Netflix_Case_Study

January 13, 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	cast	country	date_added	release_year	rating	duration
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13	90 min
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban…	South Africa	September 24, 2021	2021	TV-MA	2 Seasons
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi…	NaN	September 24, 2021	2021	TV-MA	1 Season
3	s4	TV Show	Jailbirds New Orleans	NaN	NaN	NaN	September 24, 2021	2021	TV-MA	1 Season
4	s5	TV Show	Kota Factory	NaN	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K…	India	September 24, 2021	2021	TV-MA	2 Seasons
…	…	…	…	…	…	…	…	…	…	…
8802	s8803	Movie	Zodiac	David Fincher	Mark Ruffalo, Jake Gyllenhaal, Robert Downey J…	United States	November 20, 2019	2007	R	158 min
8803	s8804	TV Show	Zombie Dumb	NaN	NaN	NaN	July 1, 2019	2018	TV-Y7	2 Seasons
8804	s8805	Movie	Zombieland	Ruben Fleischer	Jesse Eisenberg, Woody Harrelson, Emma Stone, …	United States	November 1, 2019	2009	R	88 min
8805	s8806	Movie	Zoom	Peter Hewitt	Tim Allen, Courteney Cox, Chevy Chase, Kate Ma…	United States	January 11, 2020	2006	PG	88 min
8806	s8807	Movie	Zubaan	Mozez Singh	Vicky Kaushal, Sarah-Jane Dias, Raaghav Chanan…	India	March 2, 2019	2015	TV-14	111 min

```
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]:
```
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]:
```
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]:
```
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()
```

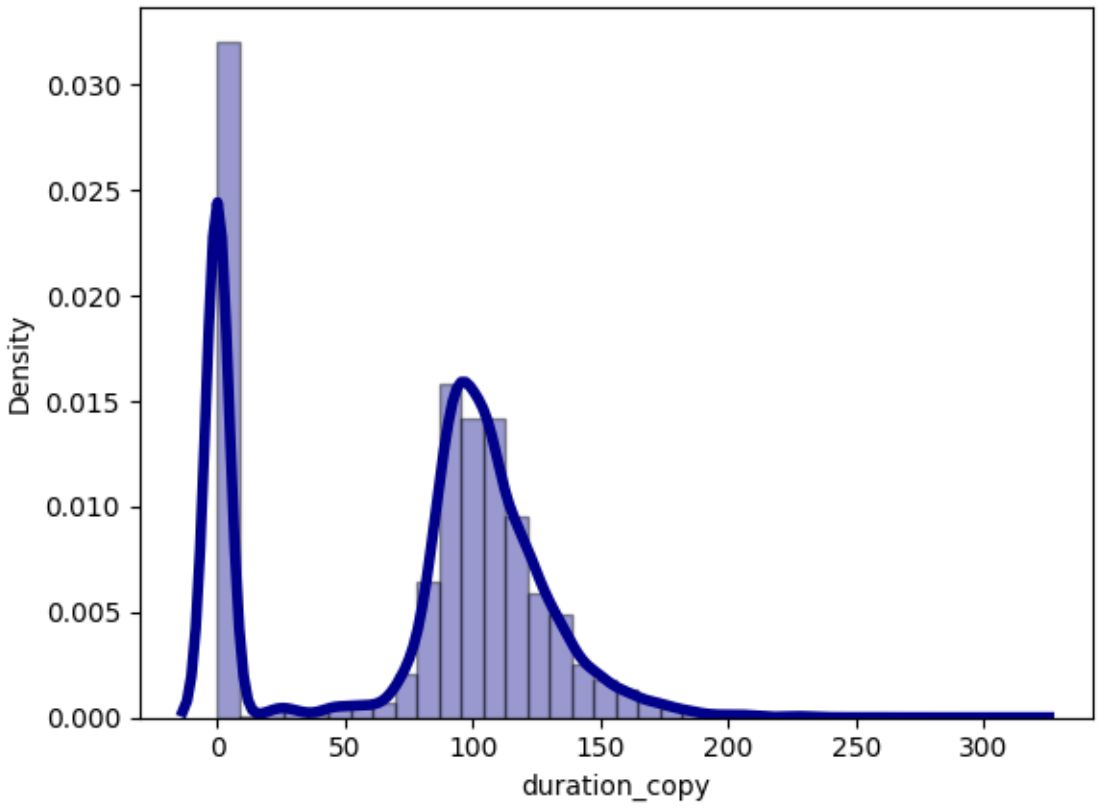
```
/var/folders/2k/nqxlqww13nd99192zjdnsjc00000gn/T/ipykernel_19337/1638109463.py:1
: UserWarning:

`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]:
```
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_19337/927289177.py:10
: 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
```

[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 duration_copy Modified_Added_date  \
0          2020  PG-13         90        80-100          2021-09-25
1          2021  TV-MA  2 Seasons            <1          2021-09-24
2          2021  TV-MA  2 Seasons            <1          2021-09-24
3          2021  TV-MA  2 Seasons            <1          2021-09-24
4          2021  TV-MA  2 Seasons            <1          2021-09-24

   month_added  week_Added  year
0            9          38  2021
1            9          38  2021
2            9          38  2021
3            9          38  2021
4            9          38  2021
```

[32]:
```
df_final1['title'] = df_final1['title'].str.replace(r"\(.*\)","")
df_final1.head()
```

```
/var/folders/2k/nqxlqww13nd99192zjdnsjc00000gn/T/ipykernel_19337/1303496868.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"\(.*\)","")
```

[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 duration_copy Modified_Added_date  \
0          2020  PG-13         90        80-100          2021-09-25
1          2021  TV-MA  2 Seasons            <1          2021-09-24
2          2021  TV-MA  2 Seasons            <1          2021-09-24
3          2021  TV-MA  2 Seasons            <1          2021-09-24
4          2021  TV-MA  2 Seasons            <1          2021-09-24

   month_added  week_Added  year
0            9          38  2021
1            9          38  2021
2            9          38  2021
3            9          38  2021
4            9          38  2021
```

[33]:
```
df_final1.groupby(['Genre']).agg({'title':'unique'})
```

[33]:

Genre	title
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…
```

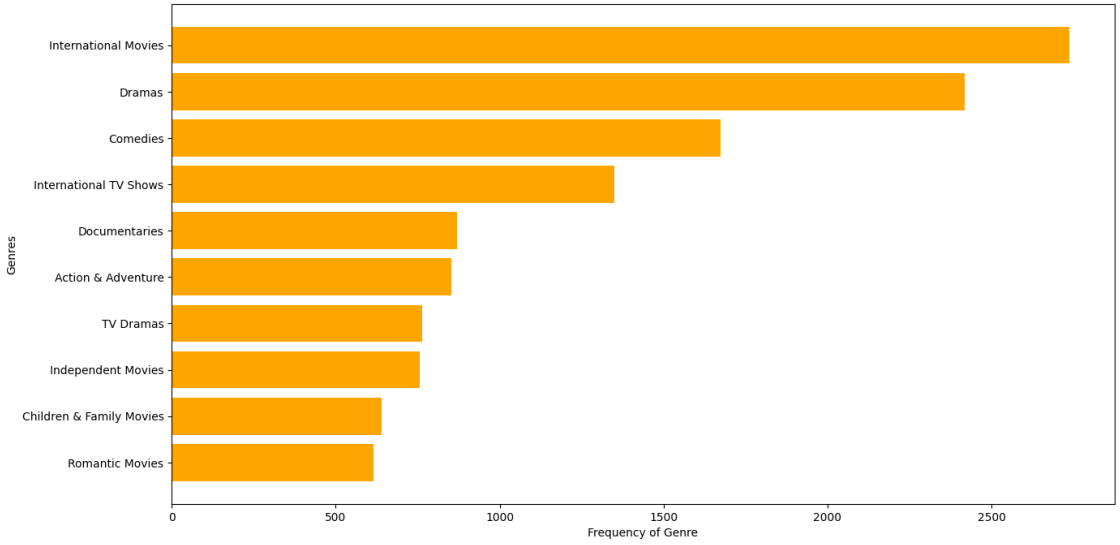
[34]:
```
df_final1.groupby(['Genre']).agg({'title':'nunique'})
```

[34]:

Genre	title
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
```

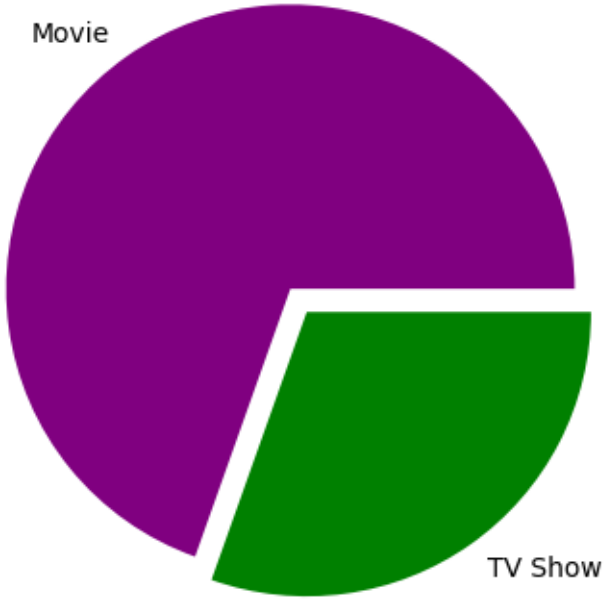
[35]:
```
df_genre = df_final1.groupby(['Genre']).agg({'title':'nunique'}).reset_index().
 ↪sort_values(by=['title'],ascending=False)[:10]
plt.figure(figsize=(15,8))
plt.barh(df_genre[::-1]['Genre'],df_genre[::-1]['title'], color=['orange'])
plt.xlabel('Frequency of Genre')
plt.ylabel('Genres')
plt.show()
```



