In [1]:

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

Loading dataset

In [2]:

```
df=pd.read_csv("C:/Users/kasaa/Downloads/netflix_titles.csv")
```

In [3]:

```
df.head()
```

Out[3]:

	show_id	type	title	director	cast	country	date_added	release_year	rat
0	81145628	Movie	Norm of the North: King Sized Adventure	Richard Finn, Tim Maltby	Alan Marriott, Andrew Toth, Brian Dobson, Cole...	United States, India, South Korea, China	September 9, 2019	2019	
1	80117401	Movie	Jandino: Whatever it Takes	NaN	Jandino Asporaat	United Kingdom	September 9, 2016	2016	
2	70234439	TV Show	Transformers Prime	NaN	Peter Cullen, Sumalee Montano, Frank Welker, J...	United States	September 8, 2018	2013	Y7-
3	80058654	TV Show	Transformers: Robots in Disguise	NaN	Will Friedle, Darren Criss, Constance Zimmer, ...	United States	September 8, 2018	2016	TV-
4	80125979	Movie	#realityhigh	Fernando Lebrija	Nesta Cooper, Kate Walsh, John Michael Higgins...	United States	September 8, 2017	2017	TV

seperating netfix movies

In [4]:

```
df_movies=df[df['type']=='Movie']
```

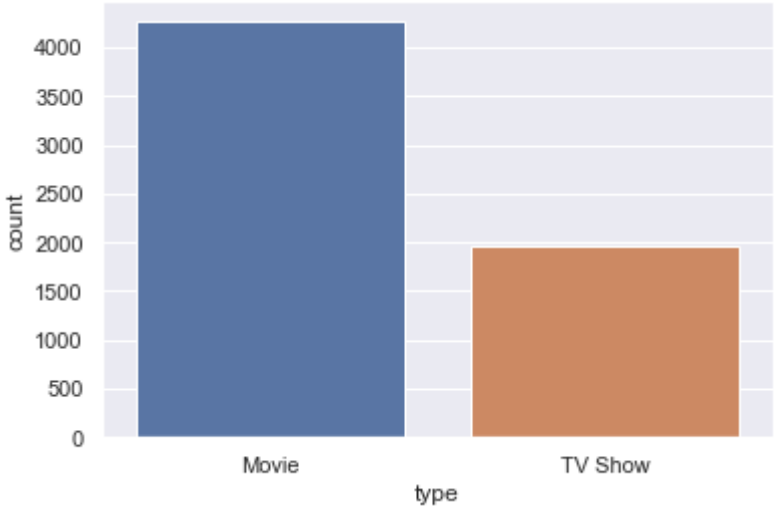
In [ ]:

```

```

Analysing count of movies and tv shows

In [6]:

```
sns.set(style='darkgrid')
MTV_count=sns.countplot( x="type",data=df)
```



chances of movie release for the next data

In [7]:

```
df_shows=df[df['type']=='TV Show']
```

In [8]:

```
netfix_date=df_shows[['date_added']].dropna()
```

In [9]:

```
netfix_date
```

Out[9]:

	date_added
2	September 8, 2018
3	September 8, 2018
5	September 8, 2017
8	September 8, 2017
26	September 7, 2018
...	...
6218	April 10, 2019
6219	April 1, 2019
6220	April 1, 2016
6221	April 1, 2016
6222	April 1, 2014

1959 rows × 1 columns

In [10]:

```
netfix_date.isnull().sum()
```

Out[10]:

```
date_added    0
dtype: int64
```

In [11]:

```
netfix_date['year']=netfix_date['date_added'].apply(lambda x : x.split(', ')[-1])
netfix_date['month']=netfix_date['date_added'].apply(lambda x : x.lstrip().split(' ')[0])

month_array=['January', 'February', 'March', 'April', 'May', 'June', 'July', 'August', 'Sep
month_array
```

Out[11]:

```
['December',
 'November',
 'October',
 'September',
 'August',
 'July',
 'June',
 'May',
 'April',
 'March',
 'February',
 'January']
```

In [12]:

```
date_group= netfix_date.groupby('year')['month'].value_counts().unstack().fillna(0)[month_a
```

In [13]:

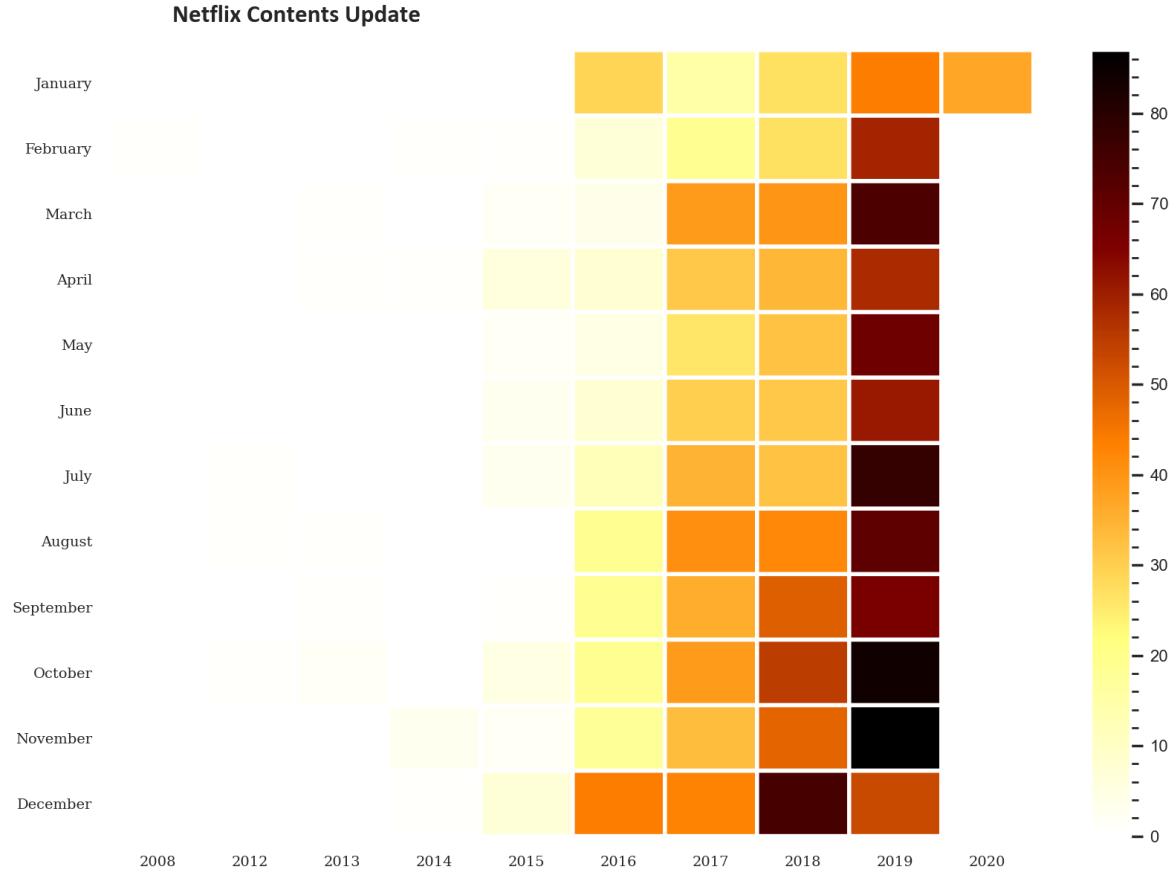
```
date_group
```

Out[13]:

year	2008	2012	2013	2014	2015	2016	2017	2018	2019	2020
month										
December	0.0	0.0	0.0	1.0	7.0	44.0	43.0	75.0	53.0	0.0
November	0.0	0.0	0.0	3.0	2.0	18.0	33.0	48.0	87.0	0.0
October	0.0	1.0	2.0	0.0	5.0	19.0	39.0	55.0	84.0	0.0
September	0.0	0.0	1.0	0.0	1.0	19.0	36.0	49.0	66.0	0.0
August	0.0	1.0	1.0	0.0	0.0	19.0	41.0	42.0	71.0	0.0
July	0.0	1.0	0.0	0.0	3.0	12.0	35.0	32.0	78.0	0.0
June	0.0	0.0	0.0	0.0	3.0	8.0	30.0	31.0	61.0	0.0
May	0.0	0.0	0.0	0.0	2.0	5.0	26.0	32.0	68.0	0.0
April	0.0	0.0	1.0	1.0	6.0	8.0	31.0	34.0	58.0	0.0
March	0.0	0.0	1.0	0.0	2.0	4.0	39.0	40.0	74.0	0.0
February	1.0	0.0	0.0	1.0	1.0	7.0	19.0	27.0	59.0	0.0
January	0.0	0.0	0.0	0.0	0.0	29.0	15.0	27.0	44.0	37.0

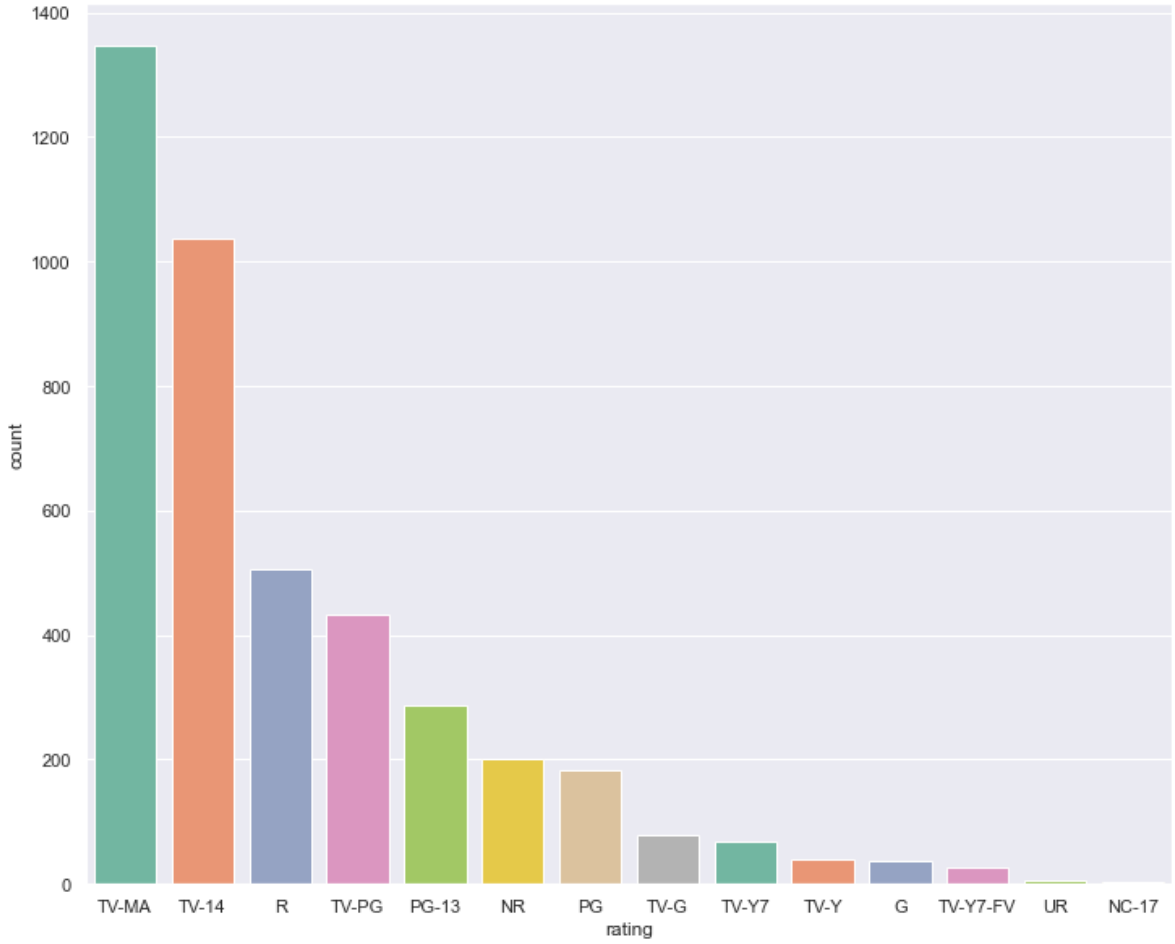
In [14]:

```
plt.figure(figsize=(10,7), dpi=200)
plt.pcolor(date_group, cmap='afmhot_r', edgecolors='white', linewidths=2)
plt.xticks(np.arange(0.5, len(date_group.columns), 1), date_group.columns, fontsize=7, font
plt.yticks(np.arange(0.5, len(date_group.index), 1), date_group.index, fontsize=7, fontfami
plt.title('Netflix Contents Update', fontsize=12, fontfamily='calibri', fontweight='bold',
cbar = plt.colorbar()
cbar.ax.tick_params(labelsize=8)
cbar.ax.minorticks_on()
plt.show()
```



In [15]:

```
plt.figure(figsize=(12,10))
sns.set(style="darkgrid")
rating_count=sns.countplot(x="rating",data=df_movies,palette="Set2",order=df_movies['rating
```



In [16]:

```
imdb_data=pd.read_csv('C:/Users/kasaa/Downloads/IMDb ratings.csv/IMDb ratings.csv')
```

In [17]:

```
imdb_data.head()
```

Out[17]:

	imdb_title_id	weighted_average_vote	total_votes	mean_vote	median_vote	votes_10	vot
0	tt0000009	5.9	154	5.9	6.0	12	
1	tt0000574	6.1	589	6.3	6.0	57	
2	tt0001892	5.8	188	6.0	6.0	6	
3	tt0002101	5.2	446	5.3	5.0	15	
4	tt0002130	7.0	2237	6.9	7.0	210	

5 rows × 49 columns

In [18]:

```
imdb_titles=pd.read_csv('C:/Users/kasaa/Downloads/IMDb movies.csv/IMDb movies.csv')
imdb_titles.head()
```

```
C:\Users\kasaa\anaconda3\lib\site-packages\IPython\core\interactiveshell.p
y:3071: DtypeWarning: Columns (3) have mixed types.Specify dtype option on
import or set low_memory=False.
  has_raised = await self.run_ast_nodes(code_ast.body, cell_name,
```

obtaining ratings and titles from imdb ratings datasets and joining them wrt titles

In [19]:

```
imdb_ratings=pd.read_csv('C:/Users/kasaa/Downloads/IMDb ratings.csv/IMDb ratings.csv',useco
imdb_titles=pd.read_csv('C:/Users/kasaa/Downloads/IMDb movies.csv/IMDb movies.csv', usecols
ratings = pd.DataFrame({'Title':imdb_titles.title,
                    'Release Year':imdb_titles.year,
                    'Rating': imdb_ratings.weighted_average_vote,
                    'Genre':imdb_titles.genre})
ratings.drop_duplicates(subset=['Title','Release Year','Rating'], inplace=True)
ratings.shape
```

```
C:\Users\kasaa\anaconda3\lib\site-packages\IPython\core\interactiveshell.py:
3071: DtypeWarning: Columns (3) have mixed types.Specify dtype option on imp
ort or set low_memory=False.
  has_raised = await self.run_ast_nodes(code_ast.body, cell_name,
```

Out[19]:

```
(85852, 4)
```

In [20]:

```
ratings
```

Out[20]:

	Title	Release Year	Rating	Genre
0	Miss Jerry	1894	5.9	Romance
1	The Story of the Kelly Gang	1906	6.1	Biography, Crime, Drama
2	Den sorte drøm	1911	5.8	Drama
3	Cleopatra	1912	5.2	Drama, History
4	L'Inferno	1911	7.0	Adventure, Drama, Fantasy
...	...	...	...	...
85850	Le lion	2020	5.3	Comedy
85851	De Beentjes van Sint-Hildegard	2020	7.7	Comedy, Drama
85852	Padmavyuhathile Abhimanyu	2019	7.9	Drama
85853	Sokagin Çocuklari	2019	6.4	Drama, Family
85854	La vida sense la Sara Amat	2019	6.7	Drama

85852 rows × 4 columns

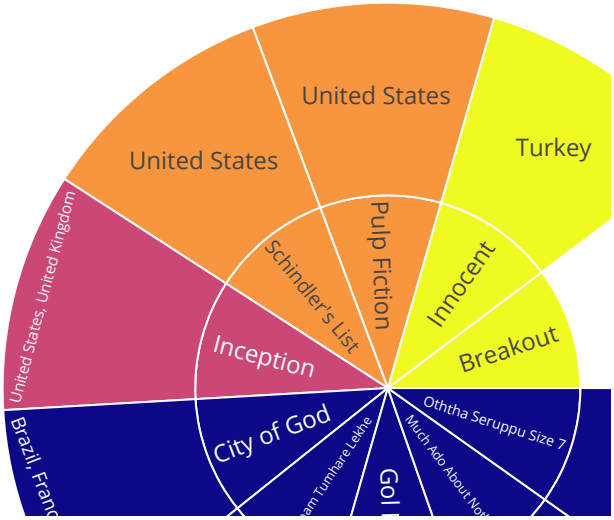
performing inner join on netflix dataset and ratings dataset

In [21]:

```
ratings.dropna()
join_data=ratings.merge(df,left_on='Title', right_on='title',how='inner')
join_data=join_data.sort_values(by='Rating',ascending=False)
```

In [22]:

```
import plotly.express as px
top_rated=join_data[0:10]
fig=px.sunburst(top_rated,path=['title','country'],values='Rating',color='Rating')
fig.show()
```



countries having highest rated content

In [23]:

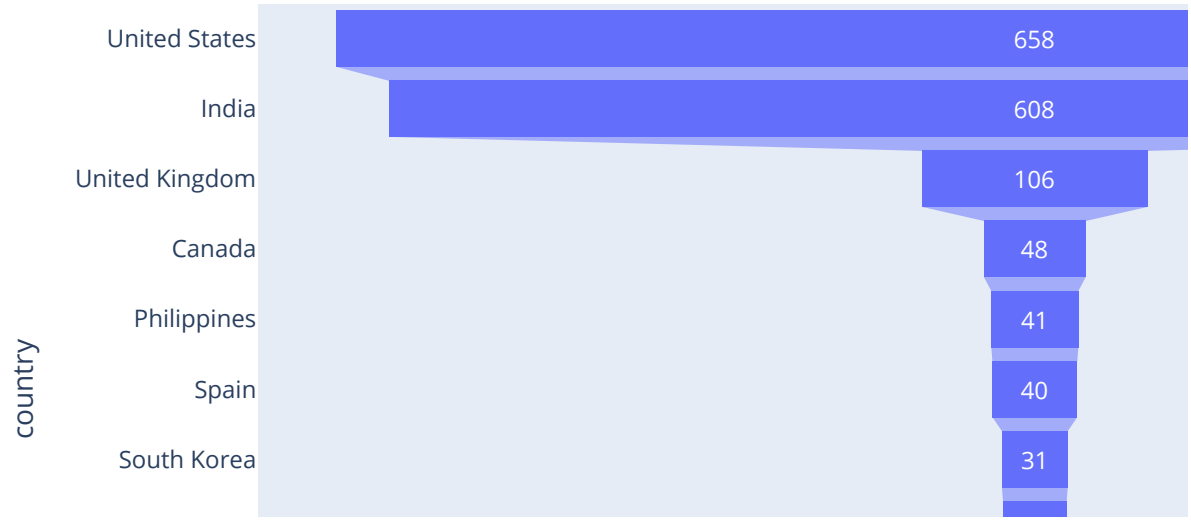
```
country_count=join_data['country'].value_counts().sort_values(ascending=False)
country_count=pd.DataFrame(country_count)
top_countries=country_count[0:11]
top_countries
```

Out[23]:

	country
United States	658
India	608
United Kingdom	106
Canada	48
Philippines	41
Spain	40
South Korea	31
Australia	30
Indonesia	29
France	29
United Kingdom, United States	21

In [24]:

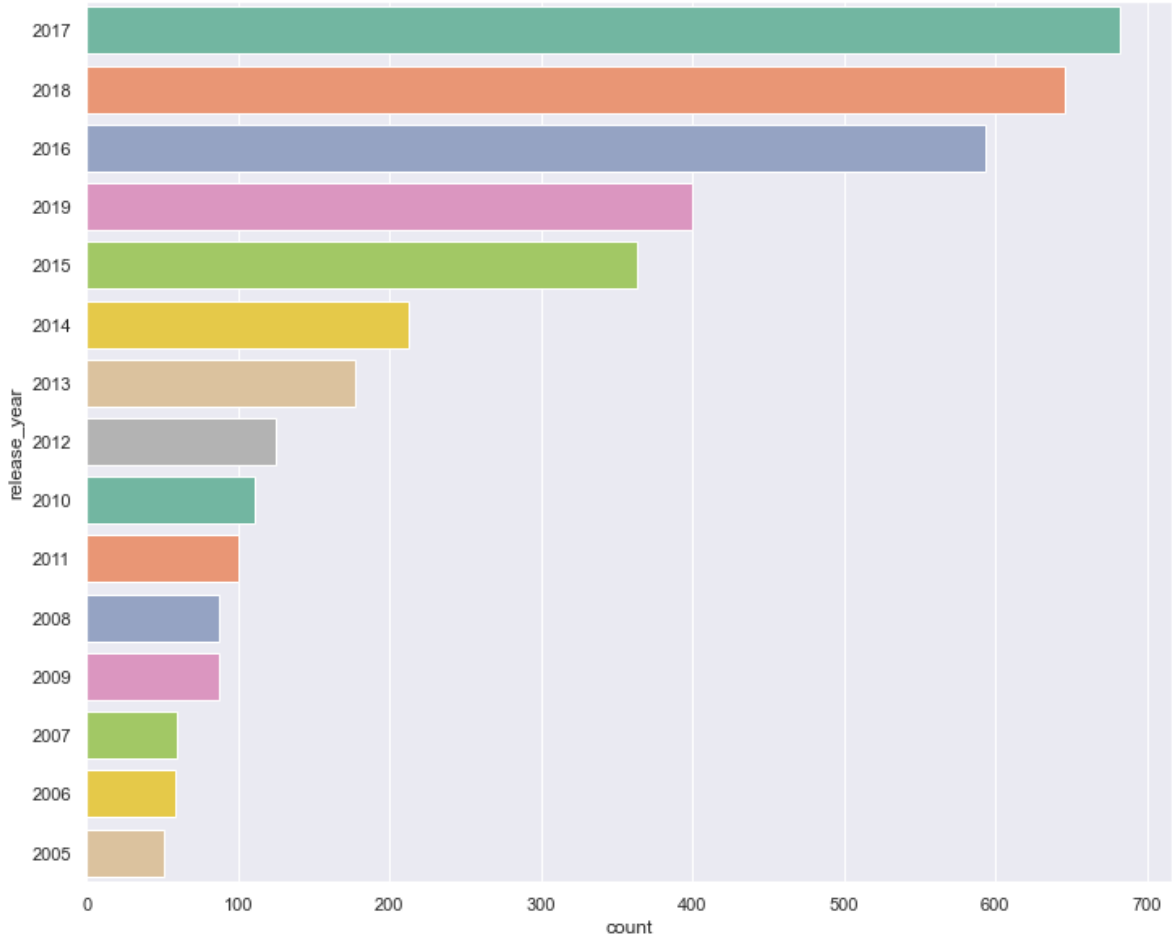
```
import plotly.express as px
data = dict(
    number=[658,608,106,48,41,40,31,30,29,29,21],
    country=["United States", "India", "United Kingdom", "Canada", "Philippines", "Spain",
fig = px.funnel(data, x='number', y='country')
fig.show()
```



performing yearwise analysis

In [25]:

```
plt.figure(figsize=(12,10))
sns.set(style="darkgrid")
year=sns.countplot(y="release_year", data=df_movies,palette="Set2", order=df_movies['releas
```



In [26]:

```
df.head()
```

Out[26]:

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration
0	81145628	Movie	Norm of the North: King Sized Adventure	Richard Finn, Tim Maltby	Alan Marriott, Andrew Toth, Brian Dobson, Cole...	United States, India, South Korea, China	September 9, 2019	2019	TV-PG	90 min
1	80117401	Movie	Jandino: Whatever it Takes	NaN	Jandino Asporaat	United Kingdom	September 9, 2016	2016	TV-MA	94 min
2	70234439	TV Show	Transformers Prime	NaN	Peter Cullen, Sumalee Montano,	United States	September 8, 2018	2013	TV-Y7-FV	1 Season

Analyzing duration of movies

In [27]:

```
df_movies['duration']=df_movies['duration'].str.replace(' min','')
df_movies['duration']=df_movies['duration'].astype(str).astype(int)
df_movies['duration']
```

```
<ipython-input-27-90a108d5af95>:1: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pand
as.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-v
ersus-a-copy)

<ipython-input-27-90a108d5af95>:2: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pand
as.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-v
ersus-a-copy)
```

Out[27]:

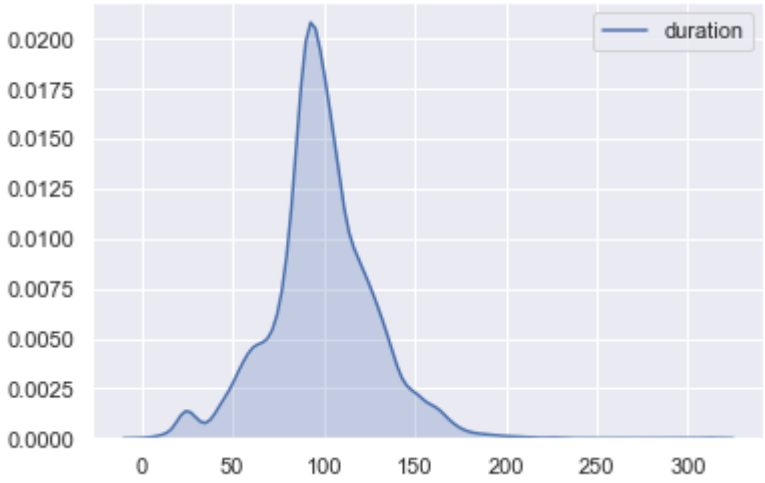
```
0        90
1        94
4        99
6       110
7        60
       ...
5577     70
5578    102
5579     88
5580    109
6231     60
Name: duration, Length: 4265, dtype: int32
```

In [28]:

```
sns.set(style="darkgrid")
sns.kdeplot(data=df_movies['duration'],shade=True)
```

Out[28]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x164a2e33220>
```



In [29]:

```
from collections import Counter
genres=list(df_movies['listed_in'])
gen=[]

for i in genres:
    i=list(i.split(','))
    for j in i:
        gen.append(j.replace(' ',""))
g=Counter(gen)
g
```

Out[29]:

```
Counter({'Children&FamilyMovies': 378,
         'Comedies': 1113,
         'Stand-UpComedy': 281,
         'InternationalMovies': 1927,
         'Sci-Fi&Fantasy': 193,
         'Thrillers': 392,
         'Action&Adventure': 597,
         'Dramas': 1623,
         'CultMovies': 55,
         'IndependentMovies': 552,
         'RomanticMovies': 376,
         'Documentaries': 668,
         'HorrorMovies': 262,
         'Music&Musicals': 243,
         'AnimeFeatures': 45,
         'Faith&Spirituality': 47,
         'LGBTQMovies': 60,
         'Movies': 56,
         'ClassicMovies': 84,
         'SportsMovies': 157})
```

In [30]:

```
sorted(g.items(), key=lambda pair: pair[1], reverse=True)
```

Out[30]:

```
[('InternationalMovies', 1927),
 ('Dramas', 1623),
 ('Comedies', 1113),
 ('Documentaries', 668),
 ('Action&Adventure', 597),
 ('IndependentMovies', 552),
 ('Thrillers', 392),
 ('Children&FamilyMovies', 378),
 ('RomanticMovies', 376),
 ('Stand-UpComedy', 281),
 ('HorrorMovies', 262),
 ('Music&Musicals', 243),
 ('Sci-Fi&Fantasy', 193),
 ('SportsMovies', 157),
 ('ClassicMovies', 84),
 ('LGBTQMovies', 60),
 ('Movies', 56),
 ('CultMovies', 55),
 ('Faith&Spirituality', 47),
 ('AnimeFeatures', 45)]
```

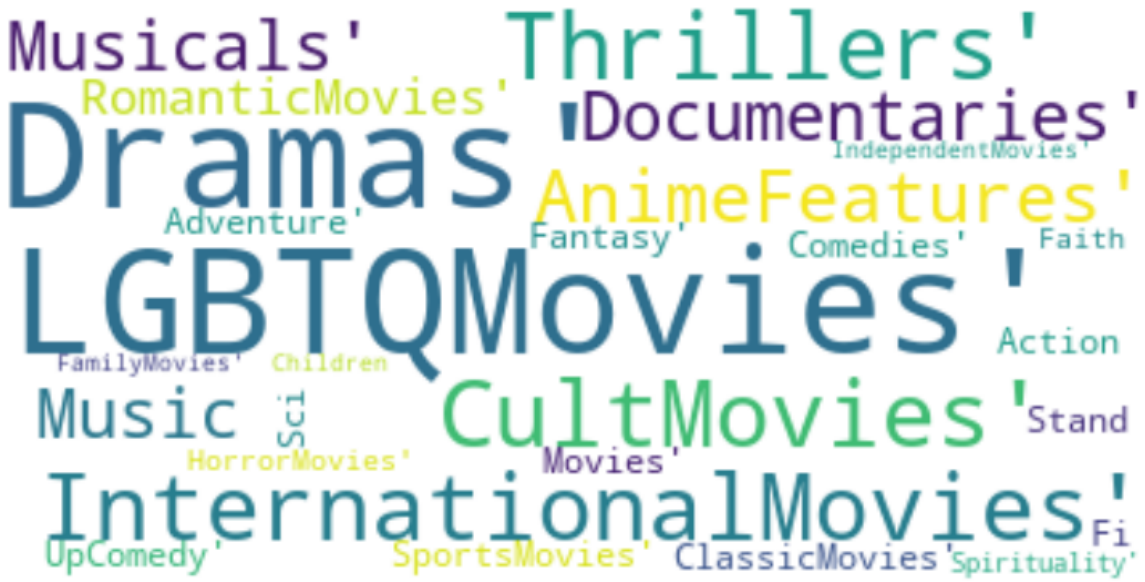
Generating wordcloud for genres wordcloud: represents text data in form of visuals with colours showing importance of particular text

In [31]:

```
from wordcloud import WordCloud, STOPWORDS, ImageColorGenerator
```

In [32]:

```
text = list(set(gen))
wordcloud = WordCloud(max_font_size=50, max_words=100, background_color="white").generate(s
plt.figure(figsize=(13,13))
plt.imshow(wordcloud,interpolation="bilinear")
plt.axis("off")
plt.show()
```



lollipop plot of Genres vs their count

In [33]:

```
g={k: v for k, v in sorted(g.items(), key=lambda item: item[1], reverse= True)}
```

In [34]:

```
g
```

Out[34]:

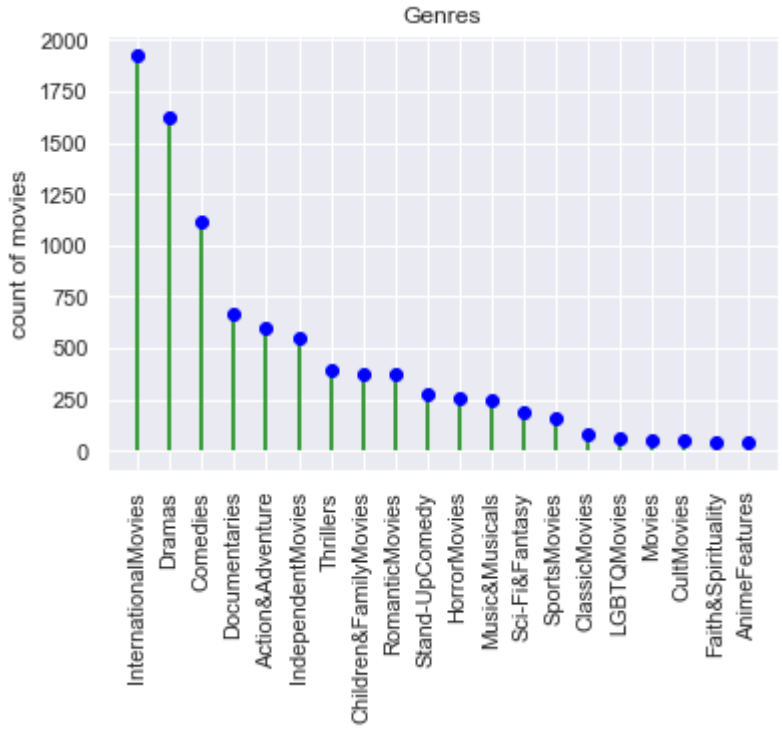
```
{'InternationalMovies': 1927,
 'Dramas': 1623,
 'Comedies': 1113,
 'Documentaries': 668,
 'Action&Adventure': 597,
 'IndependentMovies': 552,
 'Thrillers': 392,
 'Children&FamilyMovies': 378,
 'RomanticMovies': 376,
 'Stand-UpComedy': 281,
 'HorrorMovies': 262,
 'Music&Musicals': 243,
 'Sci-Fi&Fantasy': 193,
 'SportsMovies': 157,
 'ClassicMovies': 84,
 'LGBTQMovies': 60,
 'Movies': 56,
 'CultMovies': 55,
 'Faith&Spirituality': 47,
 'AnimeFeatures': 45}
```

In [35]:

```
fig, ax = plt.subplots()
fig=plt.figure(figsize=(20,20))
x=list(g.keys())
y=list(g.values())
ax.vlines(x,ymin=0,ymax=y, color="green")
ax.plot(x,y, "o",color="blue")
ax.set_xticklabels(x,rotation = 90)
ax.set_ylabel("count of movies")
ax.set_title("Genres")
```

Out[35]:

```
Text(0.5, 1.0, 'Genres')
```




```
<Figure size 1440x1440 with 0 Axes>
```

Analyzing netflix series

In [36]:

```
df_shows.head()
```

Out[36]:

	show_id	type	title	director	cast	country	date_added	release_year	r
2	70234439	TV Show	Transformers Prime	NaN	Peter Cullen, Sumalee Montano, Frank Welker, J...	United States	September 8, 2018	2013	
3	80058654	TV Show	Transformers: Robots in Disguise	NaN	Will Friedle, Darren Criss, Constance Zimmer, ...	United States	September 8, 2018	2016	
5	80163890	TV Show	Apaches	NaN	Alberto Ammann, Eloy Azorín, Verónica Echegui,...	Spain	September 8, 2017	2016	
8	80117902	TV Show	Fire Chasers	NaN	NaN	United States	September 8, 2017	2017	
26	80244601	TV Show	Castle of Stars	NaN	Chaiyapol Pupart, Jintanutda Lummakanon, Worra...	NaN	September 7, 2018	2015	

In [37]:

```
df_shows['country'].head(50)
```

Out[37]:

```
2                                United States
3                                United States
5                                        Spain
8                                United States
26                                         NaN
28                                         NaN
34                                         NaN
39                                      France
54                               United States
61                               United States
63                               United States
64                               United States
66                               United States
67                               United States
68                               United States
69                               United States
70                               United States
72                              United Kingdom
74                                         NaN
80                                         NaN
83                              United Kingdom
84                                         NaN
93                               United States
99                                       India
101                                        NaN
103                                        NaN
105                              United States
111                                     Mexico
131                                        NaN
135                              United States
146                                South Korea
147                                        NaN
148                                      Japan
149     United Kingdom, Canada, United States
150                              United States
153                              United States
155                                        NaN
156                                        NaN
157                                        NaN
158    United Kingdom, France, Germany, Spain
160                              United States
161                                      Spain
164                              United States
166                                      Japan
170                                   Thailand
174                                        NaN
175                              United States
180                      Canada, United States
182                              United States
190                                South Korea
Name: country, dtype: object
```

In [38]:

```
countries1={}
df_shows['country']=df_shows['country'].fillna('Unknown')
cou1=list(df_shows['country'])
for i in cou1:
    i=list(i.split(','))
    if len(i) == 1:
        print(countries1)
        if i in list(countries1.keys()):
            countries1[i]+=1
        else:
            countries1[i[0]]=1
    else:
        for j in i:
            if j in list(countries1.keys()):
                countries1[j]+=1
            else:
                countries1[j]=1
```

```
<ipython-input-38-661ad346ad0b>:2: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-doc
s/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://
pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-
view-versus-a-copy)
```

In [39]:

```
len(countries1)
```

Out[39]:

89

In [40]:

```
countries1
```

Out[40]:


```
{'United States': 1,
 'Spain': 1,
 'Unknown': 1,
 'France': 1,
 'United Kingdom': 1,
 'India': 2,
 'Mexico': 2,
 'South Korea': 1,
 'Japan': 1,
 ' Canada': 31,
 ' United States': 66,
 ' France': 20,
 ' Germany': 14,
 ' Spain': 6,
 'Thailand': 1,
 'Canada': 1,
 ' South Korea': 7,
 'Lebanon': 1,
 'Poland': 1,
 'China': 1,
 'Taiwan': 1,
 'Australia': 1,
 'Russia': 1,
 'Norway': 3,
 'Germany': 1,
 ' Italy': 5,
 'Switzerland': 1,
 'Czech Republic': 1,
 ' Czech Republic': 4,
 'Brazil': 1,
 'Argentina': 1,
 ' West Germany': 2,
 'Turkey': 1,
 'Malaysia': 1,
 ' United Kingdom': 22,
 ' Russia': 2,
 ' Japan': 24,
 'Colombia': 1,
 'Iceland': 1,
 ' Belgium': 2,
 ' Sweden': 3,
 'Singapore': 1,
 ' Mexico': 12,
 'Denmark': 2,
 'Belgium': 1,
 ' Netherlands': 3,
 ' China': 3,
 ' Hong Kong': 2,
 'Italy': 2,
 ' Ireland': 4,
 'Chile': 1,
 'Egypt': 1,
 'Ukraine': 1,
 ' Jordan': 1,
 'Sweden': 1,
```

```
 'New Zealand': 1,
 'Israel': 1,
 ' Greece': 3,
 'United Arab Emirates': 1,
 ' South Africa': 5,
 ' Australia': 6,
 ' New Zealand': 6,
 'Hong Kong': 1,
 ' Chile': 1,
 ' Israel': 1,
 ' Cuba': 1,
 ' Azerbaijan': 1,
 'Ireland': 1,
 'Mauritius': 1,
 'Pakistan': 1,
 'Netherlands': 2,
 ' Singapore': 3,
 'Finland': 2,
 'Indonesia': 1,
 'Philippines': 1,
 'Saudi Arabia': 1,
 ' Syria': 1,
 ' Egypt': 1,
 ' Lebanon': 1,
 ' Kuwait': 1,
 ' Indonesia': 1,
 ' Colombia': 4,
 ' Malta': 1,
 ' Brazil': 3,
 'Croatia': 1,
 ' Hungary': 1,
 'Cyprus': 1,
 ' Austria': 1,
 ' Thailand': 1}
```

In [41]:

```
countries_fin1={}
for country,no in countries1.items():
    country=country.replace(' ','')
    if country in list(countries_fin1.keys()):
        countries_fin1[country]+=no
    else:
        countries_fin1[country]=no
```

In [42]:

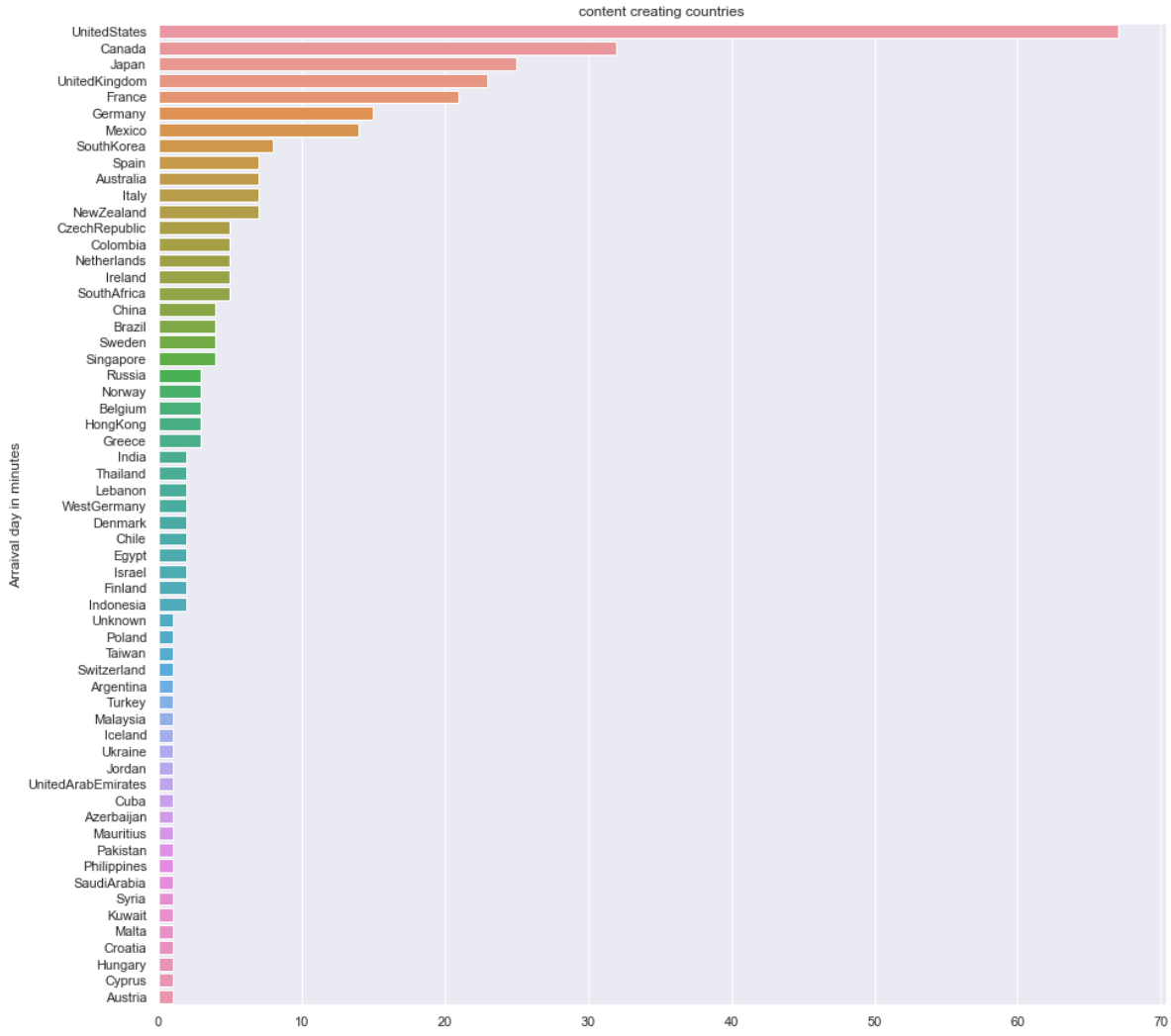
```
countries_fin1={k: v for k,v in sorted(countries_fin1.items(),key=lambda item: item[1], rev
```

In [43]:

```
plt.figure(figsize=(15,15))
plt.title("content creating countries")
sns.barplot(y=list(countries_fin1.keys()),x=list(countries_fin1.values()))
plt.ylabel("Arraival day in minutes")
```

Out[43]:

```
Text(0, 0.5, 'Arraival day in minutes')
```



In [44]:

```
df_shows.head()
```

Out[44]:

	show_id	type	title	director	cast	country	date_added	release_year
2	70234439	TV Show	Transformers Prime	NaN	Peter Cullen, Sumalee Montano, Frank Welker, J...	United States	September 8, 2018	2013
3	80058654	TV Show	Transformers: Robots in Disguise	NaN	Will Friedle, Darren Criss, Constance Zimmer, ...	United States	September 8, 2018	2016
5	80163890	TV Show	Apaches	NaN	Alberto Ammann, Eloy Azorín, Verónica Echegui,...	Spain	September 8, 2017	2016
8	80117902	TV Show	Fire Chasers	NaN	NaN	United States	September 8, 2017	2017
26	80244601	TV Show	Castle of Stars	NaN	Chaiyapol Pupart, Jintanutda Lummakanon, Worra...	Unknown	September 7, 2018	2015

In [45]:

```
features=['title','duration']
durations=df_shows[features]
durations['no_of_seasons']=durations['duration'].str.replace('Season','')
durations['no_of_seasons']=durations['no_of_seasons'].str.replace('s','')
```

```
<ipython-input-45-f2c986e19a4c>:3: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pand
as.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-v
ersus-a-copy)

<ipython-input-45-f2c986e19a4c>:4: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pand
as.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-v
ersus-a-copy)
```

In [46]:

```
durations['no_of_seasons']=durations['no_of_seasons'].astype(str).astype(int)
```

```
<ipython-input-46-ad93769c4198>:1: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pand
as.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-v
ersus-a-copy)
```

In [47]:

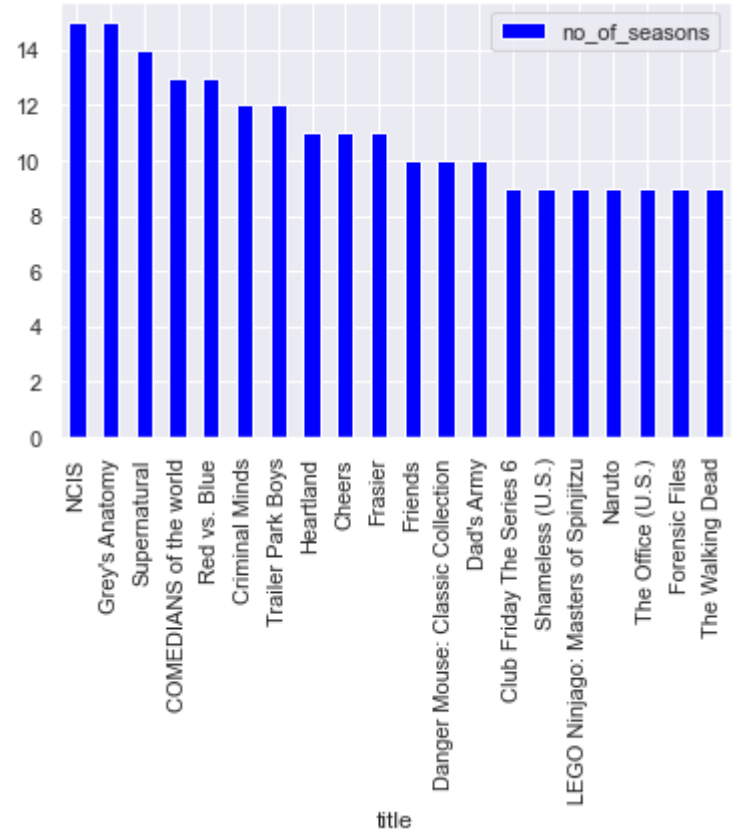
```
t=['title','no_of_seasons']
top=durations[t]
top=top.sort_values(by='no_of_seasons',ascending=False)
```

In [48]:

```
top20=top[0:20]
top20.plot(kind='bar', x='title', y='no_of_seasons', color='blue')
```

Out[48]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x164a32586d0>
```



lowest number of seasons

In [49]:

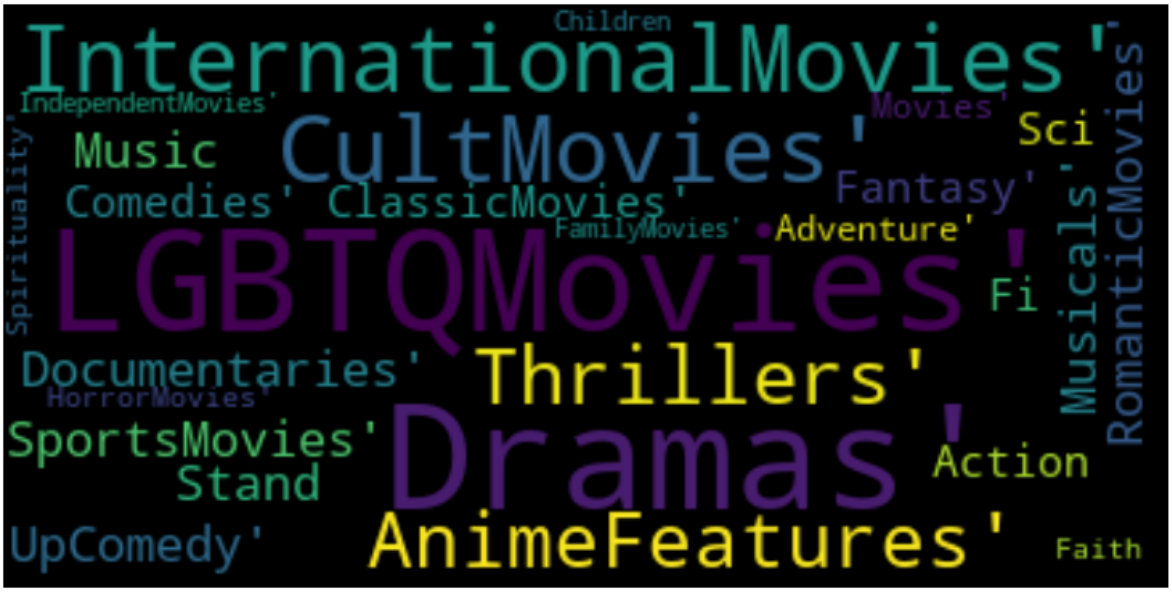
```
bottom=top.sort_values(by='no_of_seasons')
bottom=bottom[20:50]

import plotly.graph_objects as go
fig = go.Figure(data=[go.Table(header=dict(values=['Title','No of seasons']),
                               cells=dict(values=[bottom['title'],bottom['no_of_seasons']],f
                    ])
fig.show()
```

Title	
Dragons: Rescue Riders	
Skylines	
The Politician	
The Inmate	
Team Kaylie	
Pawn Stars	
Surviving R. Kelly	
Lovesick	
Fire Chasers	

Word cloud for genres

In [50]:

```
from wordcloud import WordCloud, STOPWORDS,ImageColorGenerator
text=list(set(gen))
wordcloud = WordCloud(max_font_size=50, max_words=100, background_color="black").generate(s
plt.figure(figsize=(13,13))
plt.imshow(wordcloud,interpolation="bilinear")
plt.axis("off")
plt.show()
```



In [51]:

```
us_series_data=df_shows[df_shows['country']=='United States']
```

In [52]:

```
oldest_us_series=us_series_data.sort_values(by='release_year')[0:20]
```

In [53]:

```
fig=go.Figure(data=[go.Table(header=dict(values=['Title', 'Release Year'],fill_color='palet
                             cells=dict(values=[oldest_us_series['title'],oldest_us_series[
                  ])
fig.show()
```

Title	
Pioneers of African-American Cinema	
The Twilight Zone (Original Series)	
The Andy Griffith Show	
Star Trek	
Highway to Heaven	
High Risk	
Twin Peaks	
Ken Burns: The Civil War	
Pee-wee's Playhouse	

In [54]:

```
newest_us_series=us_series_data.sort_values(by='release_year', ascending=False)[0:50]
```

In [55]:

```
fig=go.Figure(data=[go.Table(header=dict(values=['Title', 'Release Year'],fill_color='Yello
                             cells=dict(values=[newest_us_series['title'],newest_us_series[
                  ])
fig.show()
```

Title	
Killer Inside: The Mind of Aaron Hernandez	
Messiah	
Medical Police	
Cheer	
Go! Go! Cory Carson	
AJ and the Queen	
Kipo and the Age of Wonderbeasts	
Sex, Explained	
The Society	

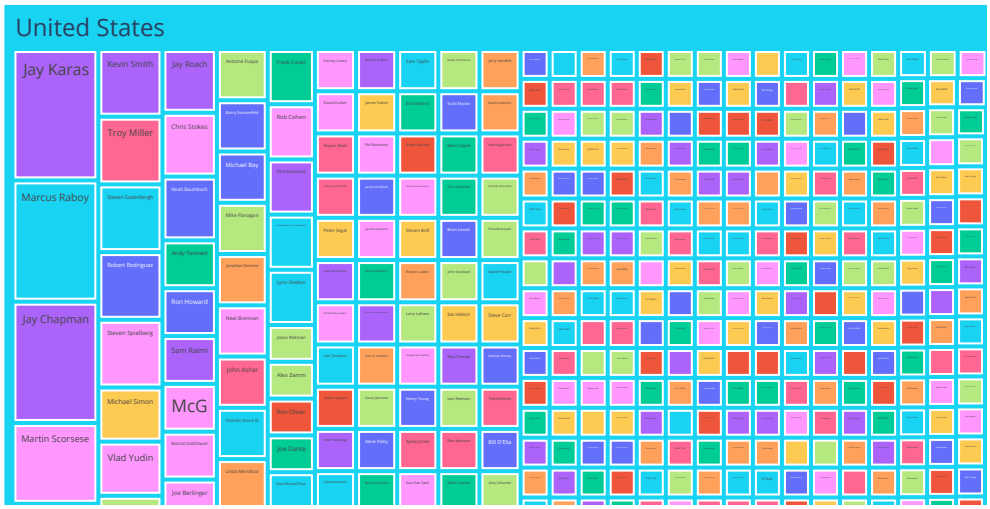
Content in France

In [56]:

```
netflix_fr=df[df['country']=='France']
nanef=netflix_fr.dropna()
import plotly.express as px
fig = px.treemap(nanef, path=['country','director'],color='director',hover_data=['director'
fig.show()
```

In [57]:

```
netflix_us=df[df['country']=='United States']
naneus=netflix_us.dropna()
import plotly.express as px
fig = px.treemap(naneus, path=['country','director'],color='director',hover_data=['director
fig.show()
```



In [58]:

```
newest_fr_series=netflix_fr.sort_values(by='release_year',ascending=False)[0:20]
```

In [59]:

```
newest_fr_series
```

Out[59]:

	show_id	type	title	director	cast	country	date_added	release_y
3472	81074060	TV Show	Until Dawn	NaN	Ahmed Sylla, Alban Ivanov, Ornella Fleury, Nat...	France	January 10, 2020	20
39	80178151	TV Show	The Spy	NaN	Sacha Baron Cohen, Noah Emmerich, Hadar Ratzon...	France	September 6, 2019	20
1014	81079723	Movie	Paradise Beach	Xavier Durringer	Sami Bouajila, Tewfik Jallab, Mélanie Doutey, ...	France	November 8, 2019	20
1791	81012340	Movie	Shéhérazade	Jean-Bernard Marlin	Dylan Robert, Kenza Fortas, Idir Azougli, Lisa...	France	May 11, 2019	20
2516	81010818	TV Show	Family Business	NaN	Jonathan Cohen, Gérard Darmon, Julia Piaton, L...	France	June 28, 2019	20
2587	81027187	Movie	The Wolf's Call	Antonin Baudry	François Civil, Omar Sy, Mathieu Kassovitz, Re...	France	June 20, 2019	20
1309	81096745	Movie	Fadily Camara : La plus drôle de tes copines	Gautier & Leduc	Fadily Camara	France	November 14, 2019	20
3858	81027190	Movie	Paris Is Us	Elisabeth Vogler	Noémie Schmidt, Grégoire Isvarine, Marie Motte...	France	February 22, 2019	20
1192	80222157	TV Show	Who Killed Little Gregory?	NaN	NaN	France	November 20, 2019	20

	show_id	type	title	director	cast	country	date_added	release_y
1152	80241539	TV Show	Mortel	NaN	Carl Malapa, Nemo Schiffman, Manon Bresch, Cor...	France	November 21, 2019	20
1135	80198859	Movie	Brother	Julien Abraham	MHD, Darren Muselet, Aïssa Maïga, Jalil Lesper...	France	November 22, 2019	20
1092	81018979	TV Show	Mythomaniac	NaN	Marina Hands, Mathieu Demy, Marie Drion, Jérém...	France	November 28, 2019	20
1945	81024044	Movie	Lady J	Emmanuel Mouret	Cécile De France, Edouard Baer, Alice Isaaz, N...	France	March 8, 2019	20
4339	80213020	TV Show	The Bonfire of Destiny	NaN	Audrey Fleurot, Julie de Bona, Camille Lou, Gi...	France	December 26, 2019	20
1079	81120982	Movie	I Lost My Body	Jérémy Clapin	Hakim Faris, Victoire Du Bois, Patrick d'Assum...	France	November 29, 2019	20
4440	80989919	TV Show	Twice Upon A Time	NaN	Gaspard Ulliel, Freya Mavor	France	December 19, 2019	20
534	81061828	TV Show	Nailed It! France	NaN	Artus, Noémie Honiat	France	October 25, 2019	20
272	80217779	TV Show	Marianne	NaN	Victoire Du Bois, Lucie Boujenah, Tiphaine Dav...	France	September 13, 2019	20
732	81034012	Movie	Street Flow	Leïla Sy, Kery James	Kery James, Jammeh Diangana, Chloé Jouannet, B...	France	October 13, 2019	20

	show_id	type	title	director	cast	country	date_added	release_y
5692	80190086	TV Show	The Hook Up Plan	NaN	Marc Ruchmann, Zita Hanrot, Sabrina Ouazani,	France	October 11, 2019	20

In [60]:

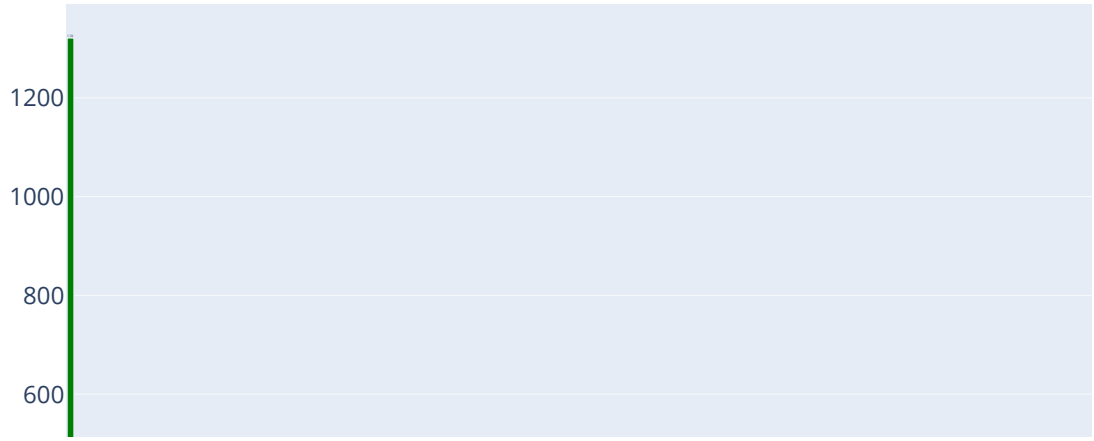
```
fig=go.Figure(data=[go.Table(header=dict(values=['Title', 'Release Year'],fill_color='Yello
                             cells=dict(values=[newest_fr_series['title'],newest_fr_series[
                  ])
fig.show()
```

Title	
Until Dawn	
The Spy	
Paradise Beach	
Shéhérazade	
Family Business	
The Wolf's Call	
Fadily Camara : La plus drôle de tes copines	
Paris Is Us	
Who Killed Little Gregory?	

Top Duration

In [61]:

```
topdirs=pd.value_counts(df['duration'])
fig = go.Figure([go.Bar(x=topdirs.index, y=topdirs.values, text=topdirs.values,marker_color
fig.update_traces(texttemplate='%{text:.2s}',textposition='outside')
fig.show()
```



Recomendation System (Content Based)

In [62]:

```
from sklearn.feature_extraction.text import TfidfVectorizer
```

In [63]:

```
tfidf = TfidfVectorizer(stop_words='english')
df['description'] =df['description'].fillna('')
tfidf_matrix = tfidf.fit_transform(df['description'])
tfidf_matrix.shape
```

Out[63]:

```
(6234, 16151)
```

compute cosine similarity of Tfidf vectorized words

In [64]:

```
from sklearn.metrics.pairwise import linear_kernel
```

In [65]:

```
cosine_sim = linear_kernel(tfidf_matrix, tfidf_matrix)
```

In [66]:

```
cosine_sim
```

Out[66]:

```
array([[1., 0., 0., ..., 0., 0., 0.],
       [0., 1., 0., ..., 0., 0., 0.],
       [0., 0., 1., ..., 0., 0., 0.],
       ...,
       [0., 0., 0., ..., 1., 0., 0.],
       [0., 0., 0., ..., 0., 1., 0.],
       [0., 0., 0., ..., 0., 0., 1.]])
```

In [67]:

```
indices = pd.Series(df.index, index=df['title']).drop_duplicates()
```

In [68]:

```
def get_recomendations(title, cosine_sim=cosine_sim):
    idx = indices[title]
    sim_scores = list(enumerate(cosine_sim[idx]))
    sim_scores = sorted(sim_scores, key=lambda x: x[1], reverse= True)
    sim_scores = sim_scores[1:11]
    movie_indices = [i[0] for i in sim_scores]
    return df['title'].iloc[movie_indices]
```

In [69]:

```
get_recomendations('Peaky Blinders')
```

Out[69]:

```
296                      Our Godfather
4491                              Don
2015                         The Fear
4852    Jonathan Strange & Mr Norrell
1231                       The Prison
3737                Power Rangers Zeo
5986                       The Tudors
1753      Once Upon a Time in Mumbaai
5494     The Legend of Michael Mishra
1142                  Shelby American
Name: title, dtype: object
```

In [70]:

```
get_recomendations('The Spy')
```

Out[70]:

```
5968                             Mossad 101
4639                          The Departed
3804                 Beauty and the Bestie
3503                         Donnie Brasco
3259                     Inside the Mossad
1038                   Undercover Brother 2
99                            Bard of Blood
3084                       The Book of Eli
5216               The Spy Who Fell to Earth
3898    Spy Kids: All the Time in the World
Name: title, dtype: object
```

content based filtering on multiple metrics

content based filtering on factors Title, Cast, Director, Listed in, Plot

In [71]:

```
filledna1=df.fillna('')
filledna1.head(2)
```

Out[71]:

	show_id	type	title	director	cast	country	date_added	release_year	rating	d
0	81145628	Movie	Norm of the North: King Sized Adventure	Richard Finn, Tim Maltby	Alan Marriott, Andrew Toth, Brian Dobson, Cole...	United States, India, South Korea, China	September 9, 2019	2019	TV-PG	
1	80117401	Movie	Jandino: Whatever it Takes		Jandino Asporaat	United Kingdom	September 9, 2016	2016	TV-MA	

cleaning data by making all words lowercase

In [72]:

```
def clean_data(x):
    return str.lower(x.replace(" ",""))
```

identifying features on which the model is to be filtered

In [137]:

```
features=['title','director','cast','listed_in','description']
filledna1=filledna1[features]
```

In [138]:

```
for feature in features:
    filledna1[feature] = filledna1[feature].apply(clean_data)
```

```
<ipython-input-138-f4c31feb857a>:2: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pand
as.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-v
ersus-a-copy)
```

In [139]:

```
filledna1.head(2)
```

Out[139]:

	title	director	
0	normofthenorth:kingsizedadventure	richardfinn,timmaltby	alanmarriott,andrewtoth,briandobson,colehowa
1	jandino:whateverittakes		jandinoaspc

creating soup or bag of words for all rows

In [140]:

```
def create_soup(x):
    return x['title']+ ' ' + x['director']+ ' ' + x['cast']+ ' ' + x['listed_in']+ ' ' + x[
```

In [141]:

```
filledna1['soup'] = filledna1.apply(create_soup, axis=1)
```

```
<ipython-input-141-a808066ace31>:1: SettingWithCopyWarning:


A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://pand
as.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-v
ersus-a-copy)
```

In [142]:

```
filledna1['soup']
```

Out[142]:

```
0       normofthenorth:kingsizedadventure richardfinn,...
1       jandino:whateverittakes  jandinoasporaat stand...
2       transformersprime  petercullen,sumaleemontano,...
3       transformers:robotsindisguise  willfriedle,dar...
4       #realityhigh fernandolebrija nestacooper,katew...
                              ...
6229    redvs.blue  burnieburns,jasonsaldaña,gustavoso...
6230    maron  marcmaron,juddhirsch,joshbrener,norazeh...
6231    littlebabybum:nurseryrhymefriends   movies nur...
6232    ayoungdoctor'snotebookandotherstories  danielr...
6233    friends  jenniferaniston,courteneycox,lisakudr...
Name: soup, Length: 6234, dtype: object
```

In [143]:

```
from sklearn.feature_extraction.text import CountVectorizer
```

In [144]:

```
from sklearn.metrics.pairwise import cosine_similarity
```

In [145]:

```
count = CountVectorizer(stop_words='english')
count_matrix = count.fit_transform(filledna1['soup'])
cosine_sim2 = cosine_similarity(count_matrix, count_matrix)
```

In [146]:

```
count_matrix
```

Out[146]:

```
<6234x56072 sparse matrix of type '<class 'numpy.int64'>'
        with 94275 stored elements in Compressed Sparse Row format>
```

In [147]:

```
filledna1=filledna1.reset_index()
indices = pd.Series(filledna1.index, index=filledna1['title'])
```

In [148]:

```
def get_recomendations_multiple(title, cosine_sim=cosine_sim):
    title=title.replace(' ','').lower()
    idx = indices[title]
    sim_scores = list(enumerate(cosine_sim[idx]))
    sim_scores = sorted(sim_scores, key=lambda x: x[1], reverse=True)
    sim_scores = sim_scores[1:11]
    movie_indices = [i[0] for i in sim_scores]
    return df['title'].iloc[movie_indices]
```

In [149]:

```
get_recomendations_multiple('PK', cosine_sim2)
```

Out[149]:

```
5054                          3 Idiots
5494       The Legend of Michael Mishra
3093                  Anthony Kaun Hai?
2196                            Haapus
691                              Sanju
4110                  Taare Zameen Par
1449                   Chance Pe Dance
2194                   Chal Dhar Pakad
1746    EMI: Liya Hai To Chukana Padega
4920                   Khosla Ka Ghosla
Name: title, dtype: object
```

In [ ]:

```

```

In [150]:

```
get_recomendations_multiple('Peaky Blinders', cosine_sim2)
```

Out[150]:

```
3465                                  Giri / Haji
6050                  The Frankenstein Chronicles
2018                        The Murder Detectives
5529                                       Loaded
550                                     Bodyguard
2505                                 Kiss Me First
5859                                  Happy Valley
233     How to Live Mortgage Free with Sarah Beeny
522                         Terrorism Close Calls
1605                               Killer Ratings
Name: title, dtype: object
```

In [151]:

```
get_recomendations_multiple('Giri / Haji', cosine_sim2)
```

Out[151]:

```
6050                  The Frankenstein Chronicles
2505                                 Kiss Me First
233     How to Live Mortgage Free with Sarah Beeny
522                         Terrorism Close Calls
1605                               Killer Ratings
4793                  Inside the Criminal Mind
4813                               I AM A KILLER
5648                               Peaky Blinders
6177                                   Hinterland
1248                                     Paranoid
Name: title, dtype: object
```

In [152]:

```
df.describe()
```

Out[152]:

	show_id	release_year
count	6.234000e+03	6234.00000
mean	7.670368e+07	2013.35932
std	1.094296e+07	8.81162
min	2.477470e+05	1925.00000
25%	8.003580e+07	2013.00000
50%	8.016337e+07	2016.00000
75%	8.024489e+07	2018.00000
max	8.123573e+07	2020.00000

In [153]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6234 entries, 0 to 6233
Data columns (total 12 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   show_id       6234 non-null   int64 
 1   type          6234 non-null   object
 2   title         6234 non-null   object
 3   director      4265 non-null   object
 4   cast          5664 non-null   object
 5   country       5758 non-null   object
 6   date_added    6223 non-null   object
 7   release_year  6234 non-null   int64 
 8   rating        6224 non-null   object
 9   duration      6234 non-null   object
 10  listed_in     6234 non-null   object
 11  description   6234 non-null   object
dtypes: int64(2), object(10)
memory usage: 584.6+ KB
```

how many neflix shows/movies are made from books

In [154]:

```
books=pd.read_csv('C:/Users/kasaa/Downloads/books.csv/books.csv')
```

In [155]:

```
books.head()
```

Out[155]:

	id	book_id	best_book_id	work_id	books_count	isbn	isbn13	authors	origi
0	1	2767052	2767052	2792775	272	439023483	9.780439e+12	Suzanne Collins	
1	2	3	3	4640799	491	439554934	9.780440e+12	J.K. Rowling, Mary GrandPré	
2	3	41865	41865	3212258	226	316015849	9.780316e+12	Stephenie Meyer	
3	4	2657	2657	3275794	487	61120081	9.780061e+12	Harper Lee	
4	5	4671	4671	245494	1356	743273567	9.780743e+12	F. Scott Fitzgerald	

5 rows × 23 columns

In [156]:

```
books['original_title']=books['original_title'].str.lower()
x=df
x['title']=x['title'].str.lower()
t=x.merge(books, left_on='title',right_on='original_title', how="inner")
```

In [157]:

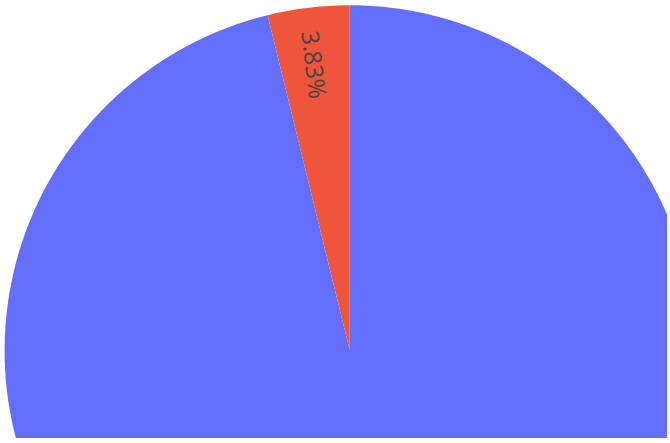
```
t.shape
```

Out[157]:

```
(248, 35)
```

In [158]:

```
import plotly.graph_objects as go
labels = ['shows from books','shows not from books']
values = [248,6234]
fig = go.Figure(data=[go.Pie(labels=labels, values=values)])
fig.show()
```



In [159]:

```
df['cast']
```

Out[159]:

```
0       Alan Marriott, Andrew Toth, Brian Dobson, Cole...
1                                          Jandino Asporaat
2       Peter Cullen, Sumalee Montano, Frank Welker, J...
3       Will Friedle, Darren Criss, Constance Zimmer, ...
4       Nesta Cooper, Kate Walsh, John Michael Higgins...
                              ...
6229    Burnie Burns, Jason Saldaña, Gustavo Sorola, G...
6230    Marc Maron, Judd Hirsch, Josh Brener, Nora Zeh...
6231                                                  NaN
6232    Daniel Radcliffe, Jon Hamm, Adam Godley, Chris...
6233    Jennifer Aniston, Courteney Cox, Lisa Kudrow, ...
Name: cast, Length: 6234, dtype: object
```

In [160]:

```
df=pd.read_csv("C:/Users/kasaa/Downloads/netflix_titles.csv/netflix_titles.csv")
```

In [161]:

```
df.head()
```

Out[161]:

	show_id	type	title	director	cast	country	date_added	release_year	rat
0	81145628	Movie	Norm of the North: King Sized Adventure	Richard Finn, Tim Maltby	Alan Marriott, Andrew Toth, Brian Dobson, Cole...	United States, India, South Korea, China	September 9, 2019	2019	
1	80117401	Movie	Jandino: Whatever it Takes	NaN	Jandino Asporaat	United Kingdom	September 9, 2016	2016	
2	70234439	TV Show	Transformers Prime	NaN	Peter Cullen, Sumalee Montano, Frank Welker, J...	United States	September 8, 2018	2013	Y7
3	80058654	TV Show	Transformers: Robots in Disguise	NaN	Will Friedle, Darren Criss, Constance Zimmer, ...	United States	September 8, 2018	2016	TV
4	80125979	Movie	#realityhigh	Fernando Lebrija	Nesta Cooper, Kate Walsh, John Michael Higgins...	United States	September 8, 2017	2017	TV

In [162]:

```
filledna1=filledna1.reset_index()
indices1 = pd.Series(filledna1.index, index=filledna1['cast'])
```

In [165]:

```
def get_recomendations_cast(cast, cosine_sim=cosine_sim):
    cast=cast.replace(' ','').lower()

    idx1 = indices1[cast]
    sim_scores = list(enumerate(cosine_sim[idx1]))
    sim_scores = sorted(sim_scores, key=lambda x: x[1], reverse=True)
    sim_scores = sim_scores[1:11]
    movie_cast = [i[0] for i in sim_scores]
    return df['title'].iloc[movie_cast]
```

In [ ]:

```
```

In [166]:

```
get_recomendations_cast('Alan Marriott, Andrew Toth, Brian Dobson, Cole Howard, Jennifer Ca
```

Out[166]:

```
1780    Norm of the North: Keys to the Kingdom
4663       Little Singham aur Kaal ka Mahajaal
5318                   Little Singham in London
621              Little Singham: Kaal Ki Tabaahi
3537              Luccas Neto in: Children's Day
406                                  Figaro Pho
2787                  Motu Patlu: King of Kings
4715                               Tellur Aliens
3308                                   Planet 51
1508                    Pettersson and Findus 2
Name: title, dtype: object
```

In [168]:

```
get_recomendations_multiple('Norm of the North: King Sized Adventure', cosine_sim2)
```

Out[168]:

```
1780    Norm of the North: Keys to the Kingdom
4663       Little Singham aur Kaal ka Mahajaal
5318                   Little Singham in London
621              Little Singham: Kaal Ki Tabaahi
3537              Luccas Neto in: Children's Day
406                                  Figaro Pho
2787                  Motu Patlu: King of Kings
4715                               Tellur Aliens
3308                                   Planet 51
1508                    Pettersson and Findus 2
Name: title, dtype: object
```

In [211]:

```
df_split=df['cast'].str.replace(',',"").str.split(' ')
```

In [212]:

```
df_split
```

Out[212]:

```
0       [Alan, Marriott, Andrew, Toth, Brian, Dobson, ...
1                                    [Jandino, Asporaat]
2       [Peter, Cullen, Sumalee, Montano, Frank, Welke...
3       [Will, Friedle, Darren, Criss, Constance, Zimm...
4       [Nesta, Cooper, Kate, Walsh, John, Michael, Hi...
                              ...
6229    [Burnie, Burns, Jason, Saldaña, Gustavo, Sorol...
6230    [Marc, Maron, Judd, Hirsch, Josh, Brener, Nora...
6231                                                  NaN
6232    [Daniel, Radcliffe, Jon, Hamm, Adam, Godley, C...
6233    [Jennifer, Aniston, Courteney, Cox, Lisa, Kudr...
Name: cast, Length: 6234, dtype: object
```

In [213]:

```
df['cast']
```

Out[213]:

```
0       Alan Marriott, Andrew Toth, Brian Dobson, Cole...
1                                        Jandino Asporaat
2       Peter Cullen, Sumalee Montano, Frank Welker, J...
3       Will Friedle, Darren Criss, Constance Zimmer, ...
4       Nesta Cooper, Kate Walsh, John Michael Higgins...
                              ...
6229    Burnie Burns, Jason Saldaña, Gustavo Sorola, G...
6230    Marc Maron, Judd Hirsch, Josh Brener, Nora Zeh...
6231                                                  NaN
6232    Daniel Radcliffe, Jon Hamm, Adam Godley, Chris...
6233    Jennifer Aniston, Courteney Cox, Lisa Kudrow, ...
Name: cast, Length: 6234, dtype: object
```

In [214]:

```
df['split_cast']=df_split
```

In [199]:

```
df.head()
```

Out[199]:

	show_id	type	title	director	cast	country	date_added	release_year	rat
0	81145628	Movie	Norm of the North: King Sized Adventure	Richard Finn, Tim Maltby	Alan Marriott, Andrew Toth, Brian Dobson, Cole...	United States, India, South Korea, China	September 9, 2019	2019	
1	80117401	Movie	Jandino: Whatever it Takes	NaN	Jandino Asporaat	United Kingdom	September 9, 2016	2016	
2	70234439	TV Show	Transformers Prime	NaN	Peter Cullen, Sumalee Montano, Frank Welker, J...	United States	September 8, 2018	2013	Y7
3	80058654	TV Show	Transformers: Robots in Disguise	NaN	Will Friedle, Darren Criss, Constance Zimmer, ...	United States	September 8, 2018	2016	TV
4	80125979	Movie	#realityhigh	Fernando Lebrija	Nesta Cooper, Kate Walsh, John Michael Higgins...	United States	September 8, 2017	2017	TV

In [240]:

```
strings=df['split_cast'][0]
' '.join(strings)
```

Out[240]:

```
'Alan Marriott Andrew Toth Brian Dobson Cole Howard Jennifer Cameron Jonatha
n Holmes Lee Tockar Lisa Durupt Maya Kay Michael Dobson'
```

In [242]:

```
df["split_cast"]= df["split_cast"].str.join(" ")
```

In [304]:

```
df['cast'][0]
```

Out[304]:

```
'Alan Marriott Andrew Toth Brian Dobson Cole Howard Jennifer Cameron Jonatha
n Holmes Lee Tockar Lisa Durupt Maya Kay Michael Dobson'
```

In [286]:

```
df['cast']=df['split_cast']
```

In [287]:

```
fillednac=df.fillna('')
```

In [308]:

```
fillednac.head()
```

Out[308]:

	index	title	director	cast	listed_in	description	soup
0	0	Norm of the North: King Sized Adventure	Richard Finn, Tim Maltby	Alan Marriott Andrew Toth Brian Dobson Cole Ho...	Children & Family Movies, Comedies	Before planning an awesome wedding for his gra...	Norm of the North: King Sized Adventure Richar...
1	1	Jandino: Whatever it Takes		Jandino Asporaat	Stand-Up Comedy	Jandino Asporaat riffs on the challenges of ra...	Jandino: Whatever it Takes Jandino Asporaat S...
2	2	Transformers Prime		Peter Cullen Sumalee Montano Frank Welker Jeff...	Kids' TV	With the help of three human allies, the Autob...	Transformers Prime Peter Cullen Sumalee Monta...
3	3	Transformers: Robots in Disguise		Will Friedle Darren Criss Constance Zimmer Kha...	Kids' TV	When a prison ship crash unleashes hundreds of...	Transformers: Robots in Disguise Will Friedle...
4	4	#realityhigh	Fernando Lebrija	Nesta Cooper Kate Walsh John Michael Higgins K...	Comedies	When nerdy high schooler Dani finally attracts...	#realityhigh Fernando Lebrija Nesta Cooper Kat...

In [288]:

```
def clean_data(x):
    return str.lower(x.replace(" ",""))
```

In [289]:

```
features=['title','director','cast','listed_in','description']
fillednac=fillednac[features]
```

In [290]:

```
def create_soup(x):
    return x['title']+ ' ' + x['director']+ ' ' + x['cast']+ ' ' + x['listed_in']+ ' ' + x[
```

In [291]:

```
fillednac['soup'] = fillednac.apply(create_soup, axis=1)
```

In [292]:

```
fillednac['soup']
```

Out[292]:

```
0       Norm of the North: King Sized Adventure Richar...
1       Jandino: Whatever it Takes  Jandino Asporaat S...
2       Transformers Prime  Peter Cullen Sumalee Monta...
3       Transformers: Robots in Disguise  Will Friedle...
4       #realityhigh Fernando Lebrija Nesta Cooper Kat...
                              ...
6229    Red vs. Blue  Burnie Burns Jason Saldaña Gusta...
6230    Maron  Marc Maron Judd Hirsch Josh Brener Nora...
6231    Little Baby Bum: Nursery Rhyme Friends   Movie...
6232    A Young Doctor's Notebook and Other Stories  D...
6233    Friends  Jennifer Aniston Courteney Cox Lisa K...
Name: soup, Length: 6234, dtype: object
```

In [293]:

```
from sklearn.feature_extraction.text import CountVectorizer
```

In [294]:

```
from sklearn.metrics.pairwise import cosine_similarity
```

In [295]:

```
count_cast = CountVectorizer(stop_words='english')
count_matrix_cast = count_cast.fit_transform(fillednac['soup'])
cosine_sim_cast = cosine_similarity(count_matrix_cast, count_matrix_cast)
```

In [296]:

```
count_matrix.shape
```

Out[296]:

```
(6234, 56072)
```

In [297]:

```
fillednac=fillednac.reset_index()
indices_cast = pd.Series(fillednac.index, index=fillednac['cast'])
```

In [301]:

```
def get_recomendations_cast(cast, cosine_sim=cosine_sim):
    cast=cast.replace(' ','').lower()

    idx1 = indices1[cast]
    sim_scores = list(enumerate(cosine_sim[idx1]))
    sim_scores = sorted(sim_scores, key=lambda x: x[1], reverse=True)
    sim_scores = sim_scores[1:11]
    movie_cast = [i[0] for i in sim_scores]
    return df['title'].iloc[movie_cast]
```

In [307]:

```
get_recomendations_cast('Alan Marriott, Andrew Toth, Brian Dobson, Cole Howard, Jennifer Ca
```

Out[307]:

```
1780    Norm of the North: Keys to the Kingdom
1379                                Holly Star
2787               Motu Patlu: King of Kings
1406                                Santa Girl
930         Barbie: The Princess & the Popstar
4715                            Tellur Aliens
926               Barbie Star Light Adventure
3286               Mune: Guardian of the Moon
3564                            Stuart Little
1800          Chhota Bheem Ka Romani Adventure
Name: title, dtype: object
```

In [ ]: