Import Libraries

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

Analysis The Movie Streaming Services

Reading dataset

```
dataset=pd.read_csv("moviestreams.csv")
dataset.head()
```

	Unnamed: 0	ID	Title	Year	Age	IMDb	Rotten Tomatoes	Netflix	Hulu	Prime Video	Disney+	Ty
0	0	1	Inception	2010	13+	8.8	87%	1	0	0	0	
1	1	2	The Matrix	1999	18+	8.7	87%	1	0	0	0	
2	2	3	Avengers: Infinity War	2018	13+	8.5	84%	1	0	0	0	
3	3	4	Back to the Future	1985	7+	8.5	96%	1	0	0	0	
4	4	5	The Good, the Bad and the Ugly	1966	18+	8.8	97%	1	0	1	0	

Check rows and columns

```
dataset.shape
```

```
(16744, 17)
```

Check columns

```
col=dataset.columns.tolist()
col
```

```
['Unnamed: 0',
 'ID',
 'Title',
 'Year',
 'Age',
 'IMDb',
 'Rotten Tomatoes',
 'Netflix',
 'Hulu',
 'Prime Video',
 'Disney+',
 'Type',
 'Directors',
 'Genres',
 'Country',
 'Language',
 'Runtime']
```

Drop Unnecessary column

```
dataset.drop(['Unnamed: 0','ID'],axis=1,inplace=True)
```

Check Again Column after drop

```
col=dataset.columns.tolist()
col
```

```
['Title',
 'Year',
 'Age',
 'IMDb',
 'Rotten Tomatoes',
 'Netflix',
 'Hulu',
 'Prime Video',
 'Disney+',
 'Type',
 'Directors',
 'Genres',
 'Country',
 'Language',
 'Runtime']
```

Check for missing values Python recognize null values as Nan

```
dataset.isnull().sum()
```

```
Title                  0
Year                   0
Age                 9390
IMDb                 571
Rotten Tomatoes    11586
Netflix                0
Hulu                   0
Prime Video            0
Disney+                0
Type                   0
Directors            726
Genres               275
Country              435
Language             599
Runtime              592
dtype: int64
```

Information of the dataset

```
dataset.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 16744 entries, 0 to 16743
Data columns (total 15 columns):
 #   Column           Non-Null Count  Dtype  
---  ------           --------------  -----  
 0   Title            16744 non-null  object 
 1   Year             16744 non-null  int64  
 2   Age              7354 non-null   object 
 3   IMDb             16173 non-null  float64
 4   Rotten Tomatoes  5158 non-null   object 
 5   Netflix          16744 non-null  int64  
 6   Hulu             16744 non-null  int64  
 7   Prime Video      16744 non-null  int64  
 8   Disney+          16744 non-null  int64  
 9   Type             16744 non-null  int64  
 10  Directors        16018 non-null  object 
 11  Genres           16469 non-null  object 
 12  Country          16309 non-null  object 
 13  Language         16145 non-null  object 
 14  Runtime          16152 non-null  float64
dtypes: float64(2), int64(6), object(7)
memory usage: 1.9+ MB
```

Lets Remove the '+' Sign attached values in Age column

```
age_map={'18+':18,'7+':7,'13+':13,'16+':16,'All':0}
dataset['Agecopy']=dataset['Age'].map(age_map)
dataset['Agecopy']
```

```
0        13.0
1        18.0
2        13.0
3         7.0
4        18.0
         ...
16739     NaN
16740     7.0
16741     NaN
16742     NaN
16743     NaN
Name: Agecopy, Length: 16744, dtype: float64
```

Lets remove the %sign attached to the vlues in Rotten Tomatoes column

```
dataset['New_Rotten_Tomatoes']=dataset['Rotten Tomatoes'].str.replace('%',"")
dataset['New_Rotten_Tomatoes']
```

```
0         87
1         87
2         84
3         96
4         97
         ...
16739    NaN
16740    NaN
16741    NaN
16742    NaN
16743    NaN
Name: New_Rotten_Tomatoes, Length: 16744, dtype: object
```

Change the datatype of Rotten_tomatoes First convert nonnumeric values (like empty strings) to NaNs and then if use pandas it is possible convert column to integers: Then for removing all non-numeric values use to_numeric with parameter errors='coerce' - to replace non-numeric values to NaNs:

```
dataset.New_Rotten_Tomatoes=pd.to_numeric(dataset.New_Rotten_Tomatoes,errors='coerce').astype
```

```
dataset.New_Rotten_Tomatoes.dtypes
```

```
Int64Dtype()
```

Stastics Information about the dataset

```
dataset.describe()
```

	Year	IMDb	Netflix	Hulu	Prime Video	Disney+
count	16744.000000	16173.000000	16744.000000	16744.000000	16744.000000	16744.000000
mean	2003.014035	5.902751	0.212613	0.053930	0.737817	0.033684
std	20.674321	1.347867	0.409169	0.225886	0.439835	0.180419
min	1902.000000	0.000000	0.000000	0.000000	0.000000	0.000000
25%	2000.000000	5.100000	0.000000	0.000000	0.000000	0.000000
50%	2012.000000	6.100000	0.000000	0.000000	1.000000	0.000000
75%	2016.000000	6.900000	0.000000	0.000000	1.000000	0.000000
max	2020.000000	9.300000	1.000000	1.000000	1.000000	1.000000

Show Visulization What is the number of movies of age group

```
df=dataset['Age'].value_counts()
```

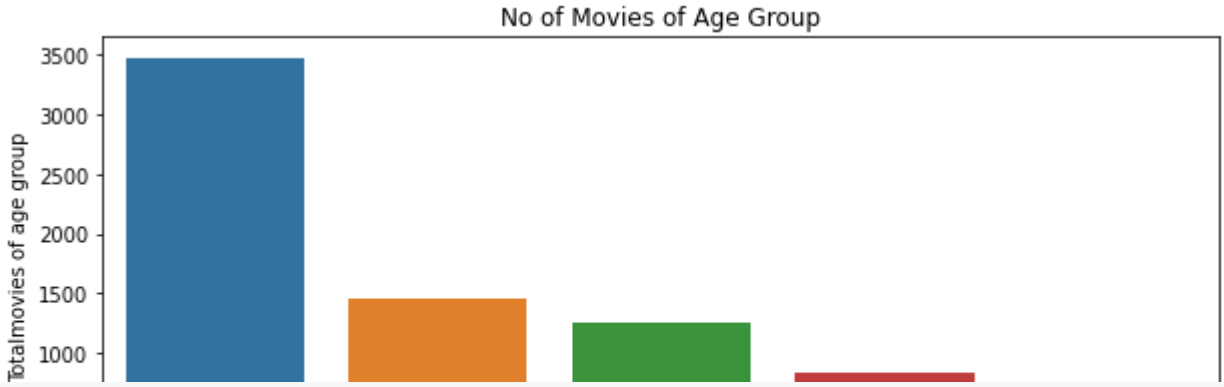
```
df.index
```

```
Index(['18+', '7+', '13+', 'all', '16+'], dtype='object')
```

```
df.values
```

```
array([3474, 1462, 1255,  843,  320])
```

```
plt.figure(figsize=(10,4))
sns.barplot(x=df.index,y=df.values)
plt.title("No of Movies of Age Group")
plt.xlabel("Age")
plt.ylabel('Totalmovies of age group')
plt.show()
```

