

Problem Statement: Analyze the data and perform EDA to find interesting patterns and insights from the data. Write some useful recommendation to the netflix team.

```
import numpy as np # importing necessary libraries of python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')

netflix=pd.read_csv('netflix.csv') # reading csv file of netflix data
netflix
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	descripti
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Nan	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her fathe
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	Afrossi paths a party, a Ca Town
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 family from power drug lc
3	s4	TV Show	Jailbirds New Orleans	Nan	Nan	Nan	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feud flirtations a toilet talk down ame
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 coachi cent known train
...
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 politi cartoonist cri reporter 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 livi alone it spooky to a young !
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 survive i world tak over by zi
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	Dragg from civili life, a form superhero

Vicky

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```
type(netflix) # nature of netflix data
```

```
pandas.core.frame.DataFrame
def __init__(data=None, index: Axes | None=None, columns: Axes | None=None, dtype: Dtype | None=None, copy: bool | None=None) -> None

/usr/local/lib/python3.11/dist-packages/pandas/core/frame.py
Two-dimensional, size-mutable, potentially heterogeneous tabular data.

Data structure also contains labeled axes (rows and columns).
Arithmetic operations align on both row and column labels. Can be
thought of as a dict-like container for Series objects. The primary
```

```
netflix.info() #Gives brief information of dataframe work
```

```
<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
```

```
netflix.head() #by default it gives first 5 rows
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Dick Johnson	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13	90 min	Documentaries
1	s2	TV Show	Blood & Water	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	NaN	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 Ledercq	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	Naomi	Naomi	Na	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go

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```
netflix.tail() # by default it gives last 5 rows
```

	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...

```
netflix.shape # Gives total number of rows and columns
```

```
→ (8807, 12)
```

```
netflix.columns # Gives name of columns
```

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

```
df=netflix # defining netflix with df variable  
df
```

	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 life, a film
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	Af cross paths at a party, a Cape Town
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 family from powerful drug cart
3	s4	TV Show	Jailbirds New Orleans	Nan	Nan	Nan	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feud flirtations at a toilet talk down am
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 coaching center known train
...
8802	s8803	Movie	Zodiac	David Fincher	Mark Ruffalo, Jake Gyllenhaal, Robert Downey Jr...	United States	November 20, 2019	2007	R	158 min	Cult Movies, Dramas, Thrillers	A political cartoonist crime reporter 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
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 zombies
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 civil life, a former superhero
					Vicky							

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```
print(df.isna()) #isna() is used to find the NAN entries
#returns the dataframw with True/False values
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	False	False	False	False	True	False	False	False	False	False	False	False
1	False	False	False	True	False	False	False	False	False	False	False	False
2	False	False	False	False	False	True	False	False	False	False	False	False
3	False	False	False	True	True	True	False	False	False	False	False	False
4	False	False	False	True	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	True	True	True	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

```
3      False  False  False  False  False
4      False  False  False  False  False
...
8802     ...    ...    ...    ...
8803     False  False  False  False  False
8804     False  False  False  False  False
8805     False  False  False  False  False
8806     False  False  False  False  False
```

