INDEX

- Creating data frame from the given dataset
- Replacing Null values
- Un-nesting the columns those have cells with multiple comma separated
- Segregating the duration into "movie_minutes" and "seasons"
- Counting number of movies and TV shows
- Actors with most number of movies
- Directors with most number of movies
- Finding top 10 countries which have produced most of movies.
- Finding top 10 countries which have porduced most of TV shows.
- Finding the top 10 directors who have been most productive in last 15 years
- Finding the top 10 actors who have been most productive in last 15 years
- Find which is the best week to release a Movie or a TV Show
- Plotting graph that how many TV Shows added on various weeks of an year
- Find which is the best month to release a Movie or a TV Show
- Finding the Top 10 Genre of the movies and shows
- Finding the Days of week when Movies and TV Shows are released on OTT

Importing the libraries and fetching the dataset

```
import pandas as pd
import numpy as np
```

Creating data frame from the given dataset

```
df=pd.read_csv("netflix.csv")
df.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	NaN	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lor...

Next steps: Generate code with df View recommended plots New interactive sheet

Replacing Null values

```
df["director"]=df["director"].fillna("Unknown director")
df["cast"]=df["cast"].fillna("Unknown actor")
df["country"]=df["country"].fillna("Unknown country")
df["rating"]=df["rating"].fillna("Unknown rating")
```

```
df["description"]=df["description"].fillna("Unknown description")
df["type"]=df["type"].fillna("Unknown type")
df.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
1	s2	TV Show	Blood & Water	Unknown director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown country	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lor...

Next steps: Generate code with df View recommended plots New interactive sheet

Un-nesting the columns those have cells with multiple comma separated

```
director_list=df["director"].apply(lambda x:x.split(", ")).tolist()
director_df=pd.DataFrame(director_list,index=df["title"]).stack().reset_index().drop(columns="level_1")
director_df.columns=["title" , "director"]
director_df.head(10)
```

	title	director
0	Dick Johnson Is Dead	Kirsten Johnson
1	Blood & Water	Unknown director
2	Ganglands	Julien Leclercq
3	Jailbirds New Orleans	Unknown director
4	Kota Factory	Unknown director
5	Midnight Mass	Mike Flanagan
6	My Little Pony: A New Generation	Robert Cullen
7	My Little Pony: A New Generation	José Luis Ucha
8	Sankofa	Haile Gerima
9	The Great British Baking Show	Andy Devonshire

Next steps: Generate code with director_df View recommended plots New interactive sheet

```
df["cast"]=df["cast"].fillna("Unknown Director")
actor_list=df["cast"].apply(lambda x:x.split(", ")).tolist()
actor_df=pd.DataFrame(actor_list,index=df["title"]).stack().reset_index().drop(columns="level_1")
actor_df.columns=["title","actor"]
actor_df.head(10)
```

	title	actor
0	Dick Johnson Is Dead	Unknown actor
1	Blood & Water	Ama Qamata
2	Blood & Water	Khosi Ngema
3	Blood & Water	Gail Mabalane
4	Blood & Water	Thabang Molaba
5	Blood & Water	Dillon Windvogel
6	Blood & Water	Natasha Thahane
7	Blood & Water	Arno Greeff
8	Blood & Water	Xolile Tshabalala
9	Blood & Water	Getmore Sithole

Next steps: Generate code with actor_df View recommended plots New interactive sheet

Segregating the duration into "movie_minutes" and "seasons"

```
df["duration"]=df["duration"].fillna("0")
df["movie_minutes"]=df["duration"][df["type"]=="Movie"].apply(lambda x:int(x.split(" ")[0]))
df["seasons"]=df["duration"][df["type"]=="TV Show"].apply(lambda x:int(x.split(" ")[0]))
df.drop(columns="duration").head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	listed_in	description	movie_minute
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown actor	United States	September 25, 2021	2020	PG-13	Documentaries	As her father nears the end of his life, filmm...	90
1	s2	TV Show	Blood & Water	Unknown director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...	Na
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown country	September 24, 2021	2021	TV-MA	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lor...	Na
3	s4	TV Show	Jailbirds New Orleans	Unknown director	Unknown actor	Unknown country	September 24, 2021	2021	TV-MA	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo...	Na
4	s5	TV Show	Kota Factory	Unknown director	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K	India	September 24, 2021	2021	TV-MA	International TV Shows, Romantic TV Shows, TV ...	In a city of coaching centers known to train I...	Na

Counting number of movies and TV shows

```
df["type"].value_counts()
```

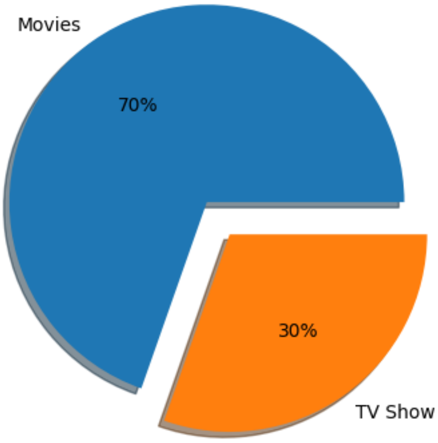
type	count
Movie	6131
TV Show	2676

Graphical representation showing the proportion of movies and shows

```
import matplotlib.pyplot as plt

y = df["type"].value_counts()
# mylabels = ["Movies", "TV Show"]

plt.pie(y , labels =["Movies", "TV Show"] , explode=[0.2, 0] ,shadow = True , autopct='%1.0f%%')
plt.show()
```



Actors with most number of movies

```
actor_df["actor"][actor_df["actor"]!="Unknown actor"].value_counts().head(10)
```

actor	count
Anupam Kher	43
Shah Rukh Khan	35
Julie Tejwani	33
Takahiro Sakurai	32
Naseeruddin Shah	32
Rupa Bhimani	31
Om Puri	30
Akshay Kumar	30
Yuki Kaji	29
Amitabh Bachchan	28

Directors with most number of movies

```
director_df["director"][director_df["director"]!="Unknown director"].value_counts().head(10)
```

director	count
Rajiv Chilaka	22
Jan Suter	21
Raúl Campos	19
Suhas Kadav	16
Marcus Raboy	16
Jay Karas	15
Cathy Garcia-Molina	13
Martin Scorsese	12
Youssef Chahine	12
Jay Chapman	12

Finding top 10 countries which have produced most of movies.

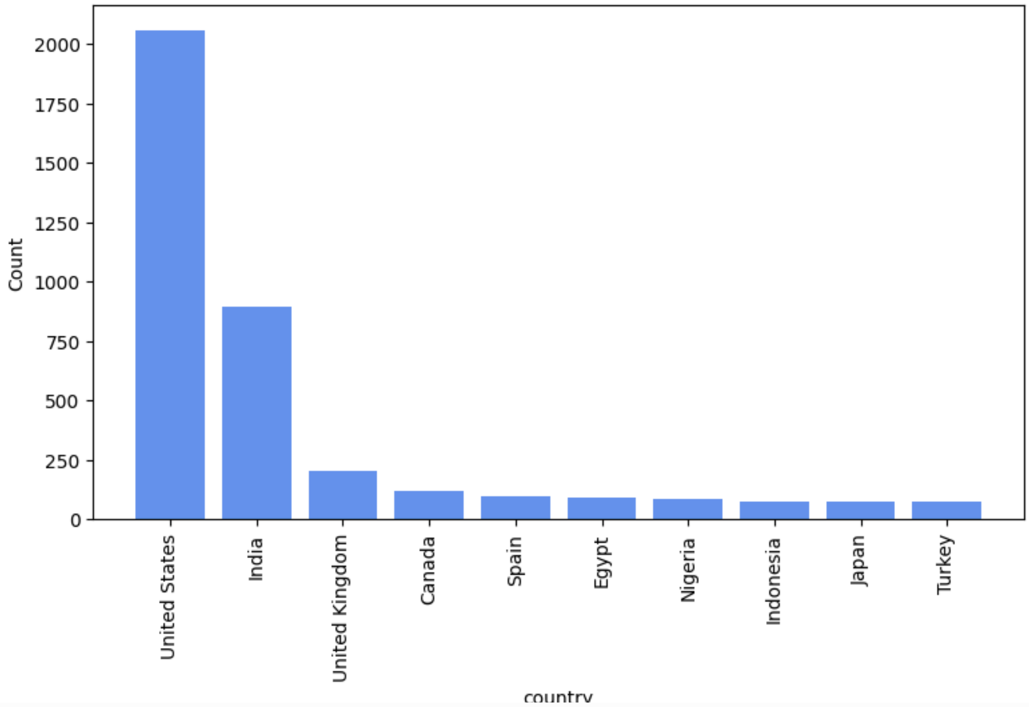
```
mv=df[(df["type"] == "Movie") &(df["country"] != "Unknown country") ].groupby("country")["title"].count().sort_values(ascending=False).
mv
```

	country	title
0	United States	2058
1	India	893
2	United Kingdom	206
3	Canada	122
4	Spain	97
5	Egypt	92
6	Nigeria	86
7	Indonesia	77
8	Japan	76
9	Turkey	76

Next steps: Generate code with mv View recommended plots New interactive sheet

Graphical representaion of above table

```
plt.figure(figsize=(9,5))
plt.bar(mv["country"], mv["title"] , color='cornflowerblue')
plt.xticks(rotation=90, fontsize=10)
plt.ylabel("Count")
plt.xlabel("country")
plt.show()
```



Finding top 10 countries which have porduced most of TV shows.

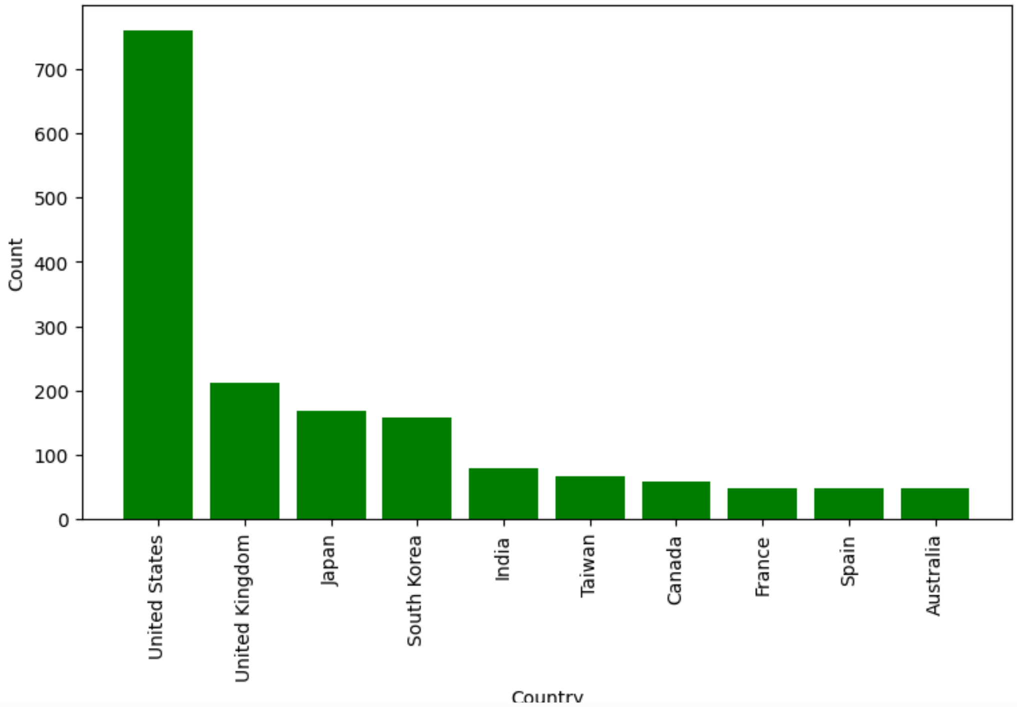
```
tv=df[(df["type"]=="TV Show")&(df["country"]!="Unknown country")].groupby("country")["title"].count().sort_values(ascending=False).rese
tv
```

	country	title
0	United States	760
1	United Kingdom	213
2	Japan	169
3	South Korea	158
4	India	79
5	Taiwan	68
6	Canada	59
7	France	49
8	Spain	48
9	Australia	48

Next steps: Generate code with tv | View recommended plots | New interactive sheet

Graphical representaion of above table

```
plt.figure(figsize=(9,5))
plt.bar(tv["country"], tv["title"] , color='green')
plt.xticks(rotation=90, fontsize=10)
plt.ylabel("Count")
plt.xlabel("Country")
plt.show()
```



Finding the top 10 directors who have been most productive in last 15 years

```
year_df=df[["title","release_year","country"]][(df["release_year"]>=2011)]

year_direc_merge_df=pd.merge(director_df,year_df , on="title" , how="right")[["title","director","release_year","country"]]
year_direc_merge_df.head(10)
```

	title	director	release_year	country
0	Dick Johnson Is Dead	Kirsten Johnson	2020	United States
1	Blood & Water	Unknown director	2021	South Africa
2	Ganglands	Julien Leclercq	2021	Unknown country
3	Jailbirds New Orleans	Unknown director	2021	Unknown country
4	Kota Factory	Unknown director	2021	India
5	Midnight Mass	Mike Flanagan	2021	Unknown country
6	My Little Pony: A New Generation	Robert Cullen	2021	Unknown country
7	My Little Pony: A New Generation	José Luis Ucha	2021	Unknown country
8	The Great British Baking Show	Andy Devonshire	2021	United Kingdom
9	The Starling	Theodore Melfi	2021	United States

Next steps: Generate code with year_direc_merge_df View recommended plots New interactive sheet

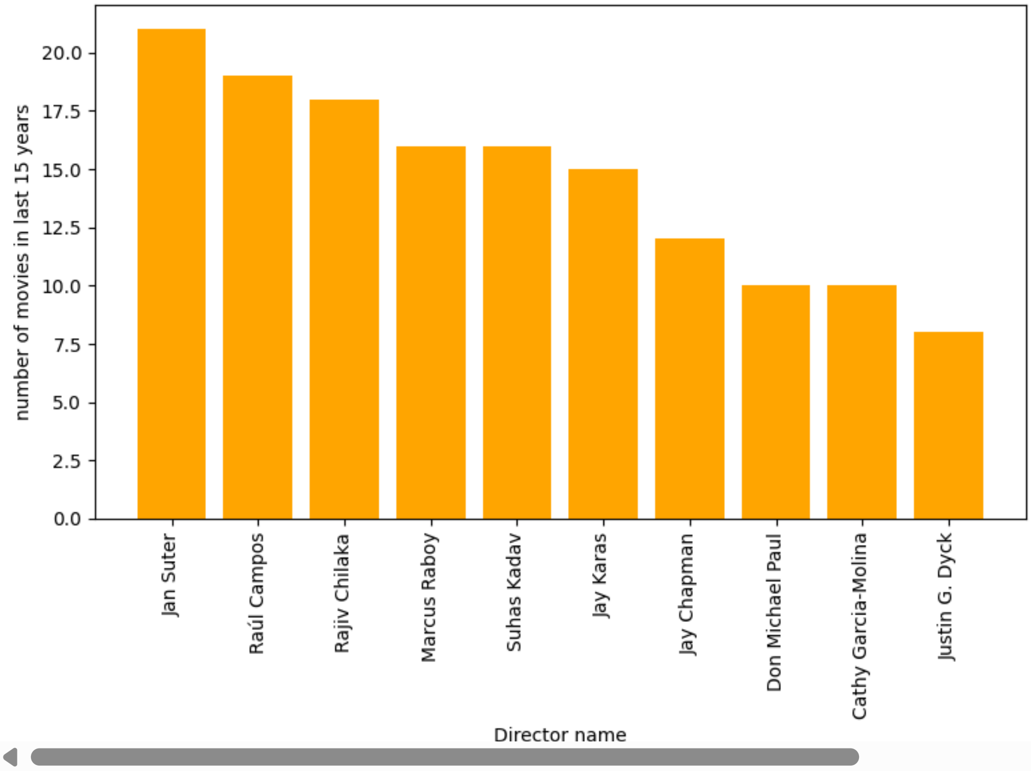
```
productive_dir=year_direc_merge_df["director"][year_direc_merge_df["director"]!="Unknown director"].value_counts().reset_index().head(1
productive_dir.head(10)
```

	director	count
0	Jan Suter	21
1	Raúl Campos	19
2	Rajiv Chilaka	18
3	Marcus Raboy	16
4	Suhas Kadav	16
5	Jay Karas	15
6	Jay Chapman	12
7	Don Michael Paul	10
8	Cathy Garcia-Molina	10
9	Justin G. Dyck	8

Next steps: Generate code with productive_dir View recommended plots New interactive sheet

Graphical representaion of above table

```
plt.figure(figsize=(9,5))
plt.bar(productive_dir["director"], productive_dir["count"] , color='orange')
plt.xticks(rotation=90, fontsize=10)
plt.ylabel("number of movies in last 15 years")
plt.xlabel("Director name")
plt.show()
```



- **Jan Suter , Raúl Campos , Rajiv Chilaka** are few of the most productive directors with whom Netflix can tie up

Finding the top 10 actors who have been most productive in last 15 years

```
actor_year_merge_df=pd.merge(actor_df,year_df , on="title" , how="right")[["title","actor","release_year","country"]]
actor_year_merge_df.head(10)
```

	title	actor	release_year	country
0	Dick Johnson Is Dead	Unknown actor	2020	United States
1	Blood & Water	Ama Qamata	2021	South Africa
2	Blood & Water	Khosi Ngema	2021	South Africa
3	Blood & Water	Gail Mabalane	2021	South Africa
4	Blood & Water	Thabang Molaba	2021	South Africa
5	Blood & Water	Dillon Windvogel	2021	South Africa
6	Blood & Water	Natasha Thahane	2021	South Africa
7	Blood & Water	Arno Greeff	2021	South Africa
8	Blood & Water	Xolile Tshabalala	2021	South Africa
9	Blood & Water	Getmore Sithole	2021	South Africa

Next steps: Generate code with `actor_year_merge_df` View recommended plots New interactive sheet

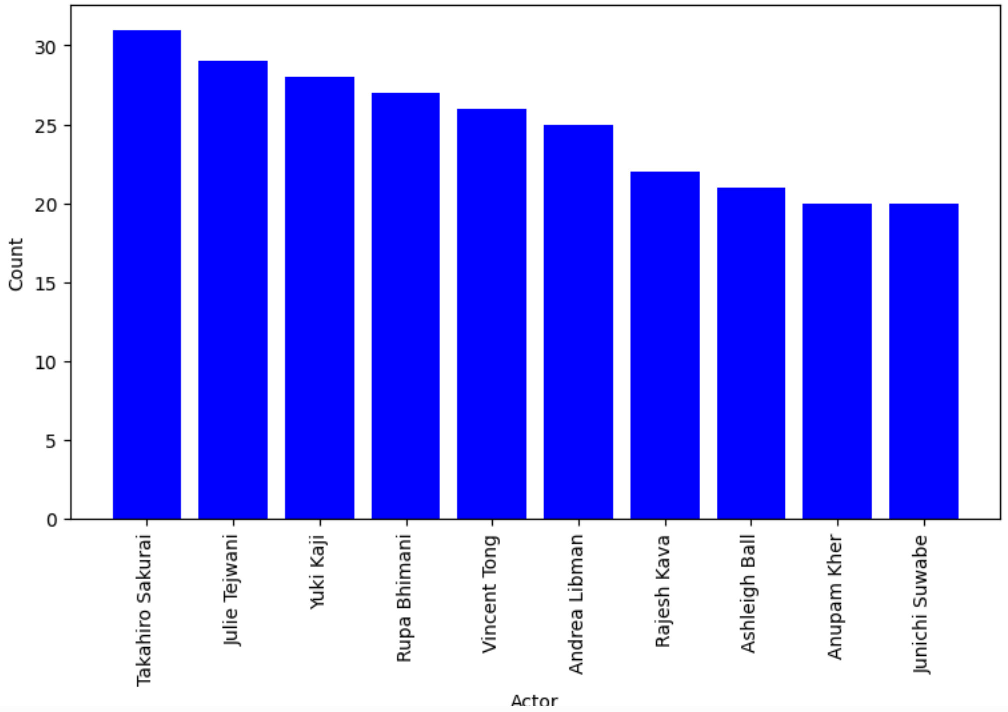
```
productive_actor=actor_year_merge_df["actor"][actor_year_merge_df["actor"]!="Unknown actor"].value_counts().reset_index().head(10)
productive_actor.head(10)
```

	actor	count
0	Takahiro Sakurai	31
1	Julie Tejwani	29
2	Yuki Kaji	28
3	Rupa Bhimani	27
4	Vincent Tong	26
5	Andrea Libman	25
6	Rajesh Kava	22
7	Ashleigh Ball	21
8	Anupam Kher	20
9	Junichi Suwabe	20

Next steps: Generate code with `productive_actor` View recommended plots New interactive sheet

Graphical representaion of above table

```
plt.figure(figsize=(9,5))
plt.bar(productive_actor["actor"], productive_actor["count"] , color='blue')
plt.ylabel("Count")
plt.xlabel("Actor")
plt.xticks(rotation=90, fontsize=10)
plt.show()
```



- **Takahiro Sakurai , Julie Tejwani, Yuki Kaji, Rupa Bhimani** are few of the most productive actors with whom Netflix can tie up

Find which is the best week to release a Movie or a TV Show

```
import datetime
releaseOTT_df=df.loc[:,["title" ,"date_added", "type" , "movie_minutes" , "seasons"]]

#Converting the date from 'string' to 'date time' format
df['date_added'] = pd.to_datetime(df['date_added'].str.strip())
releaseOTT_df["date_added"]=pd.to_datetime(releaseOTT_df['date_added'])
releaseOTT_df.head(10)
```

	title	date_added	type	movie_minutes	seasons
0	Dick Johnson Is Dead	2021-09-25	Movie	90.0	NaN
1	Blood & Water	2021-09-24	TV Show	NaN	2.0
2	Ganglands	2021-09-24	TV Show	NaN	1.0
3	Jailbirds New Orleans	2021-09-24	TV Show	NaN	1.0
4	Kota Factory	2021-09-24	TV Show	NaN	2.0
5	Midnight Mass	2021-09-24	TV Show	NaN	1.0
6	My Little Pony: A New Generation	2021-09-24	Movie	91.0	NaN
7	Sankofa	2021-09-24	Movie	125.0	NaN
8	The Great British Baking Show	2021-09-24	TV Show	NaN	9.0
9	The Starling	2021-09-24	Movie	104.0	NaN

Next steps: Generate code with releaseOTT_df View recommended plots New interactive sheet

```
releaseOTT_df['week_number']=releaseOTT_df['date_added'].dt.isocalendar().week
releaseOTT_df
```

```
                   title  date_added     type  movie_minutes  seasons  week_number
0     Dick Johnson Is Dead  2021-09-25    Movie           90.0      NaN           38
1            Blood & Water  2021-09-24  TV Show            NaN      2.0           38
2                Ganglands  2021-09-24  TV Show            NaN      1.0           38
3    Jailbirds New Orleans  2021-09-24  TV Show            NaN      1.0           38
4             Kota Factory  2021-09-24  TV Show            NaN      2.0           38
...                    ...         ...      ...            ...      ...          ...
8802                Zodiac  2019-11-20    Movie          158.0      NaN           47
8803           Zombie Dumb  2019-07-01  TV Show            NaN      2.0           27
8804            Zombieland  2019-11-01    Movie           88.0      NaN           44
8805                  Zoom  2020-01-11    Movie           88.0      NaN            2
8806                Zubaan  2019-03-02    Movie          111.0      NaN            9
8807 rows × 6 columns
```

Next steps: Generate code with releaseOTT_df | View recommended plots | New interactive sheet

```
releaseOTT_df[releaseOTT_df["type"]=="Movie"].groupby("week_number")["title"].count().sort_values(ascending=False).head(1)
```

```
             title
week_number
          1    316
```

- **First week of the year** i.e new years time is the best time for OTT release of the Movie

```
releaseOTT_df[releaseOTT_df["type"]=="TV Show"].groupby("week_number")["title"].count().sort_values(ascending=False).head(1)
```

```
             title
week_number
         27     86
```

- *27th week * is the best time for a TV show to release

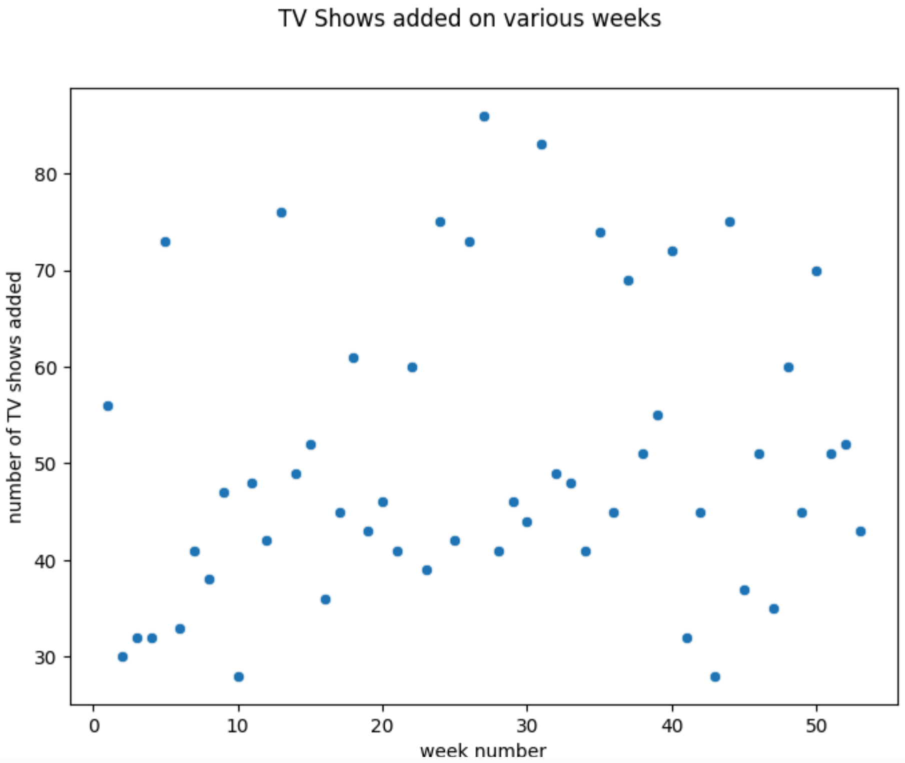
Plotting graph that how many TV Shows added on various weeks of an year

```
w=releaseOTT_df[releaseOTT_df["type"]=="TV Show"].groupby("week_number")["title"].count().sort_values(ascending=False).reset_index()
w.head(10)
```

```
   week_number  title
0           27     86
1           31     83
2           13     76
3           44     75
4           24     75
5           35     74
6            5     73
7           26     73
8           40     72
9           50     70
```

Next steps: Generate code with w | View recommended plots | New interactive sheet

```
import seaborn as sns
fig = plt.figure(figsize=(8,6))
sns.scatterplot(data=w , x="week_number", y="title")
plt.ylabel('number of TV shows added')
plt.xlabel('week number')
fig.suptitle('TV Shows added on various weeks')
plt.show()
```



Find which is the best month to release a Movie or a TV Show

```
releaseOTT_df['month_name']=releaseOTT_df['date_added'].dt.month_name()
releaseOTT_df
```

	title	date_added	type	movie_minutes	seasons	week_number	month_name
0	Dick Johnson Is Dead	2021-09-25	Movie	90.0	NaN	38	September
1	Blood & Water	2021-09-24	TV Show	NaN	2.0	38	September
2	Ganglands	2021-09-24	TV Show	NaN	1.0	38	September
3	Jailbirds New Orleans	2021-09-24	TV Show	NaN	1.0	38	September
4	Kota Factory	2021-09-24	TV Show	NaN	2.0	38	September
...	...	...	...	...	...	...	...
8802	Zodiac	2019-11-20	Movie	158.0	NaN	47	November
8803	Zombie Dumb	2019-07-01	TV Show	NaN	2.0	27	July
8804	Zombieland	2019-11-01	Movie	88.0	NaN	44	November
8805	Zoom	2020-01-11	Movie	88.0	NaN	2	January
8806	Zubaan	2019-03-02	Movie	111.0	NaN	9	March

8807 rows × 7 columns

Next steps: Generate code with releaseOTT_df View recommended plots New interactive sheet

```
releaseOTT_df[releaseOTT_df["type"]=="Movie"].groupby("month_name")["title"].count().sort_values(ascending=False).head(1)
```

	title
month_name	
July	565

- July is the best month to release a movie

```
releaseOTT_df[releaseOTT_df["type"]=="TV Show"].groupby("month_name")["title"].count().sort_values(ascending=False).head(1)
```

```
            title
month_name
December      266
```

- December is the best month to release a TV Show

Finding the Top 10 Genre of the movies and shows

```
genre_list=df["listed_in"].apply(lambda x:x.split(", ")).tolist()
genre_df=pd.DataFrame(genre_list,index=df["title"]).stack().reset_index().drop(columns="level_1")
genre_df.columns=["title" , "genre"]
genre_df
```

```
                    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
...                    ...                      ...
19318                 Zoom  Children & Family Movies
19319                 Zoom                 Comedies
19320               Zubaan                   Dramas
19321               Zubaan     International Movies
19322               Zubaan         Music & Musicals

19323 rows × 2 columns
```

Next steps: Generate code with genre_df View recommended plots New interactive sheet

```
g=genre_df.groupby("genre")["title"].count().sort_values(ascending=False).reset_index().head(10)
g
```

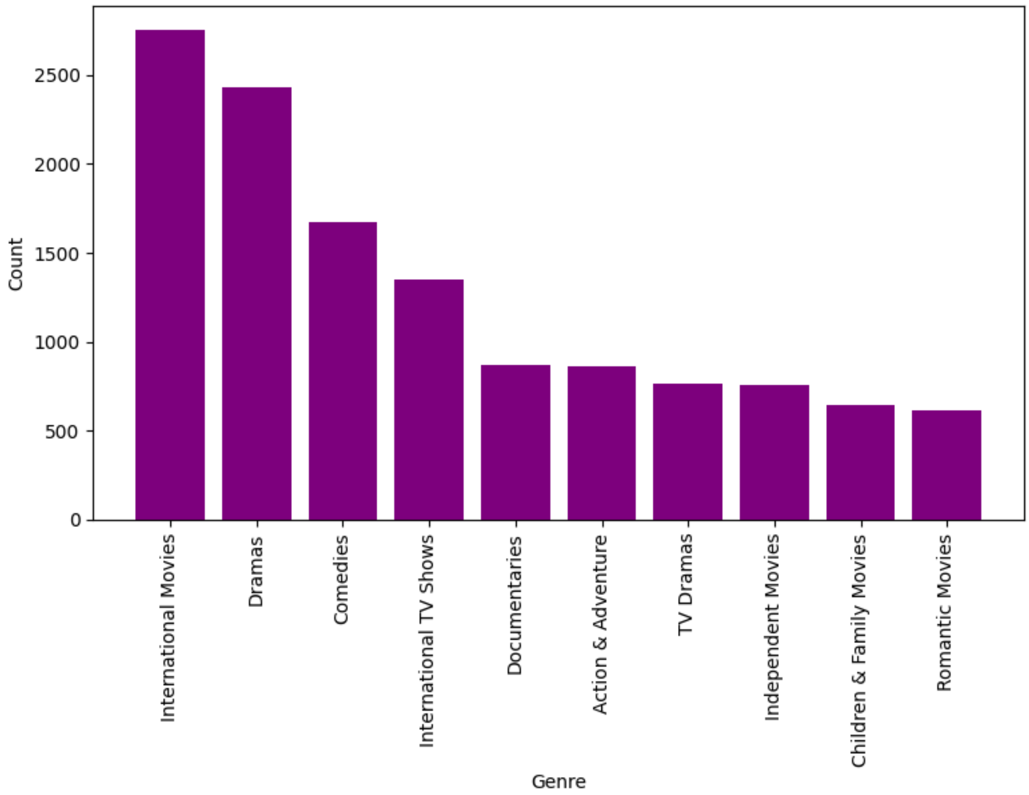
```
                      genre  title
0      International Movies   2752
1                    Dramas   2427
2                  Comedies   1674
3    International TV Shows   1351
4             Documentaries    869
5        Action & Adventure    859
6                 TV Dramas    763
7        Independent Movies    756
8  Children & Family Movies    641
9           Romantic Movies    616
```

Next steps: Generate code with g View recommended plots New interactive sheet

- The Top 10 genre shown above include International_movies,Drama , Comedies etc.

Graphical resentation of the above table

```
plt.figure(figsize=(9,5))
plt.bar(g["genre"], g["title"] , color="purple")
plt.xticks(rotation=90, fontsize=10)
plt.ylabel("Count")
plt.xlabel("Genre")
plt.show()
```



- **International Movies , Dramas , Comedies** are genre which have maximum number of shows

Finding the Days of week when Movies and TV Shows are released on OTT

- For Movies

```
releaseOTT_df['release_day_name']=releaseOTT_df['date_added'].dt.day_name()
j=releaseOTT_df[releaseOTT_df["type"]=="Movie"].groupby("release_day_name")["title"].count().sort_values(ascending=False).reset_index()
j
```

	release_day_name	title
0	Friday	1566
1	Thursday	1053
2	Wednesday	906
3	Tuesday	852
4	Monday	628
5	Sunday	569
6	Saturday	557

Next steps: Generate code with j View recommended plots New interactive sheet

- For TV Show

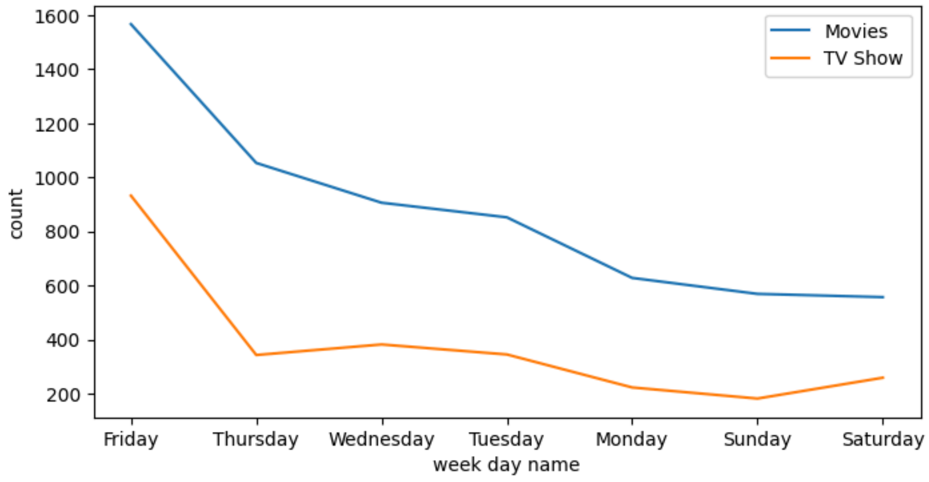
```
k=releaseOTT_df[releaseOTT_df["type"]=="TV Show"].groupby("release_day_name")["title"].count().sort_values(ascending=False).reset_index(
k
```

```
   release_day_name  title
0            Friday    932
1         Wednesday    382
2           Tuesday    345
3          Thursday    343
4          Saturday    259
5            Monday    223
6            Sunday    182
```

Next steps: Generate code with | View recommended plots | New interactive sheet

Graphical resentation of the above table

```
plt.figure(figsize=(8,4))
sns.lineplot(x='release_day_name', y='title', data=j , label='Movies')
sns.lineplot(x='release_day_name', y='title', data=k , label='TV Show')
plt.xlabel("week day name")
plt.ylabel("count")
plt.show()
```



- Most of the movies and TV shows added are on Friday

```
# "The End"
```