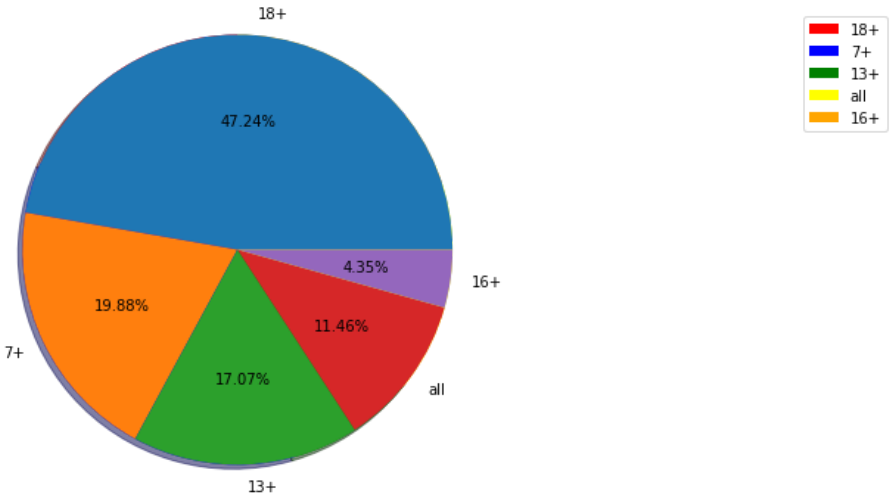



```
plt.figure(figsize=(16,6))

labels = ['18+', '7+', '13+', 'all','16+']
sizes = [23, 45, 12, 20,25]
colors = ['red', 'blue', 'green', 'yellow','orange']

patches, texts = plt.pie(sizes, colors=colors, shadow=True, startangle=90)
plt.legend(patches, labels, loc="best")

plt.pie(x=df.values,autopct='%1.2f%%',labels=labels)
plt.axis("equal")
plt.show()
```



Show Visulization Top 10 languages in streaming services

```
lan=dataset['Language'].value_counts().head(10)
lan
```

```
English            10955
Hindi                503
English,Spanish      276
Spanish              267
English,French       174
Italian              166
French               163
Japanese             155
Mandarin             151
Tamil                 93
Name: Language, dtype: int64
```

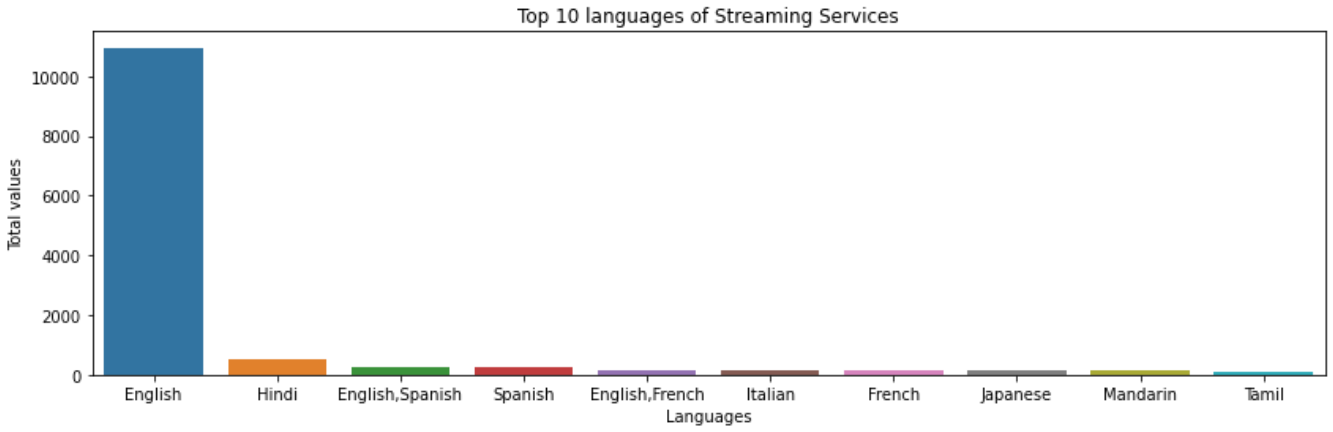
```
lan.index
```

```
Index(['English', 'Hindi', 'English,Spanish', 'Spanish', 'English,French',
       'Italian', 'French', 'Japanese', 'Mandarin', 'Tamil'],
      dtype='object')
```

```
lan.values
```

```
array([10955,   503,   276,   267,   174,   166,   163,   155,   151,
          93])
```

```
plt.figure(figsize=(14,4))
sns.barplot(x=lan.index,y=lan.values)
plt.title("Top 10 languages of Streaming Services")
plt.xlabel("Languages")
plt.ylabel('Total values')
plt.show()
```



Number of Age groups specific in Netflix

```
df_netflix=dataset[dataset['Netflix']==1]
```

```
df1=df_netflix['Age'].value_counts()
```

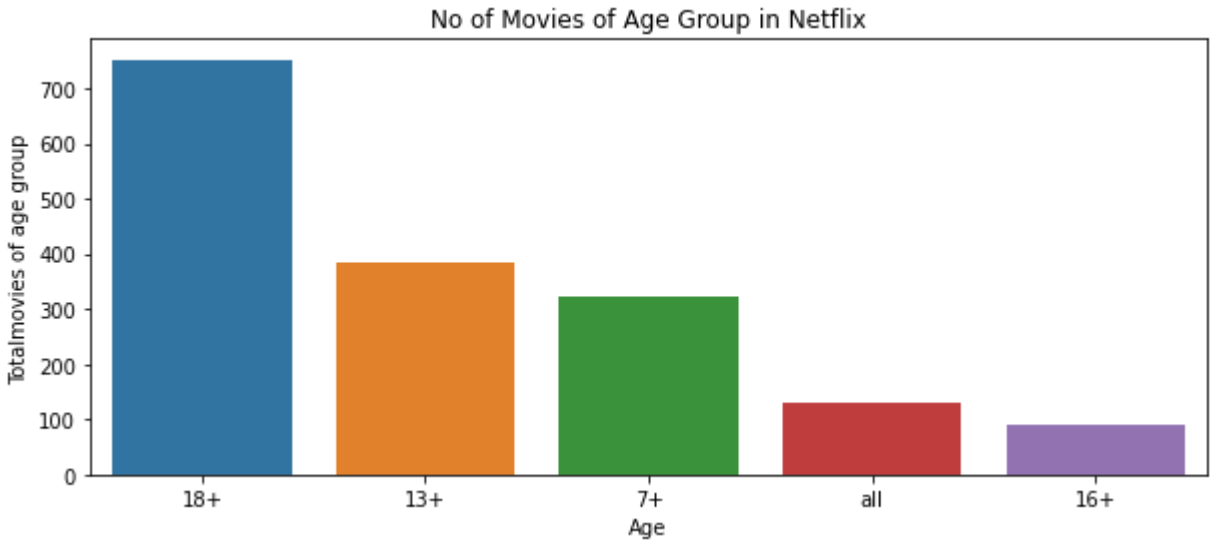
```
df1.index
```

```
Index(['18+', '13+', '7+', 'all', '16+'], dtype='object')
```

```
df1.values
```

```
array([752, 383, 323, 130,  89])
```

```
plt.figure(figsize=(10,4))
sns.barplot(x=df1.index,y=df1.values)
plt.title("No of Movies of Age Group in Netflix")
plt.xlabel("Age")
plt.ylabel('Totalmovies of age group')
plt.show()
```



Number of Age groups specific in Amazon

```
df_amazon=dataset[dataset['Prime Video']==1]
```

```
df1=df_amazon['Age'].value_counts()
df1
```

```
18+    2612
7+      916
13+     819
all     406
16+     226
Name: Age, dtype: int64
```

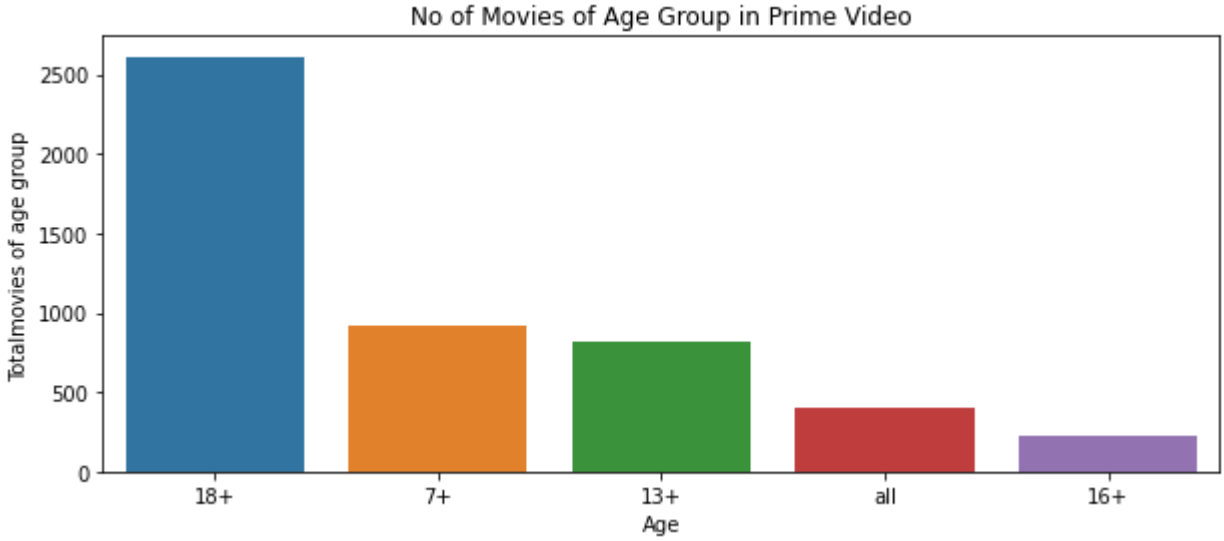
```
df1.index
```

```
Index(['18+', '7+', '13+', 'all', '16+'], dtype='object')
```

```
df1.values
```

```
array([2612,  916,  819,  406,  226])
```

```
plt.figure(figsize=(10,4))
sns.barplot(x=df1.index,y=df1.values)
plt.title("No of Movies of Age Group in Prime Video")
plt.xlabel("Age")
plt.ylabel('Totalmovies of age group')
plt.show()
```



No of Age groups in Hulu

```
df_hulu=dataset[dataset['Hulu']==1]
```

```
df1=df_hulu['Age'].value_counts()
```

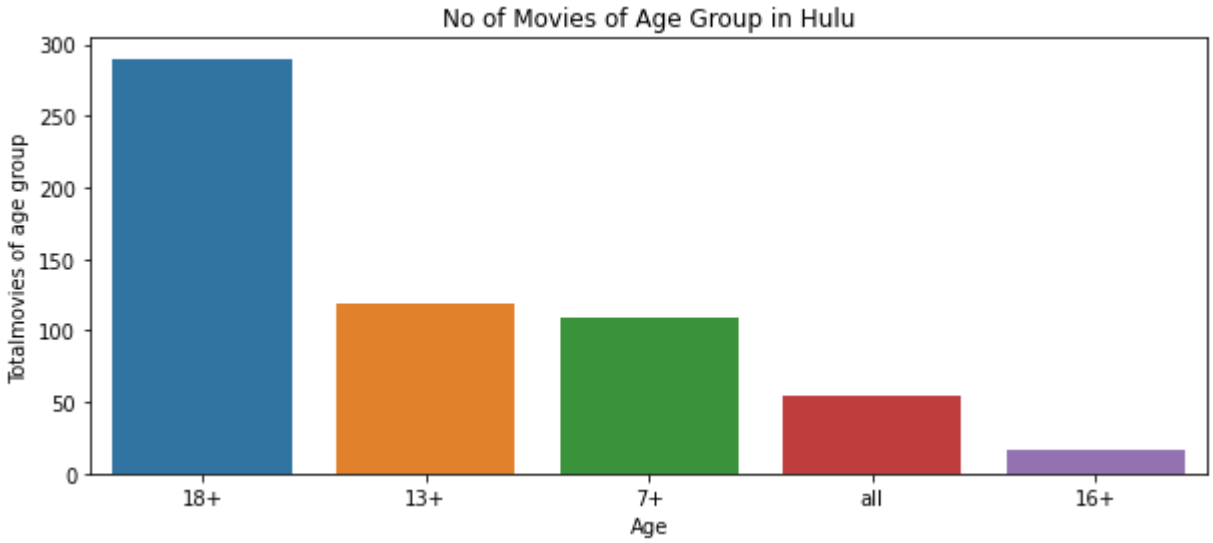
```
df1.index
```

```
Index(['18+', '13+', '7+', 'all', '16+'], dtype='object')
```

```
df1.values
```

```
array([290, 119, 109,  55,  17])
```

```
plt.figure(figsize=(10,4))
sns.barplot(x=df1.index,y=df1.values)
plt.title("No of Movies of Age Group in Hulu")
plt.xlabel("Age")
plt.ylabel('Totalmovies of age group')
plt.show()
```