[8807 rows x 12 columns]

```
print(df.isna().sum()) #Count NaN values per column
```

```
→ 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
```

```
df.fillna({'director': 'Unknown Director', 'cast': 'Unknown Actor ', 'country': 'Unknown', 'rating' : 'Unknown'}, inplace=True)
df # filling categorical columns with 'Unknown values'
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	descript
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her fat nears end of life, film
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	A cross paths ; party, a C Town
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect family from power drug i
3	s4	TV Show	Jailbirds New Orleans	Unknown Director	Unknown Actor	Unknown	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Felicitations ; toilet talk down arr
4	s5	TV Show	Kota Factory	Unknown Director	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 cit coact cent know train
...
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 polit cartoonis cr reporter ;
8803	s8804	TV Show	Zombie Dumb	Unknown Director	Unknown Actor	Unknown	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While liv alone spooky to a young
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 world ta over by z
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	Drag from civi life, a for superhei
					Vicky Kaushal.						Dramas.	A scr

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```
print(df.isna().sum()) # this shows that there is no NAN entries in categorical columns
```

```
show_id      0
type         0
title        0
director     0
cast          0
country       0
date_added   10
release_year  0
rating        0
duration      3
listed_in     0
description    0
dtype: int64
```

```
df.fillna({'date_added':0},inplace=True) # now filling 'date' column NAN entries as zero
df
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	descript
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her fat nears end of life, film
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	A cross paths ; party, a C Town
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3	s4	TV Show	Jailbirds New Orleans	Unknown Director	Unknown Actor	Unknown	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Felicitations ; toilet talk down arr
4	s5	TV Show	Kota Factory	Unknown Director	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 cit coact cent know train
...
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 polit cartoonis cr reporter ;
8803	s8804	TV Show	Zombie Dumb	Unknown Director	Unknown Actor	Unknown	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While liv alone spooky to a young
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					Vicky Kaushal.						Dramas.	A scr

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```
print(df.isna().sum()) #this shows that there is no NAN entries in 'date' column
```

```
show_id      0
type         0
title        0
director     0
cast          0
country       0
date_added   0
release_year 0
rating        0
duration      3
listed_in     0
description   0
dtype: int64
```

netflix

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	[Unknown Actor]	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	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 Ledercq]	[Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nab...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord.
3	s4	TV Show	Jailbirds New Orleans	[Unknown Director]	[Unknown Actor]	Unknown	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	[Unknown Director]	[Mayur More, Jitendra Kumar, Ranjan Raj, Alam ...]	India	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, Romantic TV Shows, TV ...	In a city coaching center known to train I...
...
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...
8803	s8804	TV Show	Zombie Dumb	[Unknown Director]	[Unknown Actor]	Unknown	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 zombies.
8805	s8806	Movie	Zoom	[Peter Hewitt]	[Tim Allen, Courteney Cox, Chevy Chase, Kate M...]	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 Chana...]	India	March 2, 2019	2015	TV-14	111 min	Dramas, International Movies, Music & Musicals	A scrappy but poor boy worms his way into ity.

8807 rows × 15 columns

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```
netflix["duration"] = netflix["duration"].astype(str) # creating new column 'movie_mins'
netflix["Movie_Mins"] = netflix["duration"].apply(lambda x: int(x.split(" ")[0]) if "min" in x else 0)
netflix[["type", "duration", "Movie_Mins"]]
netflix
#observation: in "duration" column,data is given in the combination of integer and string format
#this data is converted to integer format with new column name 'movie_mins'.
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord.
3	s4	TV Show	Jailbirds New Orleans	Unknown Director	Unknown Actor	Unknown	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	Unknown Director	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 coaching center known to train I...
...
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	Unknown Director	Unknown Actor	Unknown	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...

8807 rows × 13 columns

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print(netflix.isna().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  
Movie_Mins     0  
dtype: int64
```

- ❖ Hence there is no null values present in Netflix dataframe

```
netflix.describe() # necessary details are calculated using 'describe' function.  
# Thus 'describe' depicts the calculation on numerical data.
```

	release_year	Movie_Mins
count	8807.000000	8807.000000
mean	2014.180198	69.286817
std	8.819312	51.534755
min	1925.000000	0.000000
25%	2013.000000	0.000000
50%	2017.000000	88.000000
75%	2019.000000	106.000000
max	2021.000000	312.000000

1. How has the number of movies released per year changed over the last 20-30 years?

```
netflix
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
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...
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8807 rows × 13 columns

