# Netflix_Case_Study

January 15, 2023

[1]:
```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

[2]:
```
df = pd.read_csv('/Users/sivakumar/Data Files/netflix.csv')
df
```

[2]:
```
     show_id     type                  title         director  \
0         s1    Movie   Dick Johnson Is Dead  Kirsten Johnson
1         s2  TV Show          Blood & Water              NaN
2         s3  TV Show              Ganglands  Julien Leclercq
3         s4  TV Show  Jailbirds New Orleans              NaN
4         s5  TV Show           Kota Factory              NaN
…        …        …                      …                …
8802   s8803    Movie                 Zodiac    David Fincher
8803   s8804  TV Show            Zombie Dumb              NaN
8804   s8805    Movie             Zombieland  Ruben Fleischer
8805   s8806    Movie                   Zoom     Peter Hewitt
8806   s8807    Movie                 Zubaan      Mozez Singh

                                                   cast        country  \
0                                                   NaN  United States
1     Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban…   South Africa
2     Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi…            NaN
3                                                   NaN            NaN
4     Mayur More, Jitendra Kumar, Ranjan Raj, Alam K…          India
…                                                   …              …
8802  Mark Ruffalo, Jake Gyllenhaal, Robert Downey J…  United States
8803                                                NaN            NaN
8804  Jesse Eisenberg, Woody Harrelson, Emma Stone, …  United States
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  \
0     September 25, 2021          2020  PG-13     90 min
1     September 24, 2021          2021  TV-MA  2 Seasons
```

```
2     September 24, 2021          2021  TV-MA   1 Season
3     September 24, 2021          2021  TV-MA   1 Season
4     September 24, 2021          2021  TV-MA  2 Seasons
…                  …           …    …        …
8802   November 20, 2019          2007      R    158 min
8803        July 1, 2019          2018  TV-Y7  2 Seasons
8804    November 1, 2019          2009      R     88 min
8805    January 11, 2020          2006     PG     88 min
8806       March 2, 2019          2015  TV-14    111 min

                                              listed_in  \
0                                         Documentaries
1       International TV Shows, TV Dramas, TV Mysteries
2     Crime TV Shows, International TV Shows, TV Act…
3                                Docuseries, Reality TV
4     International TV Shows, Romantic TV Shows, TV …
…                                                 …
8802                         Cult Movies, Dramas, Thrillers
8803              Kids' TV, Korean TV Shows, TV Comedies
8804                            Comedies, Horror Movies
8805                  Children & Family Movies, Comedies
8806     Dramas, International Movies, Music & Musicals

                                            description
0     As her father nears the end of his life, filmm…
1     After crossing paths at a party, a Cape Town t…
2     To protect his family from a powerful drug lor…
3     Feuds, flirtations and toilet talk go down amo…
4     In a city of coaching centers known to train I…
…                                                 …
8802  A political cartoonist, a crime reporter and a…
8803  While living alone in a spooky town, a young g…
8804  Looking to survive in a world taken over by zo…
8805  Dragged from civilian life, a former superhero…
8806  A scrappy but poor boy worms his way into a ty…

[8807 rows x 12 columns]
```

[3]:
```
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
```

[4]:
```
#checking the shape of the data
df.shape
```

[4]:
```
(8807, 12)
```

[5]:
```
#getting the Data types of values in our data
df.dtypes
```

[5]:
```
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
```

[6]:
```
#getting basic overview of the data
df.describe()
```

[6]:
```
       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
```

[7]:

```
#checking No. of Unique values in our data
df.nunique()
```

[7]:

```
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
```

[8]:

```
#checking No. of Null values in our data
df.isnull().sum()
```

[8]:

```
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
```

[9]:

```
#Getting the Value count of each type of ratings
df['rating'].value_counts()
```

[9]:

```
TV-MA       3207
TV-14       2160
TV-PG        863
R            799
PG-13        490
TV-Y7        334
TV-Y         307
PG           287
TV-G         220
NR            80
```

```
G              41
TV-Y7-FV        6
NC-17           3
UR              3
74 min          1
84 min          1
66 min          1
Name: rating, dtype: int64
```

[10]:
```
#Here we are un-nesetting the the data, creating the new line for each.
#In this case we are doing for Director
c = df['director'].apply(lambda x: str(x).split(', ')).tolist()
df_new = pd.DataFrame(c,index=df['title'])
df_new = df_new.stack()
df_new=pd.DataFrame(df_new.reset_index())
df_new.rename (columns={0 : 'Directors'}, inplace=True)
df_new.drop(['level_1'],axis=1,inplace=True)
df_new.head()
```

[10]:
```
                   title        Directors
0   Dick Johnson Is Dead  Kirsten Johnson
1          Blood & Water              nan
2              Ganglands  Julien Leclercq
3  Jailbirds New Orleans              nan
4           Kota Factory              nan
```

[11]:
```
#Here we are un-nesetting the the data, creating the new line for each.
#In this case we are doing for Cast
c2 = df['cast'].apply(lambda x: str(x).split(', ')).tolist()
df_new2 = pd.DataFrame(c2,index=df['title'])
df_new2 = df_new2.stack()
df_new2=pd.DataFrame(df_new2.reset_index())
df_new2.rename (columns={0 : 'Actors'}, inplace=True)
df_new2.drop(['level_1'],axis=1,inplace=True)
df_new2.head()
```

[11]:
```
                  title           Actors
0  Dick Johnson Is Dead              nan
1         Blood & Water      Ama Qamata
2         Blood & Water     Khosi Ngema
3         Blood & Water   Gail Mabalane
4         Blood & Water  Thabang Molaba
```

[12]:
```
#Here we are un-nesetting the the data, creating the new line for each.
#In this case we are doing for Listed_In
c2 = df['listed_in'].apply(lambda x: str(x).split(', ')).tolist()
df_new3 = pd.DataFrame(c2,index=df['title'])
```

```
df_new3 = df_new3.stack()
df_new3=pd.DataFrame(df_new3.reset_index())
df_new3.rename (columns={0 : 'Genre'}, inplace=True)
df_new3.drop(['level_1'],axis=1,inplace=True)
df_new3.head()
```

[12]:

```
                  title                   Genre
0  Dick Johnson Is Dead           Documentaries
1         Blood & Water  International TV Shows
2         Blood & Water               TV Dramas
3         Blood & Water            TV Mysteries
4             Ganglands          Crime TV Shows
```

[13]:

```
#Here we are un-nesetting the the data, creating the new line for each.
#In this case we are doing for Country
c2 = df['country'].apply(lambda x: str(x).split(', ')).tolist()
df_new4 = pd.DataFrame(c2,index=df['title'])
df_new4 = df_new4.stack()
df_new4=pd.DataFrame(df_new4.reset_index())
df_new4.rename (columns={0 : 'Country'}, inplace=True)
df_new4.drop(['level_1'],axis=1,inplace=True)
df_new4.head()
```

[13]:

```
                   title        Country
0   Dick Johnson Is Dead  United States
1          Blood & Water   South Africa
2              Ganglands            nan
3  Jailbirds New Orleans            nan
4            Kota Factory         India
```

[14]:

```
#Now Merging all the Un-Merged Data
#Merging the data with Directors and Actors on Title
df_new5 = df_new.merge(df_new2, on=['title'], how = 'inner')
#Merging the data with above merged data with Genre
df_new6 = df_new5.merge(df_new3, on=['title'], how = 'inner')
#Merging the data with above merged data with country
df_new = df_new6.merge(df_new4, on = ['title'], how = 'inner')
#Replacing the NaN values of Director and Actor
df_new['Actors'].replace(['nan'],['Unknown Actor'],inplace=True)
df_new['Directors'].replace(['nan'],['Unknown Directors'],inplace=True)
df_new['Country'].replace(['nan'],['UnKnown Country'],inplace=True)
df_new.head()
```

[14]:

```
                  title          Directors         Actors  \
0  Dick Johnson Is Dead   Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
```

```
3          Blood & Water  Unknown Directors     Ama Qamata
4          Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country
0           Documentaries  United States
1  International TV Shows   South Africa
2               TV Dramas   South Africa
3            TV Mysteries   South Africa
4  International TV Shows   South Africa
```

[15]:

```
df_final = df_new.
 ↪merge(df[['show_id','type','title','date_added','release_year',
                           'rating','duration']], on=['title'], how='left')
df_final.head()
```

[15]:

```
                   title          Directors         Actors  \
0  Dick Johnson Is Dead    Kirsten Johnson  Unknown Actor
1          Blood & Water  Unknown Directors     Ama Qamata
2          Blood & Water  Unknown Directors     Ama Qamata
3          Blood & Water  Unknown Directors     Ama Qamata
4          Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country show_id     type          date_added  \
0           Documentaries  United States      s1    Movie  September 25, 2021
1  International TV Shows   South Africa      s2  TV Show  September 24, 2021
2               TV Dramas   South Africa      s2  TV Show  September 24, 2021
3            TV Mysteries   South Africa      s2  TV Show  September 24, 2021
4  International TV Shows   South Africa      s2  TV Show  September 24, 2021

   release_year rating   duration
0          2020  PG-13     90 min
1          2021  TV-MA  2 Seasons
2          2021  TV-MA  2 Seasons
3          2021  TV-MA  2 Seasons
4          2021  TV-MA  2 Seasons
```

[16]:

```
df_final.shape
```

[16]:

```
(201991, 11)
```

[17]:

```
df_final.isnull().sum()
```

[17]:

```
title                 0
Directors             0
Actors                0
Genre                 0
Country               0
```

```
show_id           0
type              0
date_added      158
release_year      0
rating           67
duration          3
dtype: int64
```

[18]:

```
df_final.loc[df_final['duration'].isnull(),'duration']=df_final.
 ↪loc[df_final['duration'].isnull(),'duration'].fillna(df_final['rating'])
```

[19]:

```
df_final.loc[df_final['rating'].str.contains('min', na=False),'rating']='NR'
df_final['rating'].fillna('NR',inplace=True)
df_final.isnull().sum()
```

[19]:

```
title             0
Directors         0
Actors            0
Genre             0
Country           0
show_id           0
type              0
date_added      158
release_year      0
rating            0
duration          0
dtype: int64
```

[20]:

```
df_final['rating'].value_counts()
```

[20]:

```
TV-MA       73867
TV-14       43931
R           25860
PG-13       16246
TV-PG       14926
PG          10919
TV-Y7        6304
TV-Y         3665
TV-G         2779
NR           1643
G            1530
NC-17         149
TV-Y7-FV       86
UR             86
Name: rating, dtype: int64
```

[21]:

```
df_final[df_final['date_added'].isnull()].head()
```

[21]:

```
                                              title          Directors  \
136893  A Young Doctor's Notebook and Other Stories  Unknown Directors
136894  A Young Doctor's Notebook and Other Stories  Unknown Directors
136895  A Young Doctor's Notebook and Other Stories  Unknown Directors
136896  A Young Doctor's Notebook and Other Stories  Unknown Directors
136897  A Young Doctor's Notebook and Other Stories  Unknown Directors

                  Actors             Genre         Country show_id     type  \
136893  Daniel Radcliffe  British TV Shows  United Kingdom   s6067  TV Show
136894  Daniel Radcliffe       TV Comedies  United Kingdom   s6067  TV Show
136895  Daniel Radcliffe         TV Dramas  United Kingdom   s6067  TV Show
136896          Jon Hamm  British TV Shows  United Kingdom   s6067  TV Show
136897          Jon Hamm       TV Comedies  United Kingdom   s6067  TV Show

       date_added  release_year rating   duration
136893        NaN          2013  TV-MA  2 Seasons
136894        NaN          2013  TV-MA  2 Seasons
136895        NaN          2013  TV-MA  2 Seasons
136896        NaN          2013  TV-MA  2 Seasons
136897        NaN          2013  TV-MA  2 Seasons
```

[22]:

```
for i in df_final[df_final['date_added'].isnull()]['release_year'].unique():
    im = df_final[df_final['release_year']==i]['date_added'].mode().values[0]
    df_final.loc[df_final['release_year']==i,'date_added']=df_final.
 ↪loc[df_final['release_year']==i,'date_added'].fillna(im)
```

[23]:

```
df_final
```

[23]:

```
                       title          Directors                 Actors  \
0       Dick Johnson Is Dead    Kirsten Johnson          Unknown Actor
1              Blood & Water  Unknown Directors             Ama Qamata
2              Blood & Water  Unknown Directors             Ama Qamata
3              Blood & Water  Unknown Directors             Ama Qamata
4              Blood & Water  Unknown Directors            Khosi Ngema
…                      …                …                    …
201986                Zubaan        Mozez Singh         Anita Shabdish
201987                Zubaan        Mozez Singh         Anita Shabdish
201988                Zubaan        Mozez Singh  Chittaranjan Tripathy
201989                Zubaan        Mozez Singh  Chittaranjan Tripathy
201990                Zubaan        Mozez Singh  Chittaranjan Tripathy

                         Genre        Country show_id     type  \
0                Documentaries  United States      s1    Movie
1       International TV Shows   South Africa      s2  TV Show
2                    TV Dramas   South Africa      s2  TV Show
3                 TV Mysteries   South Africa      s2  TV Show
4       International TV Shows   South Africa      s2  TV Show
```

```
…                         …            …     …      …
201986    International Movies         India   s8807    Movie
201987        Music & Musicals         India   s8807    Movie
201988                  Dramas         India   s8807    Movie
201989    International Movies         India   s8807    Movie
201990        Music & Musicals         India   s8807    Movie

                date_added  release_year rating   duration
0       September 25, 2021          2020  PG-13     90 min
1       September 24, 2021          2021  TV-MA  2 Seasons
2       September 24, 2021          2021  TV-MA  2 Seasons
3       September 24, 2021          2021  TV-MA  2 Seasons
4       September 24, 2021          2021  TV-MA  2 Seasons
…                       …           …    …        …
201986       March 2, 2019          2015  TV-14    111 min
201987       March 2, 2019          2015  TV-14    111 min
201988       March 2, 2019          2015  TV-14    111 min
201989       March 2, 2019          2015  TV-14    111 min
201990       March 2, 2019          2015  TV-14    111 min

[201991 rows x 11 columns]
```

[24]:

```python
df_final[df_final['duration'].isnull()].head()
```

[24]:

```
Empty DataFrame
Columns: [title, Directors, Actors, Genre, Country, show_id, type, date_added,
release_year, rating, duration]
Index: []
```

[25]:

```python
df_final['duration'] = df_final['duration'].str.replace(' min','')
df_final.head()
```

[25]:

```
                  title          Directors         Actors  \
0  Dick Johnson Is Dead    Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
3         Blood & Water  Unknown Directors     Ama Qamata
4         Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country show_id     type          date_added  \
0           Documentaries  United States      s1    Movie  September 25, 2021
1  International TV Shows   South Africa      s2  TV Show  September 24, 2021
2               TV Dramas   South Africa      s2  TV Show  September 24, 2021
3            TV Mysteries   South Africa      s2  TV Show  September 24, 2021
4  International TV Shows   South Africa      s2  TV Show  September 24, 2021

   release_year rating   duration
```

```
0          2020  PG-13         90
1          2021  TV-MA  2 Seasons
2          2021  TV-MA  2 Seasons
3          2021  TV-MA  2 Seasons
4          2021  TV-MA  2 Seasons
```

[26]:
```
##creating the bins for duration because it is a continous variable
df_final['duration_copy']=df_final['duration'].copy()
df_final1 = df_final.copy()
```

[27]:
```
df_final1.loc[df_final1['duration_copy'].str.
 ↪contains('Season'),'duration_copy']=0
df_final1['duration_copy'] = df_final1['duration_copy'].astype('int')
df_final1.head()
```

[27]:
```
                  title          Directors         Actors  \
0  Dick Johnson Is Dead    Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
3         Blood & Water  Unknown Directors     Ama Qamata
4         Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country show_id     type          date_added  \
0           Documentaries  United States      s1    Movie  September 25, 2021
1  International TV Shows   South Africa      s2  TV Show  September 24, 2021
2               TV Dramas   South Africa      s2  TV Show  September 24, 2021
3            TV Mysteries   South Africa      s2  TV Show  September 24, 2021
4  International TV Shows   South Africa      s2  TV Show  September 24, 2021

   release_year rating   duration  duration_copy
0          2020  PG-13         90             90
1          2021  TV-MA  2 Seasons              0
2          2021  TV-MA  2 Seasons              0
3          2021  TV-MA  2 Seasons              0
4          2021  TV-MA  2 Seasons              0
```

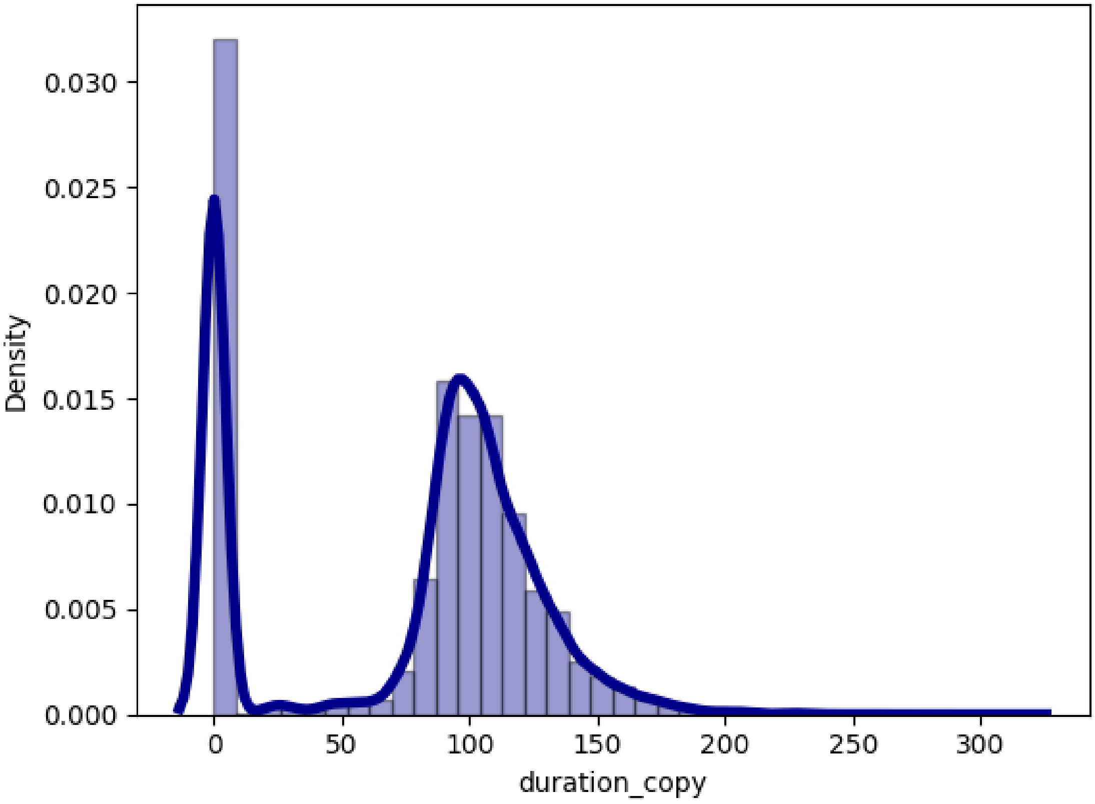
[28]:
```
df_final1['duration_copy'].describe()
```

[28]:
```
count    201991.000000
mean         77.152789
std          52.269154
min           0.000000
25%           0.000000
50%          95.000000
75%         112.000000
max         312.000000
Name: duration_copy, dtype: float64
```

[29]:

```
sns.distplot(df_final1['duration_copy'], hist = True, kde =True,
             bins=int(36), color = 'darkblue',
             hist_kws={'edgecolor': 'black'},
             kde_kws={'linewidth':4})
plt.show()
```

```
/var/folders/2k/nqxlqww13nd99192zjdnsjc00000gn/T/ipykernel_4203/1638109463.py:1:
UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

  sns.distplot(df_final1['duration_copy'], hist = True, kde =True,
```



[30]:

```
bins1 = [-1,1,50,80,100,120,150,200,315]
```

```
labels1 = ['<1', '1-50', '50-80', '80-100', '100-120', '120-150', '150-200',␣
 ↪'200-315']
df_final1['duration_copy'] = pd.cut(df_final1['duration_copy'],bins=bins1,␣
 ↪labels=labels1)
df_final1.head( )
```

[30]:

```
                 title           Directors          Actors  \
0  Dick Johnson Is Dead    Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
3         Blood & Water  Unknown Directors     Ama Qamata
4         Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country show_id     type          date_added  \
0           Documentaries  United States      s1    Movie  September 25, 2021
1  International TV Shows   South Africa      s2  TV Show  September 24, 2021
2               TV Dramas   South Africa      s2  TV Show  September 24, 2021
3            TV Mysteries   South Africa      s2  TV Show  September 24, 2021
4  International TV Shows   South Africa      s2  TV Show  September 24, 2021

  release_year rating   duration duration_copy
0         2020  PG-13         90        80-100
1         2021  TV-MA  2 Seasons            <1
2         2021  TV-MA  2 Seasons            <1
3         2021  TV-MA  2 Seasons            <1
4         2021  TV-MA  2 Seasons            <1
```

[31]:

```
df_final1.loc[~df_final1['duration'].str.
 ↪contains('Season'),'duration']=df_final1.loc[~df_final1['duration'].str.
 ↪contains('Season'),'duration_copy']
df_final1.drop(['duration_copy'],axis=1,inplace=True)
df_final1.head()
```

[31]:

```
                 title           Directors          Actors  \
0  Dick Johnson Is Dead    Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
3         Blood & Water  Unknown Directors     Ama Qamata
4         Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country show_id     type          date_added  \
0           Documentaries  United States      s1    Movie  September 25, 2021
1  International TV Shows   South Africa      s2  TV Show  September 24, 2021
2               TV Dramas   South Africa      s2  TV Show  September 24, 2021
3            TV Mysteries   South Africa      s2  TV Show  September 24, 2021
4  International TV Shows   South Africa      s2  TV Show  September 24, 2021
```

```
   release_year rating   duration
0          2020  PG-13     80-100
1          2021  TV-MA  2 Seasons
2          2021  TV-MA  2 Seasons
3          2021  TV-MA  2 Seasons
4          2021  TV-MA  2 Seasons
```

[32]:

```
##Getting the month, week and year added
from datetime import datetime
from dateutil.parser import parse
arr=[]
for i in df_final1['date_added' ].values:
    dt1=parse (i)
    arr.append(dt1.strftime('%Y-%m-%d'))
df_final1[ 'Modified_Added_date'] =arr
df_final1['Modified_Added_date']=pd.
 ↪to_datetime(df_final1['Modified_Added_date'])
df_final1['month_added']=df_final1[ 'Modified_Added_date'].dt.month
df_final1['week_Added']=df_final1['Modified_Added_date'].dt.week
df_final1['year']=df_final1['Modified_Added_date'].dt.year
df_final1.head( )
```

```
/var/folders/2k/nqxlqww13nd99192zjdnsjc00000gn/T/ipykernel_4203/3031150164.py:11
: FutureWarning: Series.dt.weekofyear and Series.dt.week have been deprecated.
Please use Series.dt.isocalendar().week instead.
  df_final1['week_Added']=df_final1['Modified_Added_date'].dt.week
```

[32]:

```
                   title          Directors         Actors  \
0  Dick Johnson Is Dead    Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
3         Blood & Water  Unknown Directors     Ama Qamata
4         Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country show_id     type          date_added  \
0           Documentaries  United States      s1    Movie  September 25, 2021
1  International TV Shows   South Africa      s2  TV Show  September 24, 2021
2               TV Dramas   South Africa      s2  TV Show  September 24, 2021
3            TV Mysteries   South Africa      s2  TV Show  September 24, 2021
4  International TV Shows   South Africa      s2  TV Show  September 24, 2021

   release_year rating   duration Modified_Added_date  month_added  \
0          2020  PG-13     80-100          2021-09-25            9
1          2021  TV-MA  2 Seasons          2021-09-24            9
2          2021  TV-MA  2 Seasons          2021-09-24            9
3          2021  TV-MA  2 Seasons          2021-09-24            9
4          2021  TV-MA  2 Seasons          2021-09-24            9
```

```
   week_Added  year
0          38  2021
1          38  2021
2          38  2021
3          38  2021
4          38  2021
```

[33]:
```
df_final1['title'] = df_final1['title'].str.replace(r"\(.*\)","")
df_final1.head()
```

```
/var/folders/2k/nqxlqww13nd99192zjdnsjc00000gn/T/ipykernel_4203/1303496868.py:1:
FutureWarning: The default value of regex will change from True to False in a
future version.
  df_final1['title'] = df_final1['title'].str.replace(r"\(.*\)","")
```

[33]:
```
                 title          Directors          Actors  \
0  Dick Johnson Is Dead    Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
3         Blood & Water  Unknown Directors     Ama Qamata
4         Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country show_id     type          date_added  \
0           Documentaries  United States      s1    Movie  September 25, 2021
1  International TV Shows   South Africa      s2  TV Show  September 24, 2021
2               TV Dramas   South Africa      s2  TV Show  September 24, 2021
3            TV Mysteries   South Africa      s2  TV Show  September 24, 2021
4  International TV Shows   South Africa      s2  TV Show  September 24, 2021

   release_year rating   duration Modified_Added_date  month_added  \
0          2020  PG-13     80-100          2021-09-25            9
1          2021  TV-MA  2 Seasons          2021-09-24            9
2          2021  TV-MA  2 Seasons          2021-09-24            9
3          2021  TV-MA  2 Seasons          2021-09-24            9
4          2021  TV-MA  2 Seasons          2021-09-24            9

   week_Added  year
0          38  2021
1          38  2021
2          38  2021
3          38  2021
4          38  2021
```

[34]:
```
df_final1.groupby(['Genre']).agg({'title':'unique'})
```

[34]:

```
                                                                         title
Genre
Action & Adventure            [The Stronghold, Birth of the Dragon, Jaws, Ja…
Anime Features                [InuYasha the Movie 2: The Castle Beyond the L…
Anime Series                  [Yowamushi Pedal, Pokémon Master Journeys: The…
British TV Shows              [The Great British Baking Show, Crime Stories:…
Children & Family Movies      [My Little Pony: A New Generation, Confessions…
Classic & Cult TV             [The Walking Dead, Okupas, A Perfect Day For A…
Classic Movies                [Jaws, Blade Runner: The Final Cut, Do the Rig…
Comedies                      [The Starling, Confessions of an Invisible Gir…
Crime TV Shows                [Ganglands, Vendetta: Truth, Lies and The Mafi…
Cult Movies                   [Blade Runner: The Final Cut, House Party, Hou…
Documentaries                 [Dick Johnson Is Dead, Europe's Most Dangerous…
Docuseries                    [Jailbirds New Orleans, Vendetta: Truth, Lies …
Dramas                        [Sankofa, The Starling, Je Suis Karl, Ankahi K…
Faith & Spirituality          [Same Kind of Different as Me, Mary Magdalene,…
Horror Movies                 [Dark Skies, Jaws 2, Jaws 3, Jaws: The Revenge…
Independent Movies            [Sankofa, Ankahi Kahaniya, Dhanak, Wind River,…
International Movies          [Sankofa, Je Suis Karl, Europe's Most Dangerou…
International TV Shows        [Blood & Water, Ganglands, Kota Factory, Vende…
Kids' TV                      [Tayo and Little Wizards, Angry Birds, Chhota …
Korean TV Shows               [Titipo Titipo, Tayo the Little Bus, Pororo - …
LGBTQ Movies                  [Snervous Tyler Oakley, Untold: Caitlyn Jenner…
Movies                        [American Masters: Inventing David Geffen, Bri…
Music & Musicals              [Minsara Kanavu, If I Leave Here Tomorrow: A F…
Reality TV                    [Jailbirds New Orleans, The Great British Baki…
Romantic Movies               [Jeans, JJ+E, Afterlife of the Party, Bright S…
Romantic TV Shows             [Kota Factory, The Smart Money Woman, Too Hot …
Sci-Fi & Fantasy              [Dark Skies, Paradise Hills, Chappie, Green La…
Science & Nature TV           [Countdown: Inspiration4 Mission to Space, Exp…
Spanish-Language TV Shows     [Falsa identidad, Jaguar, La casa de papel, Mo…
Sports Movies                 [Schumacher, Blood Brothers: Malcolm X & Muham…
Stand-Up Comedy               [Lokillo: Nothing's the Same, The Original Kin…
Stand-Up Comedy & Talk Shows  [Plastic Cup Boyz: Laughing My Mask Off!, Reve…
TV Action & Adventure         [Ganglands, Bangkok Breaking, Jaguar, Resurrec…
TV Comedies                   [Kota Factory, Dear White People, Chicago Part…
TV Dramas                     [Blood & Water, Midnight Mass, Dear White Peop…
TV Horror                     [Midnight Mass, Brand New Cherry Flavor, RESID…
TV Mysteries                  [Blood & Water, Midnight Mass, Into the Night,…
TV Sci-Fi & Fantasy           [He-Man and the Masters of the Universe, Dharm…
TV Shows                      [HQ Barbers, Navarasa, Metallica: Some Kind of…
TV Thrillers                  [Squid Game, Darwin’s Game, RESIDENT EVIL: Inf…
Teen TV Shows                 [Dive Club, Kuroko's Basketball, Titletown Hig…
Thrillers                     [Intrusion, Paranoia, The Father Who Moves Mou…
```

[35]:

```
df_final1.groupby(['Genre']).agg({'title':'nunique'})
```

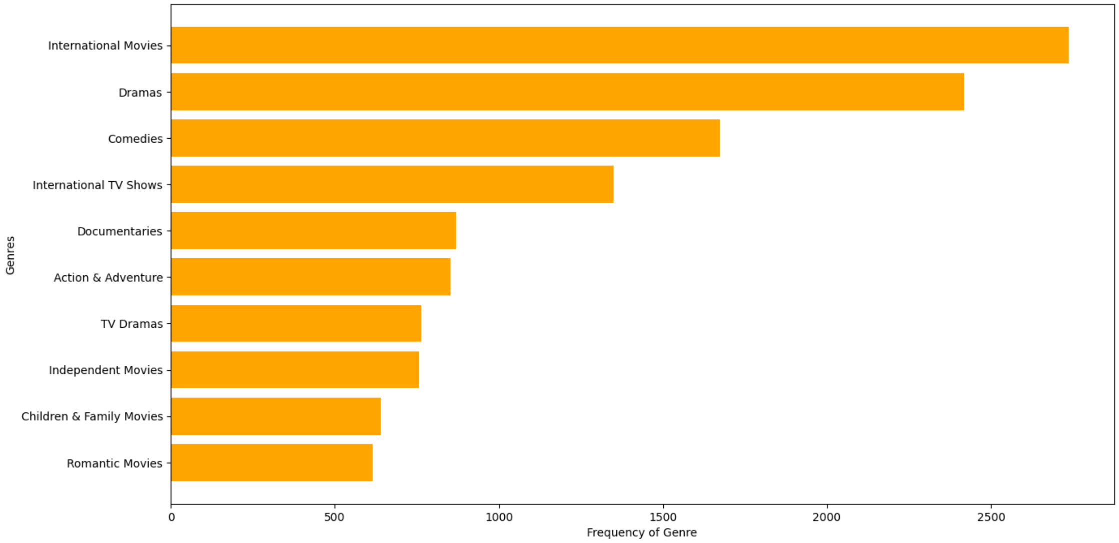
[35]:

```
                              title
Genre
Action & Adventure              854
Anime Features                   71
Anime Series                    176
British TV Shows                253
Children & Family Movies        639
Classic & Cult TV                28
Classic Movies                  116
Comedies                       1673
Crime TV Shows                  470
Cult Movies                      71
Documentaries                   869
Docuseries                      395
Dramas                         2418
Faith & Spirituality             65
Horror Movies                   353
Independent Movies              756
International Movies           2738
International TV Shows         1351
Kids' TV                        451
Korean TV Shows                 151
LGBTQ Movies                    102
Movies                           57
Music & Musicals                372
Reality TV                      255
Romantic Movies                 615
Romantic TV Shows               370
Sci-Fi & Fantasy                243
Science & Nature TV              92
Spanish-Language TV Shows       174
Sports Movies                   219
Stand-Up Comedy                 343
Stand-Up Comedy & Talk Shows     56
TV Action & Adventure           168
TV Comedies                     581
TV Dramas                       763
TV Horror                        75
TV Mysteries                     98
TV Sci-Fi & Fantasy              84
TV Shows                         16
TV Thrillers                     57
Teen TV Shows                    69
Thrillers                       573
```

[36]:

```
df_genre = df_final1.groupby(['Genre']).agg({'title':'nunique'}).reset_index().
↪sort_values(by=['title'],ascending=False)[:10]
```

```
plt.figure(figsize=(15,8))
plt.barh(df_genre[::-1]['Genre'],df_genre[::-1]['title'], color=['orange'])
plt.xlabel('Frequency of Genre')
plt.ylabel('Genres')
plt.show()
```

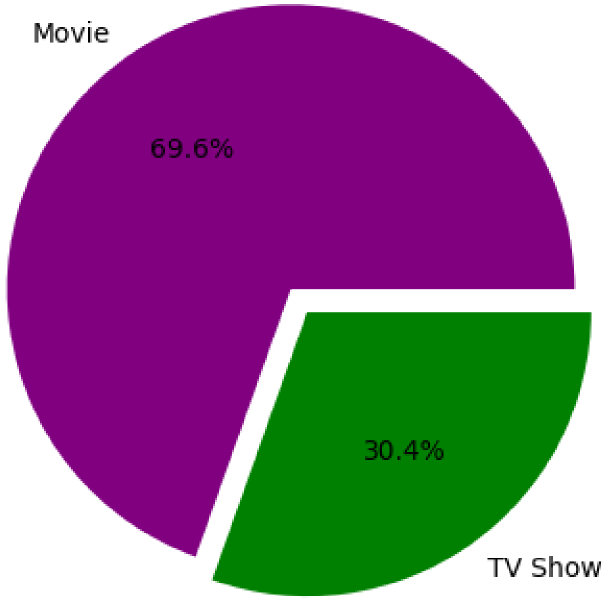


International movies, Dramas are the more popular in Netflix

[37]:
```
df_final1.groupby(['type']).agg({'title':'nunique'})
```

[37]:
```
         title
type
Movie     6115
TV Show   2676
```

[38]:
```
df_type = df_final1.groupby(['type']).agg({'title':'nunique'}).reset_index()
plt.pie(df_type['title'], explode=(0.05,0.05), labels=df_type['type'],␣
  ↪colors=['purple','green'],autopct='%.1f%%')
plt.show()
```



70% of the data we have is Movies and 30% is shows

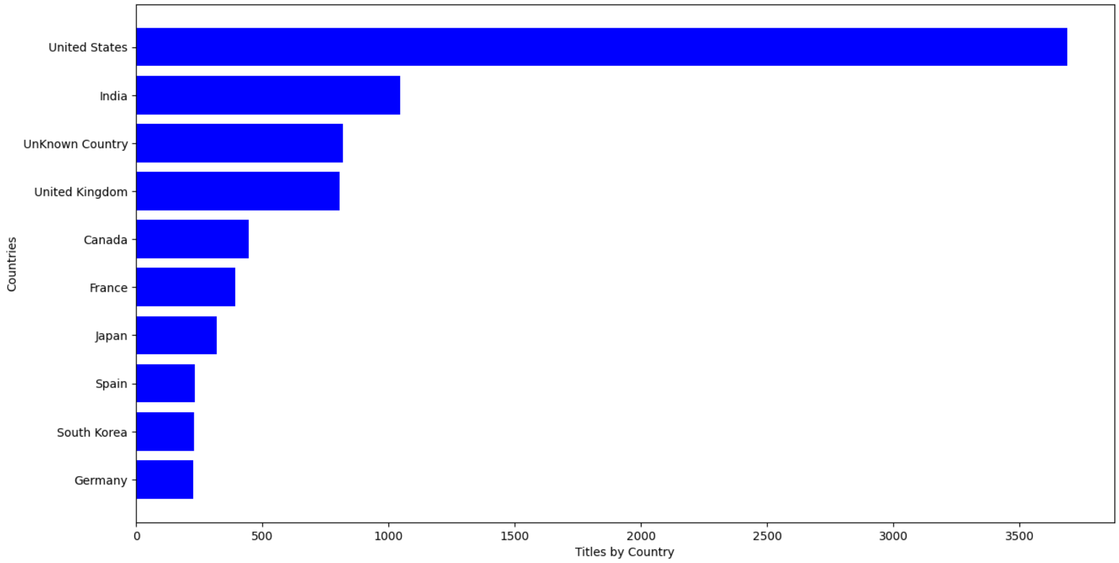
```
[39]: df_final1.groupby(['Country']).agg({'title':'nunique'})
```

```
[39]:               title
      Country
                        2
      Afghanistan       1
      Albania           1
      Algeria           3
      Angola            1
      …               …
      Vatican City      1
      Venezuela         4
      Vietnam           7
      West Germany      5
      Zimbabwe          3

      [128 rows x 1 columns]
```

```
[40]: df_final1['Country']=df_final1['Country'].str.replace(',', '')
      df_final1.head()
```

[40]:
```
                    title          Directors         Actors  \
0  Dick Johnson Is Dead    Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
3         Blood & Water  Unknown Directors     Ama Qamata
4         Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country show_id     type          date_added  \
0           Documentaries  United States      s1    Movie  September 25, 2021
1  International TV Shows   South Africa      s2  TV Show  September 24, 2021
2               TV Dramas   South Africa      s2  TV Show  September 24, 2021
3            TV Mysteries   South Africa      s2  TV Show  September 24, 2021
4  International TV Shows   South Africa      s2  TV Show  September 24, 2021

   release_year rating   duration Modified_Added_date  month_added  \
0          2020  PG-13     80-100          2021-09-25            9
1          2021  TV-MA  2 Seasons          2021-09-24            9
2          2021  TV-MA  2 Seasons          2021-09-24            9
3          2021  TV-MA  2 Seasons          2021-09-24            9
4          2021  TV-MA  2 Seasons          2021-09-24            9

   week_Added  year
0          38  2021
1          38  2021
2          38  2021
3          38  2021
4          38  2021
```

[41]:
```
df_country = df_final1.groupby(['Country']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:10]
plt.figure(figsize=(15,8))
plt.barh(df_country[::-1]['Country'],df_country[::-1]['title'], color=['blue'])
plt.xlabel('Titles by Country')
plt.ylabel('Countries')
plt.show()
```

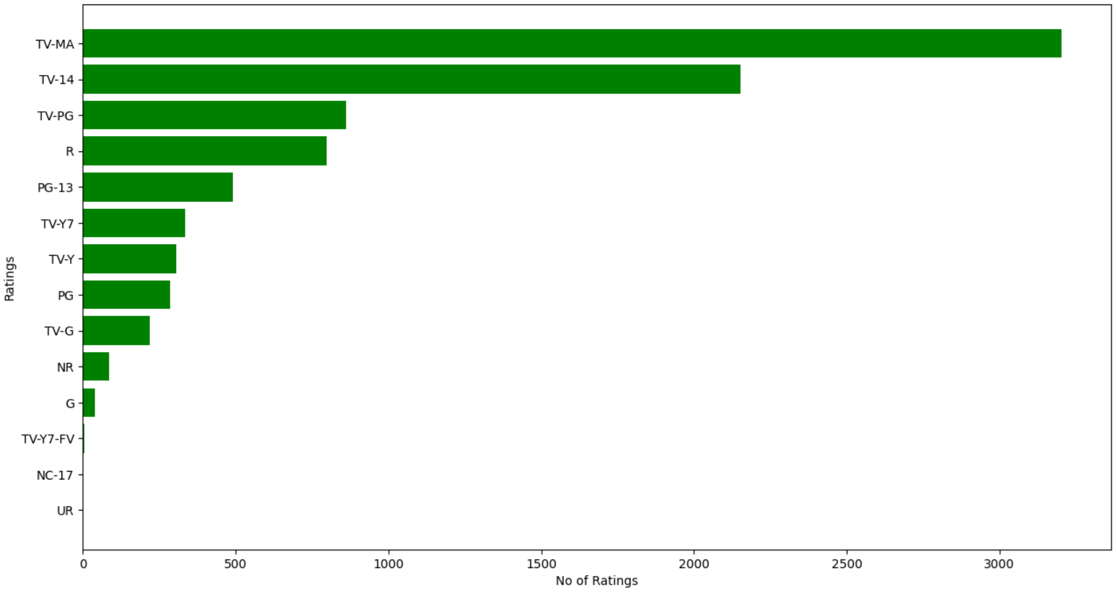


More No of movies released from USA and India

```
[42]: df_final1.groupby(['rating']).agg({'title':'nunique'})
```

```
[42]:             title
      rating
      G              41
      NC-17           3
      NR             87
      PG            287
      PG-13         490
      R             799
      TV-14        2151
      TV-G          220
      TV-MA        3204
      TV-PG         863
      TV-Y          305
      TV-Y7         334
      TV-Y7-FV        6
      UR              3
```

```
[43]: df_rating = df_final1.groupby(['rating']).agg({'title':'nunique'}).
        ↪reset_index().sort_values(by=['title'],ascending=False)
      plt.figure(figsize=(15,8))
      plt.barh(df_rating[::-1]['rating'],df_rating[::-1]['title'], color=['green'])
      plt.xlabel('No of Ratings')
      plt.ylabel('Ratings')
      plt.show()
```



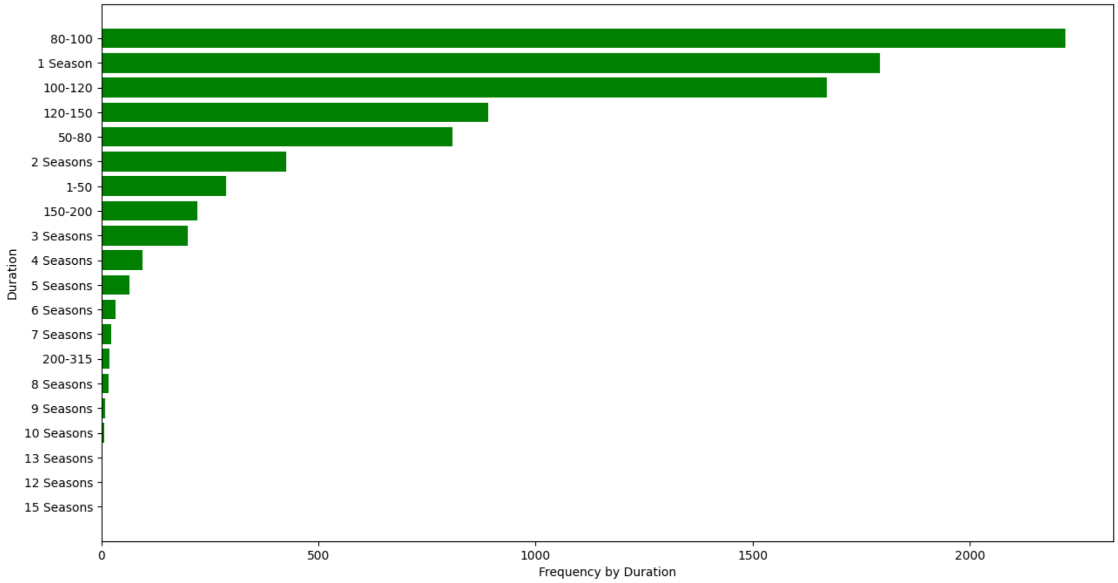
Most of the movies in Netflix is for Mature Audiece and in next 14, PG are the movies with Parental Guidance

```
[44]: df_final1.groupby(['duration']).agg({'title':'nunique'})
```

```
[44]:             title
      duration
      1 Season     1793
      1-50          287
      10 Seasons      7
      100-120      1671
      11 Seasons      2
      12 Seasons      2
      120-150       891
      13 Seasons      3
      15 Seasons      2
      150-200       222
      17 Seasons      1
      2 Seasons     425
      200-315        19
      3 Seasons     199
      4 Seasons      95
      5 Seasons      65
      50-80         808
      6 Seasons      33
      7 Seasons      23
      8 Seasons      17
      80-100       2220
```

```
9 Seasons       9
```

[45]:
```
df_duration_copy = df_final1.groupby(['duration']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:20]
plt.figure(figsize=(15,8))
plt.barh(df_duration_copy[::-1]['duration'],df_duration_copy[::-1]['title'],␣
  ↪color=['green'])
plt.xlabel('Frequency by Duration')
plt.ylabel('Duration')
plt.show()
```



Most watched movies in the duration of 80-100 mins and in shows most watched are the shows with less than 3 Seasons

[46]:
```
df_final1['Actors']= df_final1['Actors'].str.replace('\$\$','')
```

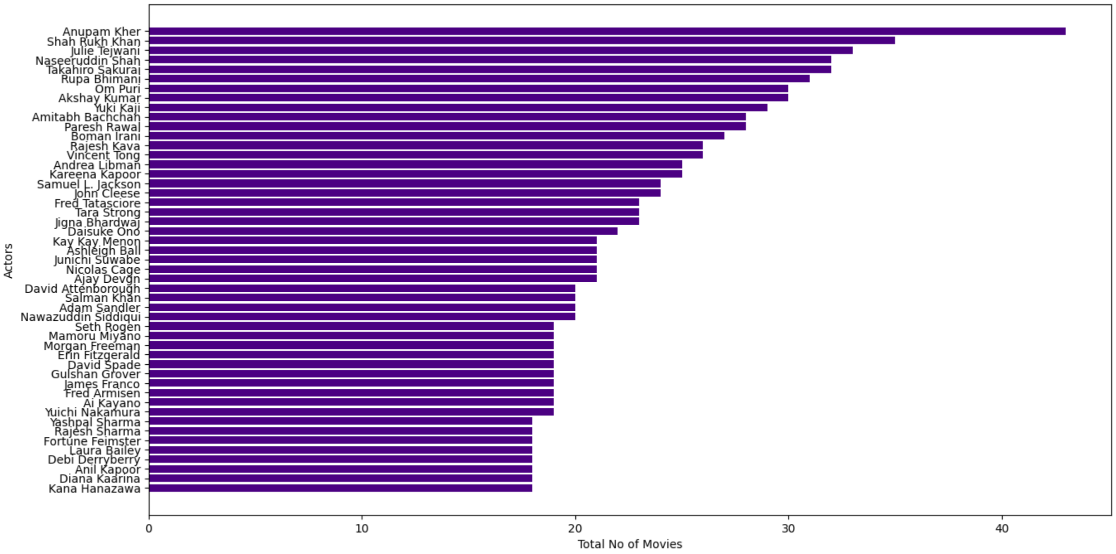
```
/var/folders/2k/nqxlqww13nd99192zjdnsjc00000gn/T/ipykernel_4203/1775556756.py:1:
FutureWarning: The default value of regex will change from True to False in a
future version.
  df_final1['Actors']= df_final1['Actors'].str.replace('\$\$','')
```

[47]:
```
df_final1.groupby(['Actors']).agg({'title':'nunique'})
```

[47]:
```
                       title
Actors
 Jr.                       2
"Riley" Lakdhar Dridi      1
'Najite Dede               2
```

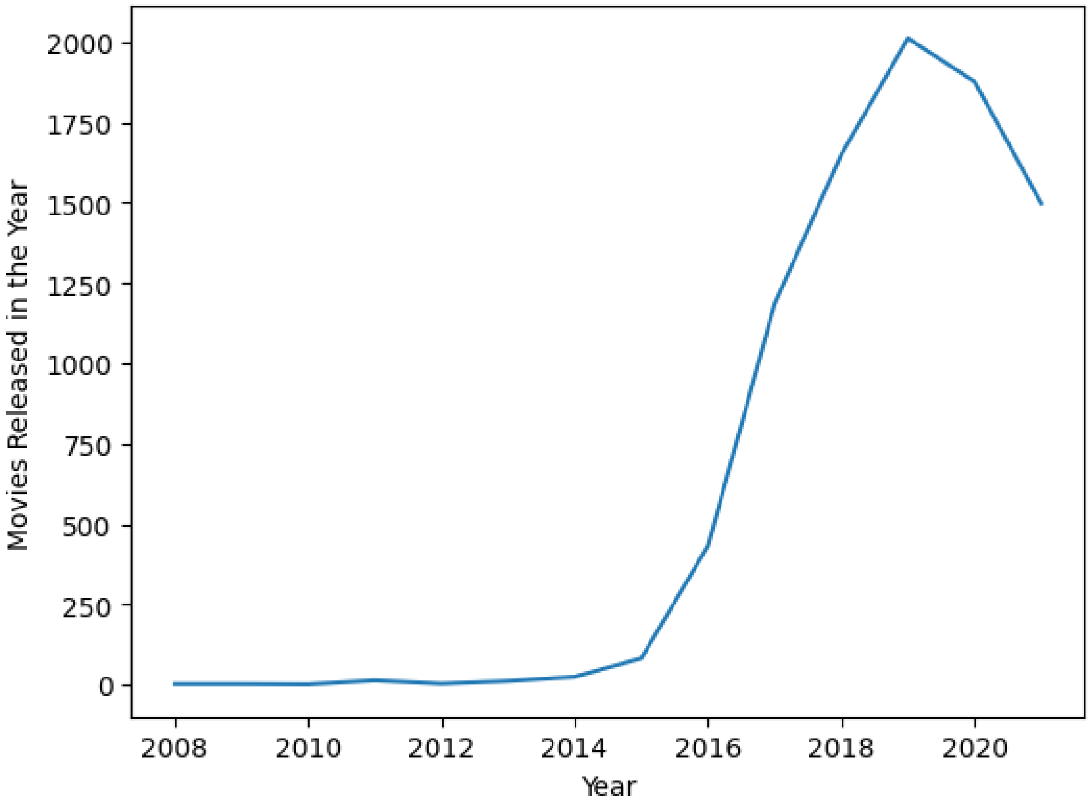
```
2 Chainz                   1
2Mex                       1
…                       …
Şevket Çoruh               1
Şinasi Yurtsever           3
Şükran Ovalı               1
Şükrü Özyıldız             2
Ṣọpé Dìrísù               1

[36440 rows x 1 columns]
```

```
[48]: df_actors = df_final1.groupby(['Actors']).agg({'title':'nunique'}).
       ↪reset_index().sort_values(by=['title'],ascending=False)[:50]
      df_actors=df_actors[df_actors['Actors'] != 'Unknown Actor']
      plt.figure(figsize=(15,8))
      plt.barh(df_actors[::-1]['Actors'],df_actors[::-1]['title'], color=['Indigo'])
      plt.xlabel('Total No of Movies')
      plt.ylabel('Actors')
      plt.show()
```



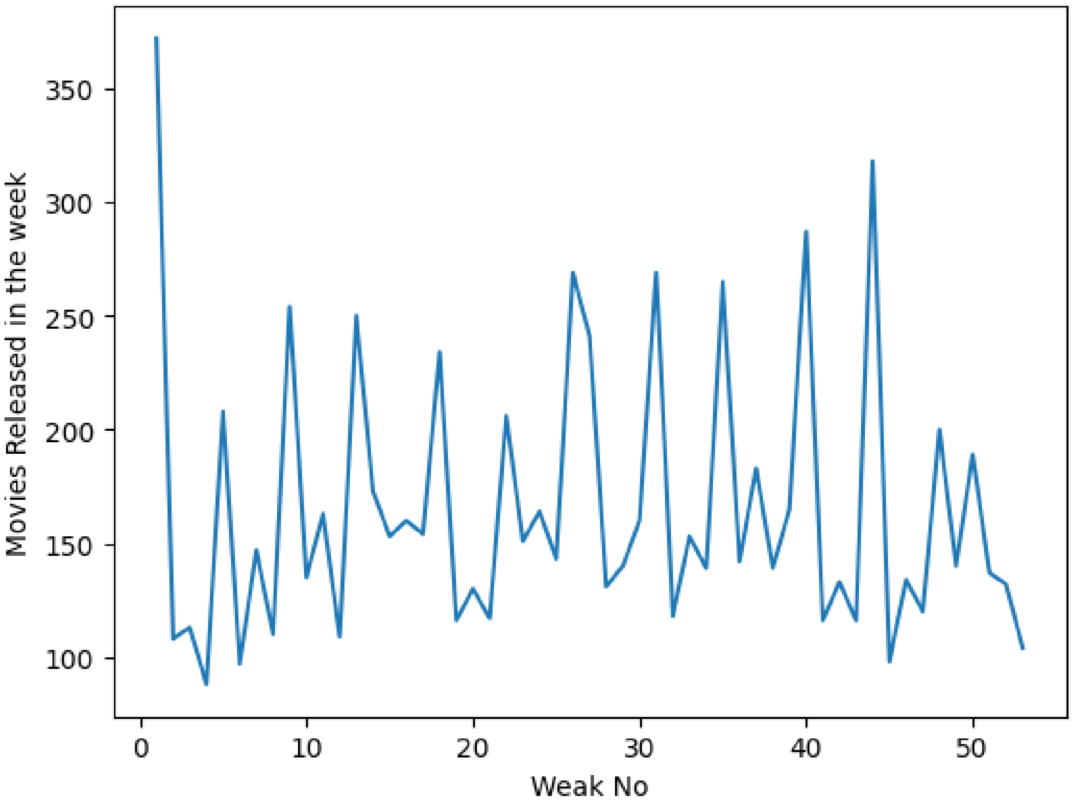
Anupam Kher and Shah Rukh Khan are in movies which most watched on Netflix

```
[49]: df_year = df_final1.groupby(['year']).agg({'title':'nunique'}).reset_index()
      sns.lineplot(data=df_year, x='year', y='title')
      plt.xlabel('Year')
      plt.ylabel('Movies Released in the Year')
      plt.show()
```



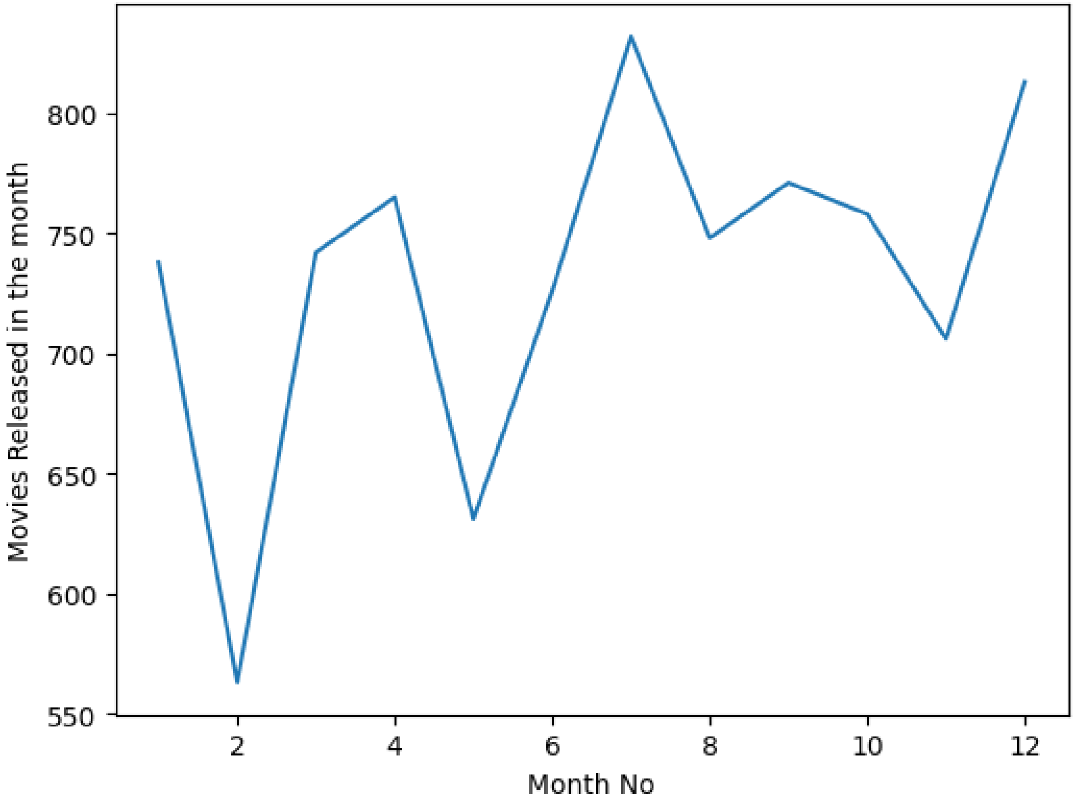
Most of the movies released after 2015

```
[50]: df_week = df_final1.groupby(['week_Added']).agg({'title':'nunique'}).
        ↪reset_index()
      sns.lineplot(data=df_week, x='week_Added', y='title')
      plt.xlabel('Weak No')
      plt.ylabel('Movies Released in the week')
      plt.show()
```



Most of the movies released in first weeks of year and in the last weeks of the november and start of the december