No of Age Groups in Disney+

```
df_disney=dataset[dataset['Disney+']==1]
```

```
df1=df_disney['Age'].value_counts()
df1
```

```
all    277
7+     179
13+     40
18+      3
16+      1
Name: Age, dtype: int64
```

```
df1.index
```

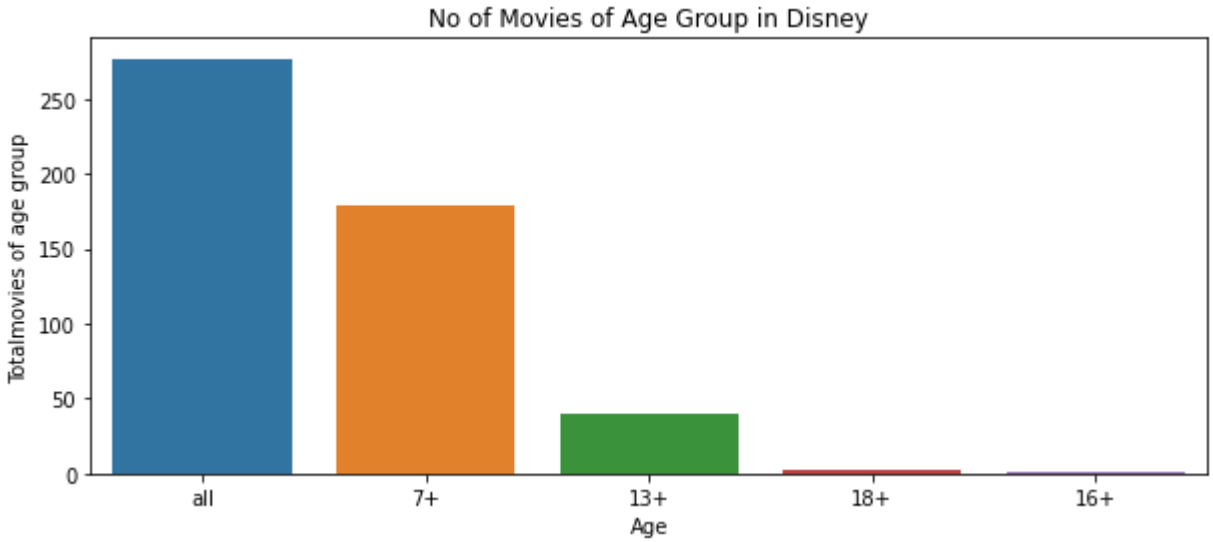
```
Index(['all', '7+', '13+', '18+', '16+'], dtype='object')
```

```
df1.values
```

```
array([277, 179,  40,   3,   1])
```

```
plt.figure(figsize=(10,4))
sns.barplot(x=df1.index,y=df1.values)
```

```
plt.title("No of Movies of Age Group in Disney")
plt.xlabel("Age")
plt.ylabel('Totalmovies of age group')
plt.show()
```



Overall Rotten Tomato Ratings

```
df=dataset['New_Rotten_Tomatoes'].value_counts()
df
```

```
100    407
80     162
50     136
83     131
67     126
      ...
28      10
7       10
4        9
3        4
2        4
Name: New_Rotten_Tomatoes, Length: 99, dtype: Int64
```

```
df.index
```

```
Int64Index([100,  80,  50,  83,  67,  88,  86,  40,  92,  75,  91,  89,  60,
            90,  57,  33,  20,  85,  71,  94,  93,  96,  95,  82,  87,  43,
            81,  63,  78,  38,  73,  29,  77,  97,  64,  84,  17,  70,  76,
            79,  69,  44,  56,  25,  22,  62,  42,  45,  98,  74,  55,  72,
            14,  68,  65,  13,  53,  58,  47,  27,  36,  30,  61,  54,  41,
            18,  59,  11,  99,  52,  19,  32,  21,  39,  16,  10,  37,  46,
            66,   8,   9,  48,  24,  26,  23,  35,  31,  51,  34,  15,  49,
            12,   6,   5,  28,   7,   4,   3,   2],
           dtype='int64')
```

```
df.values
```

```
<IntegerArray>
[407, 162, 136, 131, 126, 121, 116, 106, 106, 100, 100,  98,  98,  91,  84,
  82,  79,  78,  78,  76,  73,  73,  72,  71,  68,  68,  67,  66,  65,  64,
  64,  64,  62,  61,  59,  58,  57,  55,  53,  48,  46,  45,  44,  44,  42,
  41,  41,  41,  41,  38,  37,  36,  36,  36,  35,  34,  33,  33,  33,  33,
  31,  30,  30,  30,  30,  29,  29,  27,  26,  26,  26,  24,  21,  21,  21,
  20,  20,  20,  20,  19,  19,  19,  18,  17,  17,  16,  16,  14,  14,  14,
  13,  11,  11,  10,  10,  10,   9,   4,   4]
Length: 99, dtype: Int64
```

