ANALYZING THE NETFLIX DATA FOR RECOMMENDING MOVIES/ TV-SHOWS FOR PRODUCTION | PYTHON DATA STRUCTURES, PANDAS, NUMPY AND MATPLOTLIB/SEABORN LIBRARIES

The primary goal of this project is to leverage Python to conduct a comprehensive analysis of the Netflix dataset, encompassing all movies and TV-shows available on the platform. By employing basic matrices and non-graphical techniques, the project aims to provide actionable insights to assist Netflix in strategic decision-making regarding content production and business expansion in diverse markets.

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

```
path = "/content/drive/MyDrive/Dataset/netflix.csv"

data = pd.read_csv(path)
```

```
data.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...
		TV		Julien	Sami Bouajila, Tracy		September				Crime TV Shows	To protect his family from a

1. Defining Problem Statement and Analysing basic metrics

```
data.shape
```

```
(8807, 12)
```

```
data.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
```

```
data.columns
```

```
Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added',
       'release_year', 'rating', 'duration', 'listed_in', 'description'],
```

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

```
data.ndim
```

```
2
```

```
data.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

2: Observations on the shape of data, data types of all the attributes, conversion of categorical attributes to 'category' (If required), missing value detection, statistical summary

```
# Checking for null values

data.isnull().any()
```

```
show_id         False
type            False
title           False
director         True
cast             True
country          True
date_added       True
release_year    False
rating           True
duration         True
listed_in       False
description     False
dtype: bool
```

```
data.T.apply(lambda x: x.isnull().sum(), axis = 1)
```

```
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
```

```
data.isnull().sum().sum()
```

```
4307
```

```
data.director.fillna('Director not available', inplace = True)
data.cast.fillna('Cast not available', inplace = True)
data.country.fillna('Country not available', inplace = True)
data.dropna(subset= ['date_added', 'rating'], inplace = True)
data.dropna(subset= ['duration'], inplace = True)
```

```
data.isnull().any()
```

```
show_id         False
type            False
title           False
director        False
cast            False
country         False
date_added      False
release_year    False
rating          False
duration        False
listed_in       False
description     False
dtype: bool
```

```
data['cast'] = data['cast'].astype('category')
data['director'] = data['director'].astype('category')
data['country'] = data['country'].astype('category')
data['listed_in'] = data['listed_in'].astype('category')
```

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 8790 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column        Non-Null Count  Dtype   
---  ------        --------------  -----   
 0   show_id       8790 non-null   object  
 1   type          8790 non-null   object  
 2   title         8790 non-null   object  
 3   director      8790 non-null   category
 4   cast          8790 non-null   category
 5   country       8790 non-null   category
 6   date_added    8790 non-null   object  
 7   release_year  8790 non-null   int64   
 8   rating        8790 non-null   object  
 9   duration      8790 non-null   object  
 10  listed_in     8790 non-null   category
 11  description   8790 non-null   object  
dtypes: category(4), int64(1), object(7)
memory usage: 1.2+ MB
```

```
# Checking the data after removal of null values.

data.describe()
```

	release_year
count	8790.000000
mean	2014.183163
std	8.825466
min	1925.000000
25%	2013.000000
50%	2017.000000
75%	2019.000000
max	2021.000000

```
data.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rat
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Cast not available	United States	September 25, 2021	2020	PG
1	s2	TV Show	Blood & Water	Director not available	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV·
					Sami Bouajila, Tracy	Country			

```
data.show_id.value_counts().count()
```

```
8790
```

```
data.type.value_counts()
```

```
Movie      6126
TV Show    2664
Name: type, dtype: int64
```

```
data.country.value_counts().head(10)
```

```
United States            2809
India                     972
Country not available     829
United Kingdom            418
Japan                     243
South Korea               199
Canada                    181
Spain                     145
France                    124
Mexico                    110
Name: country, dtype: int64
```

```
data.cast.value_counts().head(10)
```

```
Cast not available                                                                                                                  825
David Attenborough                                                                                                                   19
Vatsal Dubey, Julie Tejwani, Rupa Bhimani, Jigna Bhardwaj, Rajesh Kava, Mousam, Swapnil                                              14
Samuel West                                                                                                                          10
Jeff Dunham                                                                                                                           7
David Spade, London Hughes, Fortune Feimster                                                                                          6
Michela Luci, Jamie Watson, Eric Peterson, Anna Claire Bartlam, Nicolas Aqui, Cory Doran, Julie Lemieux, Derek McGrath               6
Craig Sechler                                                                                                                         6
Kevin Hart                                                                                                                            6
Jim Gaffigan                                                                                                                          5
Name: cast, dtype: int64
```

2.1 Un-nesting the columns

```
# Creating a temporary DataFrame to explode the columns with nested data

tdf1 = pd.read_csv("/content/drive/MyDrive/Dataset/netflix.csv")
tdf1.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rat
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-

```
tdf2 = pd.read_csv("/content/drive/MyDrive/Dataset/netflix.csv")
tdf2.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rat
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-

```
# Spliting the nested columns into list and Un-nesting them using .explode()

tdf2['listed_in'] = tdf2['listed_in'].str.split(",")
tdf2_exploded = tdf2.explode('listed_in')
tdf2_exploded
```

	show_id	type	title	director	cast	country	date_added	release_year
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021
					Sami Bouajila,			

```
tdf2_exploded.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rat
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-

```
tdf2['director'] = tdf2['director'].str.split(',')
```

```
tdf2_exploded = tdf2.explode('director')
tdf2_exploded
```

	show_id	type	title	director	cast	country	date_added	release_year
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020
1	s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	NaN	September 24, 2021	2021
3	s4	TV Show	Jailbirds New Orleans	NaN	NaN	NaN	September 24, 2021	2021
4	s5	TV Show	Kota Factory	NaN	Mayur More, Jitendra Kumar, Ranjan Raj, Alam	India	September 24, 2021	2021

```
tdf2['cast'] = tdf2['cast'].str.split(',')
```

```
tdf2_exploded = tdf2.explode('cast')
tdf2_exploded
```

	show_id	type	title	director	cast	country	date_added	release_year	r
0	s1	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	NaN	United States	September 25, 2021	2020	
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Khosi Ngema	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Gail Mabalane	South Africa	September 24, 2021	2021	
1	s2	TV Show	Blood & Water	NaN	Thabang Molaba	South Africa	September 24, 2021	2021	
...	...	...	...	...	...	...	...	...	

2.2 Basic Analysis on Unnested DataFrame

```
tdf2_exploded.shape
```

```
(64951, 12)
```

```
tdf2_exploded.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 64951 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   show_id       64951 non-null  object
 1   type          64951 non-null  object
 2   title         64951 non-null  object
 3   director      45938 non-null  object
 4   cast          64126 non-null  object
 5   country       59898 non-null  object
 6   date_added    64882 non-null  object
 7   release_year  64951 non-null  int64 
 8   rating        64913 non-null  object
 9   duration      64948 non-null  object
 10  listed_in     64951 non-null  object
 11  description   64951 non-null  object
dtypes: int64(1), object(11)
memory usage: 6.4+ MB
```

```
tdf2_exploded.describe()
```

	release_year
count	64951.000000
mean	2013.637419
std	8.924462
min	1925.000000
25%	2012.000000
50%	2017.000000
75%	2019.000000
max	2021.000000

3. Non-Graphical Analysis: Value counts and unique attributes

```
tdf2_exploded.cast.value_counts().head(10)
```

```
 Anupam Kher         39
 Rupa Bhimani        31
 Takahiro Sakurai    30
 Julie Tejwani       28
 Om Puri             27
 Rajesh Kava         26
Shah Rukh Khan       26
 Yuki Kaji           25
 Paresh Rawal        25
 Andrea Libman       25
Name: cast, dtype: int64
```

```
tdf2_exploded['cast'].nunique()
```

```
39296
```

```
tdf2_exploded.cast.unique()
```

```
array([nan, 'Ama Qamata', ' Khosi Ngema', ..., ' Malkeet Rauni',
       ' Anita Shabdish', ' Chittaranjan Tripathy'], dtype=object)
```

```
tdf2_exploded.director.value_counts().head(10)
```

```
[Martin Scorsese]        139
[Cathy Garcia-Molina]    125
[Rajiv Chilaka]          121
[Steven Spielberg]       121
[Youssef Chahine]        104
[Quentin Tarantino]       94
[Robert Rodriguez]        92
[David Dhawan]            90
[Don Michael Paul]        88
[McG]                     88
Name: director, dtype: int64
```

```
tdf2_exploded['director']
```

```
0       [Kirsten Johnson]
1                     NaN
1                     NaN
1                     NaN
1                     NaN
                ...
8806        [Mozez Singh]
8806        [Mozez Singh]
8806        [Mozez Singh]
8806        [Mozez Singh]
8806        [Mozez Singh]
Name: director, Length: 64951, dtype: object
```

```
tdf2_exploded['listed_in'].value_counts().head(20)
```

```
[Dramas,  International Movies]                        3022
[Comedies,  Dramas,  International Movies]             2266
```

```
[Children & Family Movies,  Comedies]                    1956
[Dramas,  Independent Movies,  International Movies]     1919
[Children & Family Movies]                               1725
[Kids' TV]                                               1548
[Comedies,  International Movies]                        1542
[Dramas,  International Movies,  Romantic Movies]        1402
[Dramas]                                                 1284
[Action & Adventure]                                     1256
[Comedies,  International Movies,  Romantic Movies]      1209
[Anime Series,  International TV Shows]                  1186
[Dramas,  International Movies,  Thrillers]              1124
[Comedies]                                               1105
[Action & Adventure,  Dramas,  International Movies]     1103
[Crime TV Shows,  International TV Shows,  TV Dramas]    1101
[Comedies,  Dramas,  Independent Movies]                 1032
[International TV Shows,  TV Dramas]                     1027
[Action & Adventure,  International Movies]               896
[Dramas,  Independent Movies]                             888
Name: listed_in, dtype: int64
```

4. Visual Analysis - Univariate, Bivariate after pre-processing of the data

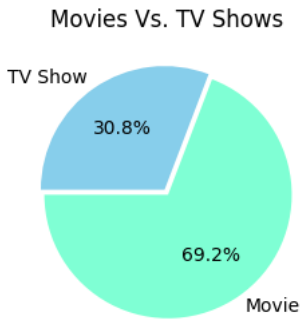
Note: Pre-processing involves unnesting of the data in columns like Actor, Director, Country

4.1 For continuous variable(s): Distplot, countplot, histogram for univariate analysis (10 Points)

4.2 For categorical variable(s): Boxplot

4.3 For correlation: Heatmaps, Pairplots

```
# Netflix content by Type

plt.figure(figsize=(6,3))
plt.title("Movies Vs. TV Shows")
g=plt.pie(tdf2_exploded.type.value_counts(),explode=(0.025,0.025),
labels=tdf2_exploded.type.value_counts().index, colors=['aquamarine','skyblue'],autopct='%1.1f%%',
startangle=180)

plt.show()

# This pie chart shows that the contents type share for Movies is 2/3 rd (69.2 %) compared to TV Shows (30.8 %)
```




```
tdf2_exploded.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating
0	s1	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	NaN	United States	September 25, 2021	2020	PG-13
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV-MA
1	s2	TV	Blood &	NaN	Khosi	South	September	2021	TV-MA

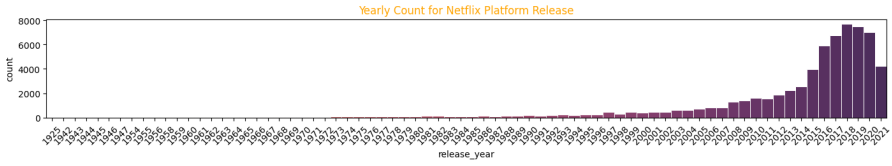
```
# Getting the yearly count of movies and TV shows when Netflix added the data onto their platform

yearly_count = tdf2_exploded.groupby(tdf2_exploded['release_year']).aggregate({ 'release_year' : 'count' }).rename(columns={"index": "year",
yearly_count.sort_values(by= 'count', ascending = False)
yearly_count['release_year'] = yearly_count['release_year'].astype('int64')

yearly_count
```

	release_year	count
0	1925	1
1	1942	3
2	1943	3
3	1944	3
4	1945	5
...	...	...
69	2017	6745
70	2018	7708
71	2019	7487
72	2020	7014
73	2021	4226

74 rows × 2 columns

```
# Figsize should be done first
plt.figure(figsize  = (17,2))

# call the plotting function
sns.barplot(data = yearly_count, x='release_year', y= 'count', palette = 'flare',width=1, edgecolor="white", linewidth=0.7)

# do the customizations
plt.xticks(rotation = 45, fontsize = 10)
plt.title('Yearly Count for Netflix Platform Release', color = 'orange', fontsize = 12 )

# show the plot
plt.show()
```

```
<ipython-input-42-05891b7244a8>:5: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0.

  sns.barplot(data = yearly_count, x='release_year', y= 'count', palette = 'flare',width
```




```
# We can fetch the data for which year, how many movies were released

release_year_cnt = tdf2_exploded.release_year.value_counts().reset_index()
release_year_cnt = release_year_cnt.rename(columns={"index": "release_year","release_year":"count"}).sort_values('count', ascending= False)
release_year_cnt.set_index('release_year', inplace=True)
release_year_cnt.sort_values('count', ascending= False)
```

release_year	count
2018	7708
2019	7487
2020	7014
2017	6745
2016	5910
...	...
1944	3
1943	3
1946	2
1947	2
1925	1

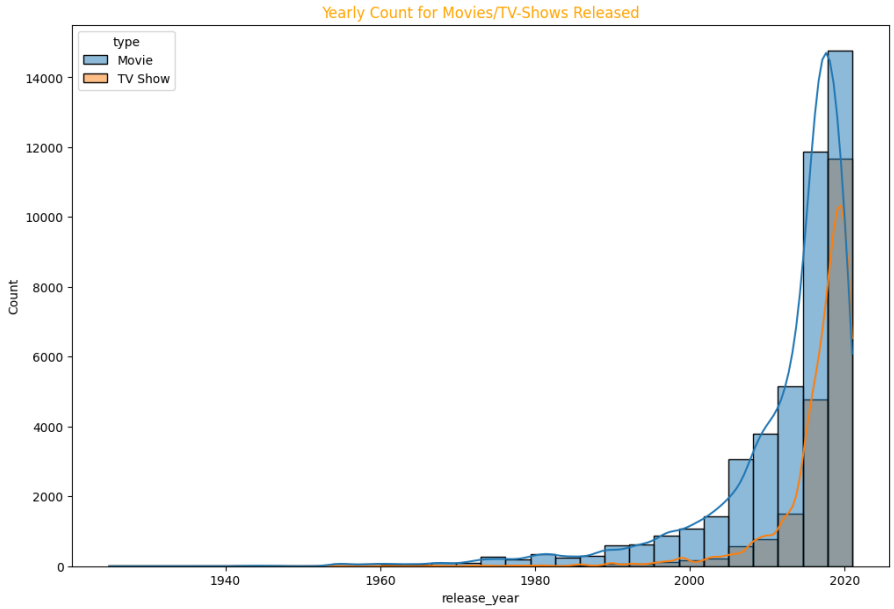
74 rows × 1 columns

```
release_year_cnt.reset_index()
```

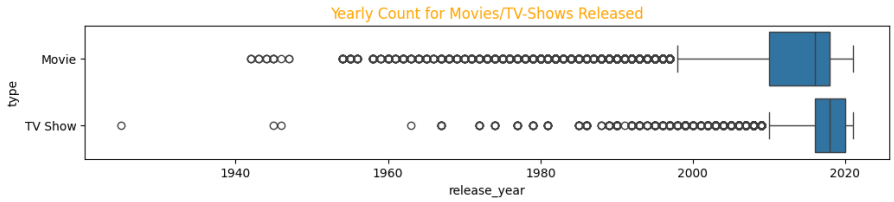
	release_year	count
0	2018	7708
1	2019	7487
2	2020	7014
3	2017	6745
4	2016	5910
...	...	...
69	1944	3
70	1943	3
71	1946	2
72	1947	2
73	1925	1

74 rows × 2 columns

```
# Histogram Plot to check the yearly release of number of Movies/TV-Shows
plt.figure(figsize  = (12,8))
sns.histplot(tdf2_exploded, x= tdf2_exploded['release_year'], hue= tdf2_exploded['type'] , bins = 30, kde = True)

plt.xticks(fontsize = 10)
plt.title('Yearly Count for Movies/TV-Shows Released', color = 'orange', fontsize = 12 )

plt.show()
```



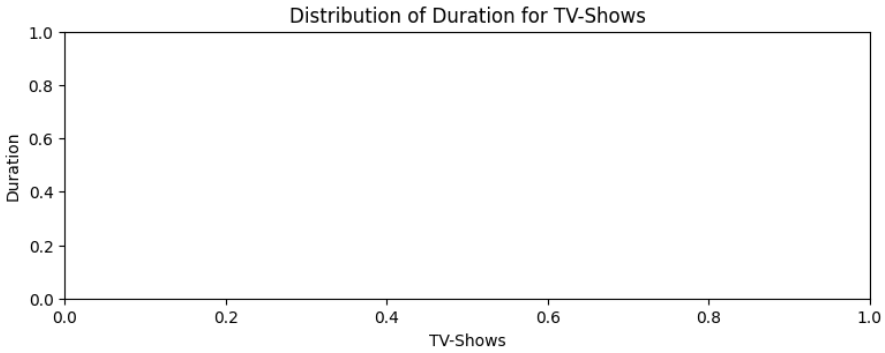

```
# Boxplot for the count of released movies and TV-shows each year

plt.figure(figsize  = (12,2))
sns.boxplot(tdf2_exploded, x= tdf2_exploded['release_year'], y= tdf2_exploded['type'])

plt.xticks(fontsize = 10)
plt.title('Yearly Count for Movies/TV-Shows Released', color = 'orange', fontsize = 12 )

plt.show()
```




```
# Duration Distribution for TV Shows

netflix_shows_tdf = tdf2_exploded[tdf2_exploded.type.str.contains("TV Shows")]
netflix_shows_tdf['duration'] = netflix_shows_tdf['duration'].str.extract('(\d+)',expand=False).astype(int)


netflix_shows_tdf
# tdf2_exploded.head()
```

show_id	type	title	director	cast	country	date_added	release_year	rating	durati

```
# Creating a boxplot for TVShows duration

plt.figure(figsize=(9, 3))
sns.boxplot(data=netflix_shows_tdf, y='type', x='duration')
plt.xlabel('TV-Shows')
plt.ylabel('Duration')
plt.title('Distribution of Duration for TV-Shows')
plt.show()
```




```
tdf2_exploded.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating
0	s1	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	NaN	United States	September 25, 2021	2020	PG-13
1	s2	TV Show	Blood & Water	NaN	Ama Qamata	South Africa	September 24, 2021	2021	TV-MA
1	s2	TV	Blood &	NaN	Khosi	South	September	2021	TV-MA

```
tdf2_exploded.listed_in.value_counts().head(10)
```

```
[Dramas,  International Movies]                        3022
[Comedies,  Dramas,  International Movies]             2266
[Children & Family Movies,  Comedies]                  1956
[Dramas,  Independent Movies,  International Movies]   1919
[Children & Family Movies]                             1725
[Kids' TV]                                             1548
[Comedies,  International Movies]                      1542
[Dramas,  International Movies,  Romantic Movies]      1402
[Dramas]                                               1284
[Action & Adventure]                                   1256
Name: listed_in, dtype: int64
```

```
x_listed_in = tdf2_exploded.listed_in.value_counts().head(10).index
x_listed_in
```

```
Index([                      ['Dramas', ' International Movies'],
                  ['Comedies', ' Dramas', ' International Movies'],
                        ['Children & Family Movies', ' Comedies'],
       ['Dramas', ' Independent Movies', ' International Movies'],
                                     ['Children & Family Movies'],
                                                    ['Kids' TV'],
                             ['Comedies', ' International Movies'],
          ['Dramas', ' International Movies', ' Romantic Movies'],
                                                       ['Dramas'],
                                          ['Action & Adventure']],
      dtype='object')
```

```
y_listed_in = tdf2_exploded.listed_in.value_counts().head(10).values
y_listed_in
```

```
array([3022, 2266, 1956, 1919, 1725, 1548, 1542, 1402, 1284, 1256])
```

```
# Conerting the dataframes types to categroy from objects

tdf2_exploded['cast'] = tdf2_exploded['cast'].astype('category')
tdf2_exploded['country'] = tdf2_exploded['country'].astype('category')
tdf2_exploded.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 64951 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column        Non-Null Count  Dtype   
---  ------        --------------  -----   
 0   show_id       64951 non-null  object  
 1   type          64951 non-null  object  
 2   title         64951 non-null  object  
 3   director      45938 non-null  object  
 4   cast          64126 non-null  category
 5   country       59898 non-null  category
 6   date_added    64882 non-null  object  
 7   release_year  64951 non-null  int64   
 8   rating        64913 non-null  object  
 9   duration      64948 non-null  object  
 10  listed_in     64951 non-null  object  
 11  description   64951 non-null  object  
dtypes: category(2), int64(1), object(9)
memory usage: 7.2+ MB
```

```
# Top 10 countrieswith most produced Movies/TV-Shows
country_count = tdf2_exploded.country.value_counts().head(10)
country_count
```

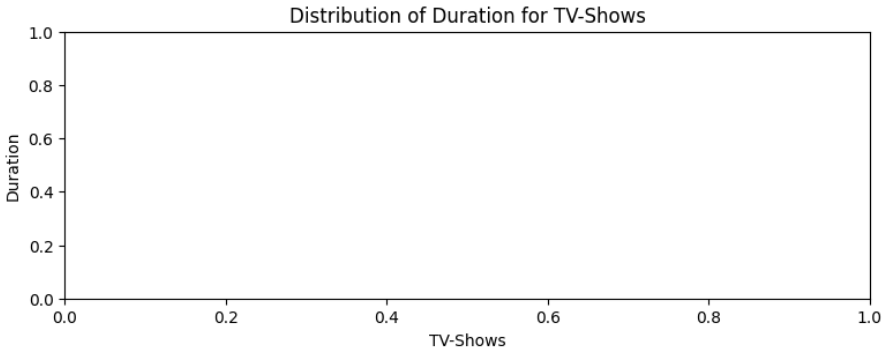
```
United States     19929
India              7246
Japan              2751
United Kingdom     2126
South Korea        1478
Canada             1278
Spain              1239
Mexico              933
Turkey              923
Nigeria             852
Name: country, dtype: int64
```

```
tdf2_exploded['cast'] = tdf2_exploded['cast'].astype('object')
tdf2_exploded['country'] = tdf2_exploded['country'].astype('object')
tdf2_exploded.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 64951 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   show_id       64951 non-null  object
 1   type          64951 non-null  object
 2   title         64951 non-null  object
 3   director      45938 non-null  object
 4   cast          64126 non-null  object
 5   country       59898 non-null  object
 6   date_added    64882 non-null  object
 7   release_year  64951 non-null  int64 
 8   rating        64913 non-null  object
 9   duration      64948 non-null  object
 10  listed_in     64951 non-null  object
 11  description   64951 non-null  object
dtypes: int64(1), object(11)
memory usage: 6.4+ MB
```

5. Missing Value & Outlier check

```
# Here a boxplot previously created for the durations distribution of TV-shows. We can check for potential outliers for the same.

plt.figure(figsize=(9, 3))
sns.boxplot(data=netflix_shows_tdf, y='type', x='duration')
plt.xlabel('TV-Shows')
plt.ylabel('Duration')
plt.title('Distribution of Duration for TV-Shows')
plt.show()
```



Analyszing the above the boxplot, we can say that any TV-shows with more than 3 seasons in Duration should be an outliers. Their are TV-shows with more than 10 Seasons. This suggests that most TV-shows on Netflix are designed to fit within a standard Seasons ranging from 1 to 3.

```
# Detecting missing values
# There are several ways to detect missing values in Python. isnull() function is widely used for the same purpose

tdf2_exploded.isnull().any()
```

```
show_id         False
type            False
title           False
director         True
cast             True
country          True
date_added       True
release_year    False
rating           True
duration         True
listed_in       False
description     False
dtype: bool
```

```
tdf2_exploded.T.apply(lambda x: x.isnull().sum(), axis = 1)
```

```
show_id            0
type               0
title              0
director       19013
cast             825
country         5053
date_added        69
release_year       0
rating            38
duration           3
listed_in          0
description        0
dtype: int64
```

```
tdf2_exploded.isnull().sum().sum()
```

```
25001
```

```
# After the identification of Missing Values we can replace these null values with appropriate content.

tdf2_exploded.director.fillna('Director not available', inplace = True)
tdf2_exploded.cast.fillna('Cast not available', inplace = True)
tdf2_exploded.country.fillna('Country not available', inplace = True)
tdf2_exploded.dropna(subset= ['date_added', 'rating'], inplace = True)
tdf2_exploded.dropna(subset= ['duration'], inplace = True)


tdf2_exploded.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating
0	s1	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	Cast not available	United States	September 25, 2021	2020	PG-13
1	s2	TV Show	Blood & Water	Director not available	Ama Qamata	South Africa	September 24, 2021	2021	TV-MA
1	s2	TV	Blood &	Director	Khosi	South	September	2021	TV-MA

6. Insights based on Non-Graphical and Visual Analysis

1. Comments on the range of attributes:

The Netflix dataframe has originally 8807 records and these records has 12 columns giving the data like Show_id, Type, Title, Director, Cast, Country, Date_added, Release_year, Rating, Duration in Minutes or Seasons , Genre Listed_in, Description about the data.

This data is a 2 Dimentional data. Also, this has a 4307 Null/Missing values.

This data should be mainly divided into Movies and TV-Shows. This data set has 6126 Movies and 2664 TV Shows included in the DataFrame.

2. Comments on the distribution of the variables and relationship between them:

This dataframe includes some columns which has multiple data points, such as Cast, Directors, Listed-in. We have un-nested all these data points. After un-nesting the record counts are increased to 64951.

3. Comments for each univariate and bivariate plot:

As the bar-plot indicates, the contents released on Netflix platform was started from 2015 and grown significantly till 2019 being the maximum released on Netflix. Then it has been a steady growth. Also, we have checked the overall movies and TV shows released. In 2018, 7708 movies and TV shows were released and 2019-20 also had same range of releases. A histogram for analysing check the yearly release of number of Movies/TV-Shows. In movies section, 2018 and 2019 shows an increasing count of releases. In TV shows, 2019-20 shows the maximum number of releases. A Boxplot for the count of released movies and TV-shows each year shows the data as mostly the maximum number of movie releases consider to be between 2010 to 2019. But when it comes to TV shows the maximum number of shows are released between 2017 to 2020. The boxplot showing distribution of duration for TV shows. Mostly the TV shows are having 1 to 3 seasons. There are TV shows who has more 3 seasons but has not much count. These should be considered as outliers for the same.

7. Business Insights

1. This above analysis has revealed that Netflix added more number of movies than that of TV shows, the platform shows more interest towards movies than in TV-shows
2. Netflix platform has the following top 10 casts who has appeared in most number of Movies/TV-shows. Netflix has content for 39296 actors.
3. Netflix platform has the following top 10 directors who has directed most number of Movies/TV-shows. These top 10 directors are as below.
4. As we have compared all the Netflix content by Type, i.e., Movies and TV-Shows. A pie chart indicating that the contents type share for Movies is 2/3rd (69.2 %) compared to TV Shows (30.8 %).
5. As the bar-plot indicates, the contents released on Netflix platform was started from 2015 and grown significantly till 2019 being the maximum released on Netflix. Then it has been a steady growth.

6. Also, we have checked the overall movies and TV shows released. In 2018, 7708 movies and TV shows were released and 2019-20 also had same range of releases.
7. A histogram for analysing check the yearly release of number of Movies/TV-Shows. In movies section, 2018 and 2019 shows an increasing count of releases. In TV shows, 2019-20 shows the maximum number of releases.
8. A Boxplot for the count of released movies and TV-shows each year shows the data as mostly the maximum number of movie releases consider to be between 2010 to 2019. But when it comes to TV shows the maximum number of shows are released between 2017 to 2020.
9. The boxplot showing distribution of duration for TV shows. Mostly the TV shows are having 1 to 3 seasons. There are TV shows who has more 3 seasons but has not much count. These should be considered as outliers for the same.
10. Top 10 countries with most produced Movies/TV-Shows. The list has United States with most number of produced content (19929),