```
[51]: df_month = df_final1.groupby(['month_added']).agg({'title':'nunique'}).
        ↪reset_index()
      sns.lineplot(data=df_month, x='month_added', y='title')
      plt.xlabel('Month No')
      plt.ylabel('Movies Released in the month')
      plt.show()
```

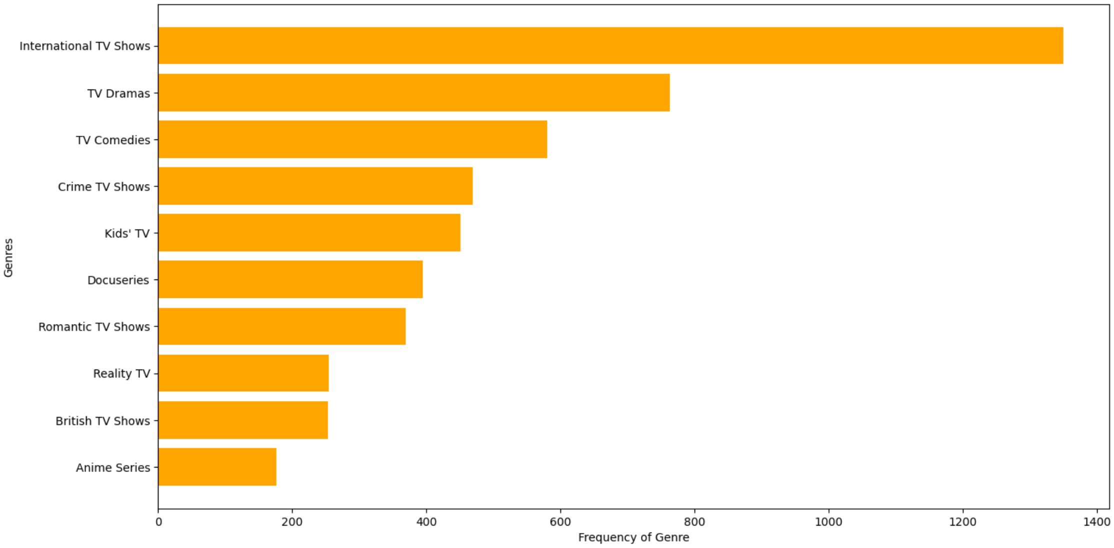


There is a huge deep of movies released in February and May. In november month also we can see the deep in release of the movies

### 0.0.1 Univariate Analysis for Shows and Movies

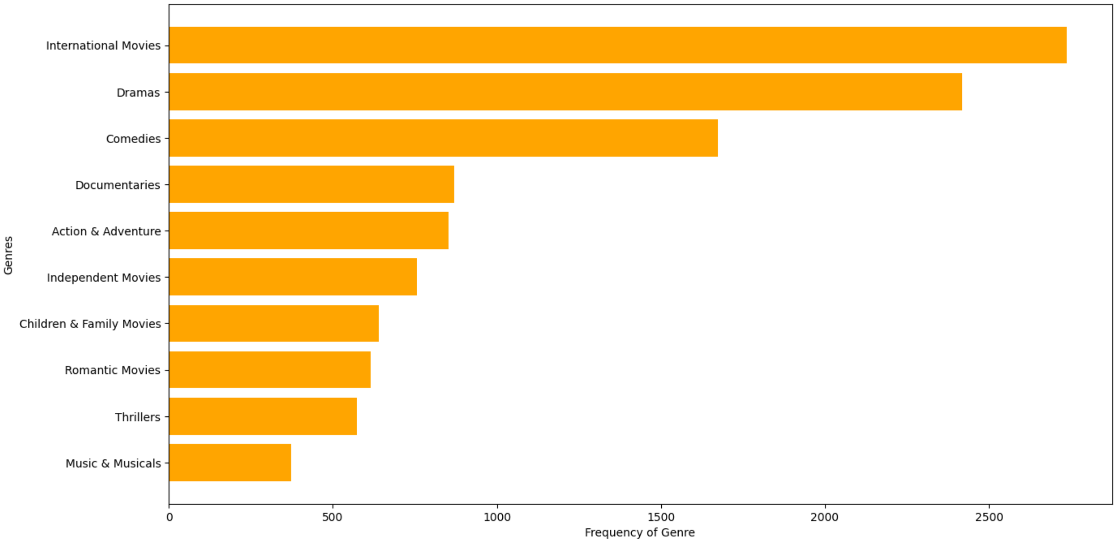
[52]:
```
df_shows = df_final1[df_final1['type']=='TV Show']
df_movies = df_final1[df_final1['type']=='Movie']
```

[53]:
```
df_genre = df_shows.groupby(['Genre']).agg({'title':'nunique'}).reset_index().
 ↪sort_values(by=['title'],ascending=False)[:10]
plt.figure(figsize=(15,8))
plt.barh(df_genre[::-1]['Genre'],df_genre[::-1]['title'], color=['orange'])
plt.xlabel('Frequency of Genre')
plt.ylabel('Genres')
plt.show()
```



International TV Shows, TV Dramas and TV Comedies are famous in TV shows in Netflix

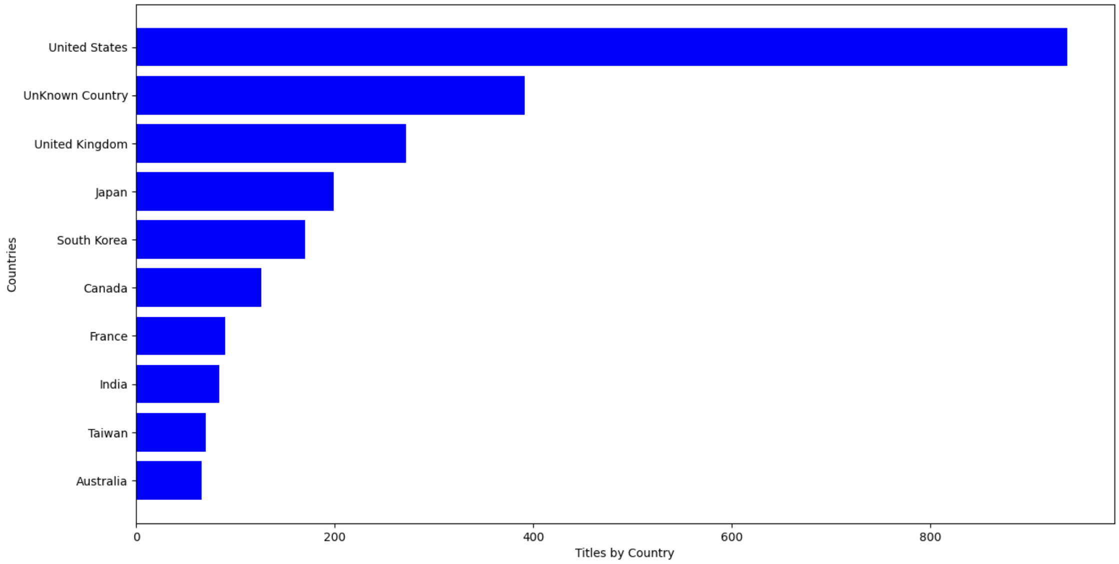
```
[54]: df_genre = df_movies.groupby(['Genre']).agg({'title':'nunique'}).reset_index().
       ↪sort_values(by=['title'],ascending=False)[:10]
      plt.figure(figsize=(15,8))
      plt.barh(df_genre[::-1]['Genre'],df_genre[::-1]['title'], color=['orange'])
      plt.xlabel('Frequency of Genre')
      plt.ylabel('Genres')
      plt.show()
```



International Movies, Dramas, Comedies are Famous in Movies section in Netflix

[55]:

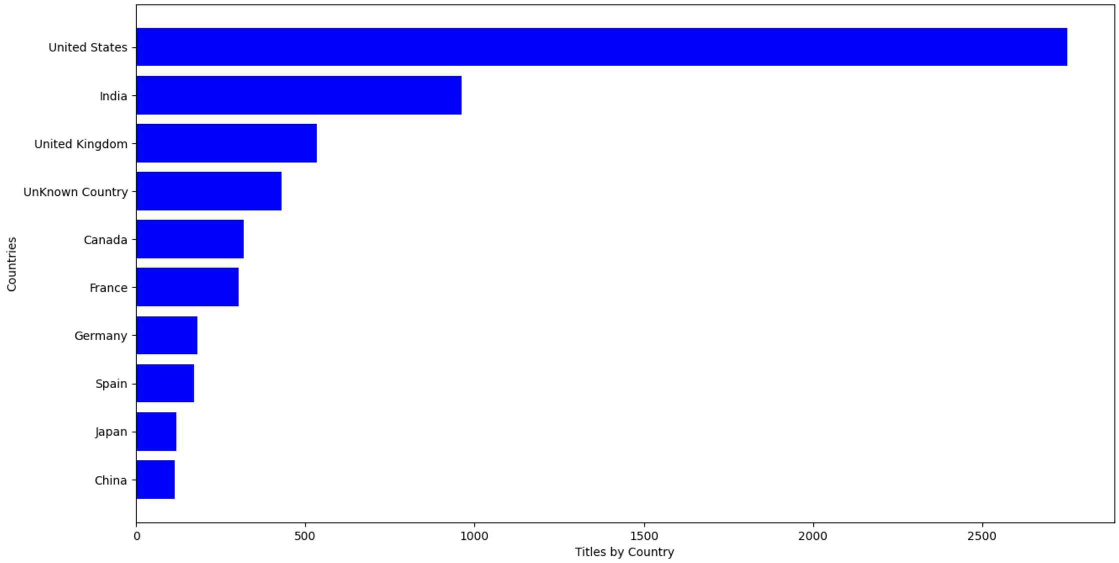
```
df_country = df_shows.groupby(['Country']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:10]
plt.figure(figsize=(15,8))
plt.barh(df_country[::-1]['Country'],df_country[::-1]['title'], color=['blue'])
plt.xlabel('Titles by Country')
plt.ylabel('Countries')
plt.show()
```



More No of Shows are From USA, UK

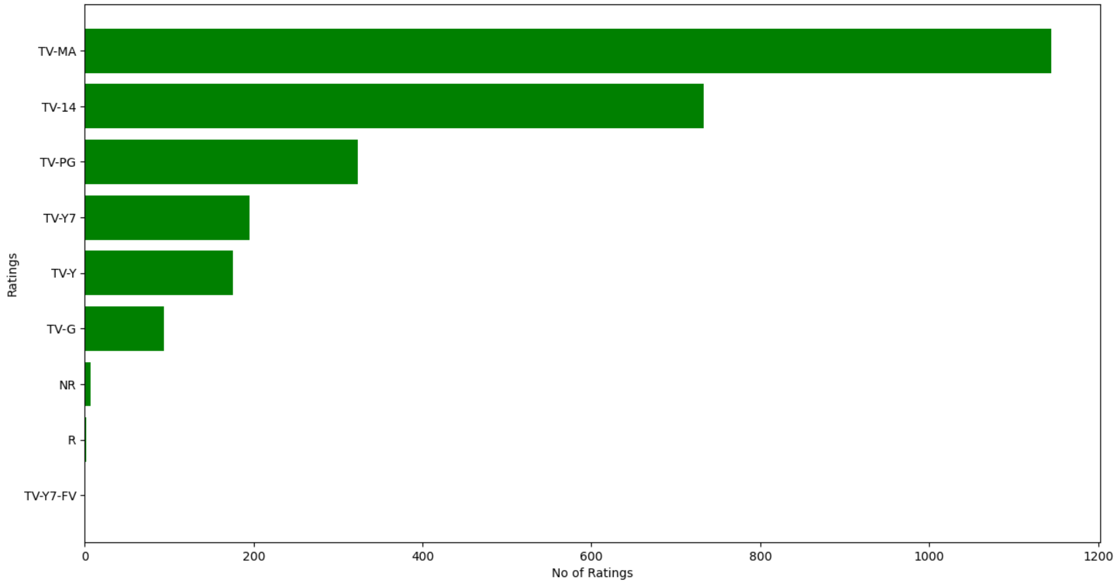
[56]:

```
df_country = df_movies.groupby(['Country']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:10]
plt.figure(figsize=(15,8))
plt.barh(df_country[::-1]['Country'],df_country[::-1]['title'], color=['blue'])
plt.xlabel('Titles by Country')
plt.ylabel('Countries')
plt.show()
```



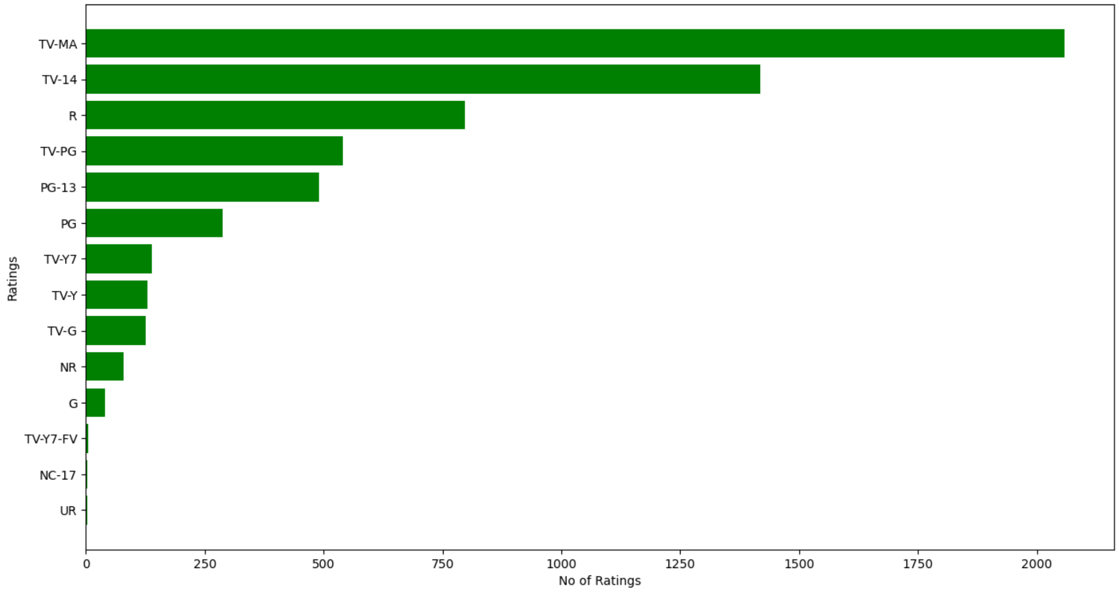
More No of Movies are form USA, India, UK

[57]:
```
df_rating = df_shows.groupby(['rating']).agg({'title':'nunique'}).reset_index().
  ↪sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_rating[::-1]['rating'],df_rating[::-1]['title'], color=['green'])
plt.xlabel('No of Ratings')
plt.ylabel('Ratings')
plt.show()
```



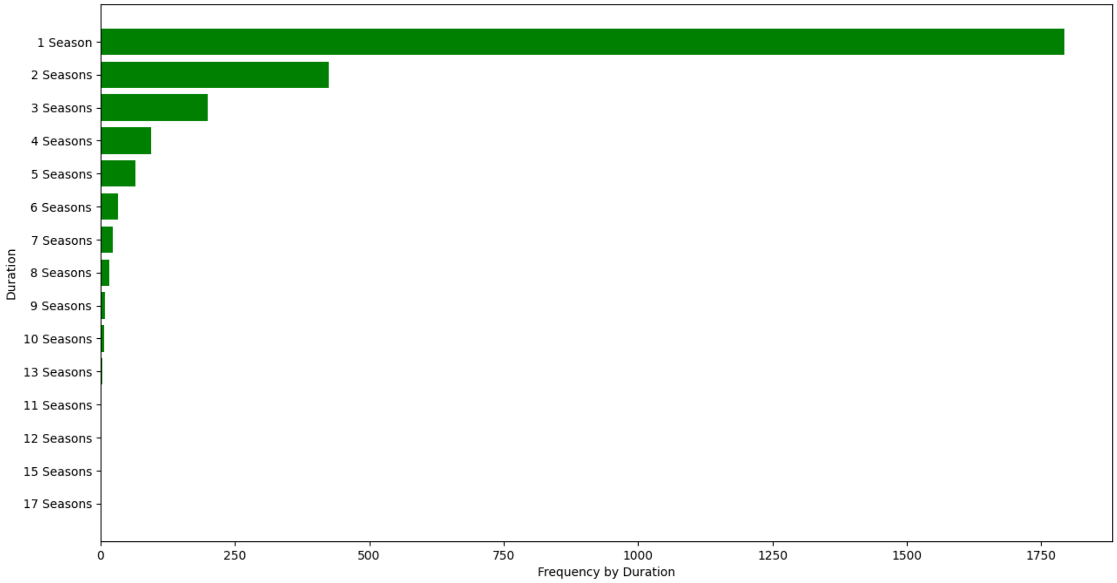
Matured Content are more in the Netflix

[58]:
```
df_rating = df_movies.groupby(['rating']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_rating[::-1]['rating'],df_rating[::-1]['title'], color=['green'])
plt.xlabel('No of Ratings')
plt.ylabel('Ratings')
plt.show()
```



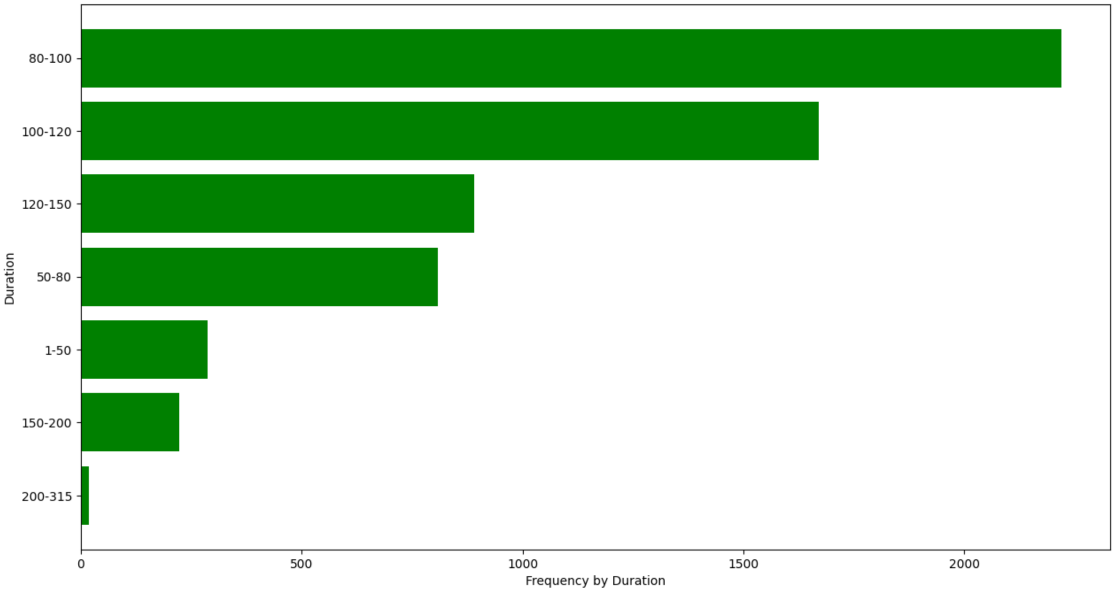
Matured content, 14, R rated movies are having the more viewing and ratings across the Netflix

[59]:
```
df_duration_copy = df_shows.groupby(['duration']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_duration_copy[::-1]['duration'],df_duration_copy[::-1]['title'],␣
  ↪color=['green'])
plt.xlabel('Frequency by Duration')
plt.ylabel('Duration')
plt.show()
```



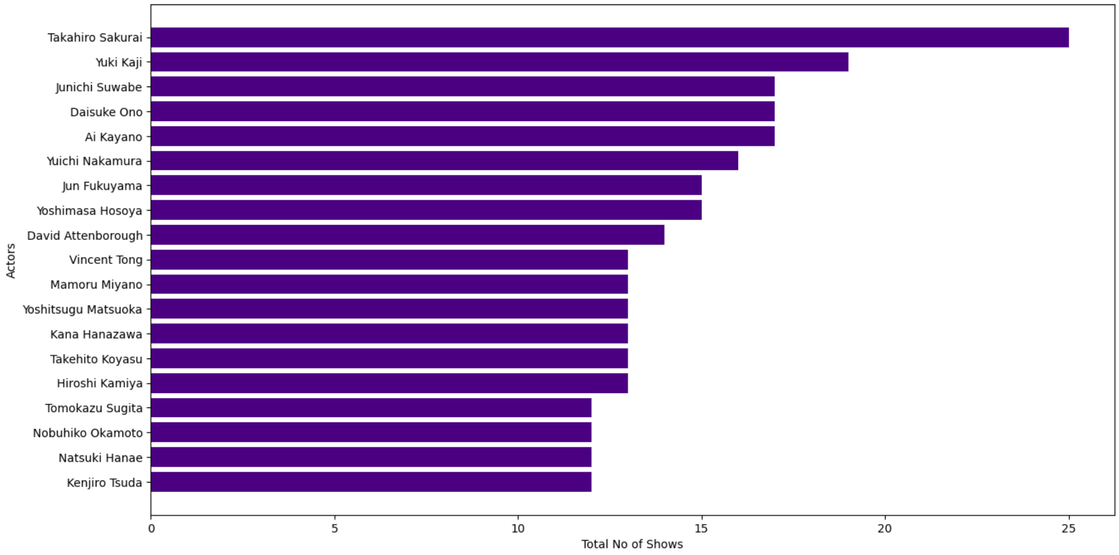
Across TV Shows, shows having only 1 Season are common as soon as the season length increases, the number of shows decrease and this definitely sounds as expected

[60]:
```
df_duration_copy = df_movies.groupby(['duration']).agg({'title':'nunique'}).
 ↪reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_duration_copy[::-1]['duration'],df_duration_copy[::-1]['title'],␣
 ↪color=['green'])
plt.xlabel('Frequency by Duration')
plt.ylabel('Duration')
plt.show()
```



Across movies 80-100,100-120 and 120-150 is the ranges of minutes for which most movies lie. So quite possibly 80-150 mins is the sweet spot we would be wanting for movies.

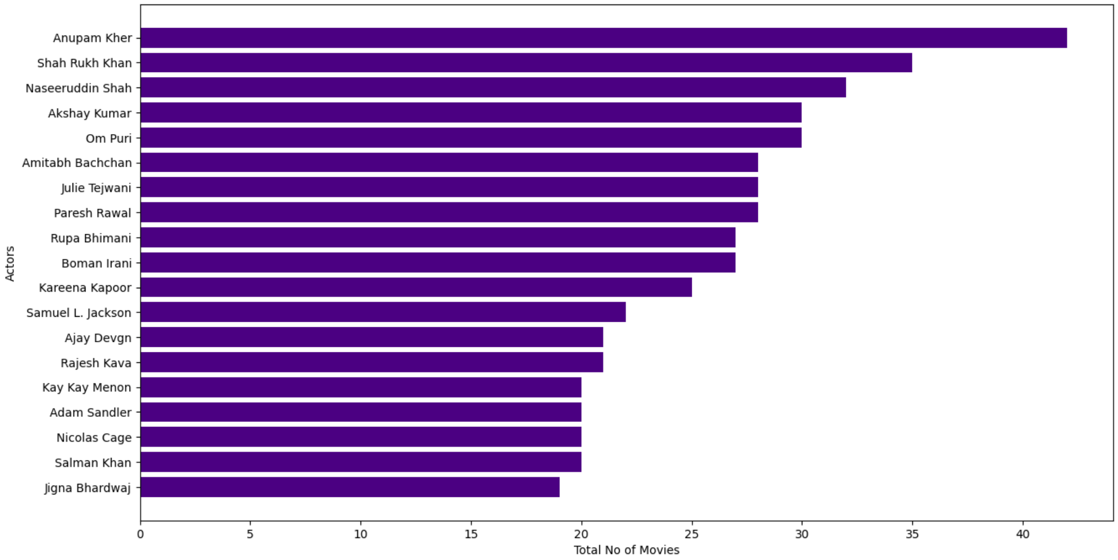
[61]:
```
df_actors = df_shows.groupby(['Actors']).agg({'title':'nunique'}).reset_index().
  ↪sort_values(by=['title'],ascending=False)[:20]
df_actors=df_actors[df_actors['Actors'] != 'Unknown Actor']
plt.figure(figsize=(15,8))
plt.barh(df_actors[::-1]['Actors'],df_actors[::-1]['title'], color=['Indigo'])
plt.xlabel('Total No of Shows')
plt.ylabel('Actors')
plt.show()
```



Takahiro Sakurai,Yuki Kaji and other South Korean/Japanese actors are the most popular actors across TV Shows

[62]:

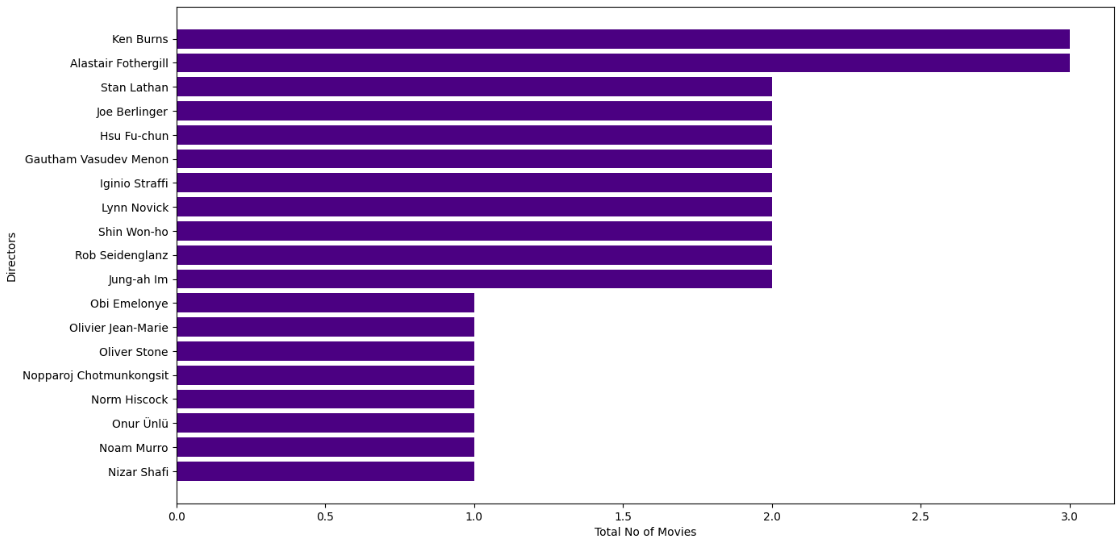
```
df_actors = df_movies.groupby(['Actors']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:20]
df_actors=df_actors[df_actors['Actors'] != 'Unknown Actor']
plt.figure(figsize=(15,8))
plt.barh(df_actors[::-1]['Actors'],df_actors[::-1]['title'], color=['Indigo'])
plt.xlabel('Total No of Movies')
plt.ylabel('Actors')
plt.show()
```



Our bollywood actors such as Anupam Kher, SRK, Naseeruddin Shah are very much popular acrossmovies on Netflix

[63]:

```
df_directors = df_shows.groupby(['Directors']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:20]
df_directors=df_directors[df_directors['Directors'] != 'Unknown Directors']
plt.figure(figsize=(15,8))
plt.barh(df_directors[::-1]['Directors'],df_directors[::-1]['title'],␣
  ↪color=['Indigo'])
plt.xlabel('Total No of Movies')
plt.ylabel('Directors')
plt.show()
```



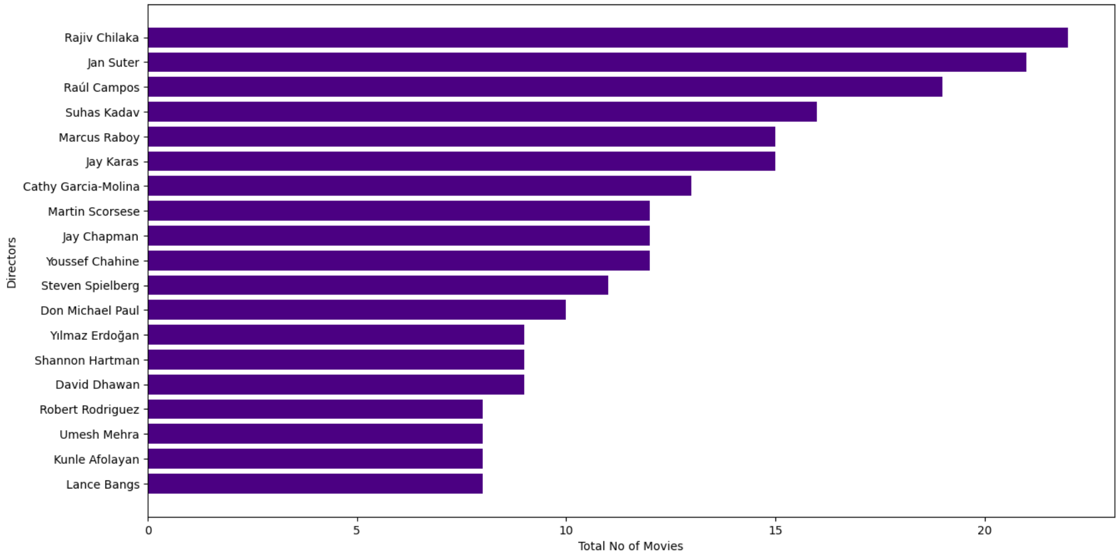
Ken Burns, Alastair Fothergill, Stan Lathan, Joe Barlinger are popular directors across TV Shows on Netflix

[64]:
```
df_shows.head()
```

[64]:
```
          title          Directors       Actors                   Genre  \
1  Blood & Water  Unknown Directors   Ama Qamata  International TV Shows
2  Blood & Water  Unknown Directors   Ama Qamata               TV Dramas
3  Blood & Water  Unknown Directors   Ama Qamata            TV Mysteries
4  Blood & Water  Unknown Directors  Khosi Ngema  International TV Shows
5  Blood & Water  Unknown Directors  Khosi Ngema               TV Dramas

        Country show_id     type          date_added  release_year rating  \
1  South Africa      s2  TV Show  September 24, 2021          2021  TV-MA
2  South Africa      s2  TV Show  September 24, 2021          2021  TV-MA
3  South Africa      s2  TV Show  September 24, 2021          2021  TV-MA
4  South Africa      s2  TV Show  September 24, 2021          2021  TV-MA
5  South Africa      s2  TV Show  September 24, 2021          2021  TV-MA

    duration Modified_Added_date  month_added  week_Added  year
1  2 Seasons          2021-09-24            9          38  2021
2  2 Seasons          2021-09-24            9          38  2021
3  2 Seasons          2021-09-24            9          38  2021
4  2 Seasons          2021-09-24            9          38  2021
5  2 Seasons          2021-09-24            9          38  2021
```

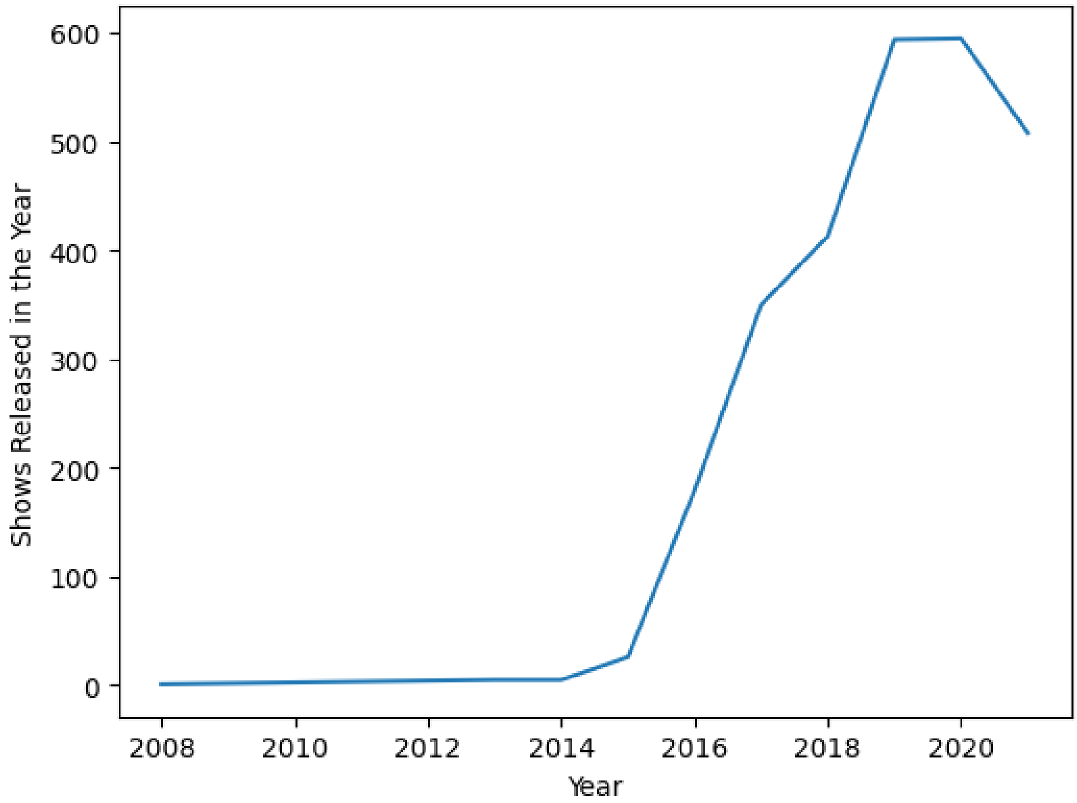
[65]:
```
df_directors = df_movies.groupby(['Directors']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:20]
df_directors=df_directors[df_directors['Directors'] != 'Unknown Directors']
```

```
plt.figure(figsize=(15,8))
plt.barh(df_directors[::-1]['Directors'],df_directors[::-1]['title'],␣
  ↪color=['Indigo'])
plt.xlabel('Total No of Movies')
plt.ylabel('Directors')
plt.show()
```



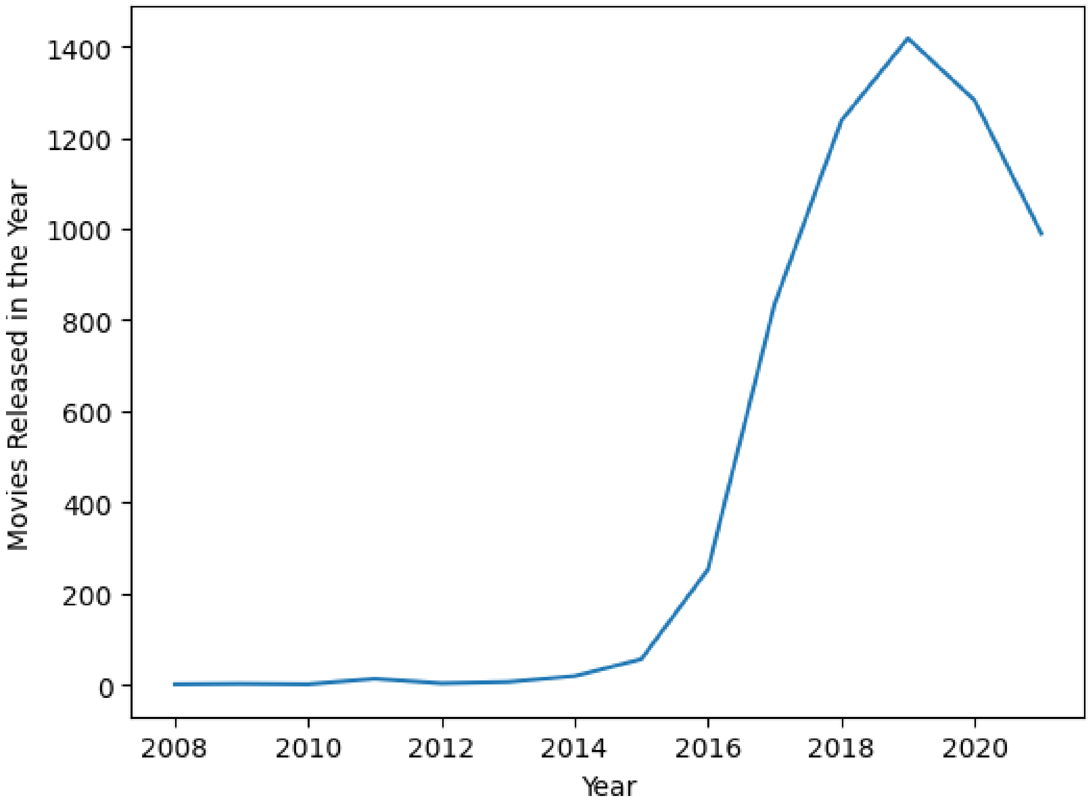
Rajiv Chilka, Jan Suter, Raul Campos, Suhas Kadav are popular directors across movies

[66]:
```
df_year = df_shows.groupby(['year']).agg({'title':'nunique'}).reset_index()
sns.lineplot(data=df_year, x='year', y='title')
plt.xlabel('Year')
plt.ylabel('Shows Released in the Year')
plt.show()
```



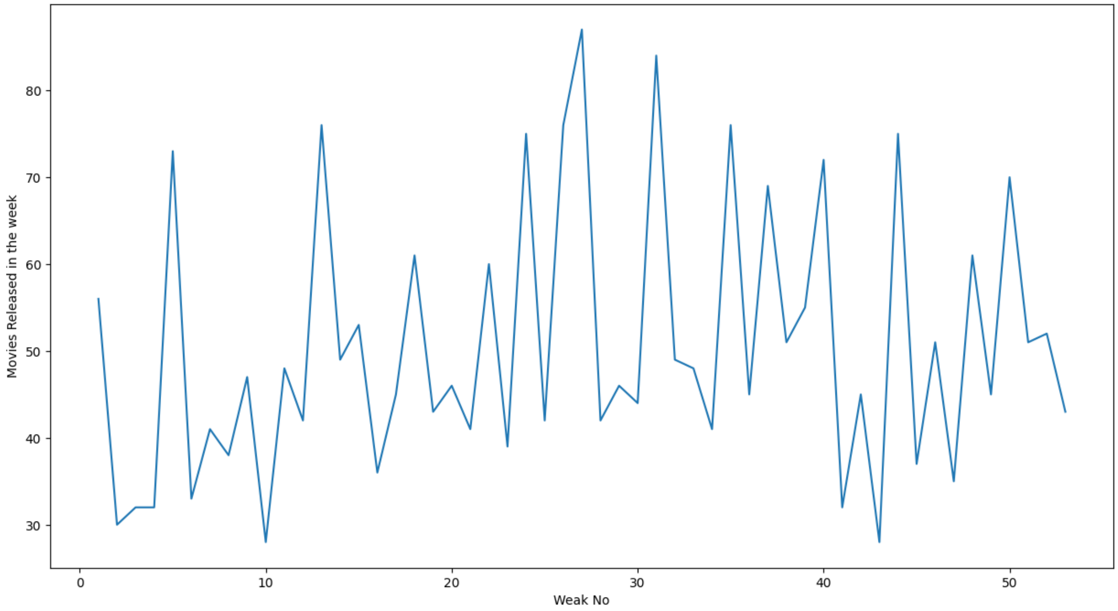
[67]:

```
df_year = df_movies.groupby(['year']).agg({'title':'nunique'}).reset_index()
sns.lineplot(data=df_year, x='year', y='title')
plt.xlabel('Year')
plt.ylabel('Movies Released in the Year')
plt.show()
```

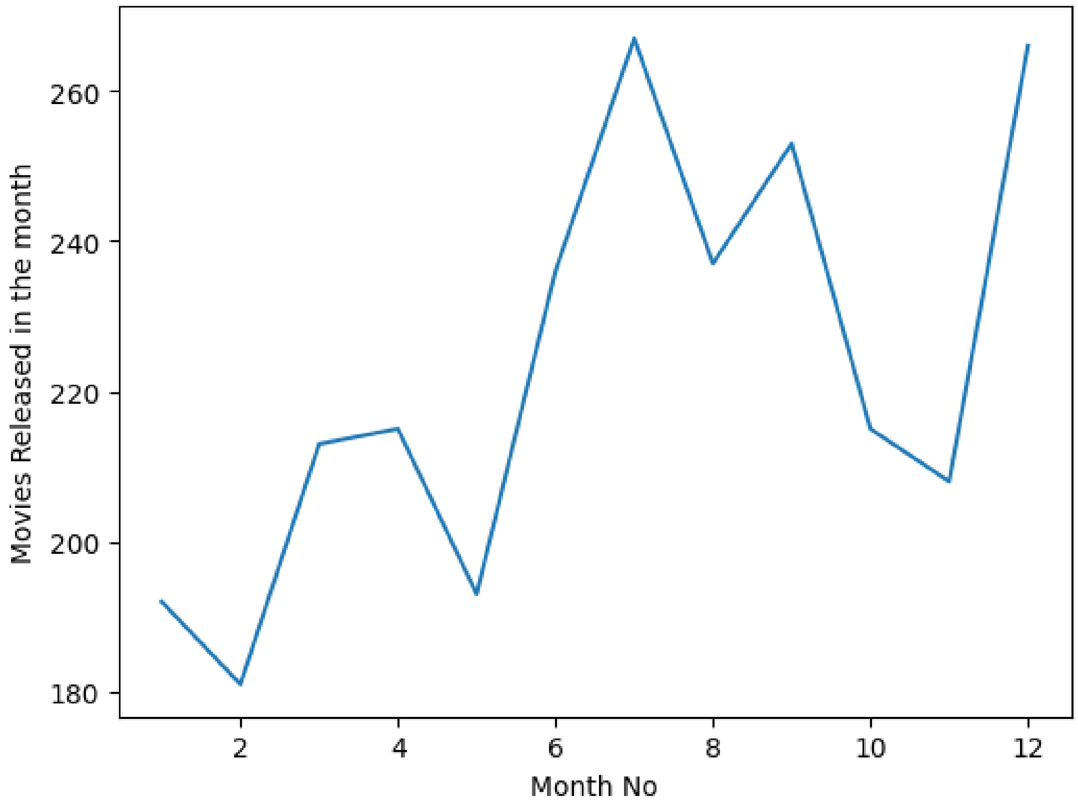


Till 2019, overall content across Netflix was increasing but due to Covid in 2020, though TV Shows didn't take a hit then Movies did take a hit. Well later in 2021, content across both was reduced significantly

```
[68]: df_week = df_shows.groupby(['week_Added']).agg({'title':'nunique'}).
        ↪reset_index()
      plt.figure(figsize=(15,8))
      sns.lineplot(data=df_week, x='week_Added', y='title')
      plt.xlabel('Weak No')
      plt.ylabel('Movies Released in the week')
      plt.show()
```

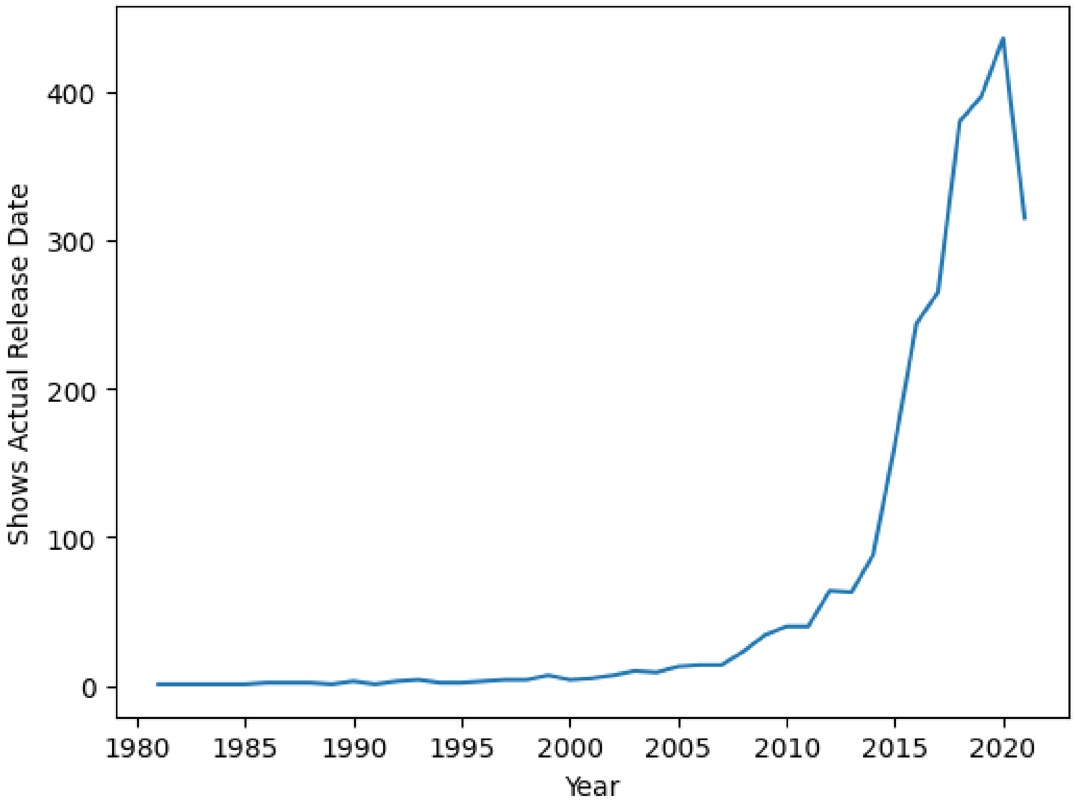


[69]:
```
df_month = df_shows.groupby(['month_added']).agg({'title':'nunique'}).
  ↪reset_index()
sns.lineplot(data=df_month, x='month_added', y='title')
plt.xlabel('Month No')
plt.ylabel('Movies Released in the month')
plt.show()
```



[70]:

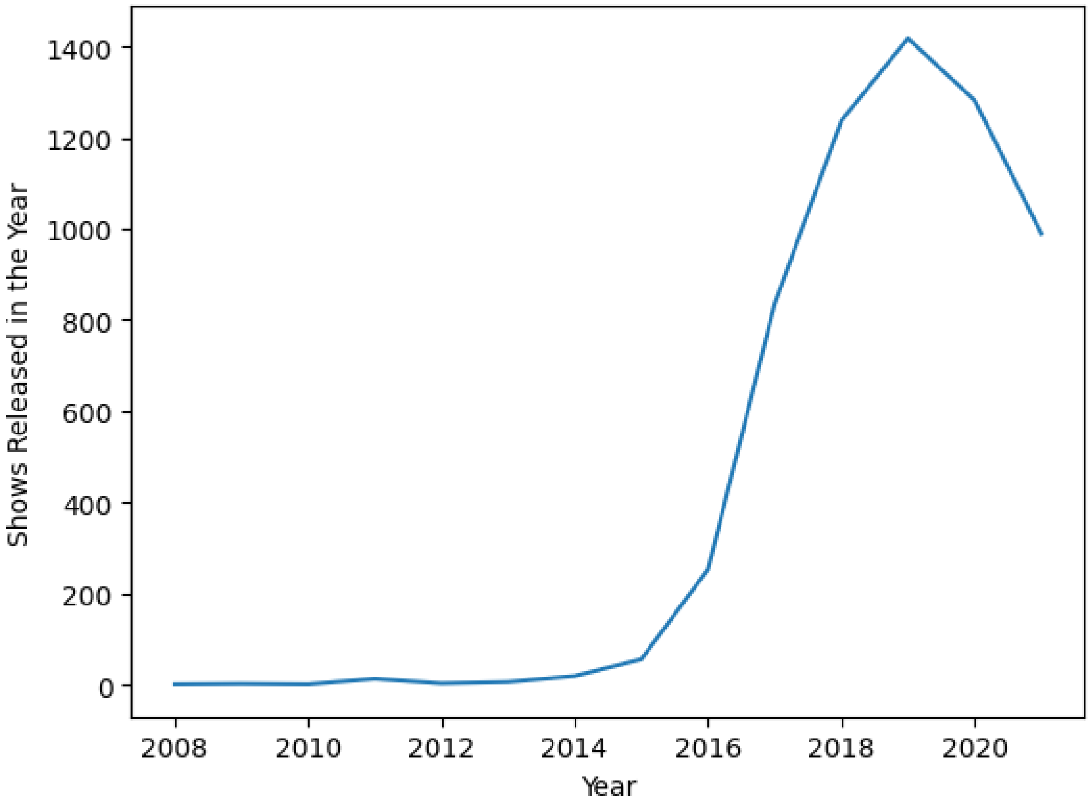
```
df_release_year=df_shows[df_shows['release_year']>=1980].
 ↪groupby(['release_year']).agg({"title":"nunique"}).reset_index()
sns.lineplot(data=df_release_year, x='release_year', y='title')
plt.ylabel("Shows Actual Release Date")
plt.xlabel("Year")
plt.show()
```



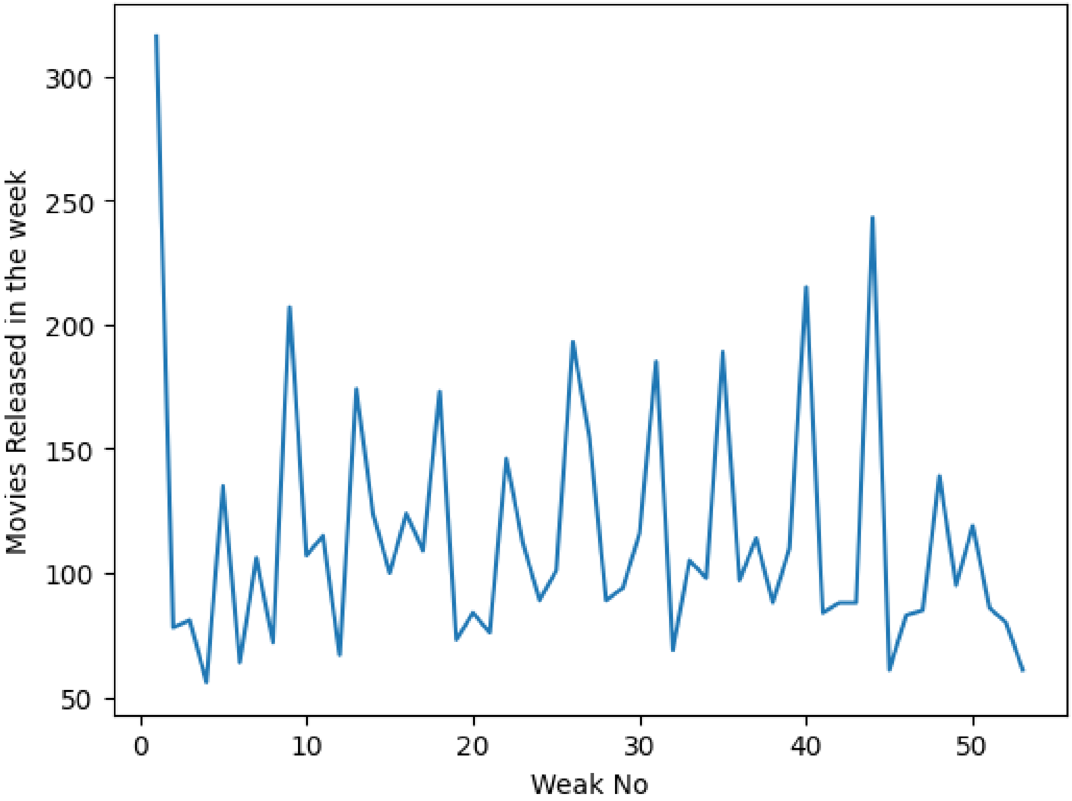
TV Shows are added in Netflix by a tremendous amount in mid weeks/months of the year, i.e- July Movies are added in Netflix by a tremendous amount in first week/last month of current year and first month of next year

[71]:

```
df_year = df_movies.groupby(['year']).agg({'title':'nunique'}).reset_index()
sns.lineplot(data=df_year, x='year', y='title')
plt.xlabel('Year')
plt.ylabel('Shows Released in the Year')
plt.show()
```

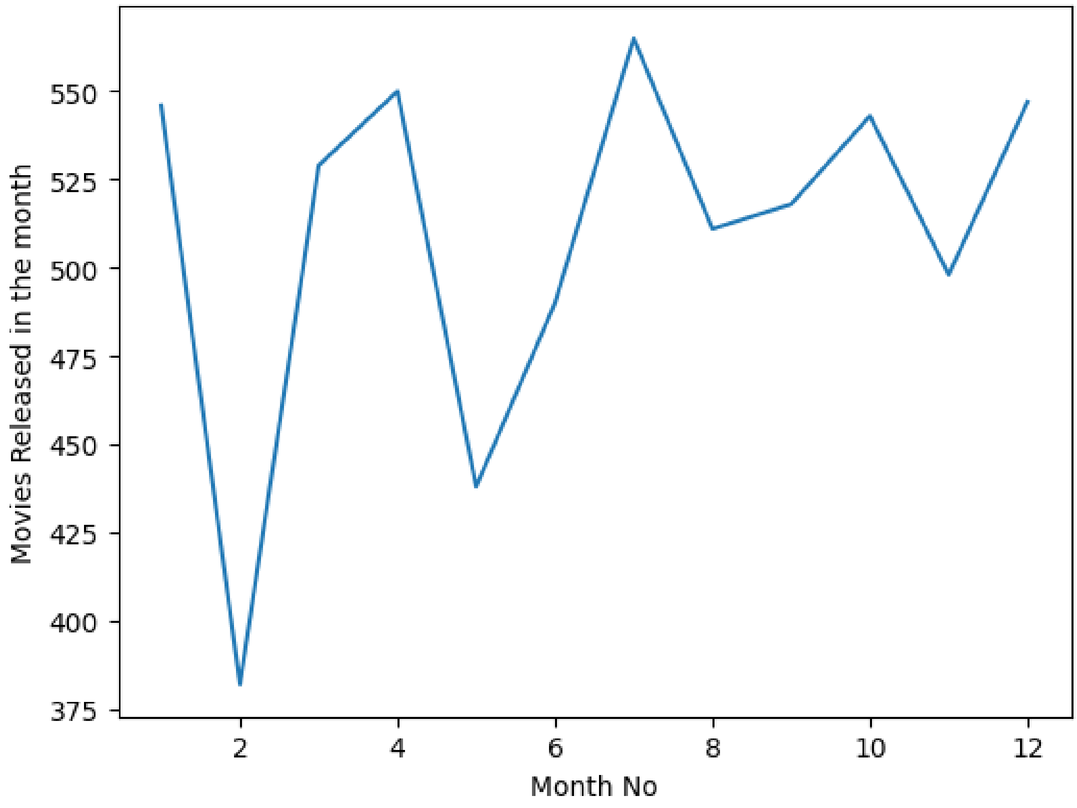


[72]:
```
df_week = df_movies.groupby(['week_Added']).agg({'title':'nunique'}).
  ↪reset_index()
sns.lineplot(data=df_week, x='week_Added', y='title')
plt.xlabel('Weak No')
plt.ylabel('Movies Released in the week')
plt.show()
```

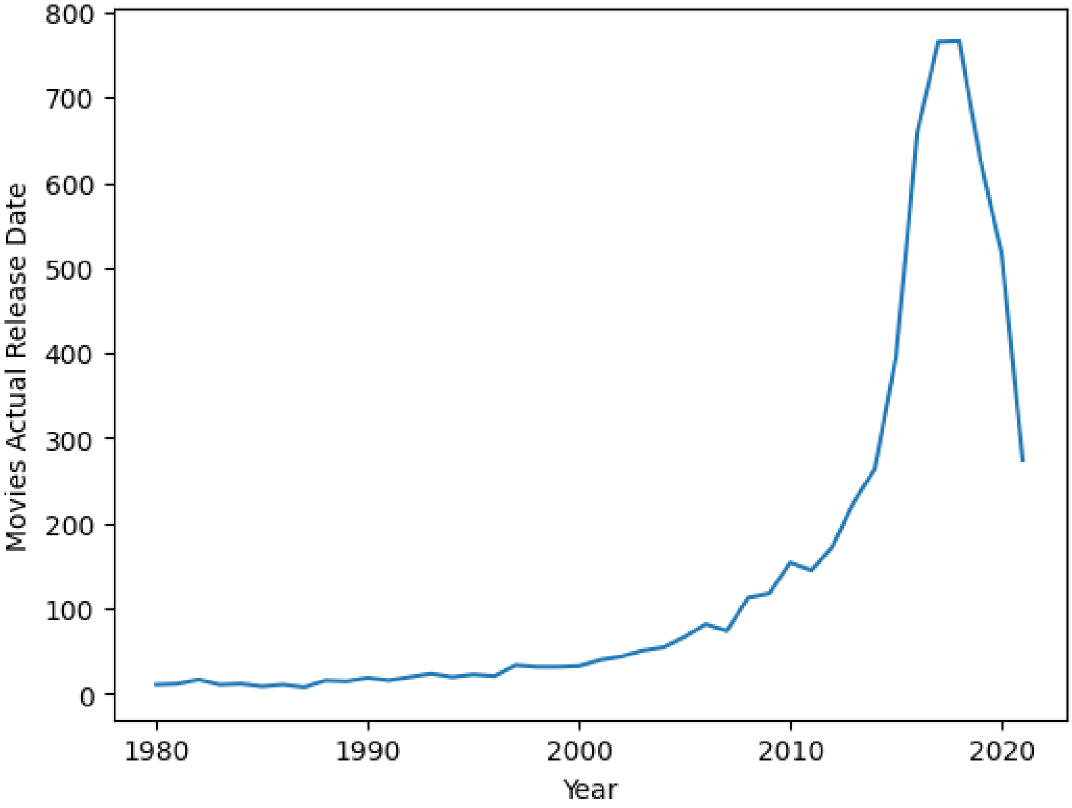


[73]:

```
df_month = df_movies.groupby(['month_added']).agg({'title':'nunique'}).
 ↪reset_index()
sns.lineplot(data=df_month, x='month_added', y='title')
plt.xlabel('Month No')
plt.ylabel('Movies Released in the month')
plt.show()
```



```
[74]: df_release_year=df_movies[df_movies['release_year']>=1980].
       ↪groupby(['release_year']).agg({"title":"nunique"}).reset_index()
      sns.lineplot(data=df_release_year, x='release_year', y='title')
      plt.ylabel("Movies Actual Release Date")
      plt.xlabel("Year")
      plt.show()
```



Actual Releases of both TV Shows and Movies have taken a hit after 2020

### 0.0.2 Univariate Analysis for Movies and TV shows in United States

[75]:
```
df_final1.head()
```

[75]:
```
                 title          Directors         Actors  \
0  Dick Johnson Is Dead   Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
3         Blood & Water  Unknown Directors     Ama Qamata
4         Blood & Water  Unknown Directors    Khosi Ngema

                    Genre        Country show_id     type          date_added  \
0           Documentaries  United States      s1    Movie  September 25, 2021
1  International TV Shows   South Africa      s2  TV Show  September 24, 2021
2               TV Dramas   South Africa      s2  TV Show  September 24, 2021
3            TV Mysteries   South Africa      s2  TV Show  September 24, 2021
4  International TV Shows   South Africa      s2  TV Show  September 24, 2021

   release_year rating   duration Modified_Added_date  month_added  \
0          2020  PG-13     80-100          2021-09-25            9
1          2021  TV-MA  2 Seasons          2021-09-24            9
2          2021  TV-MA  2 Seasons          2021-09-24            9
3          2021  TV-MA  2 Seasons          2021-09-24            9
4          2021  TV-MA  2 Seasons          2021-09-24            9

   week_Added  year
0          38  2021
1          38  2021
2          38  2021
3          38  2021
4          38  2021
```

[76]:

```
df_usa_shows=df_final1[df_final1['Country']=='United␣
 ↪States'][df_final1[df_final1['Country']=='United States']['type']=='TV Show']
df_usa_movies=df_final1[df_final1['Country']=='United␣
 ↪States'][df_final1[df_final1['Country']=='United States']['type']=='Movie']
```

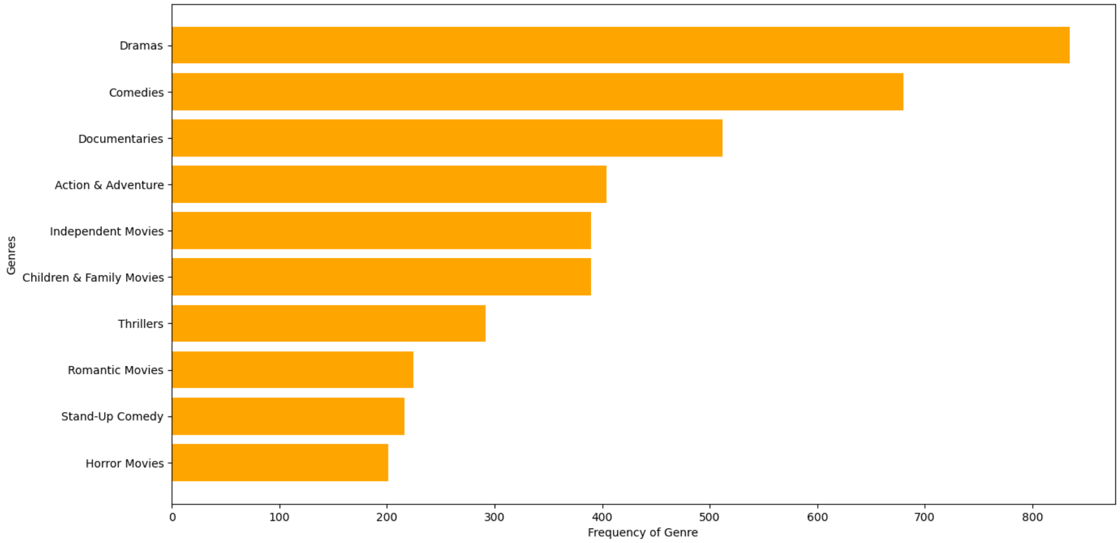
[77]:

```
df_usa_movies
```

[77]:

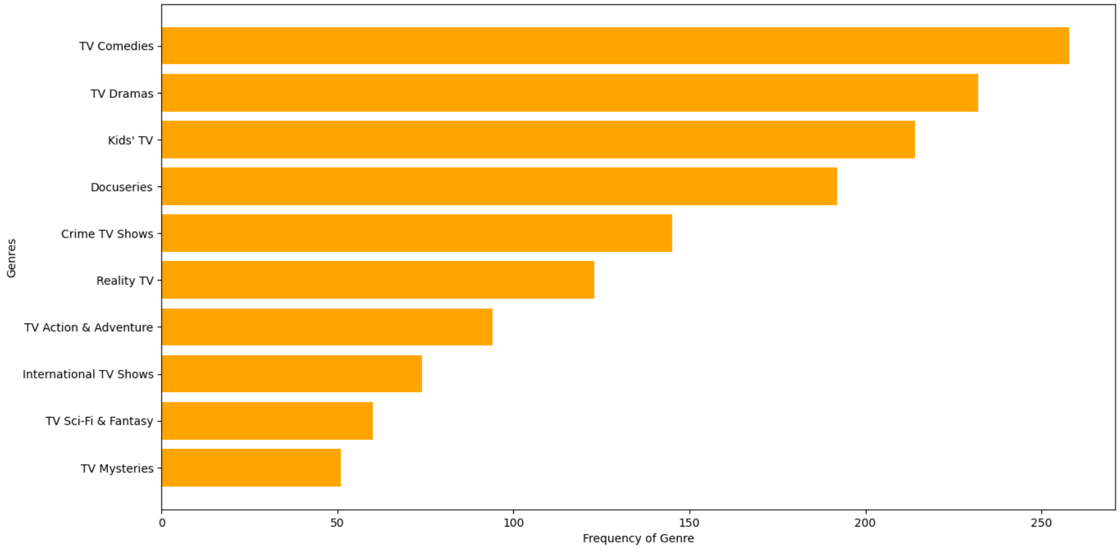
```
                      title         Directors                Actors  \
0       Dick Johnson Is Dead  Kirsten Johnson         Unknown Actor
179                  Sankofa     Haile Gerima          Kofi Ghanaba
185                  Sankofa     Haile Gerima          Kofi Ghanaba
191                  Sankofa     Haile Gerima          Kofi Ghanaba
197                  Sankofa     Haile Gerima  Oyafunmike Ogunlano
…                        …             …                    …
201962                  Zoom     Peter Hewitt       Spencer Breslin
201963                  Zoom     Peter Hewitt              Rip Torn
201964                  Zoom     Peter Hewitt              Rip Torn
201965                  Zoom     Peter Hewitt          Kevin Zegers
201966                  Zoom     Peter Hewitt          Kevin Zegers

                           Genre        Country show_id   type  \
0                  Documentaries  United States      s1  Movie
179                       Dramas  United States      s8  Movie
185           Independent Movies  United States      s8  Movie
191        International Movies  United States      s8  Movie
197                       Dramas  United States      s8  Movie
…                          …             …       …      …
201962                  Comedies  United States   s8806  Movie
201963    Children & Family Movies  United States   s8806  Movie
201964                  Comedies  United States   s8806  Movie
201965    Children & Family Movies  United States   s8806  Movie
201966                  Comedies  United States   s8806  Movie

                 date_added  release_year rating duration Modified_Added_date  \
0       September 25, 2021          2020  PG-13  80-100          2021-09-25
179     September 24, 2021          1993  TV-MA  120-150         2021-09-24
185     September 24, 2021          1993  TV-MA  120-150         2021-09-24
191     September 24, 2021          1993  TV-MA  120-150         2021-09-24
197     September 24, 2021          1993  TV-MA  120-150         2021-09-24
…                    …           …    …      …                 …
201962    January 11, 2020          2006     PG   80-100         2020-01-11
201963    January 11, 2020          2006     PG   80-100         2020-01-11
201964    January 11, 2020          2006     PG   80-100         2020-01-11
201965    January 11, 2020          2006     PG   80-100         2020-01-11
201966    January 11, 2020          2006     PG   80-100         2020-01-11

        month_added  week_Added  year
0                 9          38  2021
179               9          38  2021
185               9          38  2021
191               9          38  2021
197               9          38  2021
…             …         …   …
201962            1           2  2020
201963            1           2  2020
201964            1           2  2020
201965            1           2  2020
201966            1           2  2020

[45817 rows x 15 columns]
```

```
[78]: df_genre = df_usa_movies.groupby(['Genre']).agg({'title':'nunique'}).
       ↪reset_index().sort_values(by=['title'],ascending=False)[:10]
      plt.figure(figsize=(15,8))
      plt.barh(df_genre[::-1]['Genre'],df_genre[::-1]['title'], color=['orange'])
      plt.xlabel('Frequency of Genre')
      plt.ylabel('Genres')
      plt.show()
```



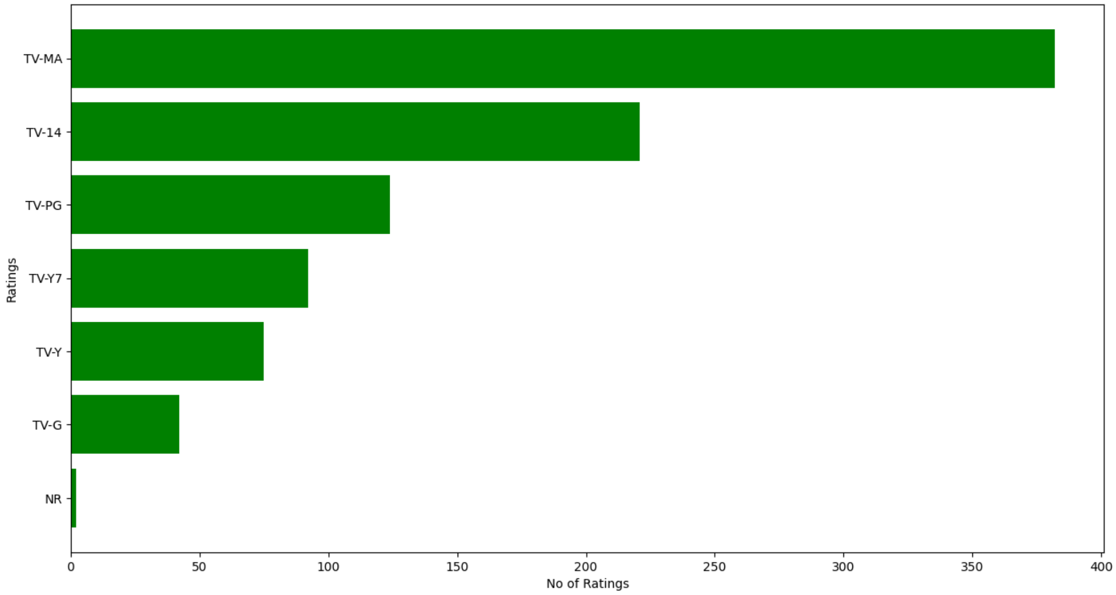
Dramas,Comedy, Kids 'TV Shows, International TV Shows and Docuseries, Genres are popular in TV Series in USA

```
[79]: df_genre = df_usa_shows.groupby(['Genre']).agg({'title':'nunique'}).
       ↪reset_index().sort_values(by=['title'],ascending=False)[:10]
      plt.figure(figsize=(15,8))
      plt.barh(df_genre[::-1]['Genre'],df_genre[::-1]['title'], color=['orange'])
      plt.xlabel('Frequency of Genre')
      plt.ylabel('Genres')
      plt.show()
```

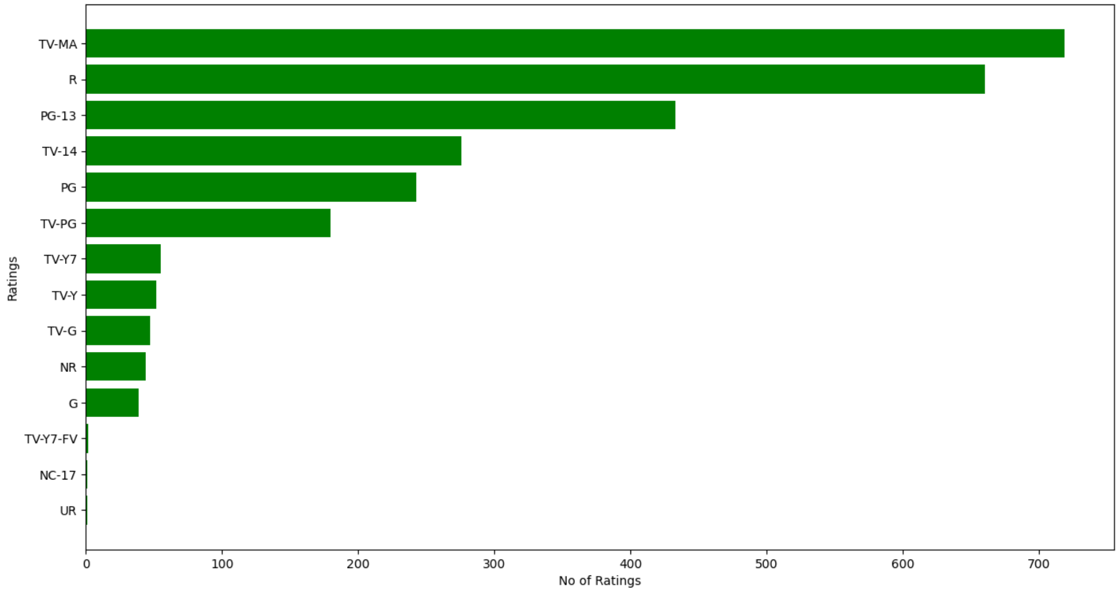


Dramas,Comedy, Kids ’TV Shows, International TV Shows and Docuseries, Genres are popular in TV Series in USA

[80]:
```
df_rating = df_usa_shows.groupby(['rating']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_rating[::-1]['rating'],df_rating[::-1]['title'], color=['green'])
plt.xlabel('No of Ratings')
plt.ylabel('Ratings')
plt.show()
```



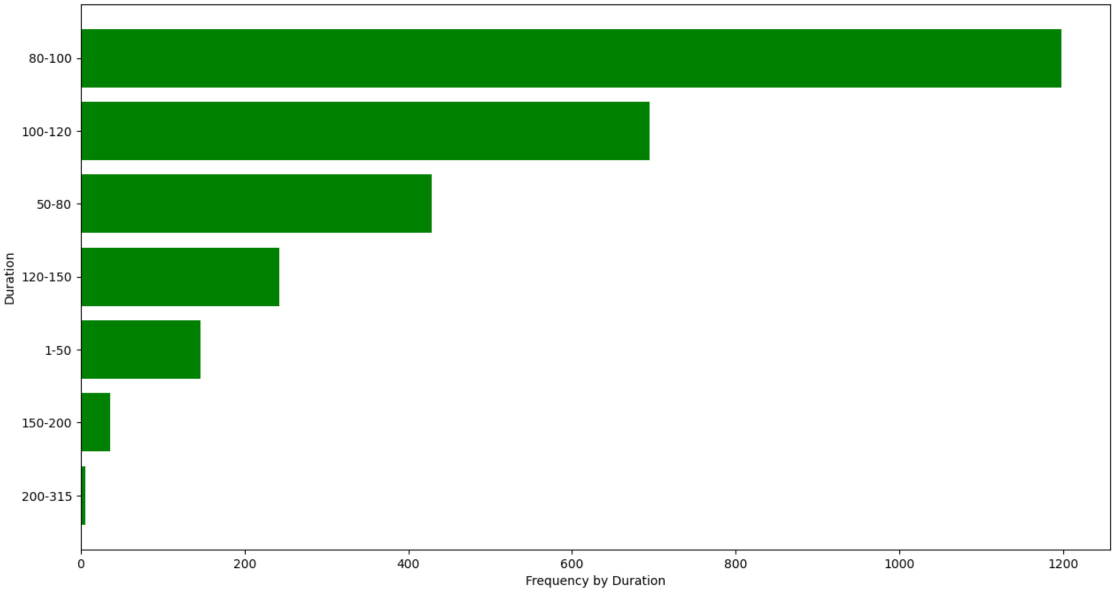
[81]:
```
df_rating = df_usa_movies.groupby(['rating']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_rating[::-1]['rating'],df_rating[::-1]['title'], color=['green'])
plt.xlabel('No of Ratings')
plt.ylabel('Ratings')
plt.show()
```



So it seems plaussible to conclude that the popular ratings across Netflix includes Mature Audiences and those appropriate for over 14/over 17 ages in both Movies and TV Shows in USA

[82]:

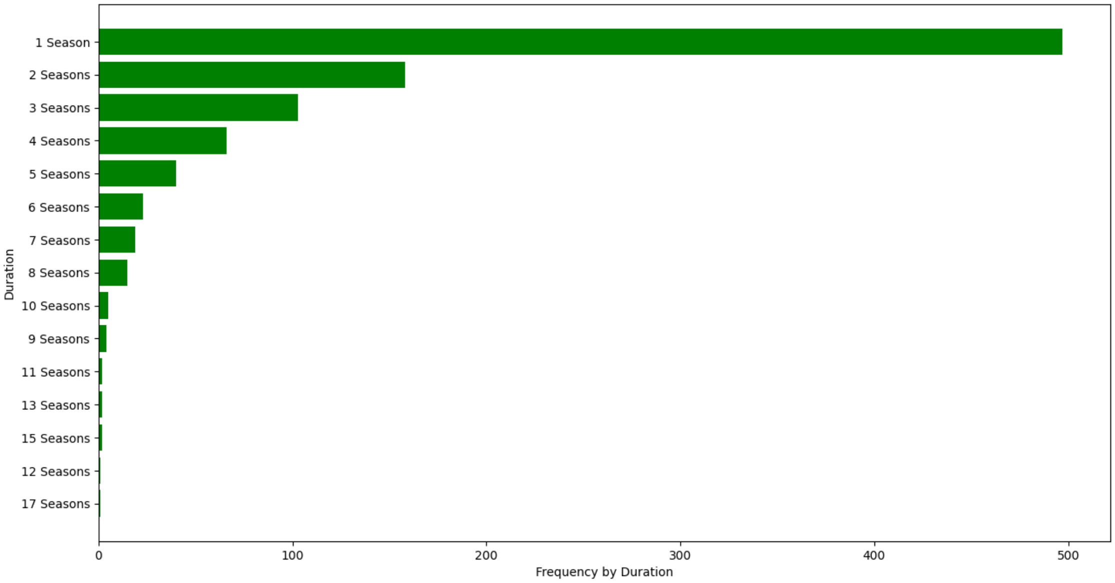
```
df_duration_copy = df_usa_movies.groupby(['duration']).agg({'title':'nunique'}).reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_duration_copy[::-1]['duration'],df_duration_copy[::-1]['title'], color=['green'])
plt.xlabel('Frequency by Duration')
plt.ylabel('Duration')
plt.show()
```



Across movies 80-100,100-120 is the ranges of minutes for which most movies lie. So quite possibly 80-120 mins is the sweet spot we would be wanting for movies in USA

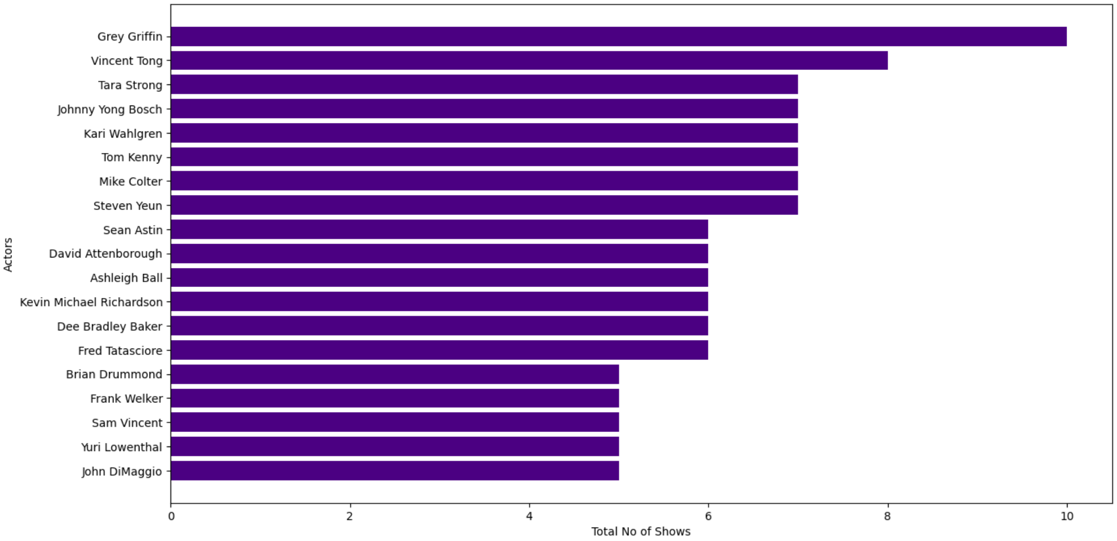
[83]:

```
df_duration_copy = df_usa_shows.groupby(['duration']).agg({'title':'nunique'}).
 ↪reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_duration_copy[::-1]['duration'],df_duration_copy[::-1]['title'],␣
 ↪color=['green'])
plt.xlabel('Frequency by Duration')
plt.ylabel('Duration')
plt.show()
```



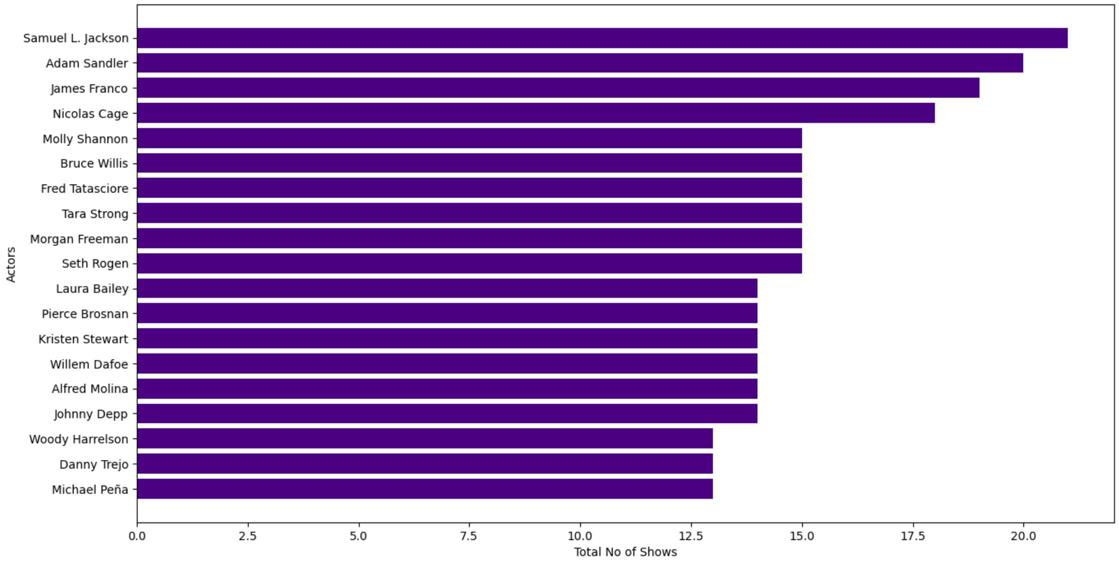
Across shows 1 season, 2 season, 3 season series are more wanting in USA

[84]:
```
df_actors = df_usa_shows.groupby(['Actors']).agg({'title':'nunique'}).
    ↪reset_index().sort_values(by=['title'],ascending=False)[:20]
df_actors=df_actors[df_actors['Actors'] != 'Unknown Actor']
plt.figure(figsize=(15,8))
plt.barh(df_actors[::-1]['Actors'],df_actors[::-1]['title'], color=['Indigo'])
plt.xlabel('Total No of Shows')
plt.ylabel('Actors')
plt.show()
```



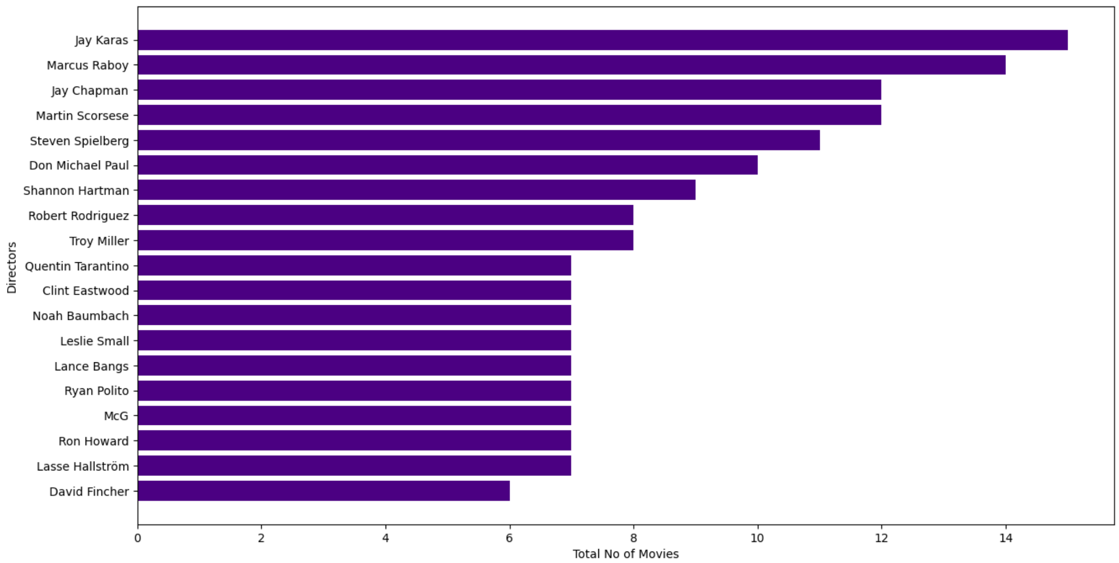
Vincent Tong,Grey Griffin and Kevin Richardson are the most popular actors across TV Shows in USA

```
[85]: df_actors = df_usa_movies.groupby(['Actors']).agg({'title':'nunique'}).
       ↪reset_index().sort_values(by=['title'],ascending=False)[:20]
      df_actors=df_actors[df_actors['Actors'] != 'Unknown Actor']
      plt.figure(figsize=(15,8))
      plt.barh(df_actors[::-1]['Actors'],df_actors[::-1]['title'], color=['Indigo'])
      plt.xlabel('Total No of Shows')
      plt.ylabel('Actors')
      plt.show()
```



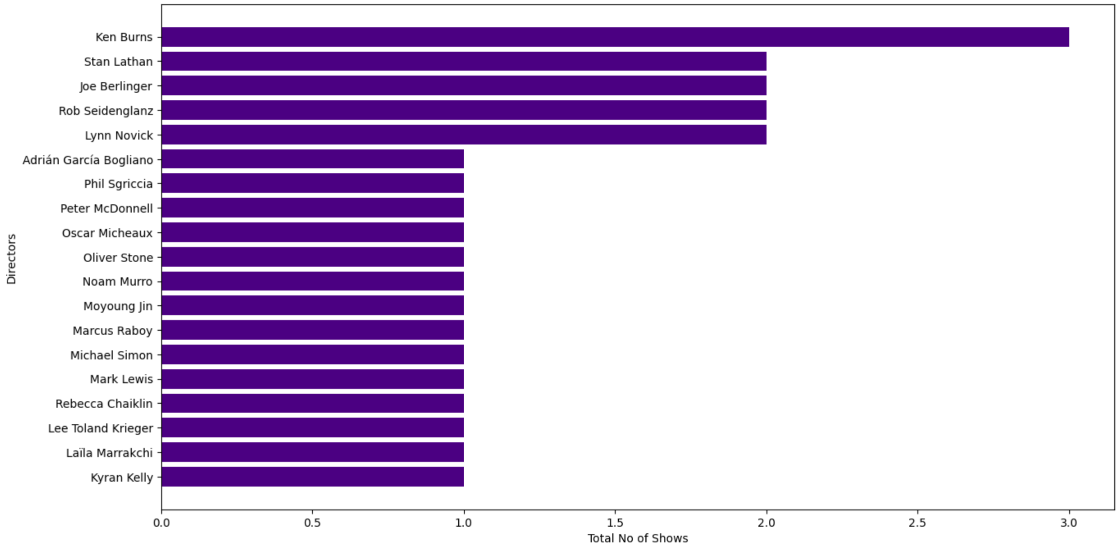
Samuel Jackson,Adam Sandler,James Franco and Nicolas Cage are very much popular across movies on Netflix in USA

```
[86]: df_directors = df_usa_movies.groupby(['Directors']).agg({'title':'nunique'}).
       ↪reset_index().sort_values(by=['title'],ascending=False)[:20]
      df_directors=df_directors[df_directors['Directors'] != 'Unknown Directors']
      plt.figure(figsize=(15,8))
      plt.barh(df_directors[::-1]['Directors'],df_directors[::-1]['title'],␣
       ↪color=['Indigo'])
      plt.xlabel('Total No of Movies')
      plt.ylabel('Directors')
      plt.show()
```



Jay Karas,Marcus Raboy,Martin Scorcese and Jay Chapman are popular directors across movies in USA

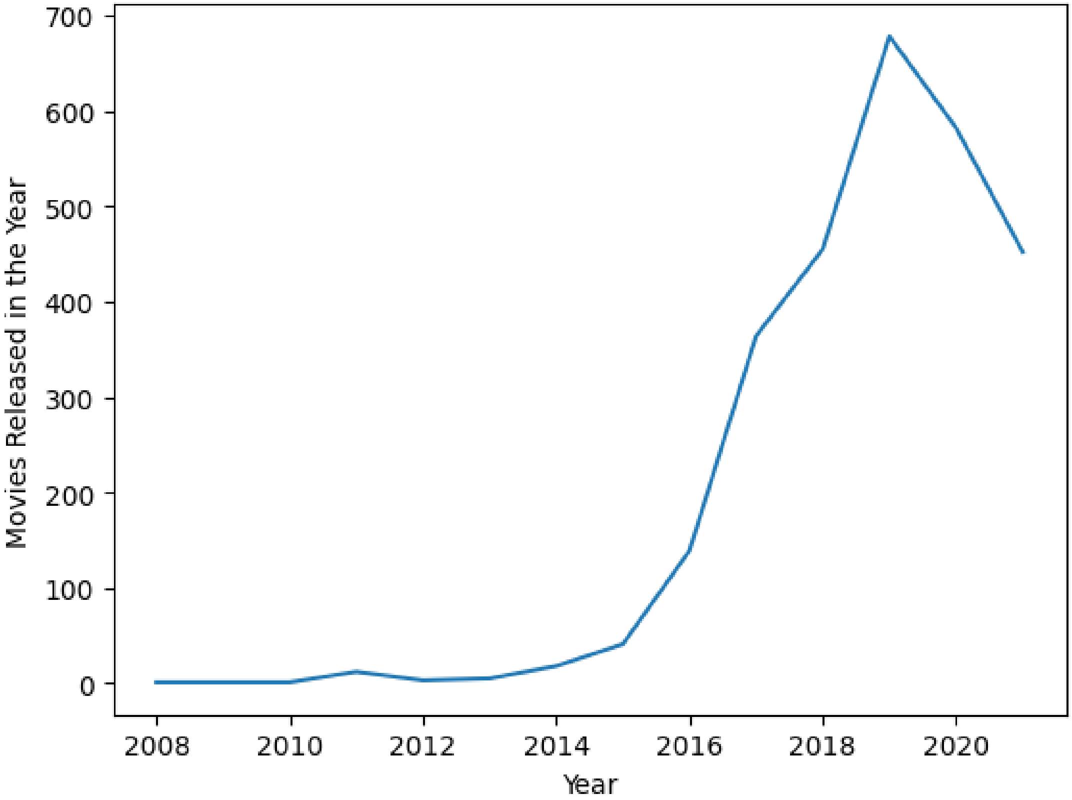
```
[87]: df_directors = df_usa_shows.groupby(['Directors']).agg({'title':'nunique'}).
       ↪reset_index().sort_values(by=['title'],ascending=False)[:20]
      df_directors=df_directors[df_directors['Directors'] != 'Unknown Directors']
      plt.figure(figsize=(15,8))
      plt.barh(df_directors[::-1]['Directors'],df_directors[::-1]['title'],␣
       ↪color=['Indigo'])
      plt.xlabel('Total No of Shows')
      plt.ylabel('Directors')
      plt.show()
```



Ken Burns,Stan Lathan, Joe Barlinger are popular directors across TV Shows on Netflix in USA

[88]:

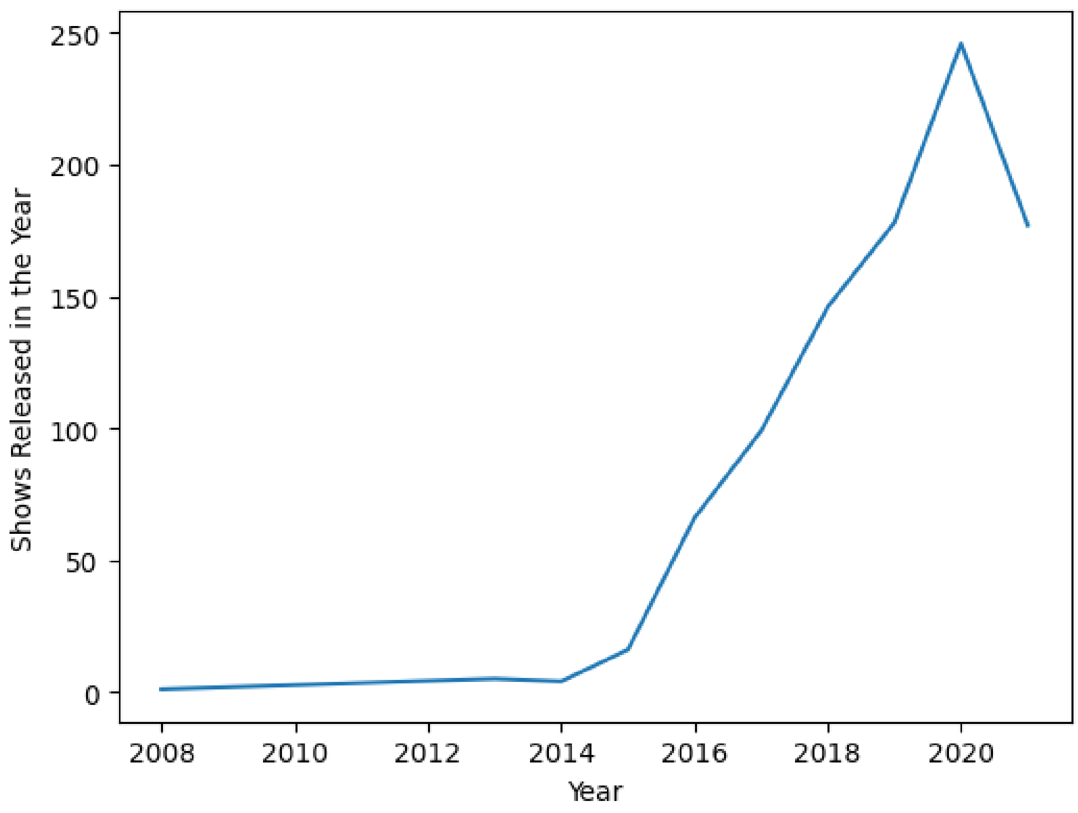
```
df_year=df_usa_movies.groupby(['year']).agg({"title":"nunique"}).reset_index()
sns.lineplot(data=df_year, x='year', y='title')
plt.ylabel("Movies Released in the Year")
plt.xlabel("Year")
plt.show()
```



In USA, number of movies remained the same in 2021 as they were in 2020 while number of movies declined

[89]:

```
df_year=df_usa_shows.groupby(['year']).agg({"title":"nunique"}).reset_index()
sns.lineplot(data=df_year, x='year', y='title')
plt.ylabel("Shows Released in the Year")
plt.xlabel("Year")
plt.show()
```



In USA, number of movies remained the same in 2021 as they were in 2020 while number of movies declined:

## 0.1 Recommendations

1. It is recommended to create content in the genres of Drama, Comedy and International TV Shows/Movies, as they are the most popular across countries and in both TV Shows and Movies.
2. To schedule TV Shows in July/August and Movies in the last week of the year/first month of the next year is recommended.
3. For audiences in the USA, it is recommended to create movies with a length of 80-120 minutes, and also to consider creating Kids TV Shows in addition to the genres mentioned in point 1.
4. For audiences in the UK, it is recommended to create movies with the same length as for USA audiences (80-120 minutes).
5. It is recommended to target audiences in the USA and India who are 14+ and above for ratings, while for the UK, it is recommended to create completely mature/R-rated content.
6. Adding movies for Indian audiences is recommended as the interest has been declining since 2018.

```
[90]: print('Peace Out')
```

```
Peace Out
```

```
[ ]:
```