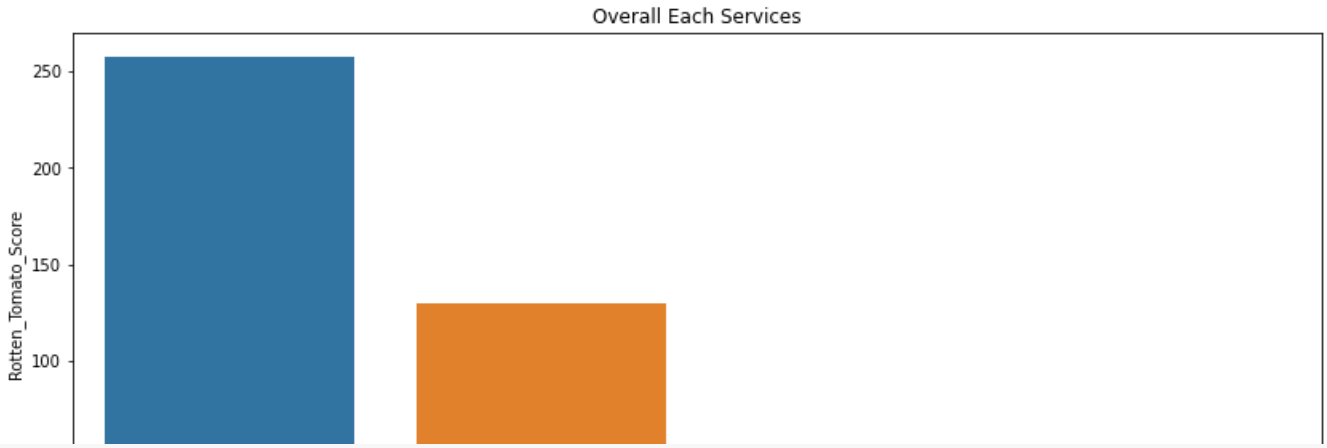
Rotten Tomato for each Service and find highest rotten for each service

```
rt_score=pd.DataFrame({'Streaming_Services':['Netflix','Hulu','Disney+','Prime Video'],
'Rotten_Tomato_Score':[df_netflix['Rotten Tomatoes'].value_counts()[0],
df_hulu['Rotten Tomatoes'].value_counts()[0],
df_disney['Rotten Tomatoes'].value_counts()[0],
df_amazon['Rotten Tomatoes'].value_counts()[0]
]})

rt=rt_score.sort_values(ascending=False,by='Rotten_Tomato_Score')
rt
```

	Streaming_Services	Rotten_Tomato_Score
3	Prime Video	257
0	Netflix	130
2	Disney+	19
1	Hulu	18

```
plt.figure(figsize=(14,6))
sns.barplot(x='Streaming_Services',y='Rotten_Tomato_Score',data=rt)
plt.title("Overall Each Services")
plt.show()
```

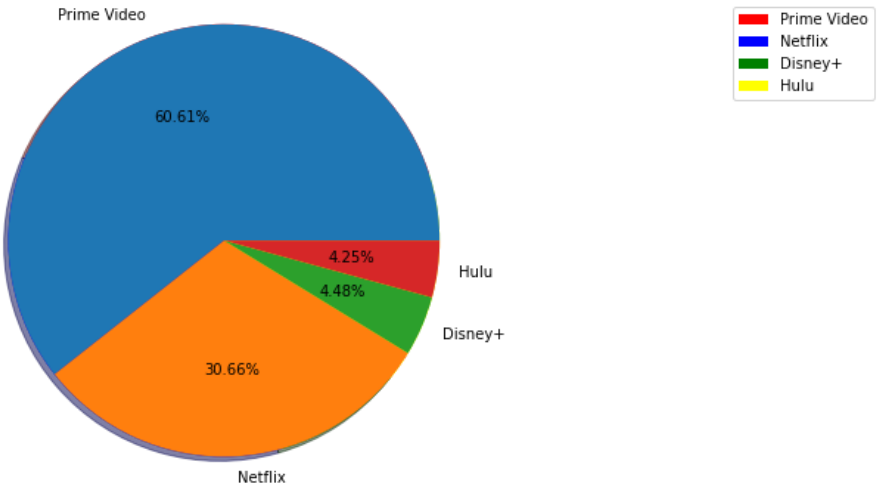



```
import matplotlib.pyplot as plt
plt.figure(figsize=(16,6))

labels = ['Prime Video', 'Netflix', 'Disney+', 'Hulu']
sizes = [23, 45, 12, 20,25]
colors = ['red', 'blue', 'green', 'yellow']

patches, texts = plt.pie(sizes, colors=colors, shadow=True, startangle=90)
plt.legend(patches, labels, loc="best")
plt.pie(x='Rotten_Tomato_Score',autopct='%1.2f%%',data=rt,labels=labels)

plt.axis("equal")
plt.show()
```



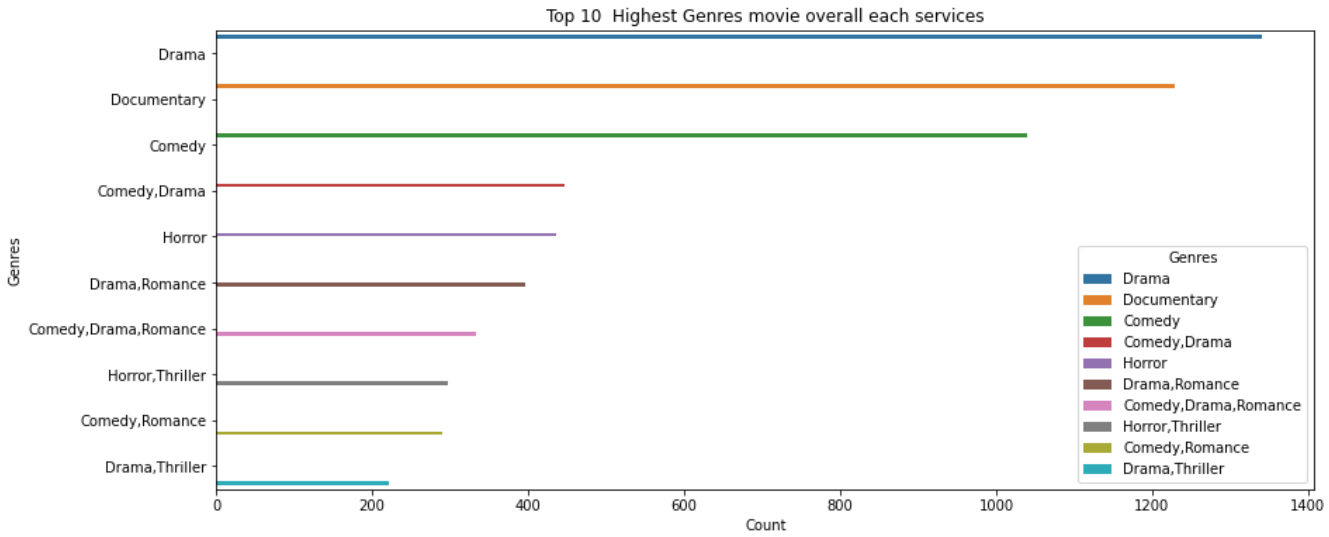
Top 10 Highest Genres Movie over all streaming services

```
genre=dataset.groupby('Genres').size().sort_values(ascending=False).reset_index().rename(colu
genre_df=genre.head(10)
```

```
genre_df
```

	Genres	Count
0	Drama	1341
1	Documentary	1229
2	Comedy	1040
3	Comedy,Drama	446
4	Horror	436
5	Drama,Romance	397
6	Comedy,Drama,Romance	333
7	Horror,Thriller	297
8	Comedy,Romance	289
9	Drama,Thriller	222

```
plt.figure(figsize=(14,6))
sns.barplot(x='Count',y='Genres',data=genre_df,hue='Genres')
plt.title("Top 10  Highest Genres movie overall each services")
plt.show()
```



Runtime of Movies

```
runtime_duration=pd.DataFrame(dict(dataset['Runtime'].value_counts().sort_values(ascending=Fa
                              columns=['Runtime','Count'])
runtime_duration
```

	Runtime	Count
0	90.0	971
1	95.0	489
2	92.0	434
3	93.0	422
4	85.0	408
...	...	...
152	19.0	8
153	32.0	8
154	9.0	8
155	7.0	8
156	10.0	8

157 rows × 2 columns

Top 10 directors

```
dataset['Directors']=dataset['Directors'].astype(str)
new_data=dataset[dataset['Directors'] !=np.nan]
directors_count=dict()
direct=list(new_data['Directors'])
for xdir in direct:
  curr_dirc= xdir.split(',')
  for xd in curr_dirc:
    if xd in directors_count.keys():
      directors_count[xd]=directors_count[xd]+1
    else:
      directors_count[xd]=1
```

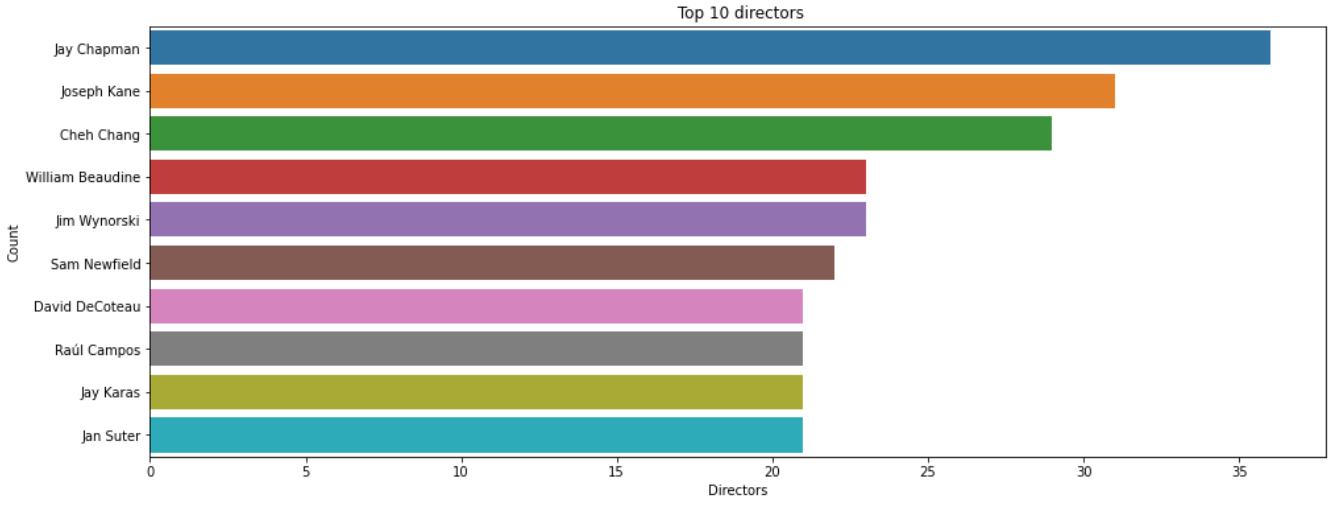
```
mov=pd.DataFrame(directors_count.items(),columns=['Director','Count'])

mov=mov.sort_values(ascending=False,by='Count')
mov=mov.drop(56,axis=0)
```

```
df=mov.head(10)
df
```

	Director	Count
977	Jay Chapman	36
8166	Joseph Kane	31
1103	Cheh Chang	29
6950	William Beaudine	23
4827	Jim Wynorski	23
8665	Sam Newfield	22
8519	David DeCoteau	21
1414	Raúl Campos	21
136	Jay Karas	21
1415	Jan Suter	21

```
plt.figure(figsize=(16,6))
sns.barplot(y='Director',x='Count',data=df)
plt.title(" Top 10 directors")
plt.ylabel("Count")
plt.xlabel('Directors')
plt.show()
```



Find out Jay chapman movies

```
data=dataset[dataset['Directors']=='Jay Chapman'][['Directors','Title','Genres','Runtime']]
data
```

	Directors	Title	Genres	Runtime
1014	Jay Chapman	Jim Gaffigan: Obsessed	Documentary,Comedy	60.0
1234	Jay Chapman	Iliza Shlesinger: War Paint	Comedy	75.0
1417	Jay Chapman	Tom Segura: Completely Normal	Documentary,Comedy	74.0
2211	Jay Chapman	Todd Barry: Spicy Honey	Comedy	60.0
2331	Jay Chapman	Craig Ferguson: Tickle Fight	Comedy	66.0

Exploring Genres

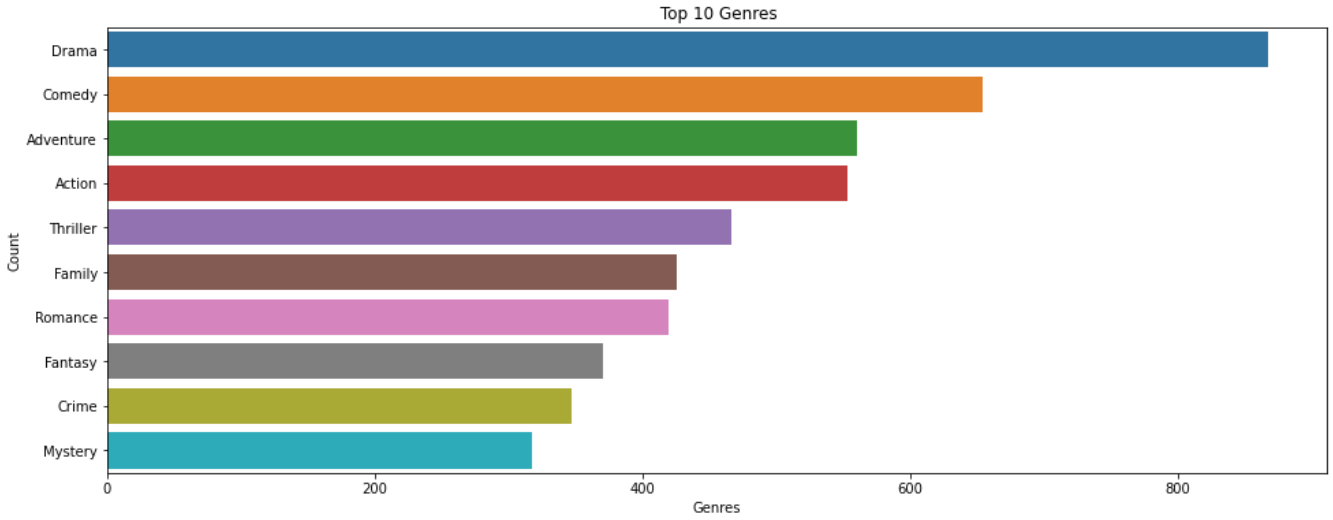
```
genre_=dict(dataset['Genres'].value_counts())
genre_count=dict()
for g ,count in genre_.items():
 g= g.split(',')
 for xd in g:
   if xd in genre_count.keys():
     genre_count[xd]=genre_count[xd]+1
   else:
      genre_count[xd]=1
```

```
genres_=pd.DataFrame(genre_count.items(),columns=['Genre','Count'])

genres_=genres_.sort_values(ascending=False,by='Count')
df1=genres_.head(10)
df1
```

	Genre	Count
0	Drama	868
2	Comedy	654

```
plt.figure(figsize=(16,6))
sns.barplot(y='Genre',x='Count',data=df1)
plt.title(" Top 10 Genres")
plt.ylabel("Count")
plt.xlabel('Genres')
plt.show()
```



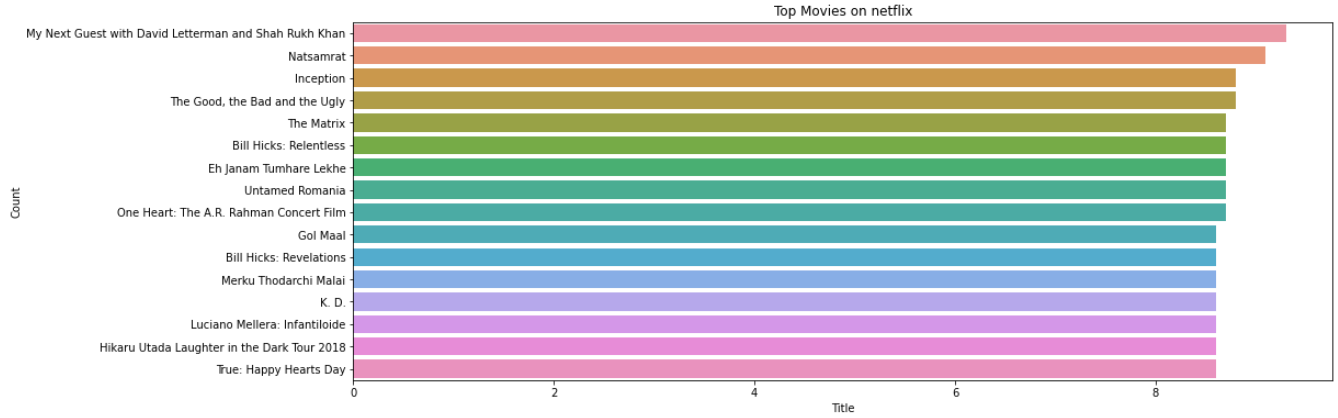
What are the top movies on each platform

On Netflix

```
top_netflix=df_netflix[df_netflix['IMDb']>8.5]
top_df=top_netflix[['Title','IMDb']].sort_values(ascending=False,by='IMDb')
top_df
```

	Title	IMDb
1292	My Next Guest with David Letterman and Shah Ru...	9.3
947	Natsamrat	9.1
0	Inception	8.8
4	The Good, the Bad and the Ugly	8.8
1	The Matrix	8.7
1214	Bill Hicks: Relentless	8.7
1311	Eh Janam Tumhare Lekhe	8.7
1458	Untamed Romania	8.7
1979	One Heart: The A.R. Rahman Concert Film	8.7
845	Gol Maal	8.6
1312	Bill Hicks: Revelations	8.6
1356	Merku Thodarchi Malai	8.6

```
plt.figure(figsize=(16,6))
sns.barplot(y='Title',x='IMDb',data=top_df)
plt.title("Top Movies on netflix")
plt.ylabel("Count")
plt.xlabel('Title')
plt.show()
```

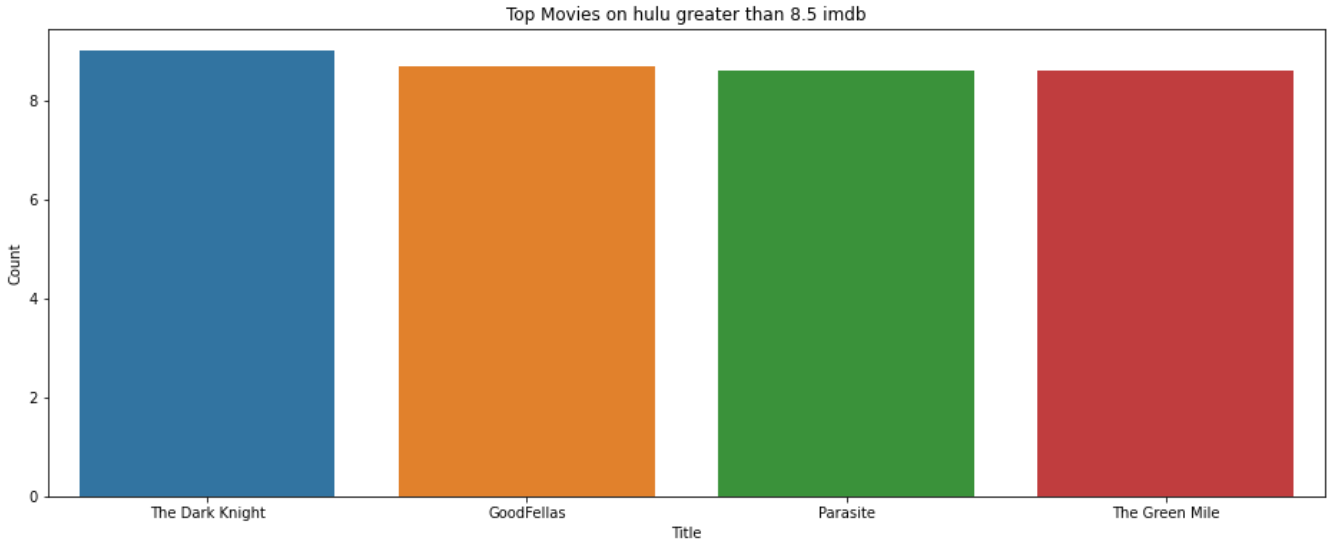


on hulu

```
top_hulu=df_hulu[df_hulu['IMDb']>8.5]
top_df1=top_hulu[['Title','IMDb']].sort_values(ascending=False,by='IMDb')
top_df1
```

	Title	IMDb
3560	The Dark Knight	9.0
3561	GoodFellas	8.7
3562	Parasite	8.6
3564	The Green Mile	8.6

```
plt.figure(figsize=(16,6))
sns.barplot(x='Title',y='IMDb',data=top_df1)
plt.title("Top Movies on hulu greater than 8.5 imdb")
plt.ylabel("Count")
plt.xlabel('Title')
plt.show()
```

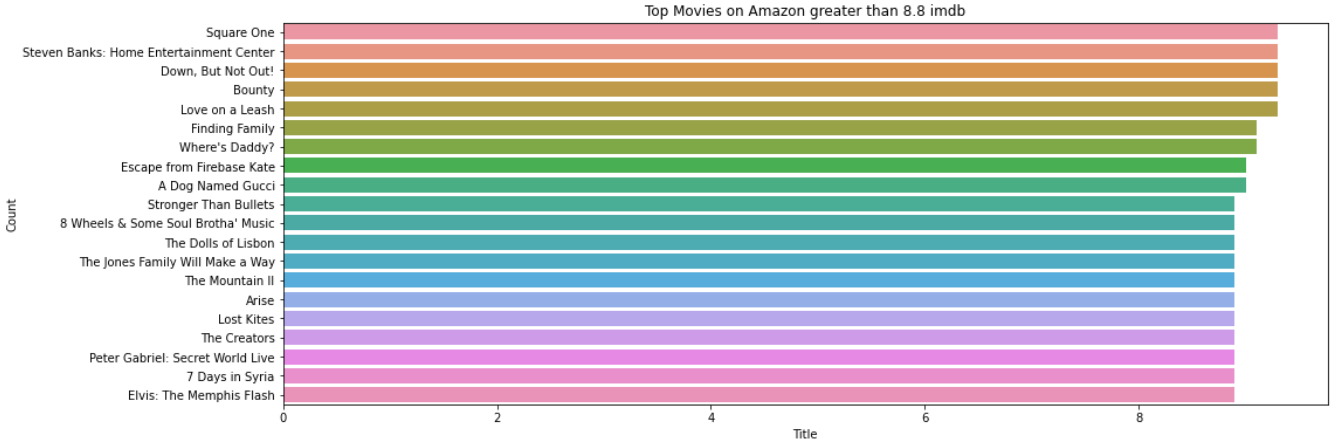


On Amazon Prime Video

```
top_amazon=df_amazon[df_amazon['IMDb']>8.8]
top_df2=top_amazon[['Title','IMDb']].sort_values(ascending=False,by='IMDb')
top_df2
```

	Title	IMDb
6566	Square One	9.3
6837	Steven Banks: Home Entertainment Center	9.3
7220	Down, But Not Out!	9.3
7426	Bounty	9.3
5110	Love on a Leash	9.3
7491	Finding Family	9.1
8458	Where's Daddy?	9.1
7002	Escape from Firebase Kate	9.0
7267	A Dog Named Gucci	9.0
8359	Stronger Than Bullets	8.9
10249	8 Wheels & Some Soul Brotha' Music	8.9
9003	The Dolls of Lisbon	8.9
8800	The Jones Family Will Make a Way	8.9
4829	The Mountain II	8.9
8271	Arise	8.9
8220	Lost Kites	8.9
8169	The Creators	8.9
6840	Peter Gabriel: Secret World Live	8.9
6424	7 Days in Syria	8.9
11079	Elvis: The Memphis Flash	8.9

```
plt.figure(figsize=(16,6))
sns.barplot(y='Title',x='IMDb',data=top_df2)
plt.title("Top Movies on Amazon greater than 8.8 imdb")
plt.ylabel("Count")
plt.xlabel('Title')
plt.show()
```

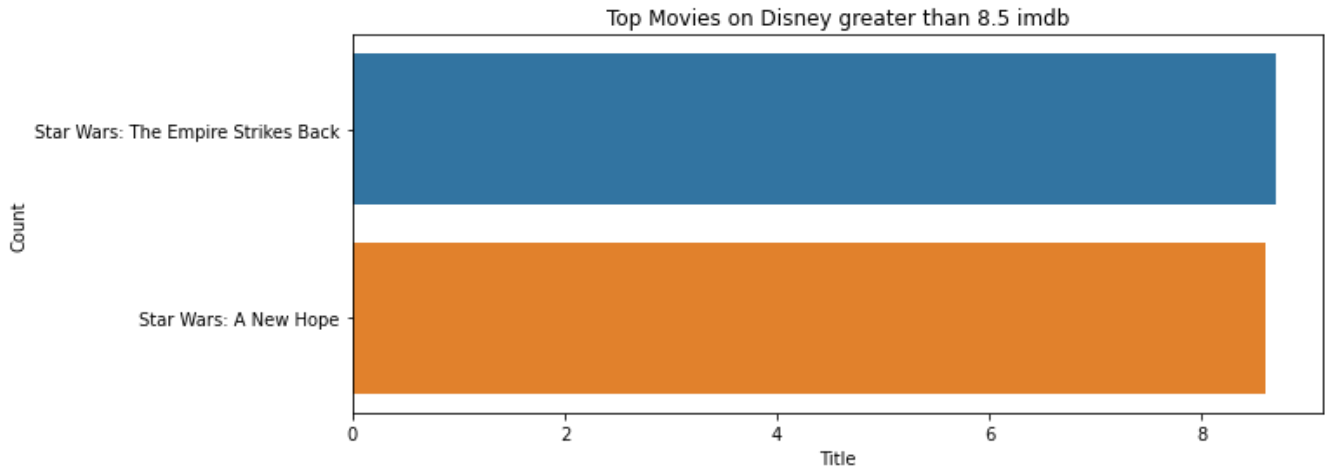


On Disney+

```
top_disney=df_disney[df_disney['IMDb']>8.5]
top_df3=top_disney[['Title','IMDb']].sort_values(ascending=False,by='IMDb')
top_df3
```

	Title	IMDb
16213	Star Wars: The Empire Strikes Back	8.7
16212	Star Wars: A New Hope	8.6

```
plt.figure(figsize=(10,4))
sns.barplot(y='Title',x='IMDb',data=top_df3)
plt.title("Top·Movies·on·Disney·greater·than·8.5·imdb")
plt.ylabel("Count")
plt.xlabel('Title')
plt.show()
```



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