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```
movie.netflix = netflix[netflix["type"] == "Movie"] # filtering movie from 'type' column.
movie.netflix
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	descript
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her fears end off life, film
6	s7	Movie	My Little Pony: A New Generation	Robert Cullen, José Luis Ucha	Vanessa Hudgens, Kimiko Glenn, James Marsden, ...	Unknown	September 24, 2021	2021	PG	91 min	Children & Family Movies	Equestria divided. a bright-e hero
7	s8	Movie	Sankofa	Haile Gerima	Kofi Ghanaba, Oyafunmike Ogunlana, Alexandra D...	United States, Ghana, Burkina Faso, United Kin...	September 24, 2021	1993	TV-MA	125 min	Dramas, Independent Movies, International Movies	On a p... sho... Ghana Amer mode
9	s10	Movie	The Starling	Theodore Melfi	Melissa McCarthy, Chris O'Dowd, Kevin Kline, T...	United States	September 24, 2021	2021	PG-13	104 min	Comedies, Dramas	A wo... adjustin... life aft... conte
12	s13	Movie	Je Suis Karl	Christian Schwochow	Luna Wedler, Jannis Niewöhner, Milan Peschel, ...	Germany, Czech Republic	September 23, 2021	2021	TV-MA	127 min	Dramas, International Movies	After mo... her fam... murder... at...
...
8801	s8802	Movie	Zinzana	Majid Al Ansari	Ali Suliman, Saleh Bakri, Yasa, Ali Al-Jabri, ...	United Arab Emirates, Jordan	March 9, 2016	2015	TV-MA	96 min	Dramas, International Movies, Thrillers	Recover... alcol... Talal wa... up insi...
8802	s8803	Movie	Zodiac	David Fincher	Mark Ruffalo, Jake Gyllenhaal, Robert Downey Jr...	United States	November 20, 2019	2007	R	158 min	Cult Movies, Dramas, Thrillers	A poli... cartooni... c reporter
8804	s8805	Movie	Zombieland	Ruben Fleischer	Jesse Eisenberg, Woody Harrelson, Emma Stone, ...	United States	November 1, 2019	2009	R	88 min	Comedies, Horror Movies	Lookin... surviv... world to... over by
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	Drag... from civ... life, a for... superher...
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 scre... but poor... worms way ir...

6131 rows × 13 columns

Next steps: [Generate code with movie.netflix](#) [View recommended plots](#) [New interactive sheet](#)

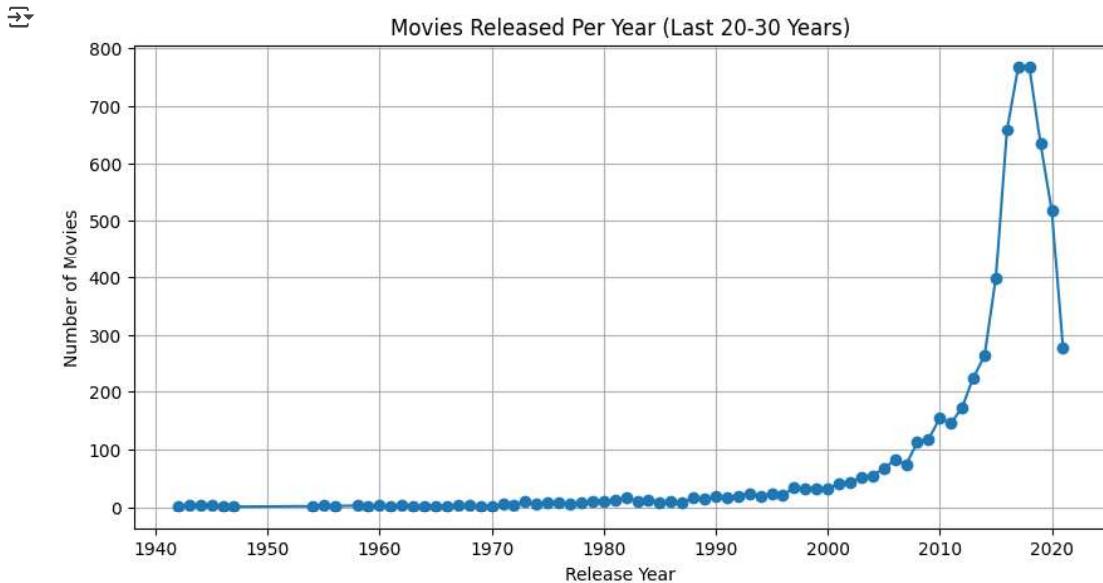
```
movies_per_year = movie.netflix.groupby("release_year").size()
movies_per_year
#The .size() function is used to count the number of rows for each unique value in the "release_year" column after grouping by year.
```

release_year	0
1942	2
1943	3
1944	3
1945	3
1946	1
...	...
2017	767
2018	767
2019	633
2020	517
2021	277

73 rows × 1 columns

dtype: int64

```
plt.figure(figsize=(10, 5))
plt.plot(movies_per_year.index, movies_per_year.values, marker='o', linestyle='--')
plt.xlabel("Release Year")
plt.ylabel("Number of Movies")
plt.title("Movies Released Per Year (Last 20-30 Years)")
plt.grid(True)
plt.show()
```



observations-1.From year 2000 to 2010, there is a steady growth in number of movies produced by countries.

