic Movies     143
Dramas                                              133
Children & Family Movies                            132
Action & Adventure                                  127
Dramas, International Movies, Thrillers             125
Comedies, Dramas, Independent Movies                114
Name: listed_in, dtype: int64
```



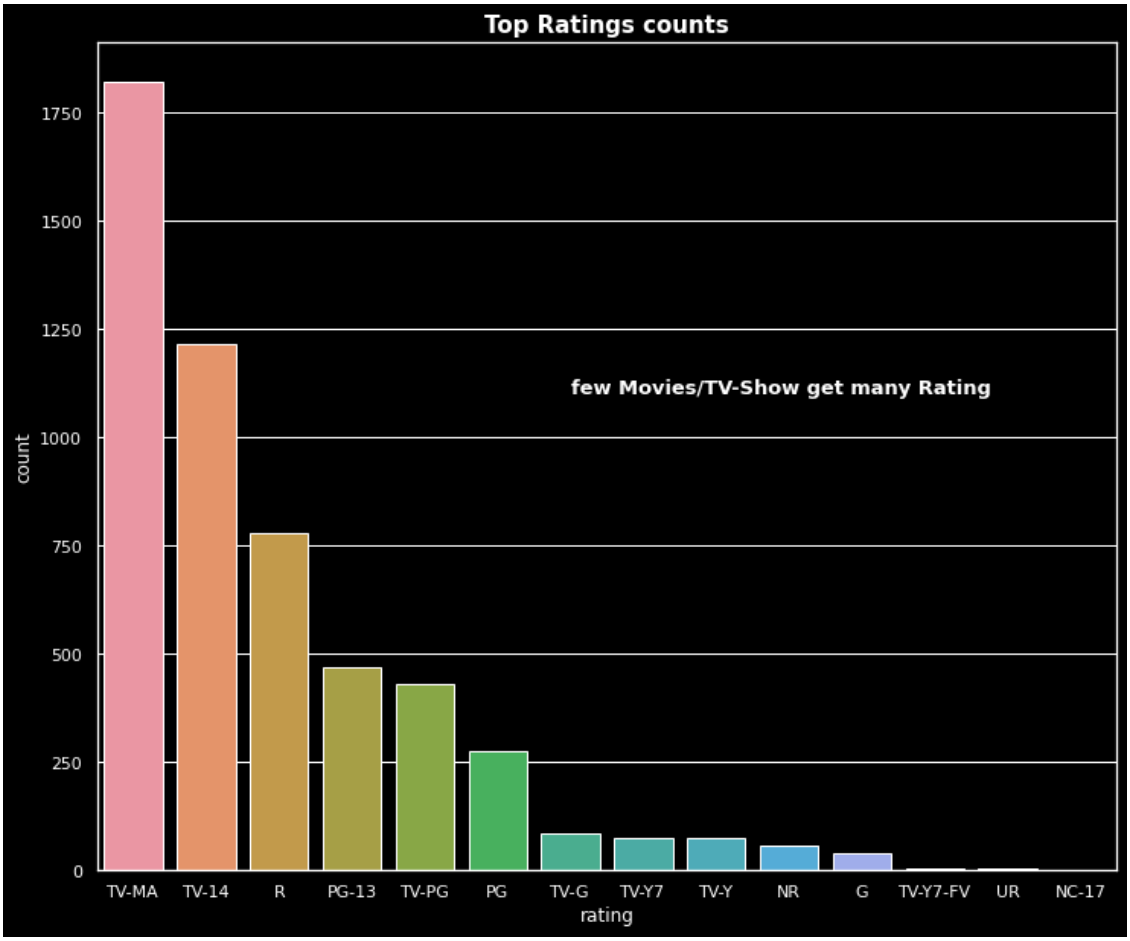
12 Number of time rating geting

like TV-MA get 1822 times & TV-14 get 1214 times

[19]:
```
netflix_data['rating'].value_counts().sort_values(ascending=False)[:2]
```

[19]:
```
TV-MA    1822
TV-14    1214
Name: rating, dtype: int64
```

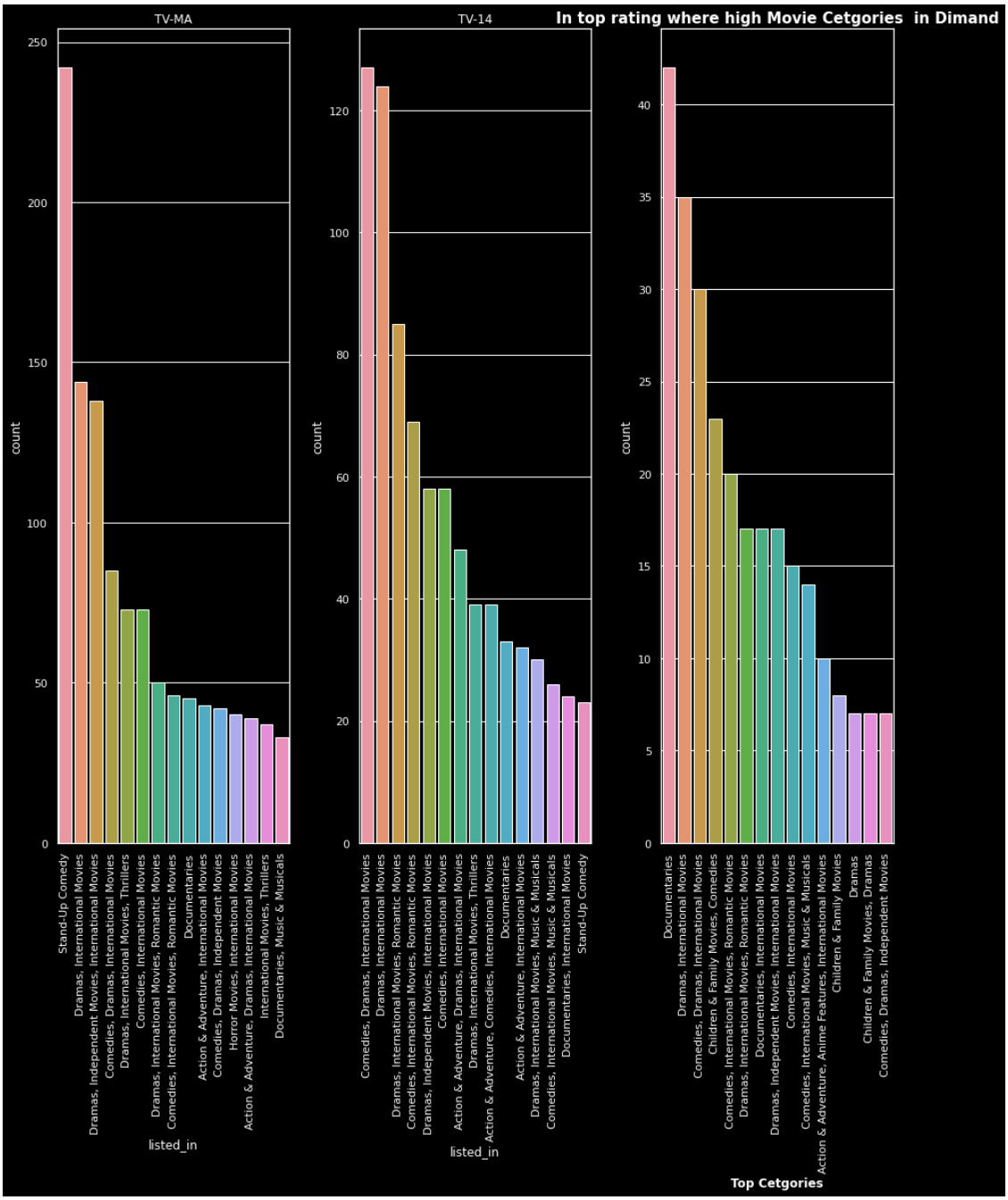
