Project 3: Netflix TV shows and Movies

1. Load the file

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
dataset=pd.read_csv("/content/archive(5).zip")
```

2. Print first 5 rows of data

```
dataset.head()
```

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

3. Print last 5 rows of data

```
dataset.tail()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
8802	s8803	Movie	Zodiac	David Fincher	Mark Ruffalo, Jake Gyllenhaal, Robert Downey J...	United States	November 20, 2019	2007	R	158 min	Cult Movies, Dramas, Thrillers	A political cartoonist, a crime reporter and a...
8803	s8804	TV Show	Zombie Dumb	NaN	NaN	NaN	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town, a young g...
8804	s8805	Movie	Zombieland	Ruben Fleischer	Jesse Eisenberg, Woody Harrelson, Emma Stone, ...	United States	November 1, 2019	2009	R	88 min	Comedies, Horror Movies	Looking to survive in a world taken over by zo...
8805	s8806	Movie	Zoom	Peter Hewitt	Tim Allen, Courteney Cox, Chevy Chase, Kate Ma...	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero...
8806	s8807	Movie	Zubaan	Mozez Singh	Vicky Kaushal, Sarah-Jane Dias, Raaghav Chanan...	India	March 2, 2019	2015	TV-14	111 min	Dramas, International Movies, Music & Musicals	A scrappy but poor boy worms his way into a ty...

4. Cleaning the data for missing values, null values etc...

```
dataset.isnull()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	False	False	False	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	...	...	...	...	...
8802	False	False	False	False	False	False	False	False	False	False	False	False
8803	False	False	False	False	False	False	False	False	False	False	False	False
8804	False	False	False	False	False	False	False	False	False	False	False	False
8805	False	False	False	False	False	False	False	False	False	False	False	False
8806	False	False	False	False	False	False	False	False	False	False	False	False

8807 rows × 12 columns

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

	0
show_id	0
type	0
title	0
director	0
cast	0
country	0
date_added	0
release_year	0
rating	0
duration	0
listed_in	0
description	0

dtype: int64

```python
dataset.dropna()
```

	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	0	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
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...	...	...	...	...	...	...	...	...	...	...	...	...
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8805	s8806	Movie	Zoom	Peter Hewitt	Tim Allen, Courteney Cox, Chevy Chase, Kate Ma...	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero...

```python
dataset.fillna('Unknown')
```

	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	0	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	0	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...
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...	...	...	...	...	...	...	...	...	...	...	...	...
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```
dataset.ffill()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
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```
dataset.bfill()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
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```
dataset.interpolate()
```

```
<ipython-input-60-c2bd1f099515>:1: FutureWarning: DataFrame.interpolate with object dtype is deprecated and will raise in a future version. Call obj.infer_objects(copy=False) before i
  dataset.interpolate()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
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8805	s8806	Movie	Zoom	Peter Hewitt	Tim Allen, Courteney Cox,	United	January 11,	2006	PG	88 min	Children & Family Movies,	Dragged from civilian life, a

6. Print info on the dataset

```
dataset.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
```

7. Get some description of the data- ONLY release_year is NUMBERS VALUES

```
dataset['release_year'].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

dtype: float64

8. Columns in the dataset

```
print(dataset.columns)
```

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

9. Shape of the data frame

```
dataset.shape
```

```
(8807, 12)
```

10. How many years of the Data (1966-2021) (release_year)

```
print(dataset['release_year'].nunique())
```

74

11. MOVIES VS TV SHOWS (types)

```
print(dataset['type'].value_counts())
```

```
type
Movie      6131
TV Show    2676
Name: count, dtype: int64
```

12. Check for null values in all columns of dataset

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

```
show_id         0
type            0
title           0
director        0
cast            0
country         0
date_added      0
release_year    0
rating          0
duration        0
listed_in       0
description     0
dtype: int64
```

13. Replace NAN values with TV-MA

```
dataset.fillna('TV-MA')
```

	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	0	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
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3	s4	TV Show	Jailbirds New Orleans	0	0	0	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo...
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...	...	...	...	...	...	...	...	...	...	...	...	...
8802	s8803	Movie	Zodiac	David Fincher	Mark Ruffalo, Jake Gyllenhaal, Robert Downey	United States	November 20, 2019	2007	R	158 min	Cult Movies, Dramas, Thrillers	A political cartoonist, a crime reporter and a...