2.from year 2011 to 2019, there is a sudden growth in number of movies produced by countries.

3.from year 2019 onwards, there is a decline in number of movies production due to COVID19 pandemic.

▼ 2.Comparison of tv shows vs movies.

netflix

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord.
3	s4	TV Show	Jailbirds New Orleans	Unknown Director	Unknown Actor	Unknown	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	Unknown Director	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 coaching center known to train I...
...
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	Unknown Director	Unknown Actor	Unknown	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...

8807 rows × 13 columns

Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
comparison = netflix["type"].value_counts() # Count Movies and TV Shows
comparison
```

	count
type	
Movie	6131
TV Show	2676

dtype: int64

```
netflix["duration"] = netflix["duration"].astype(str) # Convert 'duration' to string for processing
netflix
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord.
3	s4	TV Show	Jailbirds New Orleans	Unknown Director	Unknown Actor	Unknown	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	Unknown Director	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 coaching center known to train I...
...
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 criminal reporter and a...
8803	s8804	TV Show	Zombie Dumb	Unknown Director	Unknown Actor	Unknown	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..

8807 rows × 13 columns

Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
netflix["TV_Seasons"] = netflix["duration"].apply(lambda x: int(x.split(" ")[0]) if "Season" in x else None)
netflix # Extract number of seasons for TV Shows and creating a new column 'TV_Seasons'
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord...
3	s4	TV Show	Jailbirds New Orleans	Unknown Director	Unknown Actor	Unknown	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	Unknown Director	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...
...
i802	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...
i803	s8804	TV Show	Zombie Dumb	Unknown Director	Unknown Actor	Unknown	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...
i804	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 zombies...
i805	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...
i806	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 family...

307 rows × 14 columns

Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
print(netflix.isna().sum()) #Count NaN values per column
```

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
Movie_Mins         0
TV_Seasons       6131
dtype: int64
```

```
netflix.fillna({'TV_Seasons':0},inplace=True) # now filling 'TV_Seasons' columns NAN entries as zero
netflix
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord...
3	s4	TV Show	Jailbirds New Orleans	Unknown Director	Unknown Actor	Unknown	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	Unknown Director	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 l...
...
1802	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...
1803	s8804	TV Show	Zombie Dumb	Unknown Director	Unknown Actor	Unknown	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...
1804	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...
1805	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...
1806	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...

307 rows × 14 columns

Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
print(netflix.isna().sum()) #Count NaN values per column
#Thus it shows that there is no NAN entries
```

```
→ 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
    Movie_Mins   0
    TV_Seasons   0
    dtype: int64
```

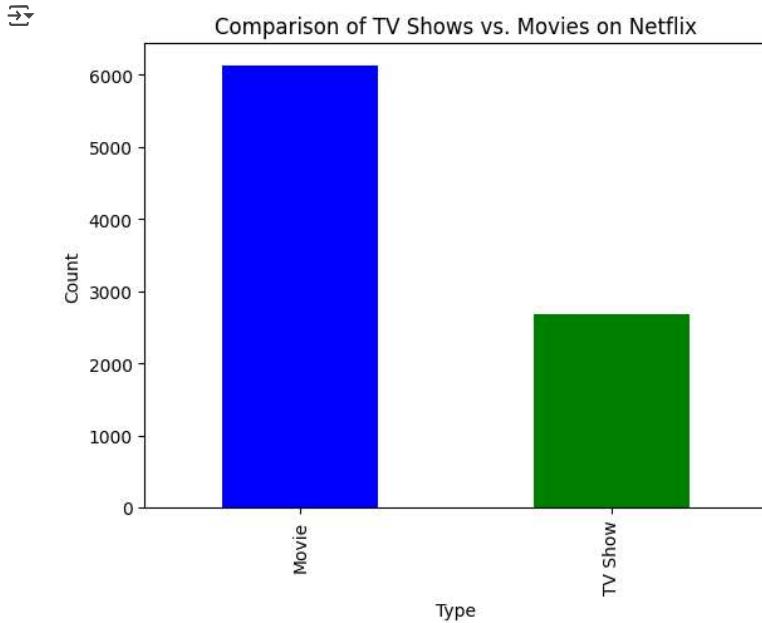
```
avg_movie_duration = netflix["Movie_Mins"].mean() #average of 'movie_mins' column
avg_movie_duration
```

```
→ np.float64(69.28681730441694)
```

```
avg_tv_show_seasons = netflix["TV_Seasons"].mean() #average of 'TV_Seasons' column
avg_tv_show_seasons
```

```
→ np.float64(0.5362779607130691)
```

```
comparison.plot(kind="bar", color=["blue", "green"]) # Bar chart for TV Shows vs Movies count
plt.xlabel("Type")
plt.ylabel("Count")
plt.title("Comparison of TV Shows vs. Movies on Netflix")
plt.show()
```



observations-1.The count of movies is much higher than the Tv Shows i.e netflix prioritize movies over Tv shows.

2.Netflix focuses more on acquiring movies as compared to Tv shows.

▼ 3.Analysis of actors/directors of different types of shows/movies.

```
netflix
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	Unknown Director	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord...
3	s4	TV Show	Jailbirds New Orleans	Unknown Director	Unknown Actor	Unknown	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	Unknown Director	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...
...
1802	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...
1803	s8804	TV Show	Zombie Dumb	Unknown Director	Unknown Actor	Unknown	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...
1804	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 zombies...
1805	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...
1806	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...

107 rows × 14 columns

Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
netf_data = netflix['director'].apply(lambda x:x.split(',')).tolist() #taking out of 'director' data into list form.
netf_data
```



```
[`Jonathan Lynn`],  
[`Courtney Hunt`],  
[`Pierre Greco`, `Nancy Florence Savard`],  
[`Andrew Davis`],  
[`Kevin Smith`],  
[`Unknown Director`],  
[`Tosin Igbo`],  
[`Chaitanya Tamhane`],  
[`Oriol Paulo`],  
[`Mike Rianda`, `Jeff Rowe`],  
[`Johannes Roberts`],  
[`Unknown Director`],  
[`Robert Pulcini`, `Shari Springer Berman`],  
[`Unknown Director`],  
[`Pedro Antonio`],  
[`Unknown Director`],  
[`Unknown Director`],  
[`John Wells`],  
[`Jonathan Liebesman`],  
[`Maria Pulera`],  
[`Unknown Director`],  
[`Santhosh Viswanath`],  
[`Seema Pahwa`],  
[`Unknown Director`],  
[`Ozan Açıktan`],  
[`Meltem Bozoflu`],  
[`Hakan Algül`],  
[`Selçuk Aydemir`, `Birkan Pusa`],  
[`Selçuk Aydemir`],  
[`Ömer Faruk Sorak`],  
[`Şenol Sönmez`],  
[`Alexis Morante`],  
[`Burak Aksak`],  
[`Kivanç Baruönü`],  
[`Kivanç Baruönü`],  
[`Rindala Kodeih`],  
[`Kongkiat Khomsiri`],  
[`Bedran Güzel`],  
[`Hakan Algül`],  
[`Marwan Nabil`],  
[`MIKIKO`, `Daito Manabe`],  
[`Unknown Director`],  
[`Kayode Kasum`],  
[`Yılmaz Erdoğan`, `Ömer Faruk Sorak`],  
[`Takashi Shimizu`],  
[`Unknown Director`],  
[`Unknown Director`],  
[`Joe Penna`],  
...]
```

```
director_details=pd.DataFrame(netf_data,index=netflix['title']).stack().reset_index().drop(columns='level_1')  
director_details.rename(columns={0:'dname'},inplace=True)  
director_details.head(20) # it tells about the 'title' corresponding to a particular director name('dname')
```

	title	dname	grid icon
0	Dick Johnson Is Dead	Kirsten Johnson	grid icon
1	Blood & Water	Unknown Director	grid icon
2	Ganglands	Julien Leclercq	grid icon
3	Jailbirds New Orleans	Unknown Director	grid icon
4	Kota Factory	Unknown Director	grid icon
5	Midnight Mass	Mike Flanagan	grid icon
6	My Little Pony: A New Generation	Robert Cullen	grid icon
7	My Little Pony: A New Generation	José Luis Ucha	grid icon
8	Sankofa	Haile Gerima	grid icon
9	The Great British Baking Show	Andy Devonshire	grid icon
10	The Starling	Theodore Melfi	grid icon
11	Vendetta: Truth, Lies and The Mafia	Unknown Director	grid icon
12	Bangkok Breaking	Kongkiat Komesiri	grid icon
13	Je Suis Karl	Christian Schwochow	grid icon
14	Confessions of an Invisible Girl	Bruno Garotti	grid icon
15	Crime Stories: India Detectives	Unknown Director	grid icon
16	Dear White People	Unknown Director	grid icon
17	Europe's Most Dangerous Man: Otto Skorzeny in ...	Pedro de Echave García	grid icon
18	Europe's Most Dangerous Man: Otto Skorzeny in ...	Pablo Azorín Williams	grid icon
19	Falsa identidad	Unknown Director	grid icon

Next steps: [Generate code with director_details](#) [View recommended pilots](#) [New interactive sheet](#)

```
director_details['dname'].value_counts() #this tells about the director, directed the number of movies/shows.
```

	count
dname	
Unknown Director	2634
Rajiv Chilaka	22
Jan Suter	18
Raúl Campos	18
Suhas Kadav	16
...	...
Ivona Juka	1
James Brown	1
Mark Risley	1
Kirati Nakintanon	1
Christian De Vita	1

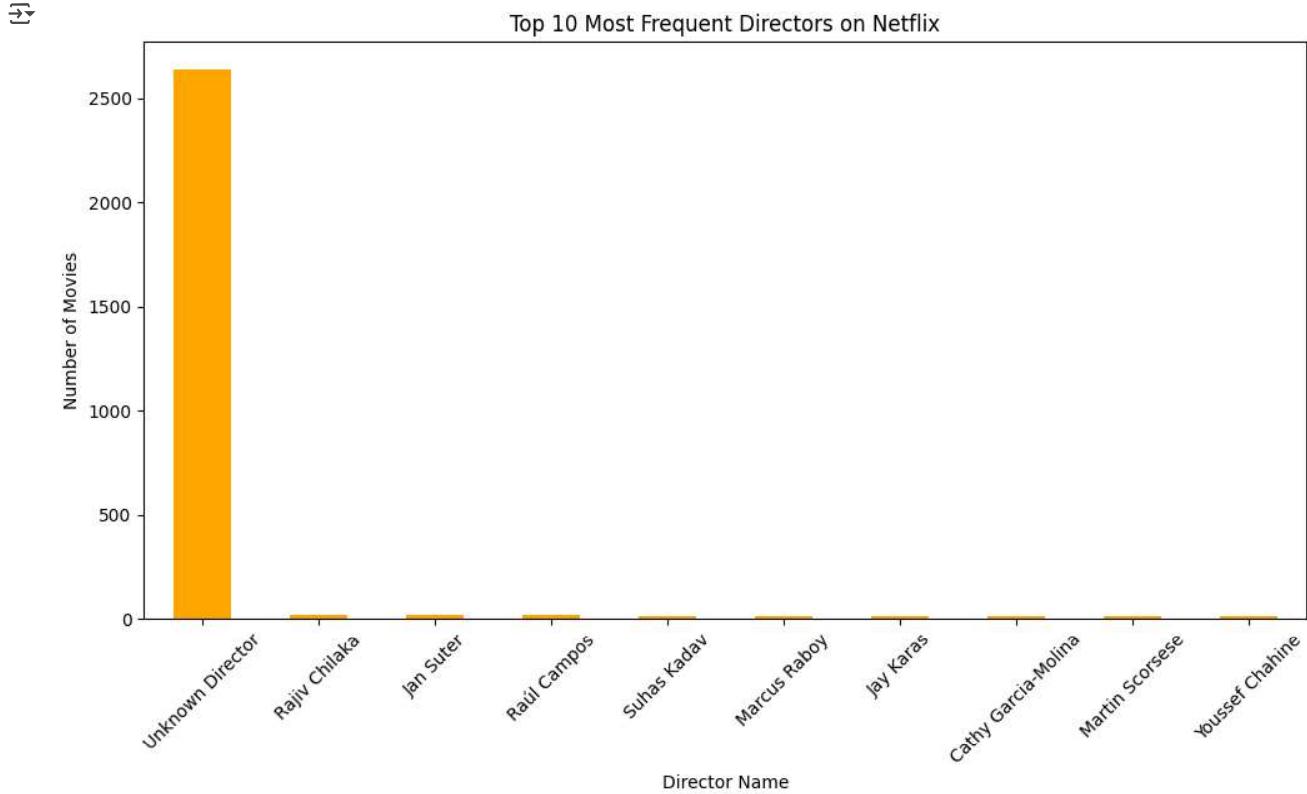
5121 rows × 1 columns

dtype: int64

observation- Rajiv Chilaka is the director who directed the highest number of movies/shows on netflix.

```
df["director"] = df["director"].astype(str).str.split(",")
director_counts = pd.Series([name.strip() for sublist in df["director"].dropna() for name in sublist]).value_counts().head(10)

# Bar chart for Most Frequent Directors
plt.figure(figsize=(12,6))
director_counts.plot(kind="bar", color="orange")
plt.xlabel("Director Name")
plt.ylabel("Number of Movies")
plt.title("Top 10 Most Frequent Directors on Netflix")
plt.xticks(rotation=45)
plt.show()
```



observations-1.The above barplot shows that there are more than 2500 movies are listed without director name.

2.Rajiv Chilaka Leads Named Directors

netflix

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	[Unknown Director]	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
2	s3	TV Show	Ganglands	[Julien Ledercq]	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord.
3	s4	TV Show	Jailbirds New Orleans	[Unknown Director]	Unknown Actor	Unknown	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	[Unknown Director]	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 coaching center known to train I...
...
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	[Unknown Director]	Unknown Actor	Unknown	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 zombies.
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 ity.

8807 rows × 14 columns

Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
netflix['genres'] = netflix['listed_in'].apply(lambda x: x.split(', '))
netflix.head() #create a new column 'genres'
```

	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description	Mo...
0	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...	
1	TV Show	Blood & Water	[Unknown Director]	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...	
2	TV Show	Ganglands	[Julien Ledercq]	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	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	TV Show	Jailbirds New Orleans	[Unknown Director]	Unknown Actor	Unknown	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo...	
4	TV Show	Kota Factory	[Unknown Director]	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...	

Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
genre_info = netflix[['title', 'genres']].explode('genres')
genre_info.rename(columns={'genres': 'genre_c'}, inplace=True)
genre_info.head(10) # creating two columns 'title' and 'genre_c'
```

	title	genre_c	grid
0	Dick Johnson Is Dead	Documentaries	grid
1	Blood & Water	International TV Shows	grid
1	Blood & Water	TV Dramas	grid
1	Blood & Water	TV Mysteries	grid
2	Ganglands	Crime TV Shows	grid
2	Ganglands	International TV Shows	grid
2	Ganglands	TV Action & Adventure	grid
3	Jailbirds New Orleans	Docuseries	grid
3	Jailbirds New Orleans	Reality TV	grid
4	Kota Factory	International TV Shows	grid

Next steps: [Generate code with genre_info](#) [View recommended plots](#) [New interactive sheet](#)