[20]:
```
plt.figure(figsize=(12,10))
sns.countplot(netflix_data['rating'],order=netflix_data['rating'].
 ↪value_counts().index[0:15])
plt.title('Top Ratings counts',fontweight='bold',fontsize=15)
plt.text(x=6,y=1100,s='few Movies/TV-Show get many␣
 ↪Rating',fontweight='bold',fontsize=13)
plt.show()
```



how many most popluare Cetagori in top rateded

[21]:
```
netflix_rate_MA=netflix_data.loc[netflix_data['rating']=='TV-MA']
netflix_rate_14=netflix_data.loc[netflix_data['rating']=='TV-14']
netflix_rate_PG=netflix_data.loc[netflix_data['rating']=='TV-PG']
```

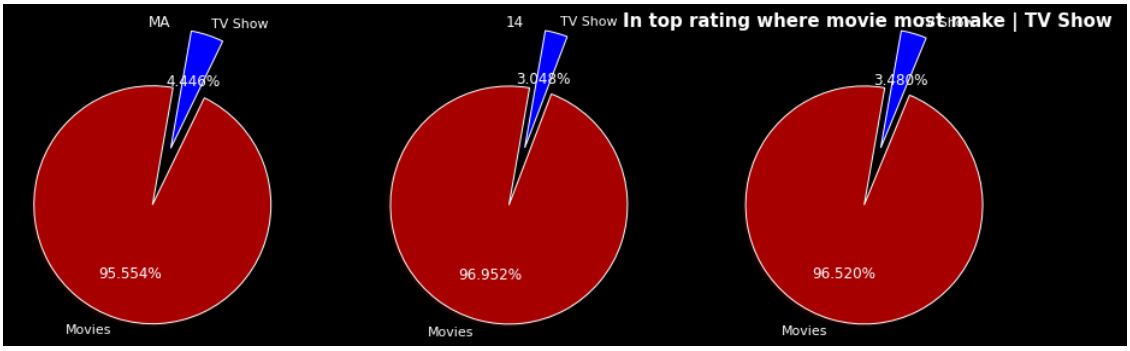
```
fig,ax=plt.subplots(1,3,figsize=(15,15))

ax[0].tick_params(axis='x', rotation=90)
ax[0].title.set_text('TV-MA')

ax[1].tick_params(axis='x', rotation=90)
ax[1].title.set_text('TV-14',)

ax[2].tick_params(axis='x', rotation=90)
ax[2].title.set_text('TV-PG')
plt.subplots_adjust(wspace=0.3)



sns.countplot(netflix_rate_MA['listed_in'],order=netflix_rate_MA['listed_in'].
 ↪value_counts().index[0:15],ax=ax[0])


sns.countplot(netflix_rate_14['listed_in'],order=netflix_rate_14['listed_in'].
 ↪value_counts().index[0:15],ax=ax[1])

sns.countplot(netflix_rate_PG['listed_in'],order=netflix_rate_PG['listed_in'].
 ↪value_counts().index[0:15],ax=ax[2])

plt.title('In top rating where high Movie Cetgories  in Dimand', fontsize= 15,␣
 ↪fontweight='bold')
plt.xlabel('Top Cetgories',fontweight='bold')
plt.show()
```



top rated movies few catgories always in demond & people most watch :)

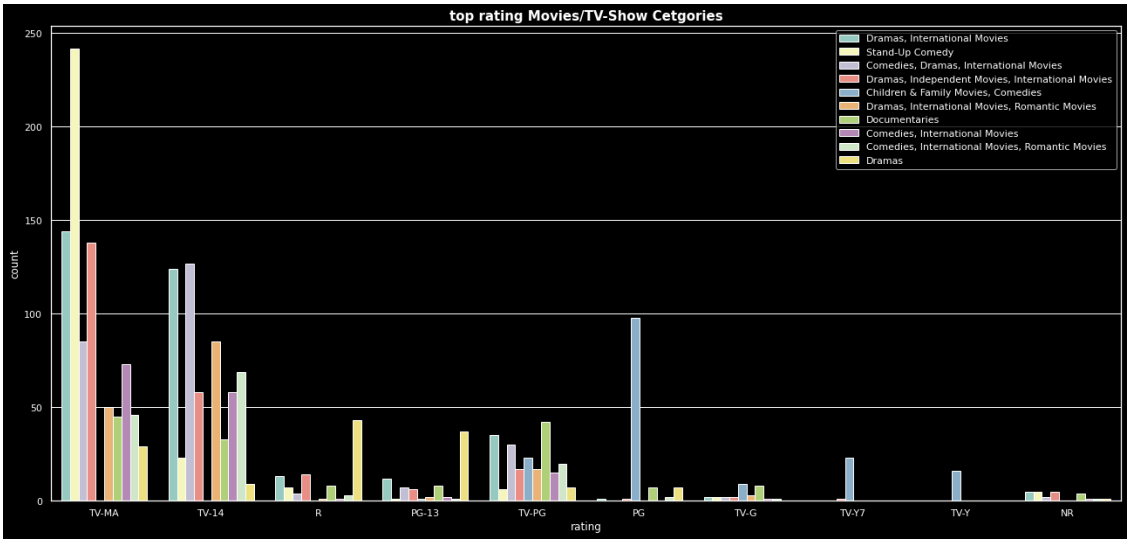
[22]:
```
netflix_rate_MA['type'].value_counts()

# plt.figure(figsize=(7,9))
fig,ax=plt.subplots(1,3,figsize=(15,10))
```

```
# print(netflix_data['type'].value_counts())
ax[0].pie(netflix_rate_MA['type'].value_counts(),labels=['Movies','TV␣
 ↪Show'],shadow=True,autopct='%1.3f%%',explode =[0.2,0.
 ↪3],colors=['#a60000','blue'],startangle=80)
ax[0].title.set_text('MA')
ax[1].pie(netflix_rate_14['type'].value_counts(),labels=['Movies','TV␣
 ↪Show'],shadow=True,autopct='%1.3f%%',explode =[0.2,0.
 ↪3],colors=['#a60000','blue'],startangle=80)
ax[1].title.set_text('14')
ax[2].pie(netflix_rate_PG['type'].value_counts(),labels=['Movies','TV␣
 ↪Show'],shadow=True,autopct='%1.3f%%',explode =[0.2,0.
 ↪3],colors=['#a60000','blue'],startangle=80,)
ax[2].title.set_text('PG')
plt.title('In top rating where movie most make | TV Show ', fontsize= 15,␣
 ↪fontweight='bold')

plt.show()
```



13 top rating Cetgories

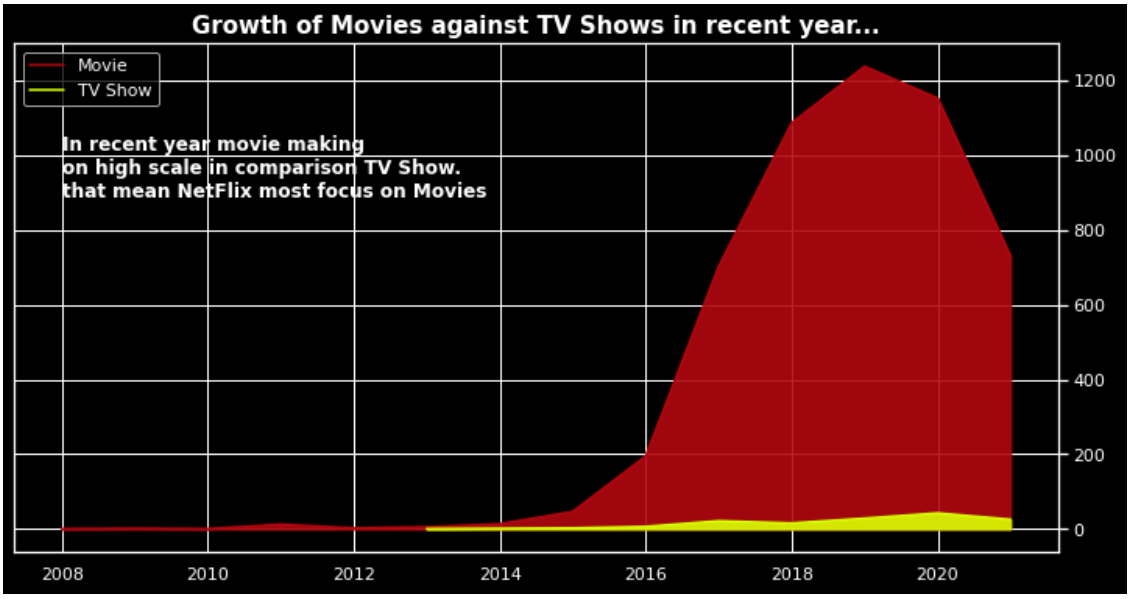
[23]:
```
plt.figure(figsize=(22,10))

sns.countplot(hue='listed_in',␣
 ↪x='rating',data=netflix_data,order=netflix_data['rating'].value_counts().
 ↪index[0:10],hue_order=netflix_data['listed_in'].value_counts().index[0:10],)
plt.legend(loc='upper right')
plt.title('top rating Movies/TV-Show Cetgories', fontsize= 15,␣
 ↪fontweight='bold')
plt.show()
```



14 growth of Movies against TV Shows in recent year...

[24]:
```
netflix_data.reset_index(inplace=True)
```

[25]:
```
fig, ax = plt.subplots(1, 1, figsize=(12, 6))
color = ["#b20710", "#d9ff00"]
type_feature=['Movies','Tv Shows']
for i, mtv in enumerate(netflix_data['type'].value_counts().index):
    mtv_rel = netflix_data[netflix_data['type']==mtv]['date_added_year'].
 ↪value_counts().sort_index()
    ax.plot(mtv_rel.index, mtv_rel,color=color[i], label=mtv)
    ax.fill_between(mtv_rel.index,mtv_rel, color=color[i],alpha=0.9)
    ax.yaxis.set_ticks_position("right")
    plt.legend(loc='upper left')
# plt.legend(['Movie','TV Show'])
plt.title('Growth of Movies against TV Shows in recent year...
 ↪',fontweight='bold',fontsize=15)
plt.text(x=2008,y=888,s='In recent year movie making\non high scale in␣
 ↪comparison TV Show.\nthat mean NetFlix most focus on␣
 ↪Movies',fontweight='bold',fontsize=12)
plt.show()
```



!!!! goal of this notebook is only practice of EDA !!!!