[36]:
```
df_final1.groupby(['type']).agg({'title':'nunique'})
```

[36]:
```
          title
type
Movie      6115
TV Show    2676
```

[37]:
```
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'])
plt.show()
```



[38]:
```
df_final1.groupby(['Country']).agg({'title':'nunique'})
```

[38]:
```
              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]
```

[39]:
```
df_final1['Country']=df_final1['Country'].str.replace(',', '')
df_final1.head()
```

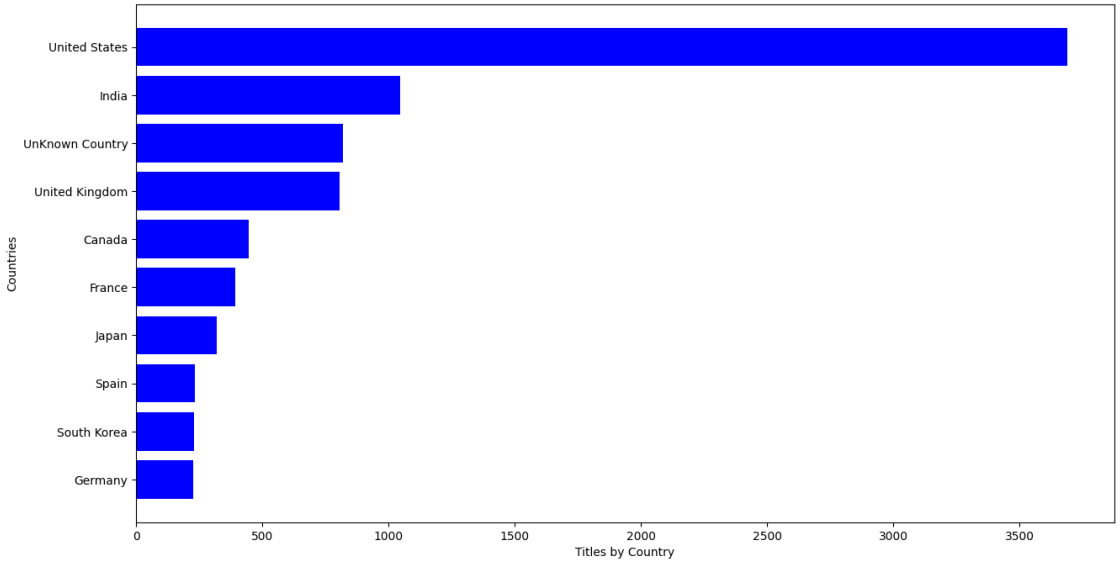
[39]:
```
                  title          Directors         Actors  \
0  Dick Johnson Is Dead    Kirsten Johnson  Unknown Actor
1         Blood & Water  Unknown Directors     Ama Qamata
2         Blood & Water  Unknown Directors     Ama Qamata
3         Blood & Water  Unknown Directors     Ama Qamata
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 Modified_Added_date  \
0          2020  PG-13         90        80-100          2021-09-25
1          2021  TV-MA  2 Seasons            <1          2021-09-24
2          2021  TV-MA  2 Seasons            <1          2021-09-24
3          2021  TV-MA  2 Seasons            <1          2021-09-24
4          2021  TV-MA  2 Seasons            <1          2021-09-24

   month_added  week_Added  year
0            9          38  2021
1            9          38  2021
2            9          38  2021
3            9          38  2021
4            9          38  2021
```

[40]:
```
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()
```

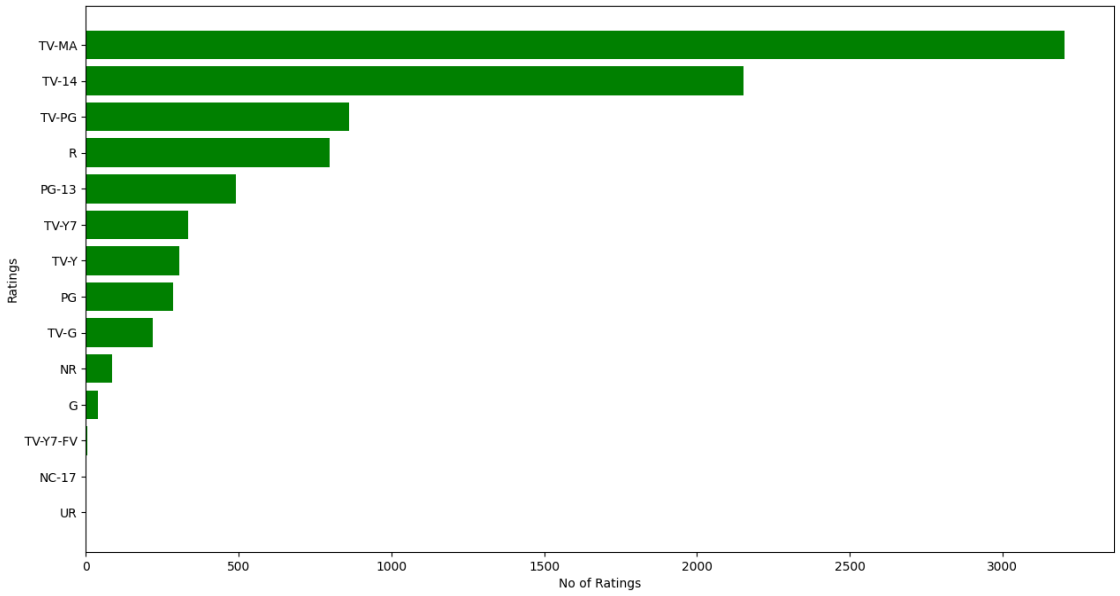


[41]:
```
df_final1.groupby(['rating']).agg({'title':'nunique'})
```

[41]:

rating	title
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

[42]:
```
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()
```

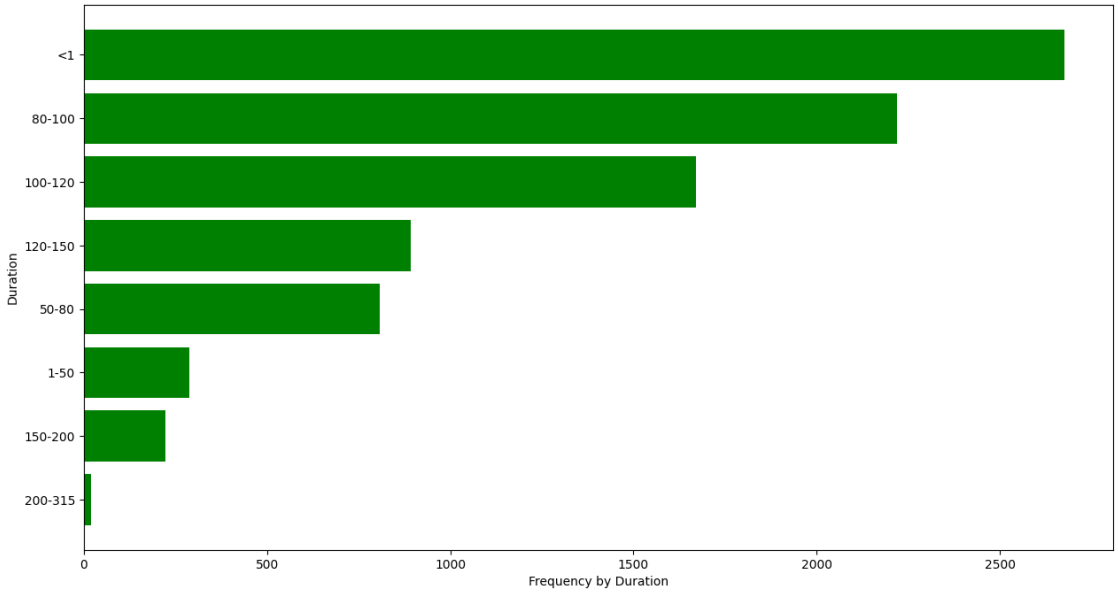


[43]:
```
df_final1.groupby(['duration_copy']).agg({'title':'nunique'})
```

[43]:

duration_copy	title
<1	2676
1-50	287
50-80	808
80-100	2220
100-120	1671
120-150	891
150-200	222
200-315	19

[44]:
```
df_duration_copy = df_final1.groupby(['duration_copy']).agg({'title':
  ↪'nunique'}).reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_duration_copy[::-1]['duration_copy'],df_duration_copy[::
  ↪-1]['title'], color=['green'])
plt.xlabel('Frequency by Duration')
plt.ylabel('Duration')
plt.show()
```



[45]:
```
df_final1['Actors']= df_final1['Actors'].str.replace('\$\$','')
```

```
/var/folders/2k/nqxlqww13nd99192zjdnsjc00000gn/T/ipykernel_19337/1775556756.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('\$\$','')
```

[46]:
```
df_final1.groupby(['Actors']).agg({'title':'nunique'})
```

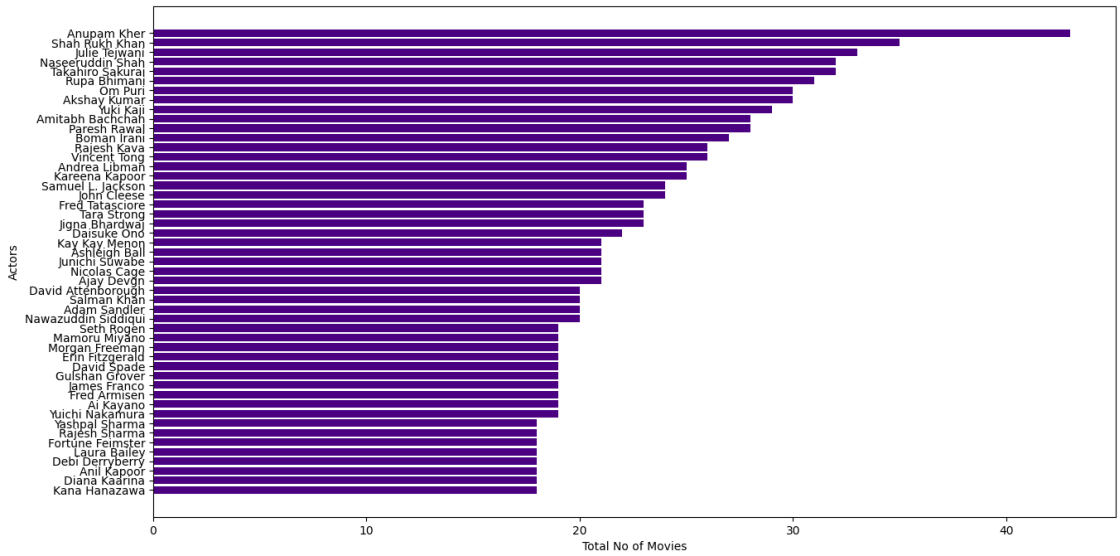
[46]:

Actors	title
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
Ṣọpẹ́ Dìrísù	1

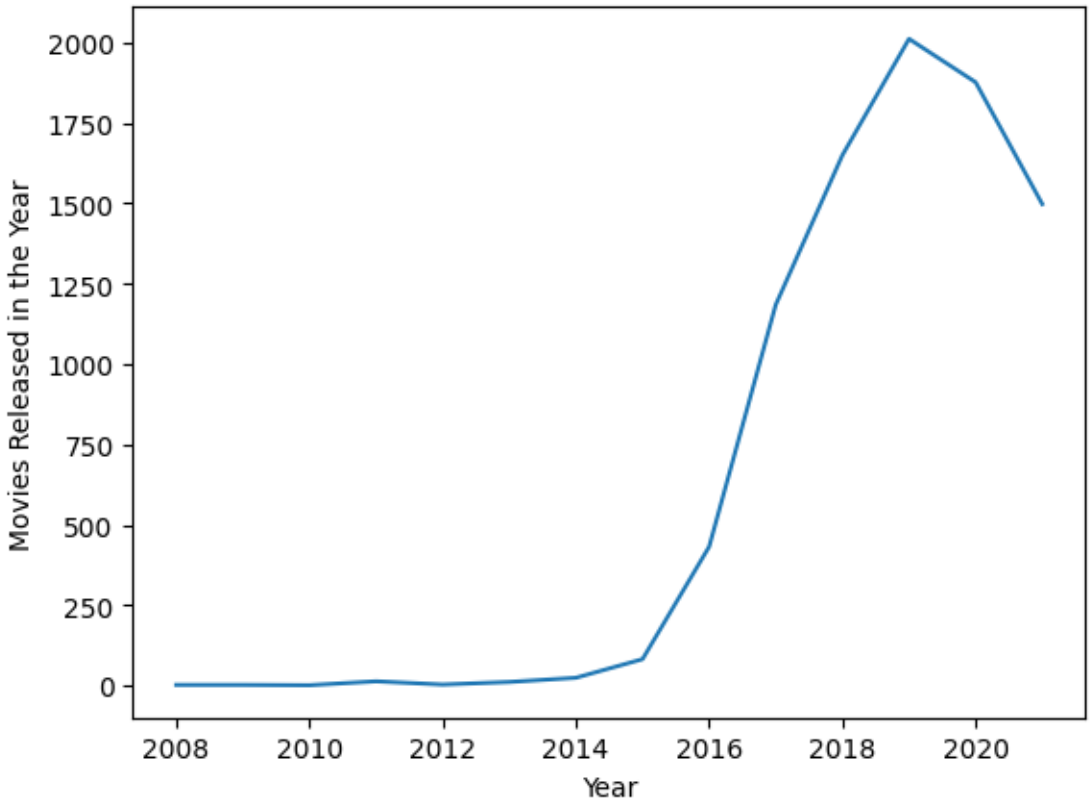
[36440 rows x 1 columns]

[47]:
```
df_actors = df_final1.groupby(['Actors']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:50]
```

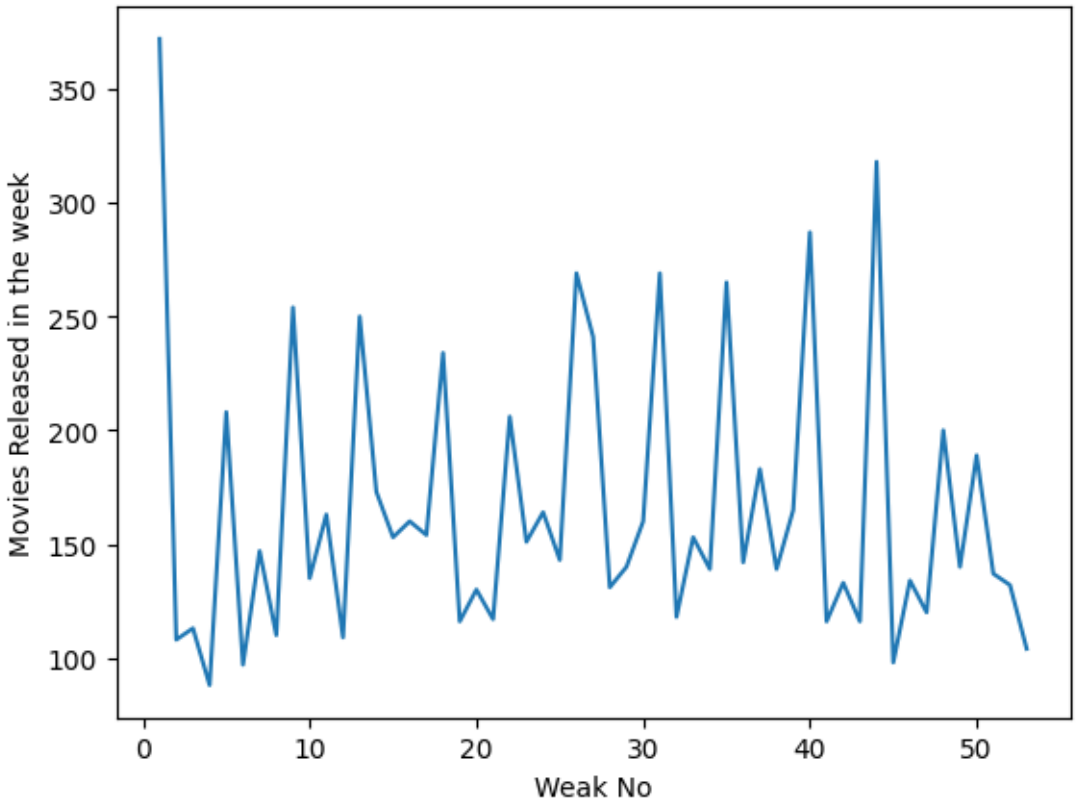
```
df_actors=df_actors[df_actors['Actors'] != 'Unknown Actor']
plt.figure(figsize=(15,8))
plt.barh(df_actors[::-1]['Actors'],df_actors[::-1]['title'], color=['Indigo'])
plt.xlabel('Total No of Movies')
plt.ylabel('Actors')
plt.show()
```



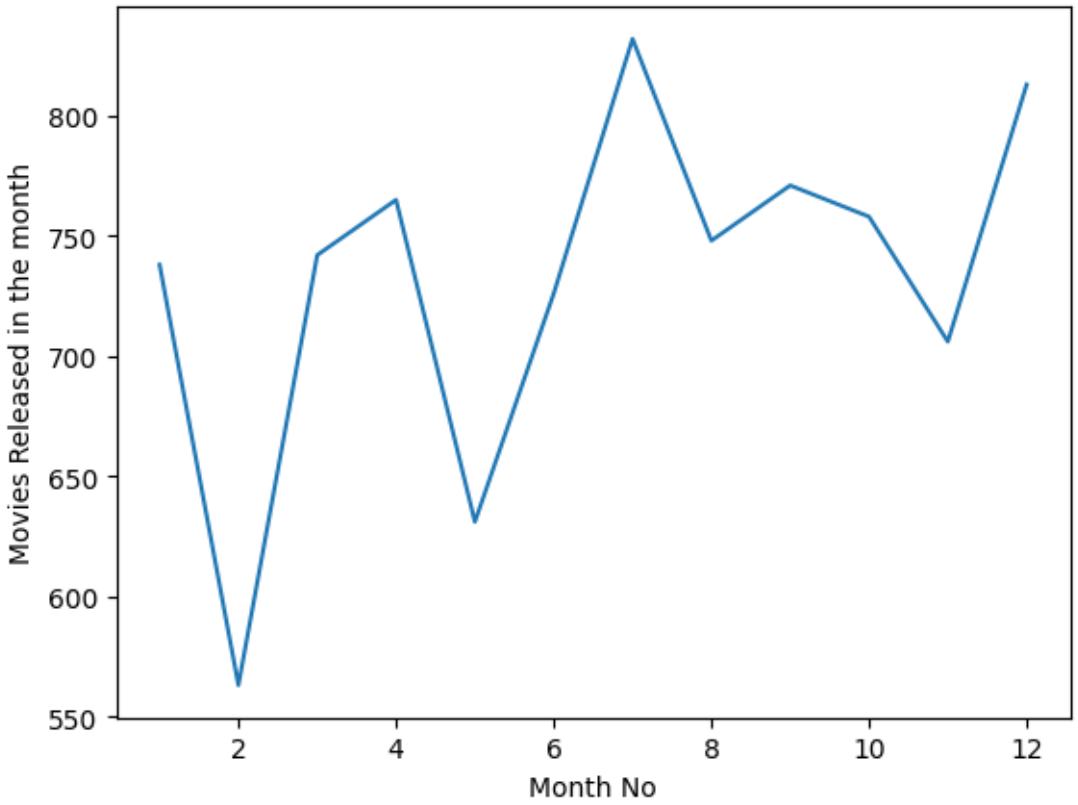
[48]:
```
df_year = df_final1.groupby(['year']).agg({'title':'nunique'}).reset_index()
sns.lineplot(data=df_year, x='year', y='title')
plt.xlabel('Year')
plt.ylabel('Movies Released in the Year')
plt.show()
```



[49]:
```
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()
```



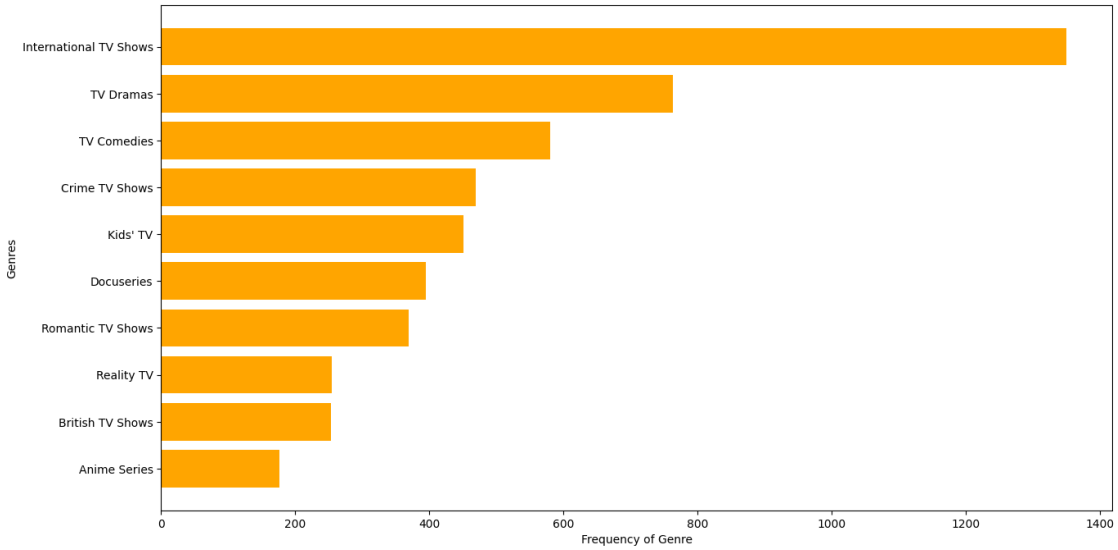
[50]:
```
df_month = df_final1.groupby(['month_added']).agg({'title':'nunique'}).
  ↪reset_index()
sns.lineplot(data=df_month, x='month_added', y='title')
plt.xlabel('Month No')
plt.ylabel('Movies Released in the month')
plt.show()
```



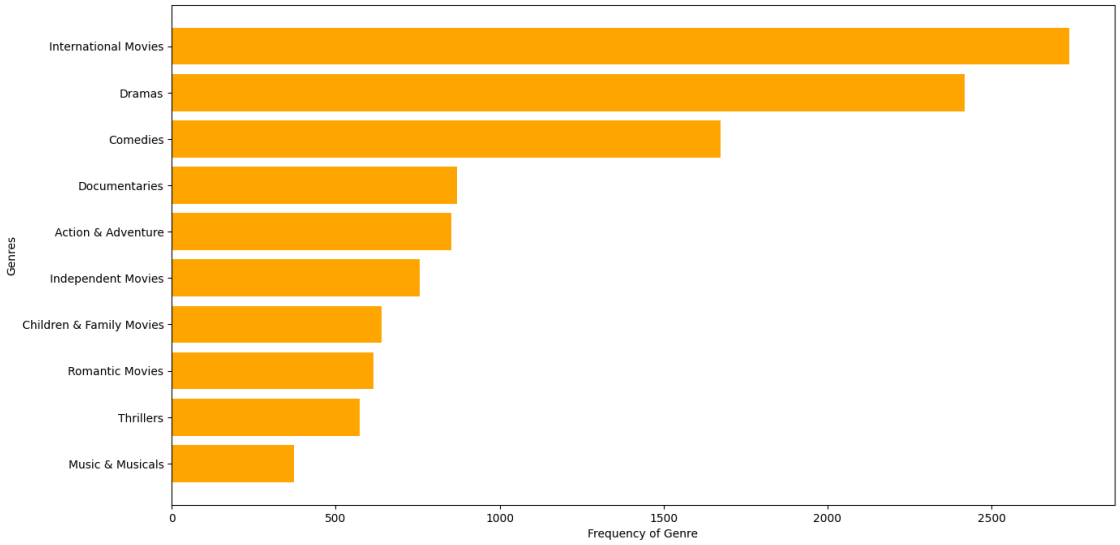
0.0.1 Univariate Analysis for Shows and Movies

[51]:
```
df_shows = df_final1[df_final1['type']=='TV Show']
df_movies = df_final1[df_final1['type']=='Movie']
```

[52]:
```
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()
```

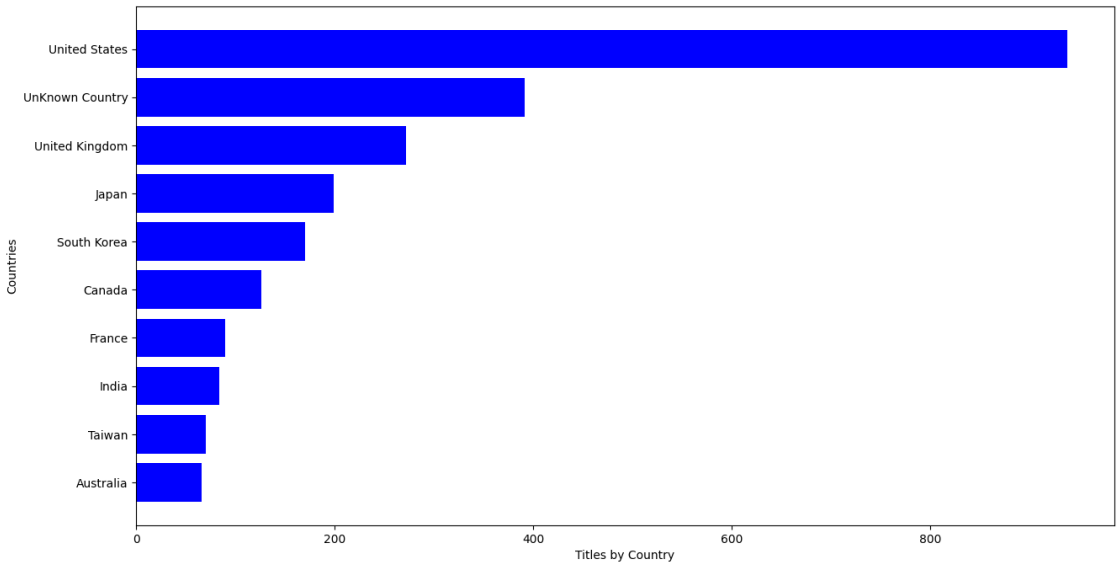


[53]:
```
df_genre = df_movies.groupby(['Genre']).agg({'title':'nunique'}).reset_index().
  ↪sort_values(by=['title'],ascending=False)[:10]
plt.figure(figsize=(15,8))
plt.barh(df_genre[::-1]['Genre'],df_genre[::-1]['title'], color=['orange'])
plt.xlabel('Frequency of Genre')
plt.ylabel('Genres')
plt.show()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

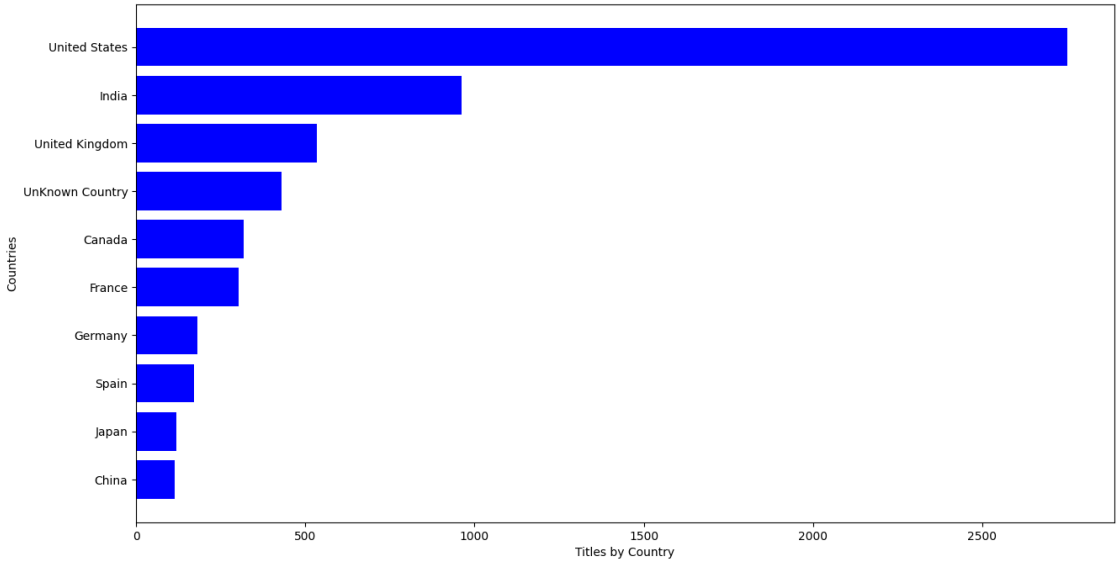


[54]:
```
df_country = df_shows.groupby(['Country']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:10]
```

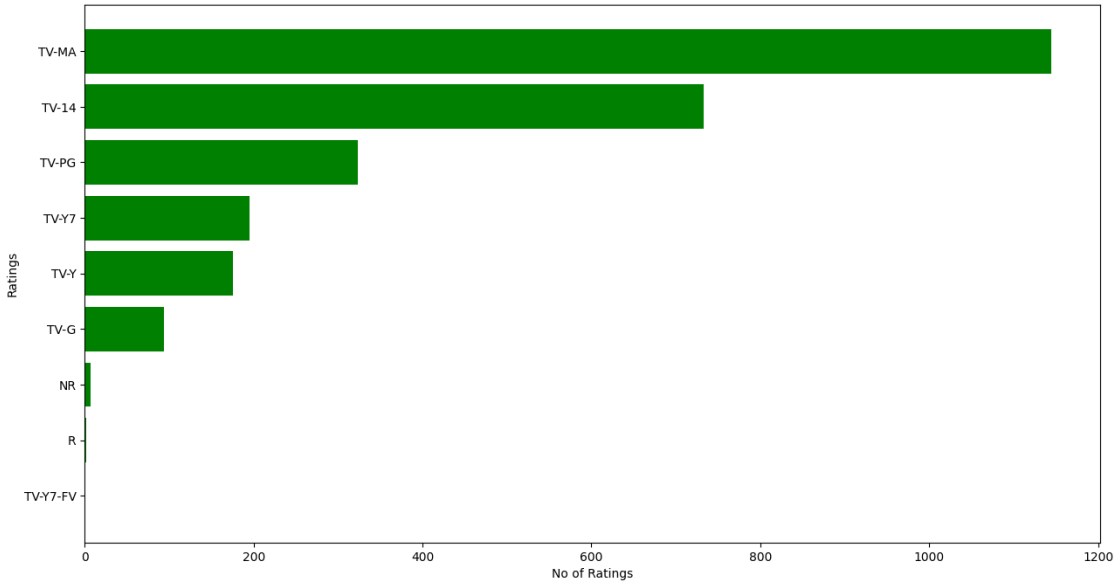
```
plt.figure(figsize=(15,8))
plt.barh(df_country[::-1]['Country'],df_country[::-1]['title'], color=['blue'])
plt.xlabel('Titles by Country')
plt.ylabel('Countries')
plt.show()
```



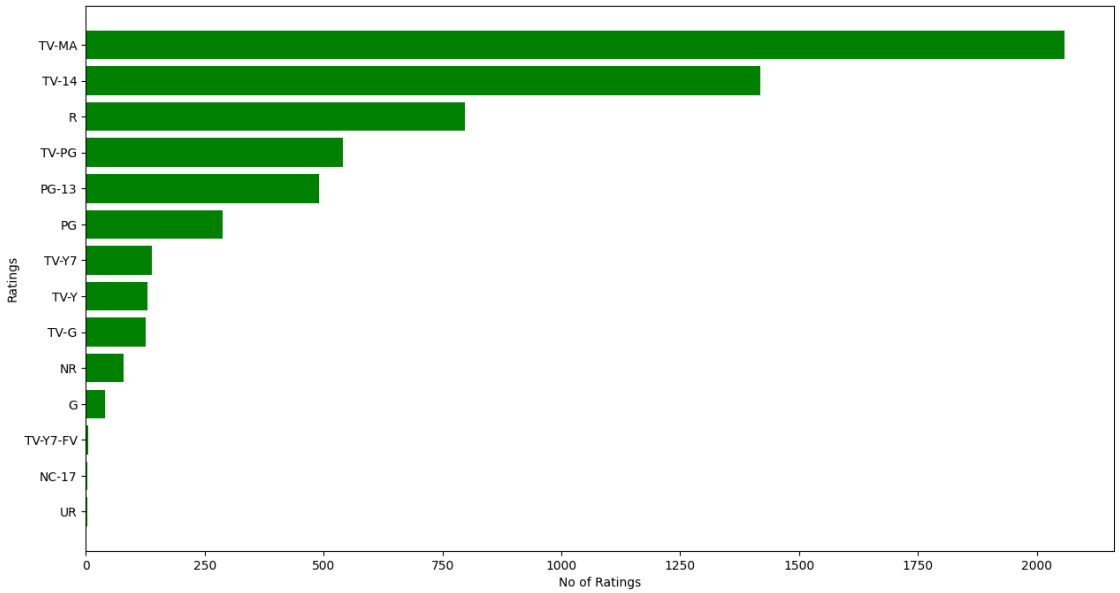
[55]:
```
df_country = df_movies.groupby(['Country']).agg({'title':'nunique'}).
  ↪reset_index().sort_values(by=['title'],ascending=False)[:10]
plt.figure(figsize=(15,8))
plt.barh(df_country[::-1]['Country'],df_country[::-1]['title'], color=['blue'])
plt.xlabel('Titles by Country')
plt.ylabel('Countries')
plt.show()
```



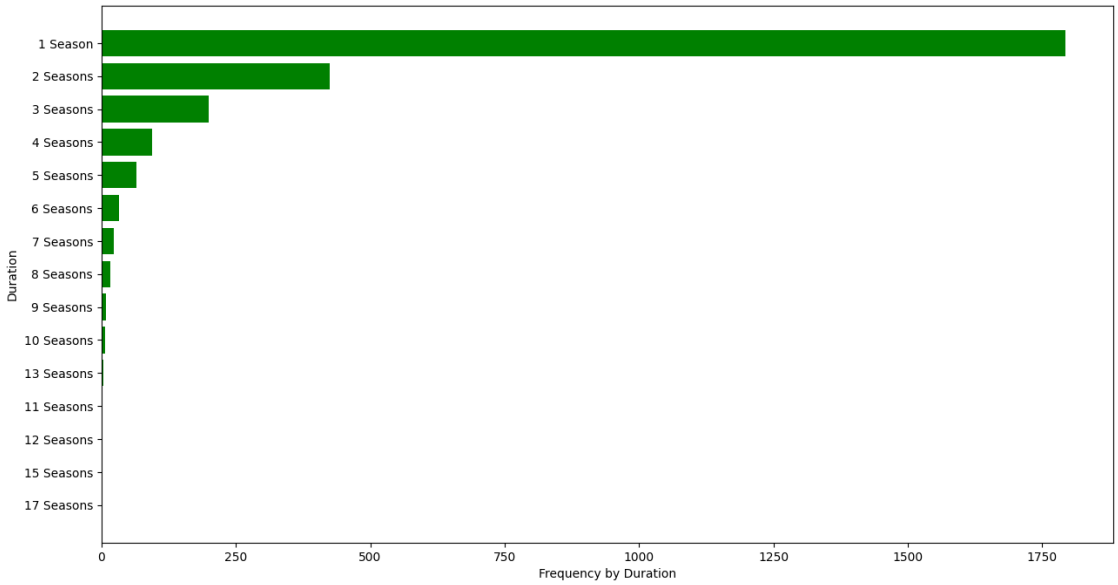
[56]:
```
df_rating = df_shows.groupby(['rating']).agg({'title':'nunique'}).reset_index().
↪sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_rating[::-1]['rating'],df_rating[::-1]['title'], color=['green'])
plt.xlabel('No of Ratings')
plt.ylabel('Ratings')
plt.show()
```



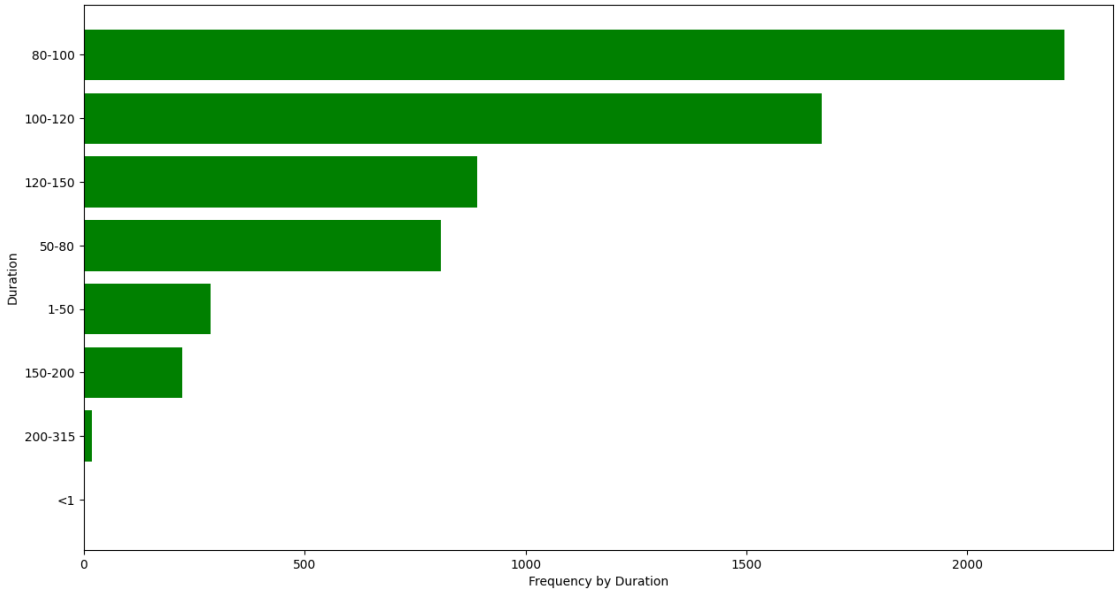
[57]:
```
df_rating = df_movies.groupby(['rating']).agg({'title':'nunique'}).
 ↪reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_rating[::-1]['rating'],df_rating[::-1]['title'], color=['green'])
plt.xlabel('No of Ratings')
plt.ylabel('Ratings')
plt.show()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



[58]:
```
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()
```

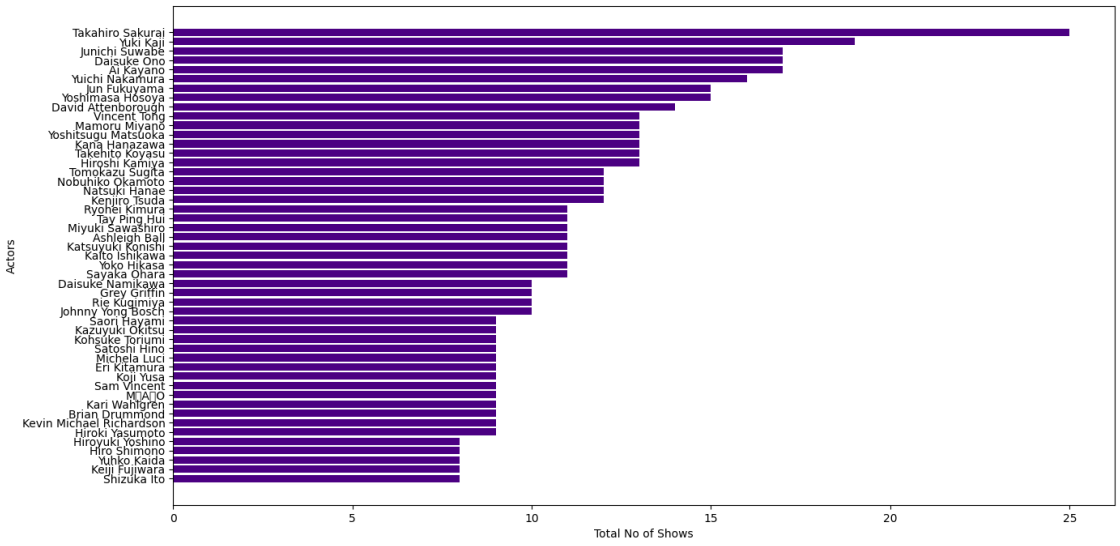


[59]:
```
df_duration_copy = df_movies.groupby(['duration_copy']).agg({'title':
  ↪'nunique'}).reset_index().sort_values(by=['title'],ascending=False)
plt.figure(figsize=(15,8))
plt.barh(df_duration_copy[::-1]['duration_copy'],df_duration_copy[::
  ↪-1]['title'], color=['green'])
plt.xlabel('Frequency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

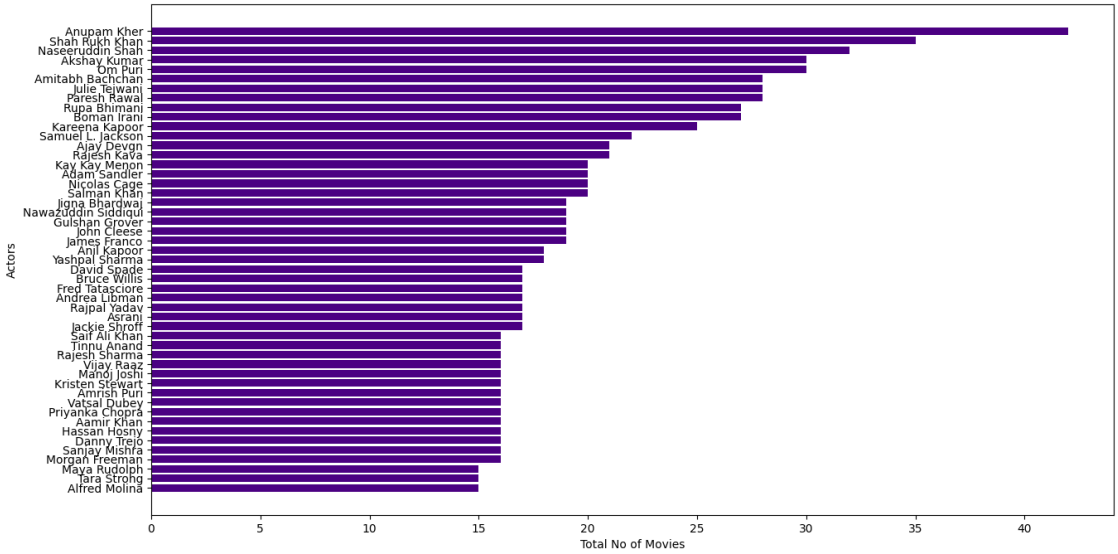


[60]:
```
df_actors = df_shows.groupby(['Actors']).agg({'title':'nunique'}).reset_index().
  ↪sort_values(by=['title'],ascending=False)[:50]
df_actors=df_actors[df_actors['Actors'] != 'Unknown Actor']
plt.figure(figsize=(15,8))
plt.barh(df_actors[::-1]['Actors'],df_actors[::-1]['title'], color=['Indigo'])
plt.xlabel('Total No of Shows')
plt.ylabel('Actors')
plt.show()
```

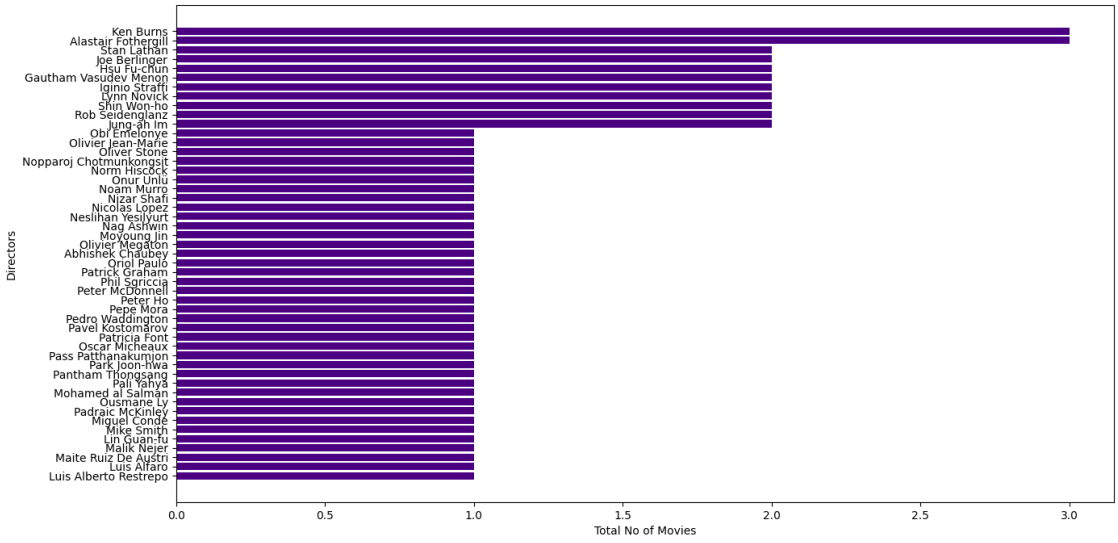
```
/Users/sivakumar/.pyenv/versions/3.10.6/lib/python3.10/site-
packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 12539 (\N{KATAKANA
MIDDLE DOT}) missing from current font.
  fig.canvas.print_figure(bytes_io, **kw)
```



[61]:
```
df_actors = df_movies.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()
```



[62]:
```
df_directors = df_shows.groupby(['Directors']).agg({'title':'nunique'}).
 ↪reset_index().sort_values(by=['title'],ascending=False)[:50]
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()
```



[63]:
```
df_shows.head()
```

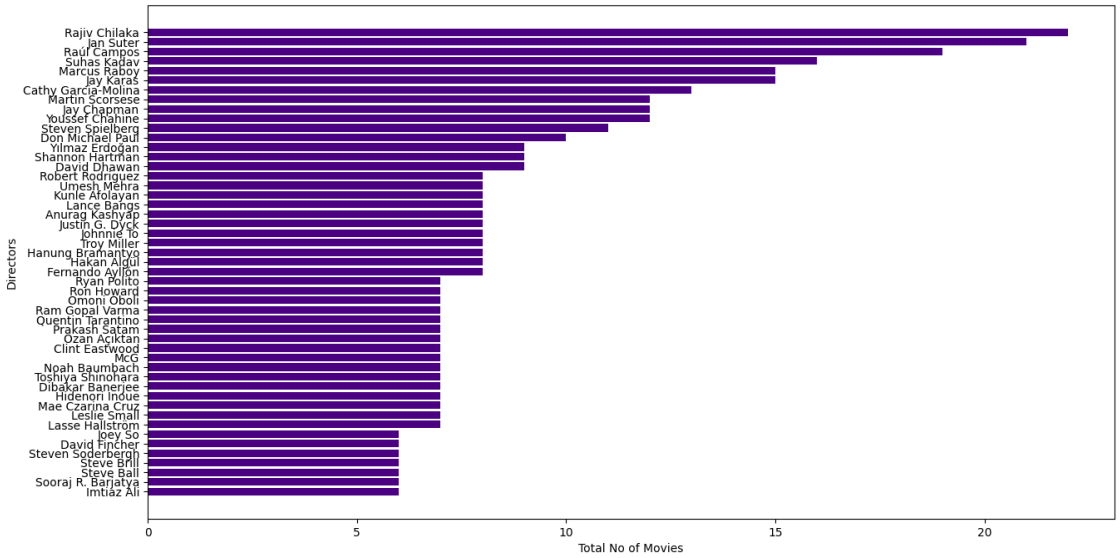
[63]:

	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

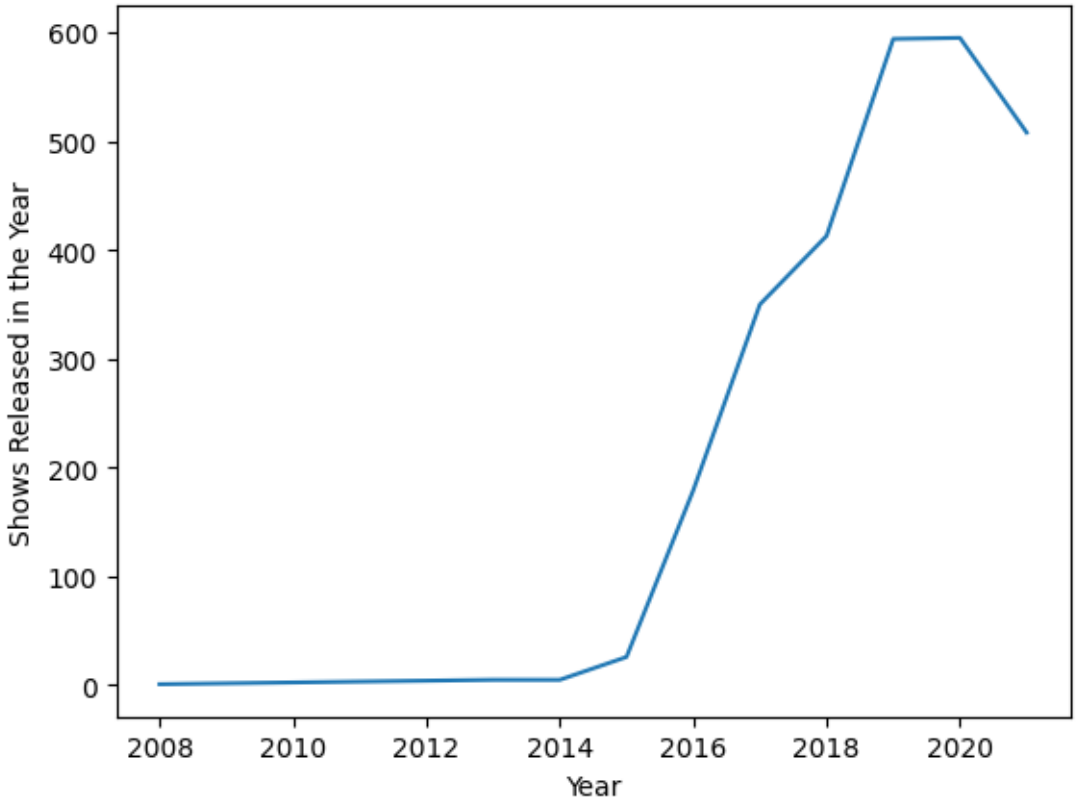
	Country	show_id	type	date_added	release_year	rating
1	South Africa	s2	TV Show	September 24, 2021	2021	TV-MA
2	South Africa	s2	TV Show	September 24, 2021	2021	TV-MA
3	South Africa	s2	TV Show	September 24, 2021	2021	TV-MA
4	South Africa	s2	TV Show	September 24, 2021	2021	TV-MA
5	South Africa	s2	TV Show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

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

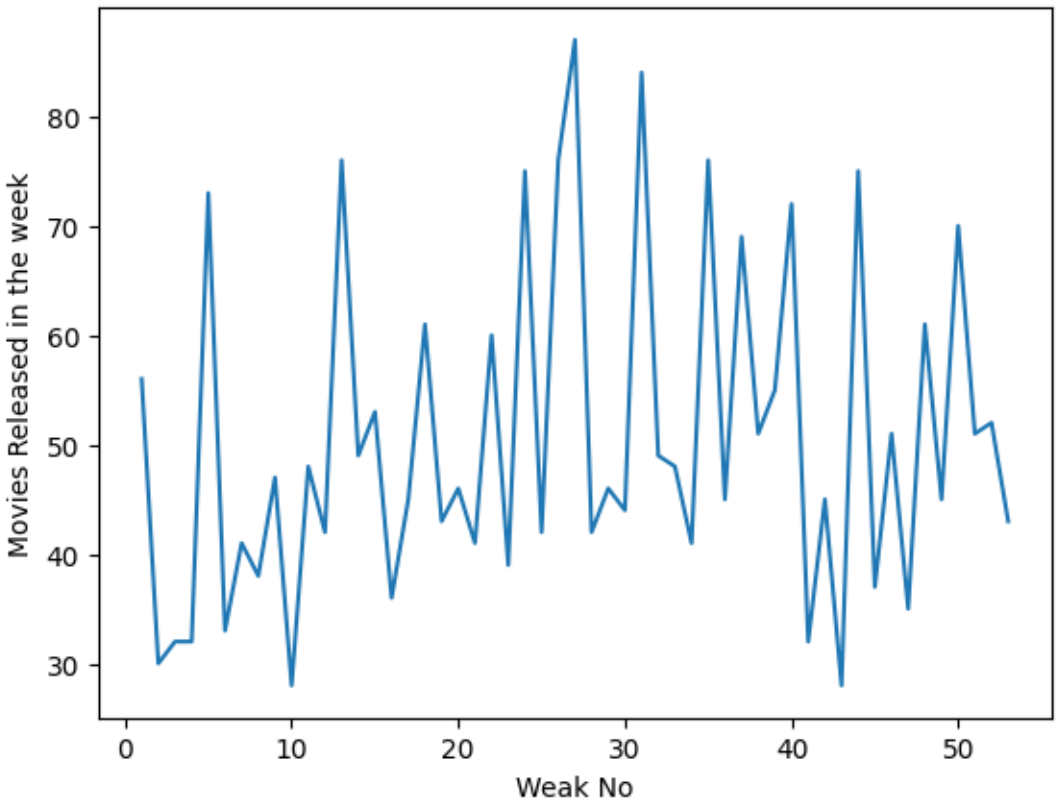
[64]:
```
df_directors = df_movies.groupby(['Directors']).agg({'title':'nunique'}).
 ↪reset_index().sort_values(by=['title'],ascending=False)[:50]
df_directors=df_directors[df_directors['Directors'] != 'Unknown Directors']
plt.figure(figsize=(15,8))
plt.barh(df_directors[::-1]['Directors'],df_directors[::-1]['title'],␣
 ↪color=['Indigo'])
plt.xlabel('Total No of Movies')
plt.ylabel('Directors')
plt.show()
```



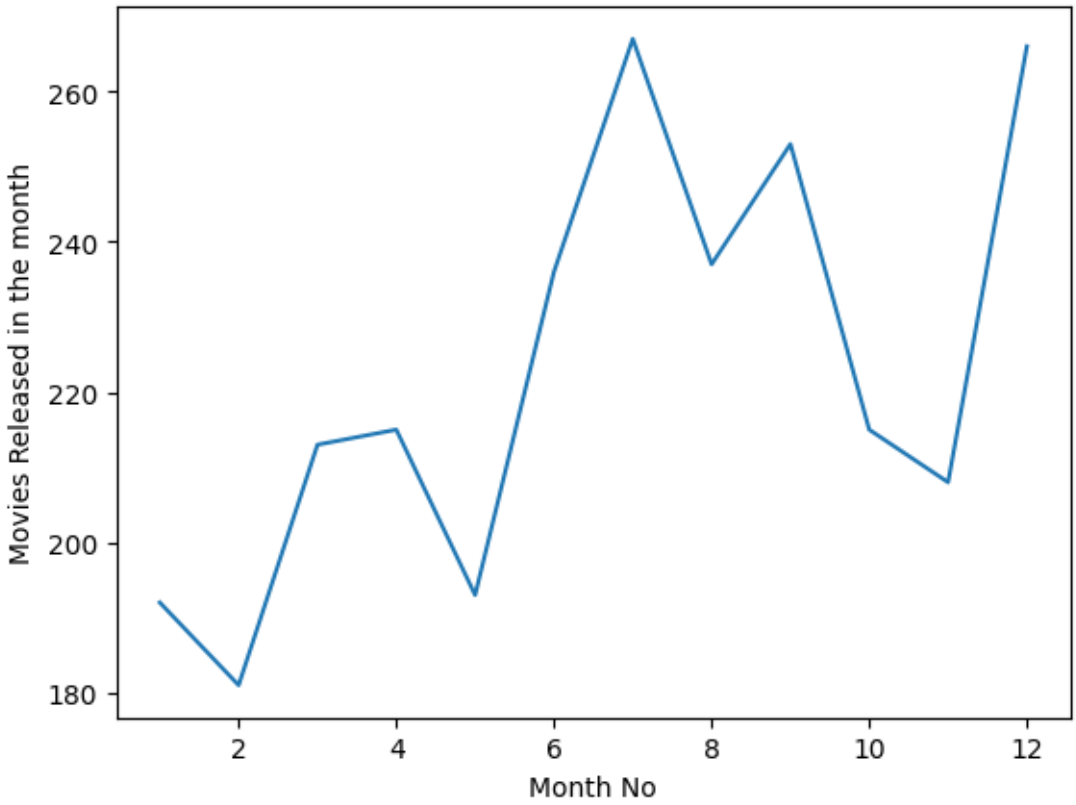
[65]:
```
df_year = df_shows.groupby(['year']).agg({'title':'nunique'}).reset_index()
sns.lineplot(data=df_year, x='year', y='title')
plt.xlabel('Year')
plt.ylabel('Shows Released in the Year')
plt.show()
```



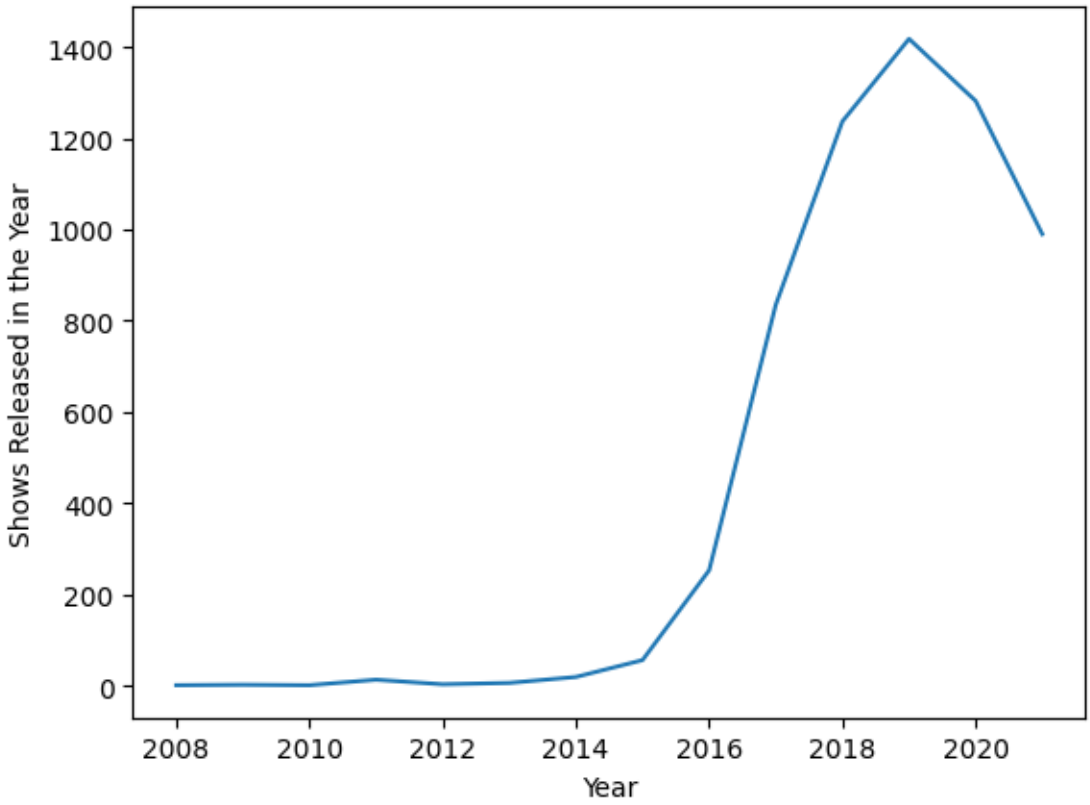
[66]:
```
df_week = df_shows.groupby(['week_Added']).agg({'title':'nunique'}).
  ↪reset_index()
sns.lineplot(data=df_week, x='week_Added', y='title')
plt.xlabel('Weak No')
plt.ylabel('Movies Released in the week')
plt.show()
```



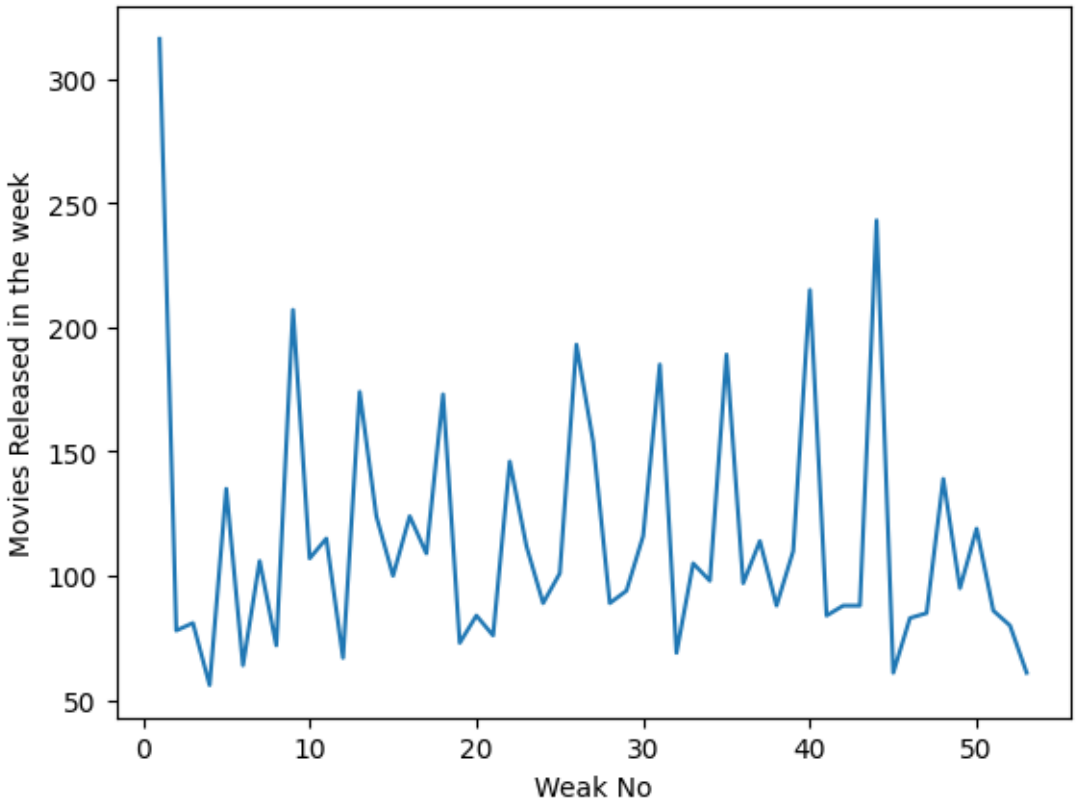
[67]:
```
df_month = df_shows.groupby(['month_added']).agg({'title':'nunique'}).
  ↪reset_index()
sns.lineplot(data=df_month, x='month_added', y='title')
plt.xlabel('Month No')
plt.ylabel('Movies Released in the month')
plt.show()
```



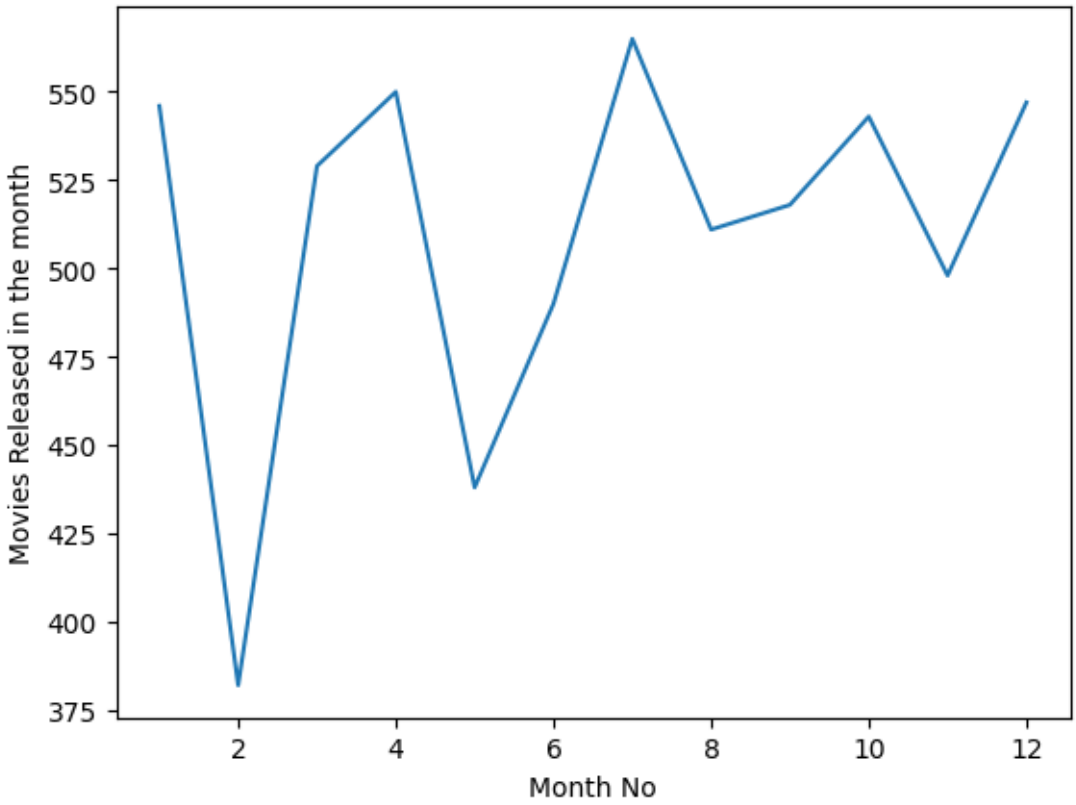
[68]:
```
df_year = df_movies.groupby(['year']).agg({'title':'nunique'}).reset_index()
sns.lineplot(data=df_year, x='year', y='title')
plt.xlabel('Year')
plt.ylabel('Shows Released in the Year')
plt.show()
```



[69]:
```
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()
```



[70]:
```
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()
```


Movies Released in the month
550
525
500
475
450
425
400
375
2
4
6
8
10
12
Month No

[ ]: