```
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
df=pd.read_csv("https://d2beiqkhq929f0.cloudfront.net/public_assets/
assets/000/000/940/original/netflix.csv")
df
```

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

                                                   cast        country
\
0                                                   NaN  United States

1     Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...   South Africa

2     Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...            NaN

3                                                   NaN            NaN

4     Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...          India

...                                                 ...            ...

8802  Mark Ruffalo, Jake Gyllenhaal, Robert Downey J...  United States

8803                                                NaN            NaN

8804  Jesse Eisenberg, Woody Harrelson, Emma Stone, ...  United States

8805  Tim Allen, Courteney Cox, Chevy Chase, Kate Ma...  United States

8806  Vicky Kaushal, Sarah-Jane Dias, Raaghav Chanan...          India


              date_added  release_year rating   duration  \
0     September 25, 2021          2020  PG-13     90 min   
1     September 24, 2021          2021  TV-MA  2 Seasons   
```

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

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

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

[8807 rows x 12 columns]
```

Business Case: Netflix - Data Exploration & Visualisation :

Business Problem : Analyze the data and generate insights that could help Netflix in deciding which type of shows/movies to produce and how they can grow the business in different countries

```
df.head()
```

```
  show_id     type                  title         director  \
0      s1    Movie   Dick Johnson Is Dead  Kirsten Johnson
1      s2  TV Show          Blood & Water              NaN
```

```
2      s3  TV Show              Ganglands  Julien Leclercq
3      s4  TV Show  Jailbirds New Orleans              NaN
4      s5  TV Show           Kota Factory              NaN

                                                cast        country  \
0                                                NaN  United States   
1  Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...   South Africa   
2  Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...            NaN   
3                                                NaN            NaN   
4  Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...          India   

           date_added  release_year rating   duration  \
0  September 25, 2021          2020  PG-13     90 min   
1  September 24, 2021          2021  TV-MA  2 Seasons   
2  September 24, 2021          2021  TV-MA   1 Season   
3  September 24, 2021          2021  TV-MA   1 Season   
4  September 24, 2021          2021  TV-MA  2 Seasons   

                                           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 ...   

                                         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...  
```

```
df.shape
```

```
(8807, 12)
```

```
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
```

```
df.describe()
```

```
       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
```

Statistical summary

```
df.describe(include = object)
```

```
       show_id   type                 title       director  \
count     8807   8807                  8807           6173   
unique    8807      2                  8807           4528   
top         s1  Movie  Dick Johnson Is Dead  Rajiv Chilaka   
freq         1   6131                     1             19   

                     cast        country       date_added rating 
duration  \
count                 7982           7976             8797   8803 
8804   
unique                7692            748             1767     17 
220   
top     David Attenborough  United States  January 1, 2020  TV-MA  1 
Season   
freq                    19           2818              109   3207 
1793   

                           listed_in  \
count                           8807   
unique                           514   
top     Dramas, International Movies   
freq                             362   

                                              description  
count                                                8807  
unique                                               8775  
top     Paranormal activity at a lush, abandoned prope...  
freq                                                    4  
```

Conclusion :-

```
Show_id and Title are the unique factors.
"Type" and "rating" column needs to be changed to categorical data
"United States" is having the maximun content available.
```

```
df.isnull().sum()
```

```
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
```

Missing value detection

```
for col in df:
  null_count = df[col].isnull().sum() / len(df) *100
  print(col , "-->" ,null_count)
```

```
show_id --> 0.0
type --> 0.0
title --> 0.0
director --> 29.908027705234474
cast --> 9.367548540933349
country --> 9.435676166685592
date_added --> 0.11354604292040424
release_year --> 0.0
rating --> 0.045418417168161695
duration --> 0.034063812876121265
listed_in --> 0.0
description --> 0.0
```

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

```
df.isnull().sum()
```

```
show_id          0
type             0
title            0
director         0
cast             0
```

```
country          0
date_added      10
release_year     0
rating           4
duration         3
listed_in        0
description      0
dtype: int64
```

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

```
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
```

```
df.loc[(df["rating"] == "74 min") | (df["rating"] == "84 min") |
(df["rating"] == "66 min")]
df["duration"][[5541,5794,5813]] = df["rating"][[5541,5794,5813]]
df["rating"][[5541,5794,5813]] = "Nan"
```

```
<ipython-input-14-eab077cc79fe>:2: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation:
https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#
returning-a-view-versus-a-copy
  df["duration"][[5541,5794,5813]] = df["rating"][[5541,5794,5813]]
<ipython-input-14-eab077cc79fe>:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation:
https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#
returning-a-view-versus-a-copy
  df["rating"][[5541,5794,5813]] = "Nan"
```

Shifting of data to the right columns

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

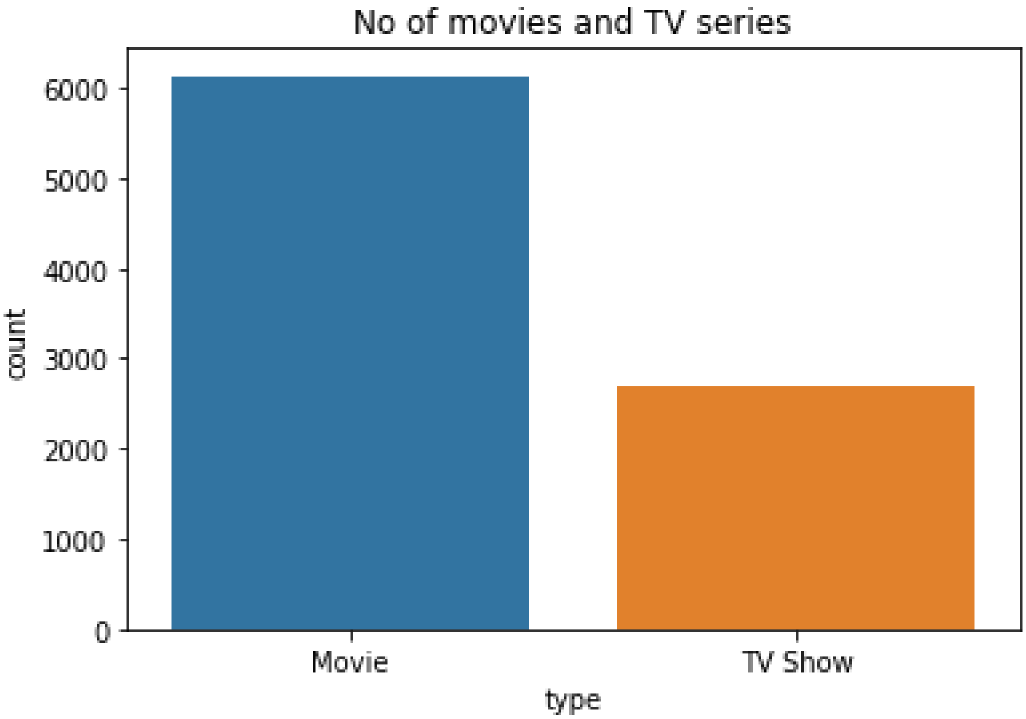
```
TV-MA       3207
TV-14       2160
TV-PG        863
R            799
PG-13        490
TV-Y7        334
TV-Y         307
PG           287
TV-G         220
NR            80
G             41
TV-Y7-FV       6
NC-17          3
Nan            3
UR             3
Name: rating, dtype: int64
```

```
df["date_added"] = pd.to_datetime(df["date_added"])
df =df.astype({"type" : "category", "rating" : "category"})
```

```
df_datetime = df.copy()
df_datetime['Year'] = df.date_added.dt.year  #adding new columns to
the dataframe --> year , month , weekday
df_datetime['month'] = df.date_added.dt.month
df_datetime['day'] = df.date_added.dt.day_name()
```

Univariate Analysis

```
sns.countplot(x = "type" , data = df_datetime) #countplot to count the
no of movies and tv shows available.
plt.title("No of movies and TV series")
plt.show()
```

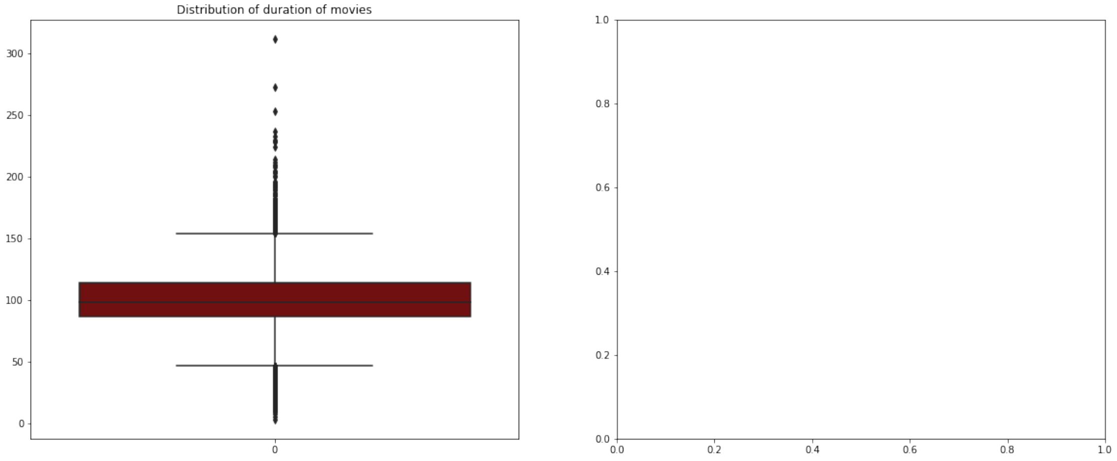


```
plt.figure(figsize=(20,8))
duration_df = df.loc[df["duration"].str.contains("min")== True]
["duration"].apply(lambda x: x.split()[0]).astype(int)  # splting the
movies duration as its type is string , extracting the numeri value
and converting it into int type
plt.subplot(1,2,1) #subplots to make the data look easy for
comparison.
sns.boxplot(duration_df , color = "maroon")
plt.title("Distribution of duration of movies")
duration_seson_df = df.loc[df["duration"].str.contains("Season")==
True]["duration"].apply(lambda x: x.split()[0]).astype(int)
plt.subplot(1,2,2)
sns.boxplot(duration_seson_df , color = "maroon")
plt.title("Distribution of no of seasons in TV show")
plt.show()
```

```
-----------------------------------------------------------------------
-----
KeyError                                  Traceback (most recent call
last)
/usr/local/lib/python3.9/dist-packages/pandas/core/indexes/base.py in
get_loc(self, key, method, tolerance)
   3628             try:
-> 3629                 return self._engine.get_loc(casted_key)
   3630             except KeyError as err:

/usr/local/lib/python3.9/dist-packages/pandas/_libs/index.pyx in
pandas._libs.index.IndexEngine.get_loc()
```

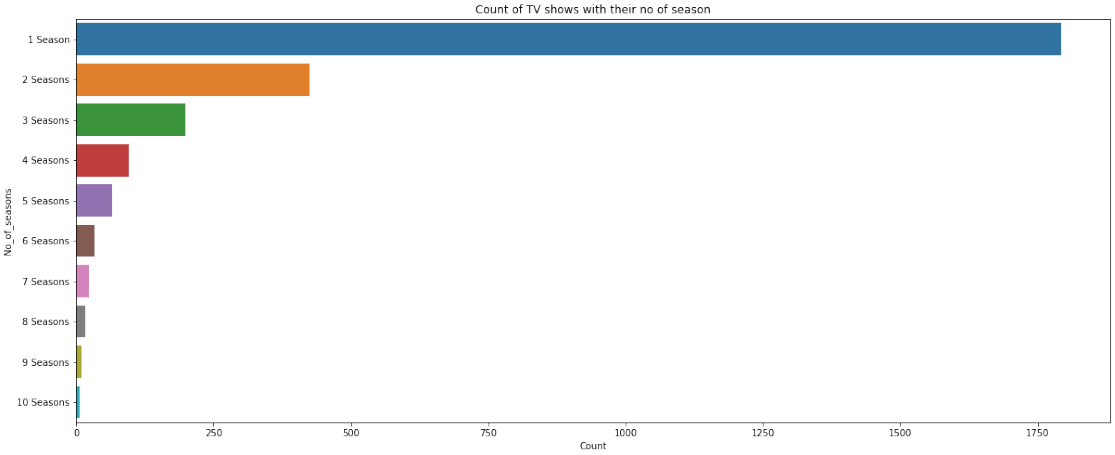
```
/usr/local/lib/python3.9/dist-packages/pandas/_libs/index.pyx in
pandas._libs.index.IndexEngine.get_loc()

pandas/_libs/hashtable_class_helper.pxi in
pandas._libs.hashtable.Int64HashTable.get_item()

pandas/_libs/hashtable_class_helper.pxi in
pandas._libs.hashtable.Int64HashTable.get_item()

KeyError: 0

The above exception was the direct cause of the following exception:

KeyError                                  Traceback (most recent call
last)
<ipython-input-20-452de32040ff> in <module>
      6 duration_seson_df =
df.loc[df["duration"].str.contains("Season")== True]
["duration"].apply(lambda x: x.split()[0]).astype(int)
      7 plt.subplot(1,2,2)
----> 8 sns.boxplot(duration_seson_df , color = "maroon")
      9 plt.title("Distribution of no of seasons in TV show")
     10 plt.show()

/usr/local/lib/python3.9/dist-packages/seaborn/categorical.py in
boxplot(data, x, y, hue, order, hue_order, orient, color, palette,
saturation, width, dodge, fliersize, linewidth, whis, ax, **kwargs)
   2229 ):
   2230
-> 2231     plotter = _BoxPlotter(x, y, hue, data, order, hue_order,
   2232                           orient, color, palette, saturation,
   2233                           width, dodge, fliersize, linewidth)

/usr/local/lib/python3.9/dist-packages/seaborn/categorical.py in
__init__(self, x, y, hue, data, order, hue_order, orient, color,
palette, saturation, width, dodge, fliersize, linewidth)
    783                  width, dodge, fliersize, linewidth):
    784
--> 785         self.establish_variables(x, y, hue, data, orient,
order, hue_order)
    786         self.establish_colors(color, palette, saturation)
    787

/usr/local/lib/python3.9/dist-packages/seaborn/categorical.py in
establish_variables(self, x, y, hue, data, orient, order, hue_order,
units)
    484                 if hasattr(data, "shape"):
    485                     if len(data.shape) == 1:
```

```
--> 486                             if np.isscalar(data[0]):
    487                                 plot_data = [data]
    488                             else:

/usr/local/lib/python3.9/dist-packages/pandas/core/series.py in
__getitem__(self, key)
    956
    957         elif key_is_scalar:
--> 958             return self._get_value(key)
    959
    960         if is_hashable(key):

/usr/local/lib/python3.9/dist-packages/pandas/core/series.py in
_get_value(self, label, takeable)
   1067
   1068         # Similar to Index.get_value, but we do not fall back
to positional
-> 1069         loc = self.index.get_loc(label)
   1070         return self.index._get_values_for_loc(self, loc,
label)
   1071

/usr/local/lib/python3.9/dist-packages/pandas/core/indexes/base.py in
get_loc(self, key, method, tolerance)
   3629                 return self._engine.get_loc(casted_key)
   3630             except KeyError as err:
-> 3631                 raise KeyError(key) from err
   3632             except TypeError:
   3633                 # If we have a listlike key,
_check_indexing_error will raise

KeyError: 0
```



```
df_TV_season = df.loc[df["duration"].str.contains("Season")== True ,
"duration" ].value_counts().reset_index()[:10]  #filtering out top 10
values of TV shows using string.
```

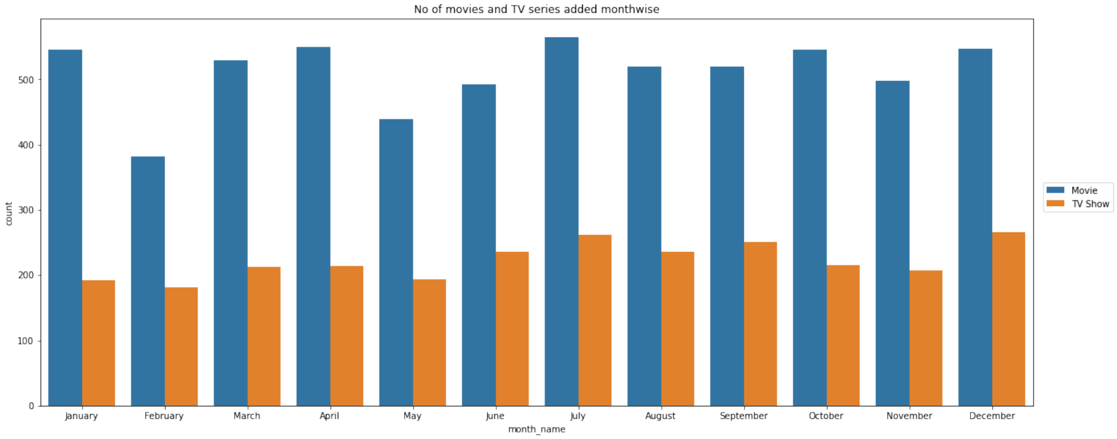
```
df_TV_season.rename(columns = {"index" : "No_of_seasons" ,
"duration" : "Count"}, inplace = True) #renaming the columns
plt.figure(figsize=(20,8))
sns.barplot(y = "No_of_seasons" , x = "Count" , data = df_TV_season)
plt.title("Count of TV shows with their no of season")
plt.show()
```



```
df_datetime = pd.DataFrame(df)
df_datetime['Year'] = df.date_added.dt.year
df_datetime['month'] = df.date_added.dt.month
df_datetime['day'] = df.date_added.dt.day_name()
df_datetime_month = df_datetime.sort_values(by ="month")
df_datetime_month['month_name'] = df.date_added.dt.month_name()
```

Bivariate Analysis

```
plt.figure(figsize=(20,8)) #defining fig size fot the graph image
sns.countplot(x = "month_name" , data = df_datetime_month , hue =
"type")
plt.title("No of movies and TV series added monthwise") #title name of
the plot
plt.legend(loc=(1.01,0.5))
plt.show()
```

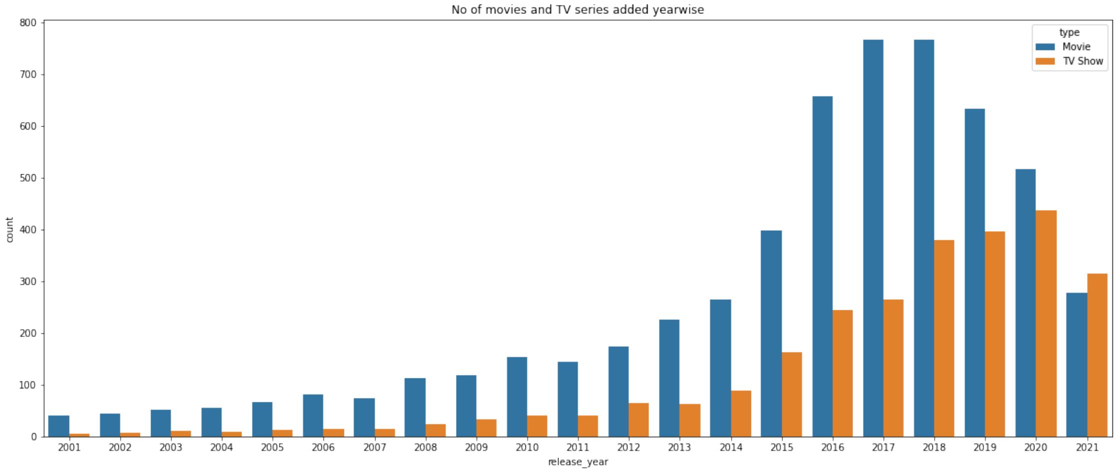


Analysis of number of content added on Netflix over the period

Conclusion :-

```
July and December are the months when most content was added becasue
no of TV shows durind these two months are maximum among all.
No of movies added per month is greater then no of TV shows added per
month.
```

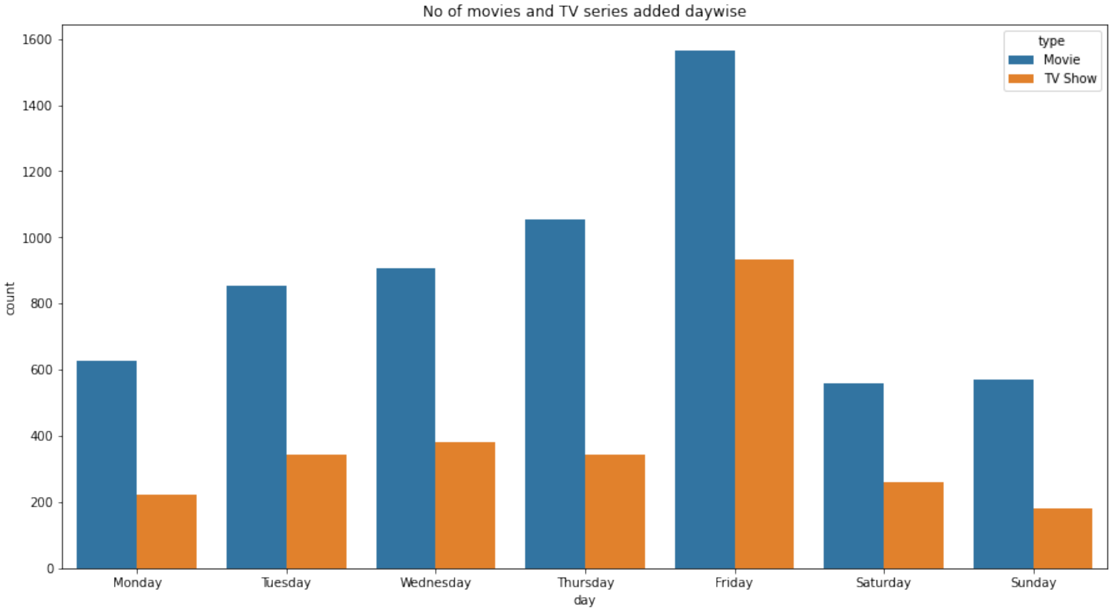
```
plt.figure(figsize=(20,8))
df_year = df.loc[df['release_year']>2000] #used masked to get out data for movies and TV shows released after 2000
sns.countplot(x='release_year', data = df_year, hue='type')
plt.title("No of movies and TV series added yearwise")
plt.show()
```



Conclusion :-

```
In 2020 , maximum no. of TV shows are added followed by 2019 & 2021.
More no of movies added on Netflix after "2015"
We can see in 2021 count of movies add drop significanty ,maybe due to
COVID pandemic.
```

```
plt.figure(figsize=(15,8))
sns.countplot(x = "day" , data = df_datetime , hue = "type" ,
order=["Monday" , "Tuesday" , "Wednesday", "Thursday", "Friday",
"Saturday" ,"Sunday"])
plt.title("No of movies and TV series added daywise")
plt.show()
```

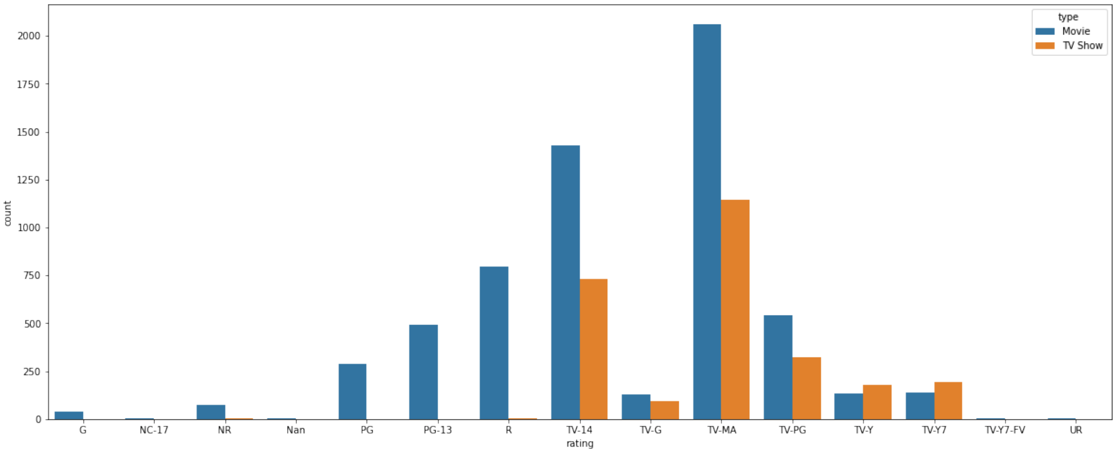


Conclusion :-

```
Mostly TV shows and movies are belongs to TV-MA & TV-14 rating.
Mostly content available on netflix is for adults and teenagers.
```

Conclusion :- Most of the content added on netflix on "Friday" followed by Thursday as weekend appraches after these days.

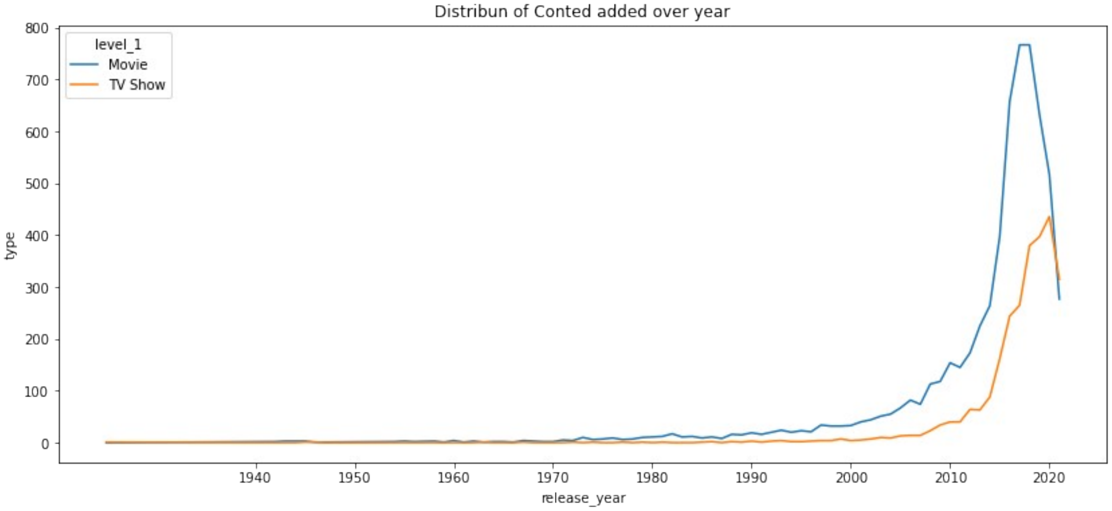
```
df_rating = df[df["rating"].isnull()== False]
df_rating.reset_index(inplace = True)
plt.figure(figsize=(20,8))
sns.countplot(x ="rating" , data = df_rating , hue = "type")
plt.show()
```



Conclusion :-

```
Mostly TV shows and movies are belongs to TV-MA & TV-14 rating.
Mostly content available on netflix is for adults and teenagers.
```

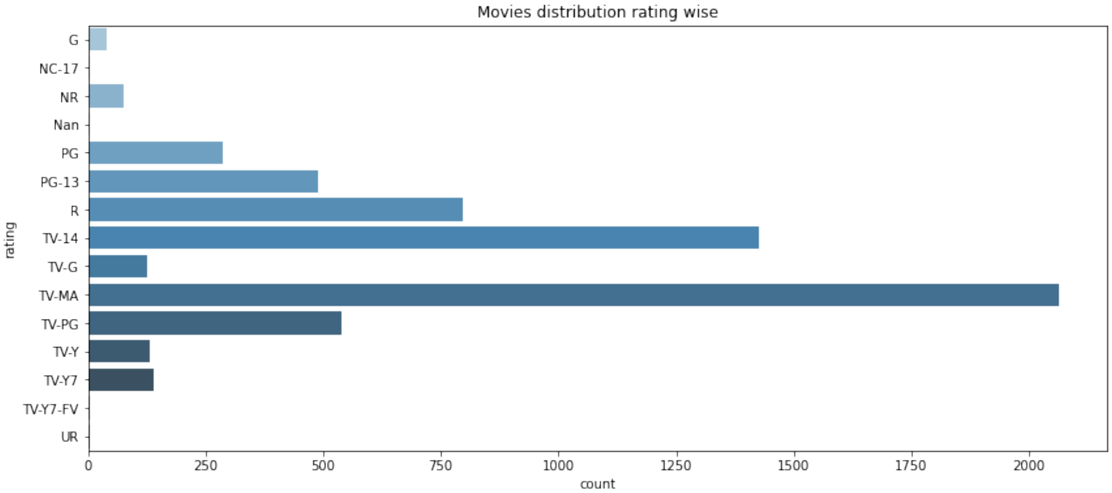
```
df_yearwise_trend = pd.DataFrame(df.groupby("release_year")
["type"].value_counts())  #grouping of the content by year forr movies
and TV shows
df_yearwise_trend.reset_index(inplace = True)
df_content_count =df_yearwise_trend.pivot(index = "release_year",
                        columns = "level_1",
                        values ="type")
df_content_count.reset_index(inplace = True)
plt.figure(figsize=(14,6))
sns.lineplot(x = "release_year" , y = "type" , data =
df_yearwise_trend , hue = "level_1")
plt.xticks(np.arange(1940,2025,10))
plt.title("Distribun of Conted added over year")
plt.show()
```



Conclusion :-

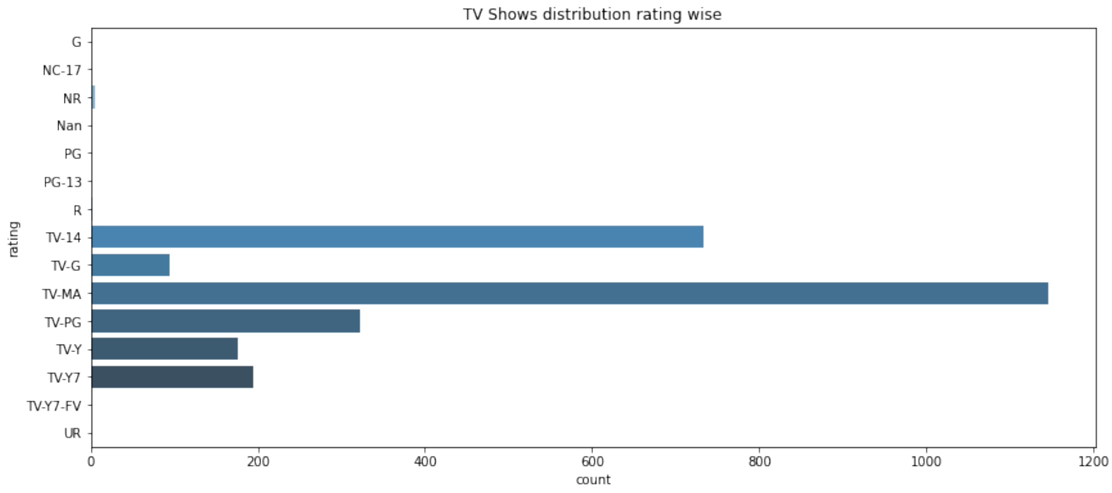
```
In 2020 , maximum no. of TV shows are added followed by 2019 & 2021.
More no of movies added on Netflix after "2015"
We can see in 2021 count of movies add drop significanty ,maybe due to
COVID pandemic.
```

```
plt.figure(figsize=(14,6))
movies_ratingwise = df.loc[df["type"] == "Movie" , ["type" ,
"rating"]]
sns.countplot( y="rating" , data =movies_ratingwise,
palette="Blues_d" )
plt.title("Movies distribution rating wise")
plt.show()
```



Conclusion : Mostly movies are belongs to TV-MA & TV-14 rating.

```
plt.figure(figsize=(14,6))
movies_ratingwise = df.loc[df["type"] == "TV Show" , ["type" ,
"rating"]]
sns.countplot( y="rating" , data =movies_ratingwise,
palette="Blues_d" )
plt.title("TV Shows distribution rating wise")
plt.show()
```



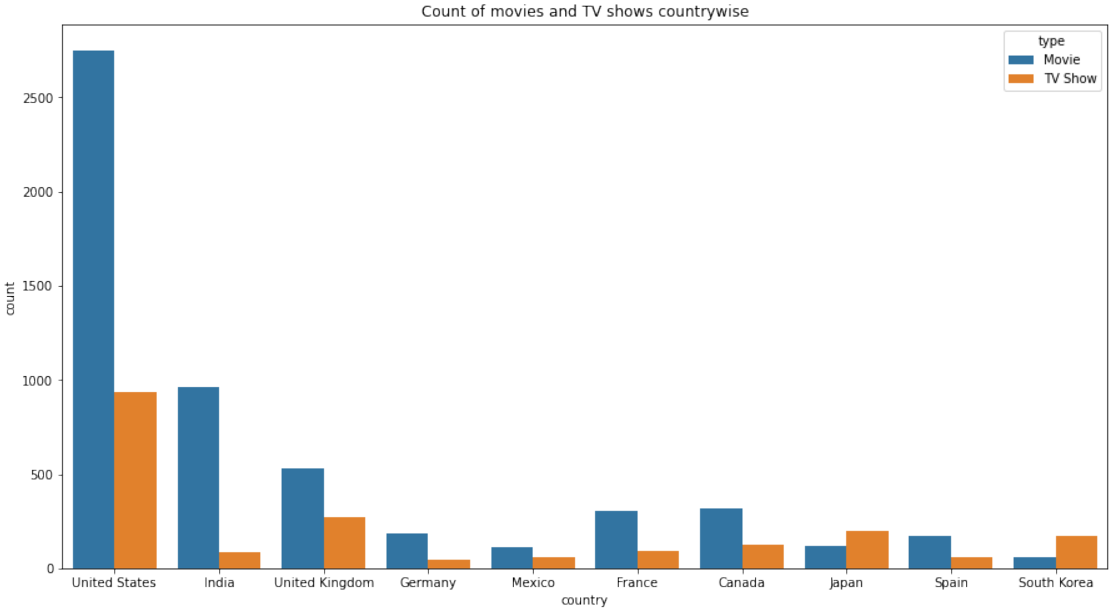
Conclusion :- Mostly TV Shows are belongs to TV-MA & TV-14 rating.

```
director = df["director"].apply(lambda x : str(x).split(",
")).tolist()  #exploding the nested data in directors column.
df_director = pd.DataFrame(director, index = df["title"])
df_director= df_director.stack()
df_director = df_director.reset_index()
df_director.drop(columns ="level_1" , inplace = True) #droping the
columns
df_director.columns = ["title" , "director"] #renaming the columns
df_fav_director = df.merge(df_director , on = "title" ) #merging of
the dataframes
df_fav_director.head(4)
```

```
  show_id     type                     title       director_x  \
0      s1    Movie      Dick Johnson Is Dead  Kirsten Johnson   
1      s2  TV Show             Blood & Water          Unknown   
2      s3  TV Show                 Ganglands  Julien Leclercq   
3      s4  TV Show     Jailbirds New Orleans          Unknown   

                                                cast        country  \
0                                            Unknown  United States   
1  Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...   South Africa   
2  Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...        Unknown   
3                                            Unknown        Unknown   

  date_added  release_year rating   duration  \
0 2021-09-25          2020  PG-13     90 min   
1 2021-09-24          2021  TV-MA  2 Seasons   
2 2021-09-24          2021  TV-MA   1 Season   
3 2021-09-24          2021  TV-MA   1 Season   

                                        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

                                         description    Year  month
day  \
0  As her father nears the end of his life, filmm...  2021.0    9.0
Saturday
1  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
2  To protect his family from a powerful drug lor...  2021.0    9.0
Friday
3  Feuds, flirtations and toilet talk go down amo...  2021.0    9.0
Friday

        director_y
0  Kirsten Johnson
1          Unknown
2  Julien Leclercq
3          Unknown
```

```
country = df["country"].apply(lambda x: str(x).split(", ")).tolist()
#exploding the country column
df_country = pd.DataFrame(country, index = df["title"])
df_country = df_country.stack()
df_country = df_country.reset_index()
df_country.drop(columns = "level_1" , inplace = True)
df_country.columns = ["title" , "country"]

Country_wise_trend = df.merge(df_country , on = "title") #making new
dataframe by merfing df_country and original dataframe.
Country_wise_trend.drop(columns = "country_x" , inplace = True)
Country_wise_trend.rename(columns = {"country_y" : "country"}, inplace
= True)
Country_wise_trend =
Country_wise_trend.loc[Country_wise_trend["country"] != "Unknown"]
top10_country =
Country_wise_trend["country"].value_counts().head(10).reset_index()
top10_country.rename(columns = {"index" :"country" , "country" :
"count"}, inplace = True)
Country_wise_trend = Country_wise_trend.merge(top10_country, how =
"inner" , on = "country")
plt.figure(figsize = (15,8))
sns.countplot(x ="country" , data =Country_wise_trend , hue = "type" )
plt.title("Count of movies and TV shows countrywise")
plt.show()
```



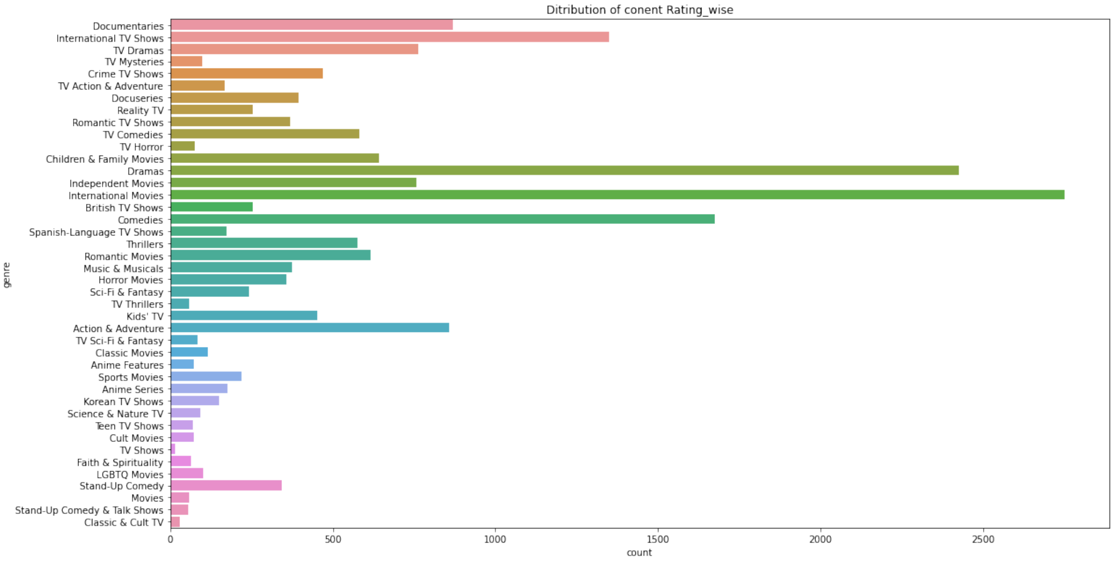
Conclusion :-

Netflix should target to add more movies in Unites states and India as compare to TV Series.
Netflix should target to add more TV shows in Japan and South Korea.

```
listed_in = df["listed_in"].apply(lambda x: str(x).split(",
")).tolist()
df_genre = pd.DataFrame(listed_in, index = df["title"])
df_genre = df_genre.stack()
df_genre = df_genre.reset_index()
df_genre.drop(columns = "level_1" , inplace = True)
df_genre.columns = ["title" , "genre"]
df_genre.head()
```

```
                  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
```

```
plt.figure(figsize = (18,10))
sns.countplot(y = "genre" , data =df_genre )
plt.title("Ditribution of conent Rating_wise")
plt.show()
```



```
director_countrywise= df_fav_director.merge(df_country , on = "title")
director_countrywise= director_countrywise.drop(columns =
["director_x" , "country_x" ])
director_countrywise.rename(columns = {"director_y": "director" ,
"country_y" : "country"}, inplace = True)
director_countrywise =
director_countrywise.loc[director_countrywise["director"] !=
"Unknown"]
director_countrywise.reset_index(inplace= True)
director_countrywise.head()
```

```
   index show_id     type                                  title  \
0      0      s1    Movie                   Dick Johnson Is Dead
1      2      s3  TV Show                              Ganglands
2      5      s6  TV Show                          Midnight Mass
3      6      s7    Movie  My Little Pony: A New Generation
4      7      s7    Movie  My Little Pony: A New Generation

                                                cast date_added
release_year  \
0                                            Unknown 2021-09-25
2020
1  Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi... 2021-09-24
2021
2  Kate Siegel, Zach Gilford, Hamish Linklater, H... 2021-09-24
2021
3  Vanessa Hudgens, Kimiko Glenn, James Marsden, ... 2021-09-24
2021
4  Vanessa Hudgens, Kimiko Glenn, James Marsden, ... 2021-09-24
2021

  rating  duration                                         listed_in
```

```
\
0  PG-13    90 min                                      Documentaries

1  TV-MA  1 Season  Crime TV Shows, International TV Shows, TV Act...

2  TV-MA  1 Season                 TV Dramas, TV Horror, TV Mysteries

3     PG    91 min                           Children & Family Movies

4     PG    91 min                           Children & Family Movies


                                         description    Year  month
day  \
0  As her father nears the end of his life, filmm...  2021.0    9.0
Saturday
1  To protect his family from a powerful drug lor...  2021.0    9.0
Friday
2  The arrival of a charismatic young priest brin...  2021.0    9.0
Friday
3  Equestria's divided. But a bright-eyed hero be...  2021.0    9.0
Friday
4  Equestria's divided. But a bright-eyed hero be...  2021.0    9.0
Friday

          director        country
0  Kirsten Johnson  United States
1  Julien Leclercq        Unknown
2    Mike Flanagan        Unknown
3    Robert Cullen        Unknown
4   José Luis Ucha        Unknown
```

```
country = director_countrywise['country'].value_counts()
[:6].index.tolist()
print(' Top 2 Directors of Top 5 Countries')
print('\n')
for val in country:
  if val != 'Unknown':
    print(f'**{val}**')

print(director_countrywise.loc[director_countrywise['country']==val,
'director'].value_counts()[:2])
    print('\n')
```

```
 Top 2 Directors of Top 5 Countries


**United States**
Jay Karas       15
Marcus Raboy    15
```

```
Name: director, dtype: int64


**India**
Anurag Kashyap    9
David Dhawan      9
Name: director, dtype: int64


**United Kingdom**
Alastair Fothergill    4
Edward Cotterill       4
Name: director, dtype: int64


**Canada**
Justin G. Dyck      8
Mike Clattenburg    5
Name: director, dtype: int64


**France**
Thierry Donard     5
Youssef Chahine    4
Name: director, dtype: int64
```

```
director_countrywise["director"].value_counts().head(3)
```

```
Rajiv Chilaka    22
Jan Suter        21
Raúl Campos      19
Name: director, dtype: int64
```

```
cast = df["cast"].apply(lambda x : str(x).split(", ")).tolist()
df_cast = pd.DataFrame(cast,  index = df["title"])
df_cast = df_cast.stack()
df_cast = df_cast.reset_index()
df_cast.drop(columns = "level_1" , inplace = True)
df_cast.columns = ["title" , "cast"]
df_fav_cast = df.merge(df_cast , on = "title" )

cast_countrywise= df_fav_cast.merge(df_country , on = "title")
cast_countrywise= cast_countrywise.drop(columns = ["cast_x" ,
"country_x"])
cast_countrywise = cast_countrywise.rename(columns = {"cast_y" :
"cast" , "country_y" : "country"})
cast_countrywise = cast_countrywise.loc[cast_countrywise["cast"] !=
"Unknown"].reset_index() #making new dataframe by dropping all rows
```

```
whose cast is unknown and then resetting the index..00
cast_countrywise.head()

   index show_id     type          title director date_added
release_year  \
0      1      s2  TV Show  Blood & Water  Unknown 2021-09-24
2021
1      2      s2  TV Show  Blood & Water  Unknown 2021-09-24
2021
2      3      s2  TV Show  Blood & Water  Unknown 2021-09-24
2021
3      4      s2  TV Show  Blood & Water  Unknown 2021-09-24
2021
4      5      s2  TV Show  Blood & Water  Unknown 2021-09-24
2021

  rating   duration
listed_in  \
0  TV-MA  2 Seasons  International TV Shows, TV Dramas, TV Mysteries

1  TV-MA  2 Seasons  International TV Shows, TV Dramas, TV Mysteries

2  TV-MA  2 Seasons  International TV Shows, TV Dramas, TV Mysteries

3  TV-MA  2 Seasons  International TV Shows, TV Dramas, TV Mysteries

4  TV-MA  2 Seasons  International TV Shows, TV Dramas, TV Mysteries


                                         description    Year  month
day  \
0  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
1  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
2  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
3  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
4  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday

               cast       country
0        Ama Qamata  South Africa
1       Khosi Ngema  South Africa
2     Gail Mabalane  South Africa
3    Thabang Molaba  South Africa
4  Dillon Windvogel  South Africa
```

Non-Graphical Analysis

```
country_actor = cast_countrywise['country'].value_counts()
[:6].index.tolist()
print(' Top 2 Actors of Top 5 Countries')
print('\n')
for val in country:
  if val != 'Unknown':
    print(f'--{val}--')
    print(cast_countrywise.loc[cast_countrywise['country']==val,
'cast'].value_counts()[:2])
    print('\n')
```

```
 Top 2 Actors of Top 5 Countries



--United States--
Tara Strong          22
Samuel L. Jackson    22
Name: cast, dtype: int64



--India--
Anupam Kher       40
Shah Rukh Khan    34
Name: cast, dtype: int64



--United Kingdom--
David Attenborough    17
John Cleese           16
Name: cast, dtype: int64



--Canada--
John Paul Tremblay    14
Robb Wells            14
Name: cast, dtype: int64



--France--
Wille Lindberg    5
Benoît Magimel    5
Name: cast, dtype: int64
```

Conclusion :

Anurag Kashyap and David Dhawan are the most famous directors for Inida.

```
Jay Karas and Marcus Raboyare the most famous directors in United
States.
```

```
Conclusion :

    Anurag Kashyap and David Dhawan are the most famous directors for
Inida.
    Jay Karas and Marcus Raboyare the most famous directors in United
States.
```

```
  File "<ipython-input-48-22ca1a47a62b>", line 1
    Conclusion :
                ^
SyntaxError: invalid syntax
```

```
cast_countrywise["cast"].value_counts().head(5) #value_counts of the
cast columns to get the most famous actors
```

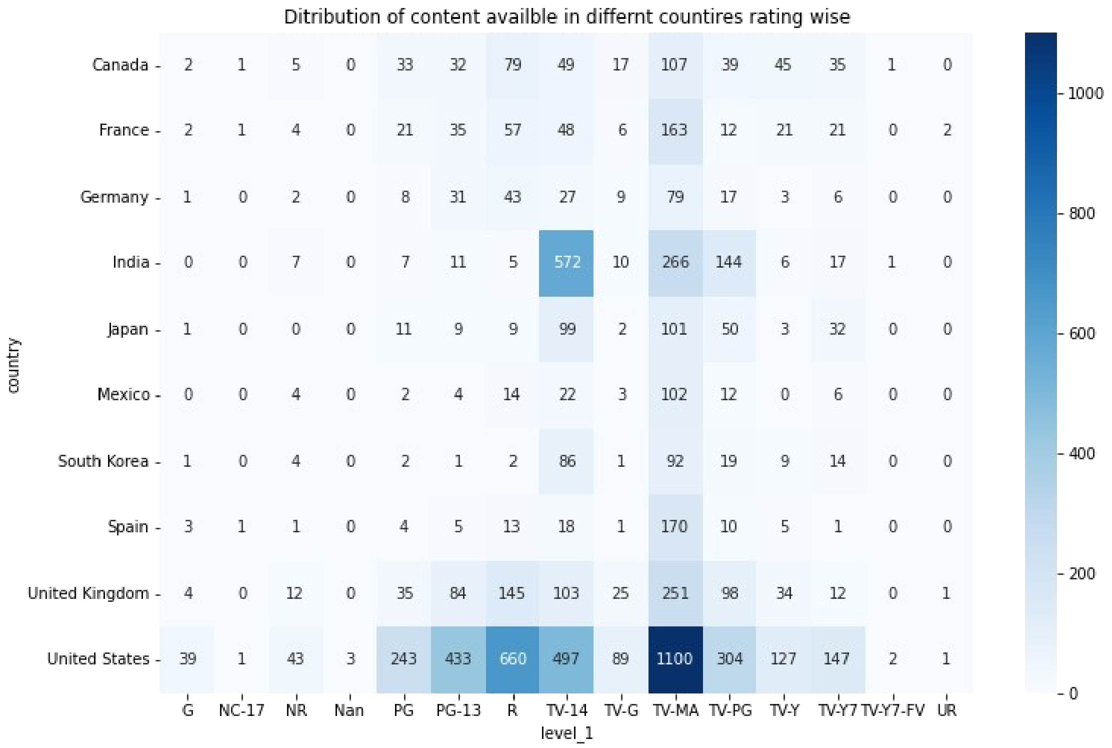
```
Anupam Kher           46
David Attenborough    45
Vincent Tong          42
John Cleese           40
Tara Strong           39
Name: cast, dtype: int64
```

```
df_trend_country = df.merge(df_country , on = "title")
df_trend_country.drop(columns = "country_x" , inplace = True)
df_trend_country.rename(columns = {"country_y":"country"}, inplace =
True)
```

Heatmap

```
temp = df_trend_country['country'].value_counts()[:11].reset_index()
temp.rename(columns = {'index':'country', 'country':'count'},
inplace=True)
country_list = temp['country'].tolist()
df_top10country =
df_trend_country.loc[df_trend_country['country'].isin(country_list)]
df_top10country = df_top10country.loc[df_top10country["country"]!
="Unknown"] #dropping of rows whose value is unknown

heat_rating = df_top10country.groupby("country")
["rating"].value_counts().reset_index()
heat_rating = heat_rating.pivot("country" , "level_1" , "rating")
```

```
plt.figure(figsize = (12,8))
sns.heatmap(heat_rating, annot = True,  cmap="Blues", fmt = "d")
plt.title("Ditribution of content availble in differnt countires
rating wise")
plt.show()
```



Conclusion :-

Top 10 countries are having most content that belongs to TV-MA (Adults

Category)

India and United States are having large content in TV-14 category.
United Kingdom and United States are having large content in R
category.

```
genre_country_df= df_trend_country.merge(df_genre , on= "title")
genre_country_df.head(5)
```

```
  show_id     type                  title         director  \
0      s1    Movie   Dick Johnson Is Dead  Kirsten Johnson
1      s2  TV Show          Blood & Water          Unknown
2      s2  TV Show          Blood & Water          Unknown
3      s2  TV Show          Blood & Water          Unknown
4      s3  TV Show              Ganglands  Julien Leclercq

                                                cast date_added
release_year  \
0                                            Unknown 2021-09-25
```

```
2020
1  Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban... 2021-09-24
2021
2  Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban... 2021-09-24
2021
3  Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban... 2021-09-24
2021
4  Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi... 2021-09-24
2021

  rating   duration                                           listed_in
\
0  PG-13     90 min                                       Documentaries

1  TV-MA  2 Seasons    International TV Shows, TV Dramas, TV Mysteries

2  TV-MA  2 Seasons    International TV Shows, TV Dramas, TV Mysteries

3  TV-MA  2 Seasons    International TV Shows, TV Dramas, TV Mysteries

4  TV-MA   1 Season  Crime TV Shows, International TV Shows, TV Act...


                                         description    Year  month
day  \
0  As her father nears the end of his life, filmm...  2021.0    9.0
Saturday
1  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
2  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
3  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
4  To protect his family from a powerful drug lor...  2021.0    9.0
Friday

         country                   genre
0  United States           Documentaries
1   South Africa  International TV Shows
2   South Africa               TV Dramas
3   South Africa             TV Mysteries
4        Unknown          Crime TV Shows
```

```
temp_genre = genre_country_df['genre'].value_counts()
[:10].reset_index()
temp_genre.rename(columns = {'index':'genre', 'genre':'count'},
inplace=True)
genre_list = temp_genre['genre'].tolist()
df_top10_genre =
genre_country_df.loc[genre_country_df['genre'].isin(genre_list)]
df_top10_genre.head()
```

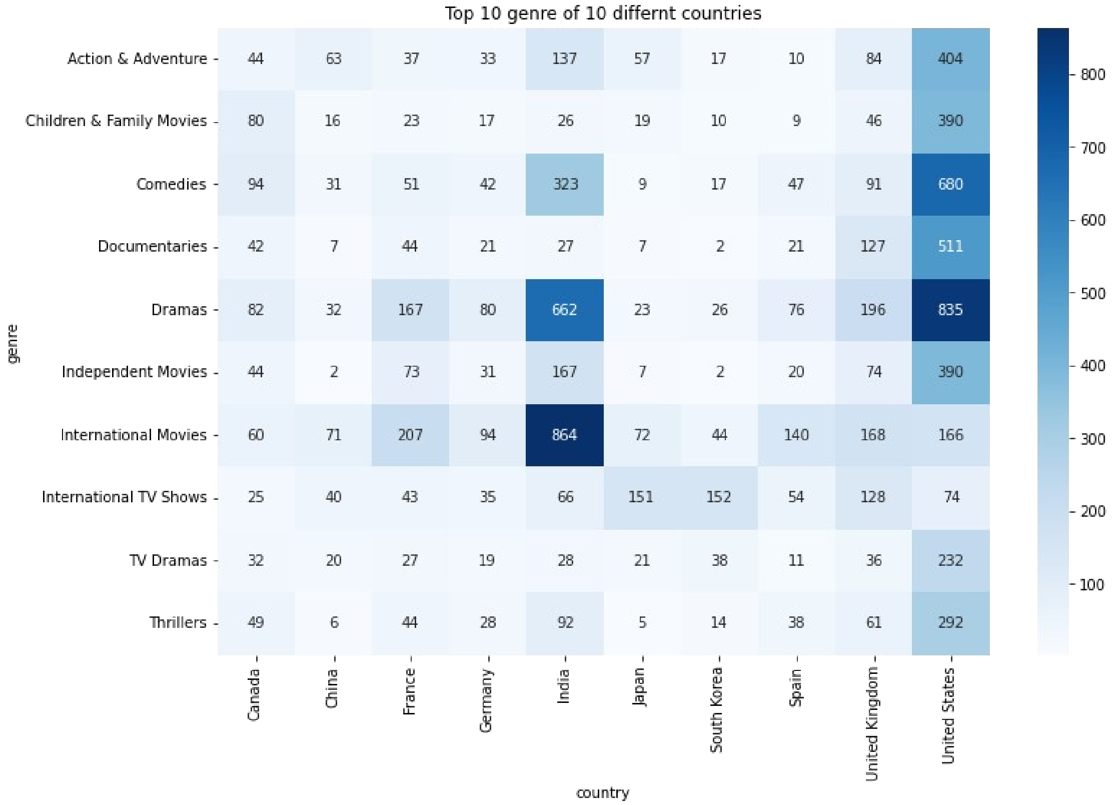
```
  show_id     type                 title         director  \
0      s1    Movie  Dick Johnson Is Dead  Kirsten Johnson
1      s2  TV Show         Blood & Water          Unknown
2      s2  TV Show         Blood & Water          Unknown
5      s3  TV Show             Ganglands  Julien Leclercq
9      s5  TV Show          Kota Factory          Unknown

                                                cast date_added
release_year  \
0                                            Unknown 2021-09-25
2020
1  Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban... 2021-09-24
2021
2  Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban... 2021-09-24
2021
5  Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi... 2021-09-24
2021
9  Mayur More, Jitendra Kumar, Ranjan Raj, Alam K... 2021-09-24
2021

  rating   duration                                          listed_in
\
0  PG-13     90 min                                      Documentaries

1  TV-MA  2 Seasons    International TV Shows, TV Dramas, TV Mysteries

2  TV-MA  2 Seasons    International TV Shows, TV Dramas, TV Mysteries

5  TV-MA   1 Season  Crime TV Shows, International TV Shows, TV Act...

9  TV-MA  2 Seasons  International TV Shows, Romantic TV Shows, TV ...


                                         description    Year  month
day  \
0  As her father nears the end of his life, filmm...  2021.0    9.0
Saturday
1  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
2  After crossing paths at a party, a Cape Town t...  2021.0    9.0
Friday
5  To protect his family from a powerful drug lor...  2021.0    9.0
Friday
9  In a city of coaching centers known to train I...  2021.0    9.0
Friday
```

```
         country                   genre
0  United States           Documentaries
1   South Africa  International TV Shows
2   South Africa               TV Dramas
5        Unknown  International TV Shows
9          India  International TV Shows
```

```
df_top10_genre = df_top10_genre.loc[df_top10_genre["country"] !=
"Unknown"]
df_top10_genre["country"].value_counts()[:10]
```

```
temp_c = df_top10_genre["country"].value_counts()[:10].reset_index()
temp_c.rename(columns = {'index':'country', 'country':'count'},
inplace=True)
country_list = temp_c["country"].tolist()
df_top10_genre_countrywise =
df_top10_genre.loc[df_top10_genre['country'].isin(country_list)]
df_top10_genre_countrywise.head()
```

```
heat_genre= pd.DataFrame(df_top10_genre_countrywise.groupby("genre")
["country"].value_counts())
heat_genre.rename(columns = {"country" : "count"}, inplace = True)
heat_genre.reset_index(inplace = True)
heat_genre_final = heat_genre.pivot("genre" , "country" , "count")
plt.figure(figsize = (12,8))
sns.heatmap(heat_genre_final , annot = True,  cmap="Blues", fmt = "d")
plt.title("Top 10 genre of 10 differnt countries")
plt.show()
```



Conclusion :-

For India, netflix should add more content of genre International movies , Comedies and Dramas.
For United States , Netflix should add more content of genre Dramas and Comedy.
For Canada, Netflix should add more content of genre Dramas & Children and family movies.

Summary :-

Netflix added more movies as compare to TV shows
Content for United States on netflix is maximum as compare to other countries.
Netflix content is mostly availabe for adults only
Most popular genres in recent years are International movies, Dramas, Comedies, International TV Shows and Action & Adventure.
In 2021 , there is significant amount of drop in content added due to COVID pandemic.

*Most of viewers of Netflix is from United States followed by India & United Kingdom

Movies:-

In United States , India and United kingdom movies are more popular as comapre to other countires
Almost same no. of movies are added on netflix every month.

Mostly movies are of "100 min" duration.
Top people casted in Movies are from India.
"Rajiv Chilakaa" is the most famous director among all.

TV Shows :-

TV Shows mostly are having season 1 and season 2 respectively.
For Japan and South Korea, netflix should focus more on TV showes as compare to movies

Recommendations :

Movies :-

Preferd movies duration is between 90-100 minutes.
Netflix should add more movies for United States and India falling in category of Internation movies and comedies
Netflix should add more movies for United States and India having rating of TV-MA & TV-14.
Top three countries where movies added are United States, India & United Kingdom.
Netflix shoud add TV Show on Friday than any other weekday.

TV Show:-

Preferd movies duration is 1-2 seeasons.
Netflix should focus on countries like Japan, South Korea and France in TV shows , as they prefer TV shows over movies.
Netflix shoud add TV Show on Friday than other weekday.
As per 2021 data, count of TV showes are more than movies , this means people wants more web-series as they have for leisure time may be due to work from home scenario.