Netflix Data Analysis using Data Science

April 15, 2023

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

```python
[2]: df=pd.read_csv('netflix1.csv')
     df
```

```
[2]:       Show_Id Category                                Title  \
     0          s1  TV Show                                   3%
     1          s2    Movie                                07:19
     2          s3    Movie                                23:59
     3          s4    Movie                                    9
     4          s5    Movie                                   21
     ...       ...      ...                                  ...
     7784    s7783    Movie                                 Zozo
     7785    s7784    Movie                               Zubaan
     7786    s7785    Movie                    Zulu Man in Japan
     7787    s7786  TV Show              Zumbo's Just Desserts
     7788    s7787    Movie  ZZ TOP: THAT LITTLE OL' BAND FROM TEXAS

                    Director                                          Cast  \
     0                   NaN  João Miguel, Bianca Comparato, Michel Gomes, R…
     1      Jorge Michel Grau  Demián Bichir, Héctor Bonilla, Oscar Serrano, …
     2           Gilbert Chan  Tedd Chan, Stella Chung, Henley Hii, Lawrence …
     3            Shane Acker  Elijah Wood, John C. Reilly, Jennifer Connelly…
     4         Robert Luketic  Jim Sturgess, Kevin Spacey, Kate Bosworth, Aar…
     ...                  ...                                          ...
     7784        Josef Fares  Imad Creidi, Antoinette Turk, Elias Gergi, Car…
     7785        Mozez Singh  Vicky Kaushal, Sarah-Jane Dias, Raaghav Chanan…
     7786                NaN                                        Nasty C
     7787                NaN                 Adriano Zumbo, Rachel Khoo
     7788          Sam Dunn                                            NaN

                              Country     Release_Date  \
     0                         Brazil    August 14, 2020
     1                         Mexico  December 23, 2016
     2                      Singapore  December 20, 2018
```

```
3                                        United States   November 16, 2017
4                                        United States     January 1, 2020
…                                                   …                    …
7784  Sweden, Czech Republic, United Kingdom, Denmar…   October 19, 2020
7785                                             India       March 2, 2019
7786                                               NaN  September 25, 2020
7787                                         Australia    October 31, 2020
7788            United Kingdom, Canada, United States       March 1, 2020

      Rating    Duration                                            Type  \
0      TV-MA   4 Seasons  International TV Shows, TV Dramas, TV Sci-Fi &…
1      TV-MA      93 min                   Dramas, International Movies
2          R      78 min             Horror Movies, International Movies
3      PG-13      80 min  Action & Adventure, Independent Movies, Sci-Fi…
4      PG-13     123 min                                          Dramas
…          …          …                                               …
7784   TV-MA      99 min                   Dramas, International Movies
7785   TV-14     111 min     Dramas, International Movies, Music & Musicals
7786   TV-MA      44 min  Documentaries, International Movies, Music & M…
7787   TV-PG    1 Season           International TV Shows, Reality TV
7788   TV-MA      90 min             Documentaries, Music & Musicals

                                            Description
0         In a future where the elite inhabit an island …
1         After a devastating earthquake hits Mexico Cit…
2         When an army recruit is found dead, his fellow…
3         In a postapocalyptic world, rag-doll robots hi…
4         A brilliant group of students become card-coun…
…                                                     …
7784     When Lebanon's Civil War deprives Zozo of his …
7785     A scrappy but poor boy worms his way into a ty…
7786     In this documentary, South African rapper Nast…
7787     Dessert wizard Adriano Zumbo looks for the nex…
7788     This documentary delves into the mystique behi…

[7789 rows x 11 columns]
```

```
[3]: #check no of rows and columns
     df.shape
```

```
[3]: (7789, 11)
```

```
[4]: #check all columns names
     df.columns
```

```
[4]: Index(['Show_Id', 'Category', 'Title', 'Director', 'Cast', 'Country',
            'Release_Date', 'Rating', 'Duration', 'Type', 'Description'],
```

```
          dtype='object')
```

[5]: *#checking datatype*
     df.info()

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7789 entries, 0 to 7788
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   Show_Id       7789 non-null   object
 1   Category      7789 non-null   object
 2   Title         7789 non-null   object
 3   Director      5401 non-null   object
 4   Cast          7071 non-null   object
 5   Country       7282 non-null   object
 6   Release_Date  7779 non-null   object
 7   Rating        7782 non-null   object
 8   Duration      7789 non-null   object
 9   Type          7789 non-null   object
 10  Description   7789 non-null   object
dtypes: object(11)
memory usage: 669.5+ KB
```

[6]: *#check duplicate values*
     df[df.duplicated()]

[6]:   Show_Id Category   Title   Director \
     6300   s684   Movie   Backfire   Dave Patten
     6622   s6621   Movie The Lost Okoroshi Abba T. Makama

                                            Cast   Country \
     6300 Black Deniro, Byron "Squally" Vinson, Dominic … United States
     6622 Seun Ajayi, Judith Audu, Tope Tedela, Ifu Enna…   Nigeria

              Release_Date Rating Duration \
     6300   April 5, 2019 TV-MA   97 min
     6622 September 4, 2020 TV-MA   94 min

                                        Type \
     6300 Dramas, Independent Movies, Thrillers
     6622   Comedies, Dramas, Independent Movies

                                        Description
     6300 When two would-be robbers accidentally kill a …
     6622 A disillusioned security guard transforms into…

```
[7]: #drop duplicated vales
     df.drop_duplicates(inplace=True)
```

```
[8]: df[df.duplicated()]
```
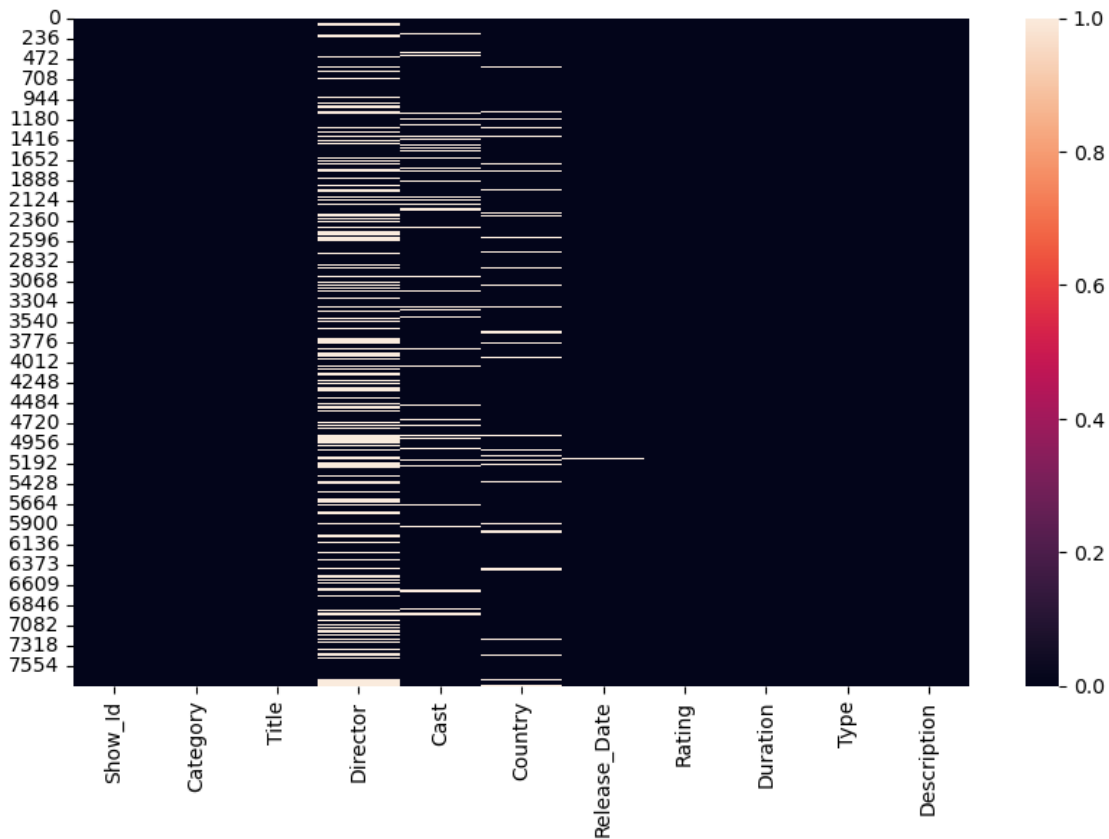
```
[8]: Empty DataFrame
     Columns: [Show_Id, Category, Title, Director, Cast, Country, Release_Date,
     Rating, Duration, Type, Description]
     Index: []
```

```
[9]: df.isnull().sum()
```

```
[9]: Show_Id             0
     Category            0
     Title               0
     Director         2388
     Cast              718
     Country           507
     Release_Date       10
     Rating              7
     Duration            0
     Type                0
     Description         0
     dtype: int64
```

```
[10]: #using heatmap to show null values
      plt.figure(figsize=[10,6])
      sns.heatmap(df.isnull())
```

```
[10]: <AxesSubplot:>
```

```
[11]: #show all records of partcular column
      df[df['Title'].isin(['Jalpari: The Desert Mermaid'])]
```

```
[11]:       Show_Id Category                        Title          Director  \
      3117    s3118    Movie  Jalpari: The Desert Mermaid  Nila Madhab Panda

                                             Cast Country  Release_Date  \
      3117  Lehar Khan, Krishang Trivedi, Parvin Dabas, Su…   India  May 19, 2018

            Rating Duration                                         Type  \
      3117   TV-14   94 min  Dramas, Independent Movies, International Movies

                                      Description
      3117   When they travel to their father's ancestral v…
```

```
[12]: #In which year highest number of TV Shows and Movies were released? Show with␣
      ↪bar graph.
      #Formatting release date column
      df['Date']=pd.to_datetime(df['Release_Date'])
      df.head()
```

```
[12]:   Show_Id Category  Title          Director  \
     0      s1  TV Show     3%                NaN
     1      s2    Movie  07:19  Jorge Michel Grau
     2      s3    Movie  23:59        Gilbert Chan
     3      s4    Movie      9        Shane Acker
     4      s5    Movie     21      Robert Luketic

                                               Cast        Country  \
     0  João Miguel, Bianca Comparato, Michel Gomes, R…          Brazil
     1  Demián Bichir, Héctor Bonilla, Oscar Serrano, …          Mexico
     2  Tedd Chan, Stella Chung, Henley Hii, Lawrence …       Singapore
     3  Elijah Wood, John C. Reilly, Jennifer Connelly…   United States
     4  Jim Sturgess, Kevin Spacey, Kate Bosworth, Aar…   United States

            Release_Date Rating   Duration  \
     0    August 14, 2020  TV-MA  4 Seasons
     1  December 23, 2016  TV-MA     93 min
     2  December 20, 2018      R     78 min
     3  November 16, 2017  PG-13     80 min
     4    January 1, 2020  PG-13    123 min

                                               Type  \
     0  International TV Shows, TV Dramas, TV Sci-Fi &…
     1                 Dramas, International Movies
     2          Horror Movies, International Movies
     3  Action & Adventure, Independent Movies, Sci-Fi…
     4                                       Dramas

                                         Description        Date
     0  In a future where the elite inhabit an island … 2020-08-14
     1  After a devastating earthquake hits Mexico Cit… 2016-12-23
     2  When an army recruit is found dead, his fellow… 2018-12-20
     3  In a postapocalyptic world, rag-doll robots hi… 2017-11-16
     4  A brilliant group of students become card-coun… 2020-01-01
```
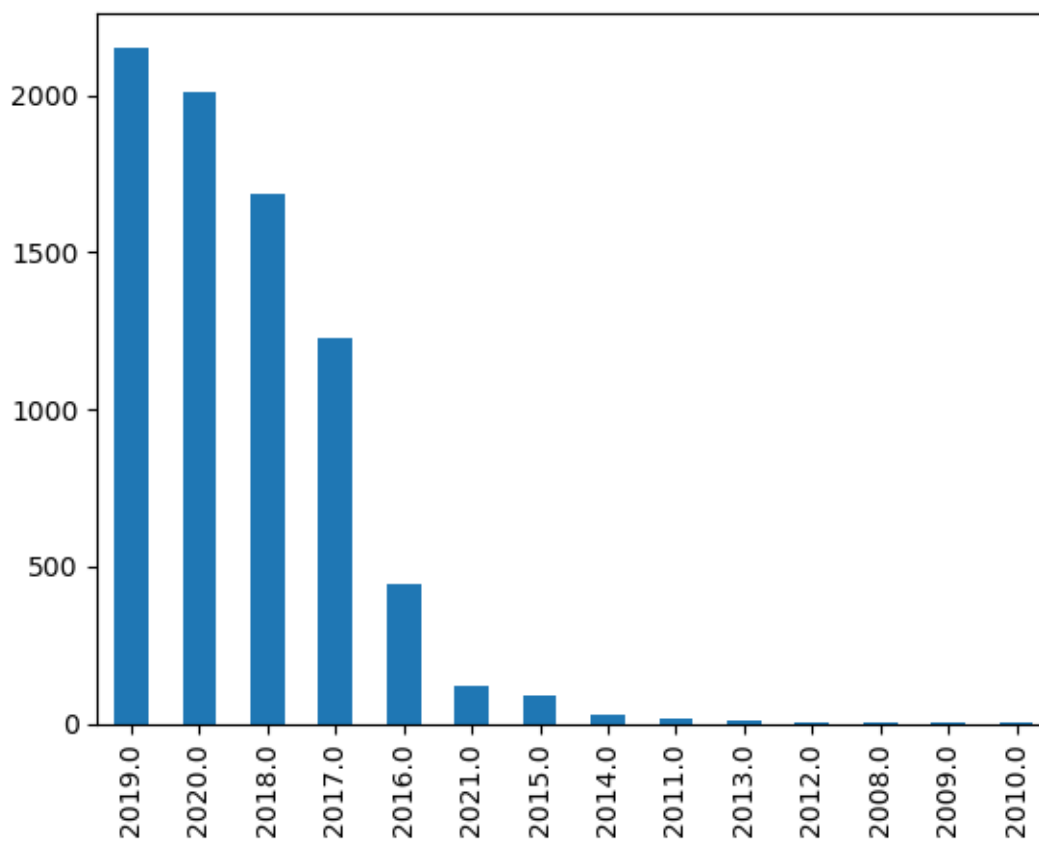
[13]: *#using value_counts() function to know which year highest TV Shows and Movies↵*
      ↪were released.
      df['Date'].dt.year.value_counts()

```
[13]: 2019.0    2153
      2020.0    2009
      2018.0    1685
      2017.0    1225
      2016.0     443
      2021.0     117
      2015.0      88
      2014.0      25
```

```
2011.0     13
2013.0     11
2012.0      3
2008.0      2
2009.0      2
2010.0      1
Name: Date, dtype: int64
```

[14]: ```
#show with bar graph
df['Date'].dt.year.value_counts().plot(kind='bar')
```

[14]: <AxesSubplot:>



[15]: ```
#How many movies and shows are in the dataset? Show with the bar graph
df['Category'].value_counts()
```
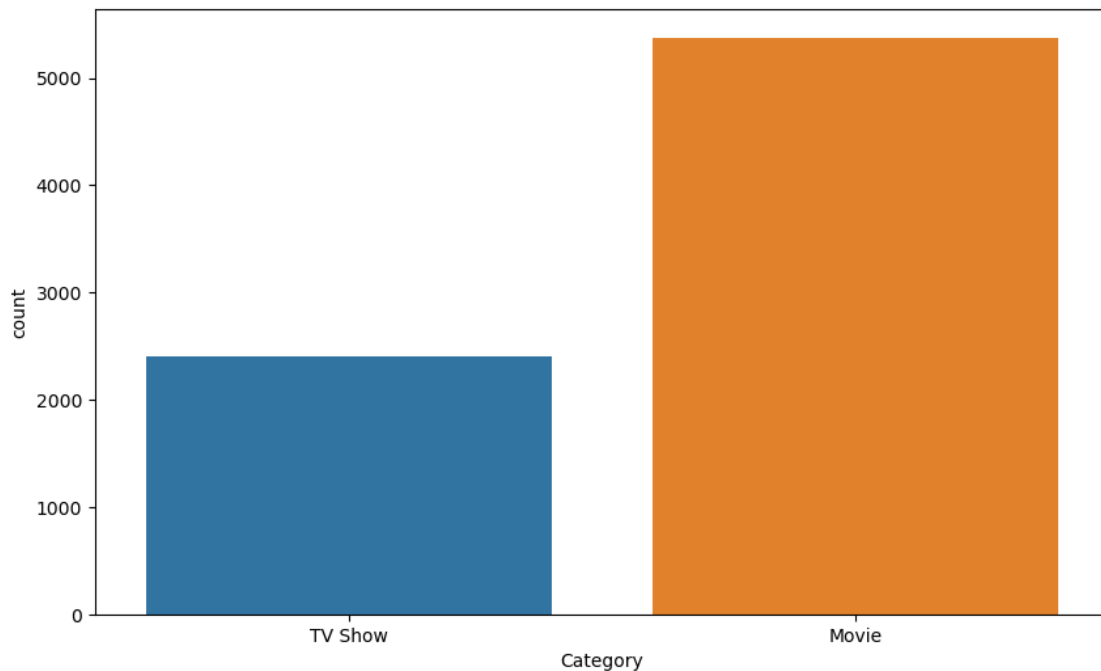
[15]: ```
Movie   5377
TV Show   2410
Name: Category, dtype: int64
```

```
[16]: plt.figure(figsize=[10,6])
      sns.countplot(df['Category'])
```

C:\Users\HP\anaconda3\lib\site-packages\seaborn_decorators.py:36:
FutureWarning: Pass the following variable as a keyword arg: x. From version
0.12, the only valid positional argument will be `data`, and passing other
arguments without an explicit keyword will result in an error or
misinterpretation.
  warnings.warn(

[16]: <AxesSubplot:xlabel='Category', ylabel='count'>


```
[17]: #Show all the Movies that were released in 2020
      df['Year']=df['Date'].dt.year
      df.head()
      df[(df['Category']=='Movie') & (df['Year']==2020)].head()
```

```
[17]:     Show_Id Category                         Title  \
      4        s5    Movie                            21
      6        s7    Movie                           122
      14      s15    Movie                          3022
      27      s28    Movie                        #Alive
      28      s29    Movie  #AnneFrank - Parallel Stories

                            Director  \
```

8

```
4                      Robert Luketic
6                   Yasir Al Yasiri
14                       John Suits
27                           Cho Il
28  Sabina Fedeli, Anna Migotto
```

```
                                              Cast         Country  \
4    Jim Sturgess, Kevin Spacey, Kate Bosworth, Aar…  United States
6    Amina Khalil, Ahmed Dawood, Tarek Lotfy, Ahmed…          Egypt
14   Omar Epps, Kate Walsh, Miranda Cosgrove, Angus…  United States
27                          Yoo Ah-in, Park Shin-hye    South Korea
28                     Helen Mirren, Gengher Gatti           Italy
```

```
         Release_Date Rating Duration  \
4       January 1, 2020  PG-13  123 min
6          June 1, 2020  TV-MA   95 min
14      March 19, 2020      R   91 min
27   September 8, 2020  TV-MA   99 min
28         July 1, 2020  TV-14   95 min
```

```
                                              Type  \
4                                          Dramas
6                 Horror Movies, International Movies
14   Independent Movies, Sci-Fi & Fantasy, Thrillers
27    Horror Movies, International Movies, Thrillers
28             Documentaries, International Movies
```

```
                                       Description        Date    Year
4    A brilliant group of students become card-coun…  2020-01-01  2020.0
6    After an awful accident, a couple admitted to …  2020-06-01  2020.0
14   Stranded when the Earth is suddenly destroyed …  2020-03-19  2020.0
27   As a grisly virus rampages a city, a lone man …  2020-09-08  2020.0
28   Through her diary, Anne Frank's story is retol…  2020-07-01  2020.0
```

[18]: `#Show only the titles of all the TV Shows that were released in Pakistan.`
`df[(df['Category']=='TV Show')&(df['Country']=='Pakistan')]['Title']`

[18]:
```
2864              Humsafar
3352               Khaani
5338       Sadqay Tumhare
7769    Zindagi Gulzar Hai
Name: Title, dtype: object
```

[19]: `#Show top 5 directors who gave highest number of TV Shows and Movies to Netflix.`

`df['Director'].value_counts().head()`

```
[19]: Raúl Campos, Jan Suter       18
      Marcus Raboy                  16
      Jay Karas                     14
      Cathy Garcia-Molina           13
      Jay Chapman                   12
      Name: Director, dtype: int64
```

```
[20]: #Show all the records where 'Category is Movies and Type is Comedies' or␣
      ↪'Country is United states.

      df[(df['Category']=='Movie') & (df['Type']=='Comedies') |␣
      ↪(df['Country']=='United States')].head()
```

```
[20]:     Show_Id Category Title         Director  \
      3        s4    Movie     9     Shane Acker
      4        s5    Movie    21   Robert Luketic
      7        s8    Movie   187   Kevin Reynolds
      10      s11    Movie  1922    Zak Hilditch
      14      s15    Movie  3022       John Suits

                                                Cast        Country  \
      3    Elijah Wood, John C. Reilly, Jennifer Connelly…  United States
      4    Jim Sturgess, Kevin Spacey, Kate Bosworth, Aar…  United States
      7    Samuel L. Jackson, John Heard, Kelly Rowan, Cl…  United States
      10   Thomas Jane, Molly Parker, Dylan Schmid, Kaitl…  United States
      14   Omar Epps, Kate Walsh, Miranda Cosgrove, Angus…  United States

             Release_Date Rating Duration  \
      3    November 16, 2017  PG-13    80 min
      4      January 1, 2020  PG-13   123 min
      7     November 1, 2019      R   119 min
      10    October 20, 2017  TV-MA   103 min
      14      March 19, 2020      R    91 min

                                              Type  \
      3    Action & Adventure, Independent Movies, Sci-Fi…
      4                                          Dramas
      7                                          Dramas
      10                               Dramas, Thrillers
      14     Independent Movies, Sci-Fi & Fantasy, Thrillers

                                         Description        Date    Year
      3    In a postapocalyptic world, rag-doll robots hi… 2017-11-16  2017.0
      4    A brilliant group of students become card-coun… 2020-01-01  2020.0
      7    After one of his high school students attacks … 2019-11-01  2019.0
      10   A farmer pens a confession admitting to his wi… 2017-10-20  2017.0
      14   Stranded when the Earth is suddenly destroyed … 2020-03-19  2020.0
```

```python
[21]: #Drop the null values from the dataset with the help of dropna() function

df1=df.dropna()
df1.head()
```

```
[21]:    Show_Id Category  Title        Director  \
      1       s2    Movie  07:19  Jorge Michel Grau
      2       s3    Movie  23:59        Gilbert Chan
      3       s4    Movie      9       Shane Acker
      4       s5    Movie     21     Robert Luketic
      5       s6  TV Show     46        Serdar Akar

                                                 Cast        Country  \
      1  Demián Bichir, Héctor Bonilla, Oscar Serrano, …         Mexico
      2  Tedd Chan, Stella Chung, Henley Hii, Lawrence …      Singapore
      3  Elijah Wood, John C. Reilly, Jennifer Connelly…  United States
      4  Jim Sturgess, Kevin Spacey, Kate Bosworth, Aar…  United States
      5  Erdal Beşikçioğlu, Yasemin Allen, Melis Birkan…         Turkey

           Release_Date Rating  Duration  \
      1  December 23, 2016  TV-MA    93 min
      2  December 20, 2018      R    78 min
      3  November 16, 2017  PG-13    80 min
      4    January 1, 2020  PG-13   123 min
      5       July 1, 2017  TV-MA  1 Season

                                                 Type  \
      1                    Dramas, International Movies
      2             Horror Movies, International Movies
      3  Action & Adventure, Independent Movies, Sci-Fi…
      4                                          Dramas
      5    International TV Shows, TV Dramas, TV Mysteries

                                          Description        Date    Year
      1  After a devastating earthquake hits Mexico Cit… 2016-12-23  2016.0
      2  When an army recruit is found dead, his fellow… 2018-12-20  2018.0
      3  In a postapocalyptic world, rag-doll robots hi… 2017-11-16  2017.0
      4  A brilliant group of students become card-coun… 2020-01-01  2020.0
      5  A genetics professor experiments with a treatm… 2017-07-01  2017.0
```

```python
[22]: #In how many TV Shows/Movies Rajneesh Duggal was casted?

df1[df1['Cast'].str.contains('Amina Khalil')]
```

```
[22]:      Show_Id Category   Title        Director  \
      6         s7    Movie     122  Yasir Al Yasiri
      6205   s6205    Movie  The Cell  Tarek Al Eryan
```

```
6913    s6912    Movie   The Suit      Mohammad Adel
```

```
                                             Cast Country  \
6       Amina Khalil, Ahmed Dawood, Tarek Lotfy, Ahmed…    Egypt
6205    Ahmed Ezz, Mohamed Mamdouh, Samer al Masri, Am…    Egypt
6913    Tamer Hosny, Akram Hosny, Amina Khalil, Dalal …    Egypt


          Release_Date Rating Duration  \
6          June 1, 2020  TV-MA    95 min
6205      June 13, 2019  TV-MA   126 min
6913  November 23, 2020  TV-14    97 min


                                           Type  \
6                 Horror Movies, International Movies
6205    Action & Adventure, Dramas, International Movies
6913    Action & Adventure, Comedies, International Mo…


                                     Description       Date    Year
6       After an awful accident, a couple admitted to … 2020-06-01  2020.0
6205    A special operations officer vows to get reven… 2019-06-13  2019.0
6913    After a duo of slackers dress up as policemen … 2020-11-23  2020.0
```

[23]: #What are the different rating defined by Netflix, and how many Movies got␣
      ↪TV-14 Rating in United States?

df1['Rating'].unique()

[23]: array(['TV-MA', 'R', 'PG-13', 'TV-14', 'TV-G', 'TV-PG', 'NR', 'PG', 'G',
             'TV-Y7', 'TV-Y', 'NC-17', 'TV-Y7-FV', 'UR'], dtype=object)

[24]: df1[(df1['Rating']=='TV-14') & (df1['Country']=='United States')].head()

```
[24]:     Show_Id Category                          Title  \
33          s34    Movie                   #realityhigh
47          s48    Movie                   1 Mile to You
184        s185    Movie  A Haunting at Silver Falls: The Return
232        s233    Movie          A Stoning in Fulham County
247        s248    Movie             A Very Murray Christmas


              Director                                      Cast  \
33    Fernando Lebrija  Nesta Cooper, Kate Walsh, John Michael Higgins…
47         Leif Tilden  Billy Crudup, Graham Rogers, Liana Liberato, S…
184       Teo Konuralp  Laura Flannery, James Cavlo, Harry Hains, Clem…
232      Larry Elikann  Ken Olin, Jill Eikenberry, Maureen Mueller, Gr…
247      Sofia Coppola  Bill Murray, Miley Cyrus, George Clooney, Chri…


            Country      Release_Date Rating Duration  \
```

```
33   United States    September 8, 2017   TV-14    99 min
47   United States        July 7, 2017   TV-14   105 min
184  United States   September 17, 2019  TV-14    80 min
232  United States      October 1, 2011  TV-14    95 min
247  United States    December 4, 2015   TV-14    57 min


                                                Type  \
33                                         Comedies
47     Dramas, Romantic Movies, Sports Movies
184        Horror Movies, Independent Movies
232                                          Dramas
247               Comedies, Music & Musicals


                                    Description        Date    Year
33   When nerdy high schooler Dani finally attracts… 2017-09-08  2017.0
47   After escaping the bus accident that killed hi… 2017-07-07  2017.0
184  When the ghost of her serial killer aunt seemi… 2019-09-17  2019.0
232  After reckless teens kill an Amish child, a pr… 2011-10-01  2011.0
247  Bill Murray rounds up an all-star cast for an … 2015-12-04  2015.0
```

[25]:
```python
#Which country has the highest no. of TV Shows? Show with the bar graph.

tvshows=df1[df1['Category']=='TV Show']
tvshows.head()
```

[25]:
```
     Show_Id Category            Title        Director  \
5         s6  TV Show               46     Serdar Akar
132     s133  TV Show        7 (Seven)     Nizar Shafi
218     s219  TV Show  A Queen Is Born    Carla Barros
260     s261  TV Show        A.I.C.O.   Kazuya Murata
276     s277  TV Show     Abby Hatcher     Kyran Kelly


                                              Cast              Country  \
5     Erdal Beşikçioğlu, Yasemin Allen, Melis Birkan…                Turkey
132   Rahman, Havish, Regina Cassandra, Nandita Swet…                India
218                      Gloria Groove, Alexia Twister               Brazil
260   Haruka Shiraishi, Yusuke Kobayashi, Makoto Fur…                Japan
276   Macy Drouin, Wyatt White, Paul Sun-Hyung Lee, …  United States, Canada


          Release_Date Rating  Duration  \
5          July 1, 2017  TV-MA  1 Season
132       July 30, 2019  TV-14  1 Season
218   November 11, 2020  TV-14  1 Season
260       March 9, 2018  TV-14  1 Season
276        July 1, 2020   TV-Y  1 Season


                                                Type  \
```

```
5        International TV Shows, TV Dramas, TV Mysteries
132                                            TV Shows
218                   International TV Shows, Reality TV
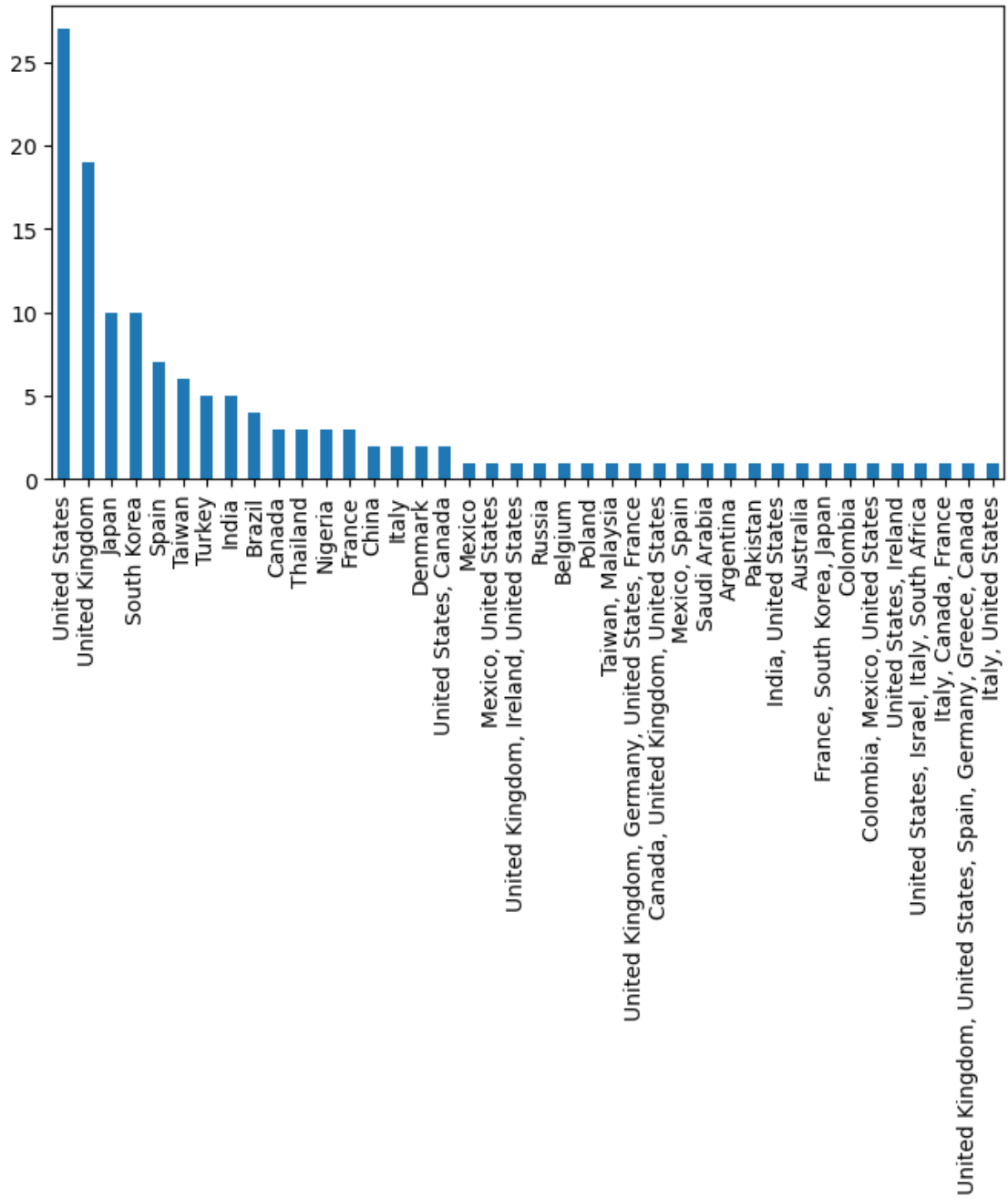260             Anime Series, International TV Shows
276                                           Kids' TV

                                   Description        Date    Year
5     A genetics professor experiments with a treatm…  2017-07-01  2017.0
132   Multiple women report their husbands as missin…  2019-07-30  2019.0
218   Gloria Groove and Alexia Twister make drag dre…  2020-11-11  2020.0
260   Everything Aiko knew was a lie. Now she's join…  2018-03-09  2018.0
276   A big-hearted girl helps her Fuzzly friends wh…  2020-07-01  2020.0
```

[26]: `tvshows.Country.value_counts().head()`

```
[26]: United States     27
      United Kingdom    19
      Japan             10
      South Korea       10
      Spain              7
      Name: Country, dtype: int64
```

[27]:
```python
plt.figure(figsize=[8,4])
tvshows.Country.value_counts().plot(kind='bar')
```

[27]: `<AxesSubplot:>`