14. Replace NAN values with United States

```
dataset.fillna('United States')
```

	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	0	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
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15. Rename the Column "listed_in" to "genre"

```
dataset = dataset.rename(columns={"listed_in": "genre"})
print(dataset.columns)
dataset.head()
```

```
Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added',
       'release_year', 'rating', 'duration', 'genre', 'description'],
      dtype='object')
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	genre	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	0	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
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VISUALIZATION

1. Calculate mean of release_year and show it using barh plot

```
import matplotlib.pyplot as plt
mean_release_year = dataset['release_year'].mean()
plt.figure(figsize=(10, 5), dpi=80, facecolor='w', edgecolor='k', frameon=True, linewidth=1.2)
plt.barh(['Mean Release Year'], [mean_release_year], color='green', edgecolor='black', linewidth=1.2)
plt.title('Netflix release year')
plt.ylabel('Category')
plt.xlabel('Release Year')
plt.show()
```
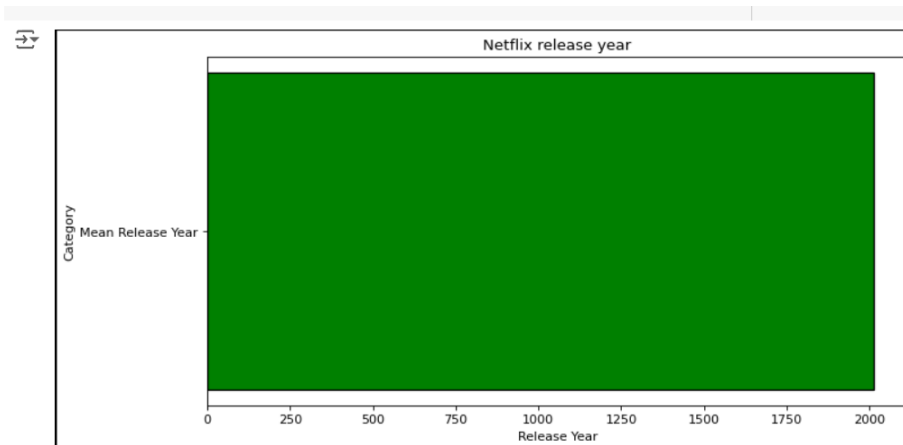
## 2. TV shows vs Movies on netflix using bar chart

```python
movie_count = dataset['type'].value_counts()['Movie']
tv_show_count = dataset['type'].value_counts()['TV Show']
plt.figure(figsize=(8, 6), dpi=80, facecolor='w', edgecolor='k', frameon=True,linewidth=1.2)
plt.bar(['Movies', 'TV Shows'], [movie_count, tv_show_count], color=['red', 'yellow'],edgecolor='black',linewidth=1.2)
plt.xlabel('Types')
plt.ylabel('Counts')
plt.title('Movies vs TV Shows on Netflix')
plt.show()
```
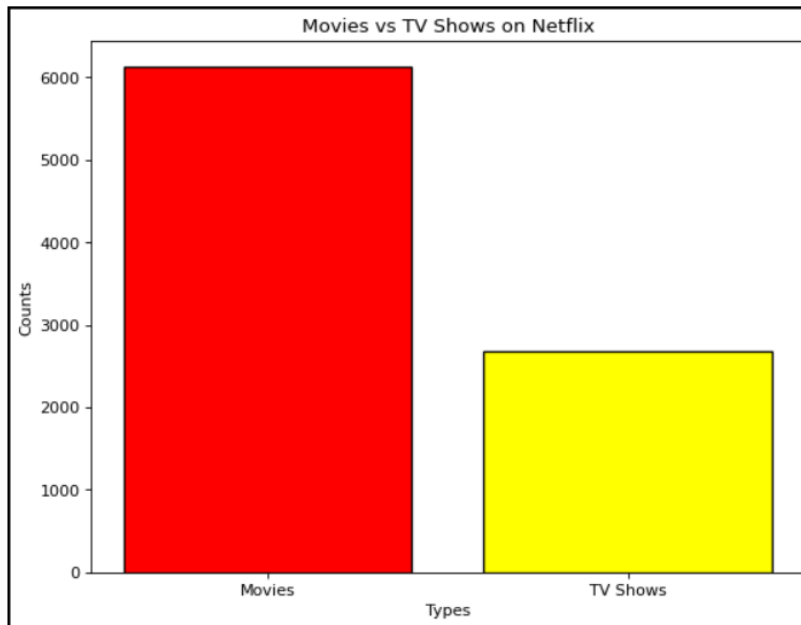

3. Types of shows percentage on netflex using piechart

```python
type_counts = dataset['type'].value_counts()
type_percentages = type_counts / len(dataset) * 100
plt.figure(figsize=(8, 8), dpi=80, facecolor='w', edgecolor='k', frameon=True,linewidth=1.2)
plt.pie(type_percentages, labels=type_percentages.index, autopct='%1.1f%%', startangle=90, colors=['pink', 'orange'], textprops={'fontsize': 12}, explode=(0.1, 0), shadow=True,wedgepr
plt.axis('equal')
plt.title('Types of Shows on Netflix')
plt.axis('equal')
plt.legend(title='Types', loc='best')
plt.show()
```

Types of Shows on Netflix
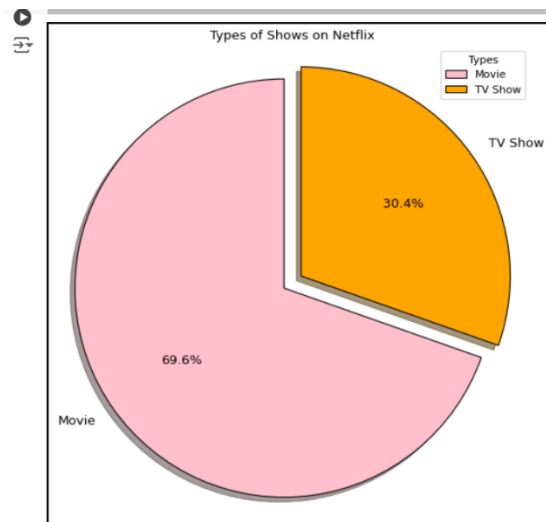
4. Show Netflix rating distribution , visualized by a count plot

```python
plt.figure(figsize=(12, 6), dpi=80, facecolor='w', edgecolor='k', frameon=True,linewidth=1.2)
sns.countplot(x='rating', data=dataset, edgecolor='black', linewidth=1.2,hue='type',  dodge=True, hue_order=['Movie', 'TV Show'],
plt.title('Netflix Rating Distribution')
plt.xlabel('Rating')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.legend(title='Type', loc='upper right')
plt.show()
```
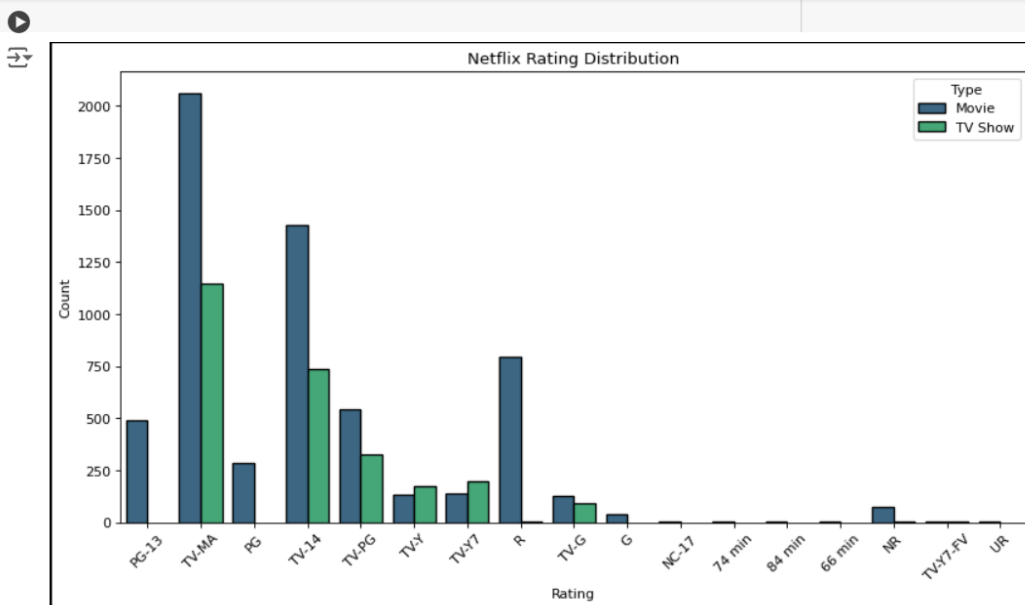

5. Show the Top 5 countries with Highest Movies/TV Shows, visualised by a PIE CHART
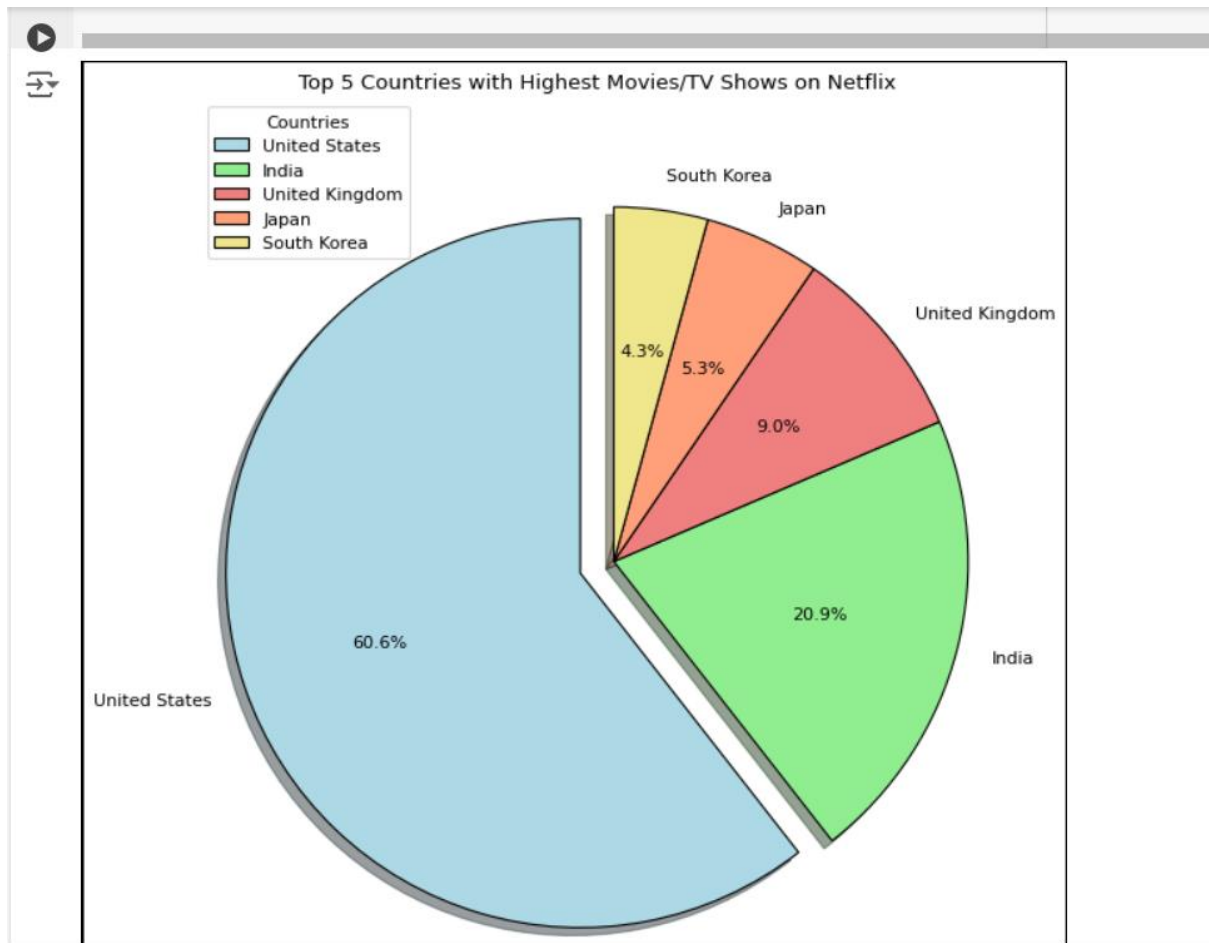
```python
top_countries = dataset['country'].value_counts().head(5)
plt.figure(figsize=(8, 8), dpi=80, facecolor='w', edgecolor='k', frameon=True,linewidth=1.2, layout='tight')
plt.pie(top_countries, labels=top_countries.index, autopct='%1.1f%%', startangle=90, colors=['lightblue', 'lightgreen', 'lightcoral', 'lightsalmon', 'khaki'], textprops={'fontsize': 1
plt.axis('equal')
plt.title('Top 5 Countries with Highest Movies/TV Shows on Netflix')
plt.legend(title='Countries', loc='best')
plt.show()
```

Top 5 Countries with Highest Movies/TV Shows on Netflix

6.Shows the Top 5 Netflix Country distribution separated by type of release(i.e movies, tv shows), visualizing via Bar graph

```python
country_type_counts = dataset.groupby(['country', 'type'])['title'].count().reset_index(name='count')
top_countries = country_type_counts.groupby('country')['count'].sum().nlargest(5).index
top_country_data = country_type_counts[country_type_counts['country'].isin(top_countries)]


plt.figure(figsize=(12, 6), dpi=80, facecolor='w', edgecolor='k', frameon=True,linewidth=1.2, layout='tight')
sns.barplot(x='country', y='count', hue='type', data=top_country_data, edgecolor='black', linewidth=1.2, palette='viridis',
plt.title('Top 5 Countries with Highest Movies/TV Shows on Netflix')
plt.xlabel('Country')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.legend(title='Type', loc='upper right')
plt.show()
```

Top 5 Countries with Highest Movies/TV Shows on Netflix
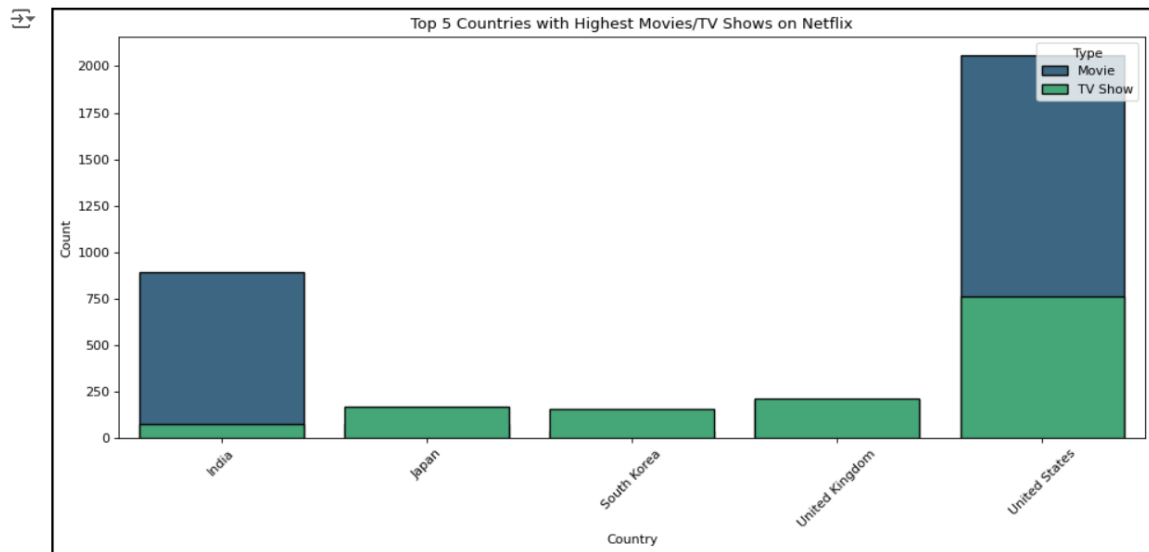
7. Show the Top 10 genres of movies and also tv shows

```python
genre_type_counts = dataset.groupby(['listed_in', 'type'])['title'].count().reset_index(name='count')


top_genres_movies = genre_type_counts[genre_type_counts['type'] == 'Movie'].sort_values(by='count', ascending=False).head(10)
top_genres_tv_shows = genre_type_counts[genre_type_counts['type'] == 'TV Show'].sort_values(by='count', ascending=False).head(10)


plt.figure(figsize=(12, 6), dpi=80, facecolor='w', edgecolor='k', frameon=True, linewidth=1.1, layout='tight')
width = 0.35


x_movies = np.arange(len(top_genres_movies['listed_in']))
plt.bar(x_movies, top_genres_movies['count'], width, label='Movies', color='peachpuff', edgecolor='black', linewidth=1.2, alpha=0.7, hatch='*', align='center')


x_tv_shows = [x + width for x in x_movies]
plt.bar(x_tv_shows, top_genres_tv_shows['count'], width, label='TV Shows', color='violet', edgecolor='black', linewidth=1.2, alpha=0.7, hatch='//', align='center')


plt.xlabel('Genre')
plt.ylabel('Count')
plt.title('Top 10 Netflix Genres Distribution by Type')
plt.xticks([x + width/2 for x in x_movies], top_genres_movies['listed_in'], rotation=45)
plt.legend(title='Types', loc='best')
plt.tight_layout()
plt.show()
```
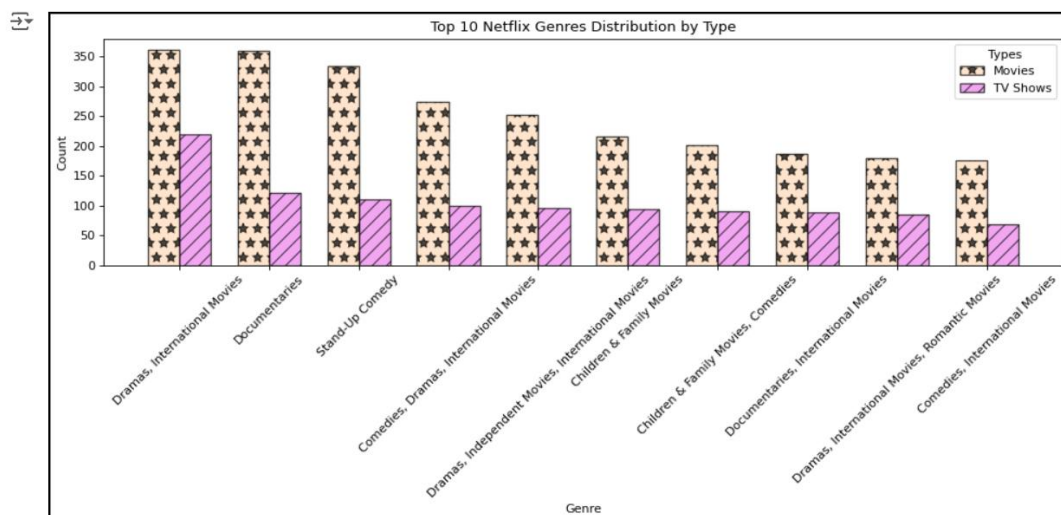

Top 10 Netflix Genres Distribution by Type

8. When is the Best itme to release a Movie/TV Shows? show it using heatmap

```
dataset['date_added'] = pd.to_datetime(dataset['date_added'], format='%B %d, %Y', errors='coerce') #The code error='coerce' is used for error handling


dataset['month'] = dataset['date_added'].dt.month
dataset['year'] = dataset['date_added'].dt.year


release_counts = dataset.groupby(['month', 'year'])['title'].count().reset_index(name='count')


heatmap_data = release_counts.pivot(index='month', columns='year', values='count')


plt.figure(figsize=(15, 8), dpi=80, facecolor='w', edgecolor='k', frameon=True, linewidth=1.2)
sns.heatmap(heatmap_data, cmap='viridis', annot=False, fmt=".0f", linewidths=.5, cbar_kws={'label': 'Number of Releases'})
plt.title('Netflix Release Trend Over Time')
plt.xlabel('Year')
plt.ylabel('Month')
plt.xticks(rotation=45)
plt.yticks(rotation=0)
plt.tight_layout()
plt.show()
```