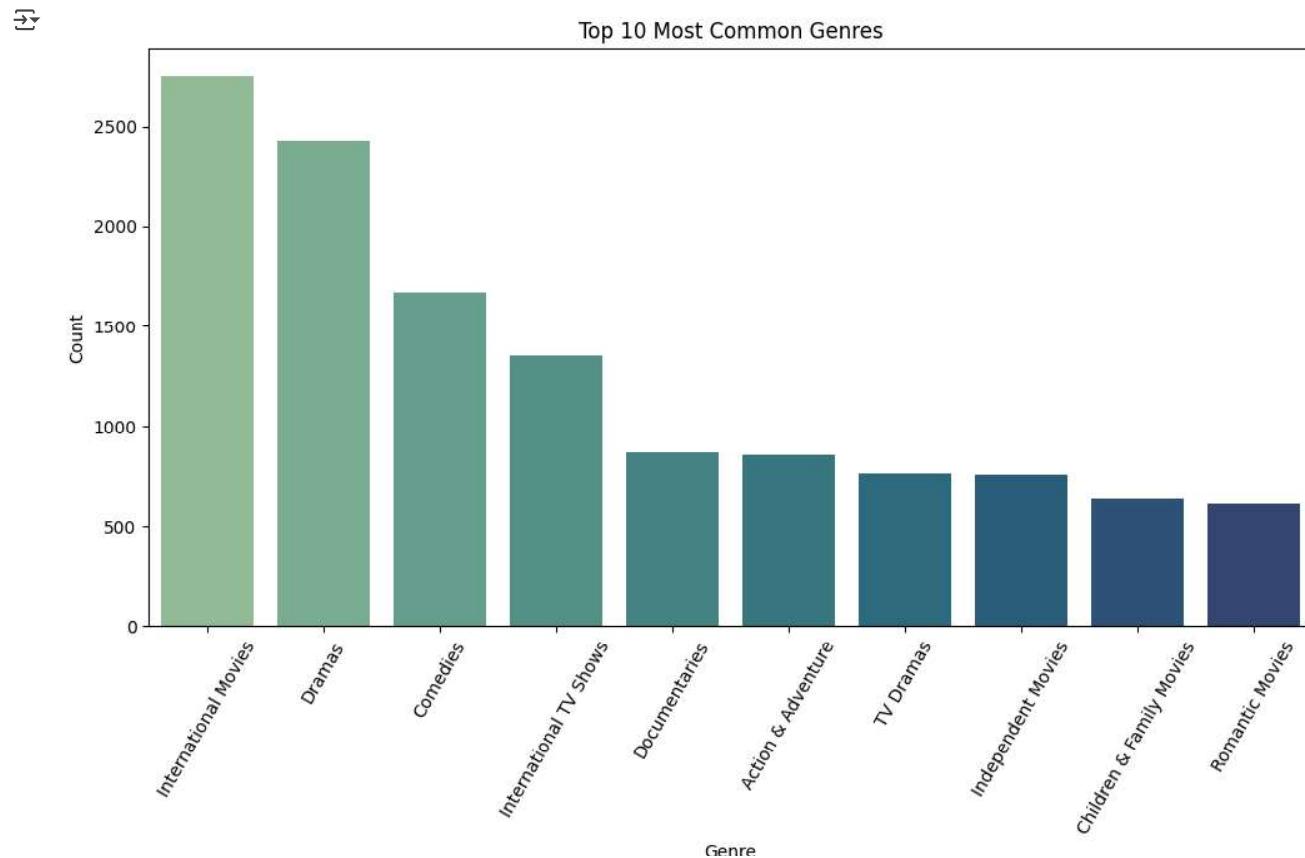
```
genre_info['genre_c'].value_counts() # count of different types of genre
```

	count
genre_c	
International Movies	2752
Dramas	2427
Comedies	1674
International TV Shows	1351
Documentaries	869
Action & Adventure	859
TV Dramas	763
Independent Movies	756
Children & Family Movies	641
Romantic Movies	616
TV Comedies	581
Thrillers	577
Crime TV Shows	470
Kids' TV	451
Docuseries	395
Music & Musicals	375
Romantic TV Shows	370
Horror Movies	357
Stand-Up Comedy	343
Reality TV	255
British TV Shows	253
Sci-Fi & Fantasy	243
Sports Movies	219
Anime Series	176
Spanish-Language TV Shows	174
TV Action & Adventure	168
Korean TV Shows	151
Classic Movies	116
LGBTQ Movies	102
TV Mysteries	98
Science & Nature TV	92
TV Sci-Fi & Fantasy	84
TV Horror	75
Cult Movies	71
Anime Features	71
Teen TV Shows	69
Faith & Spirituality	65
TV Thrillers	57
Movies	57
Stand-Up Comedy & Talk Shows	56
Classic & Cult TV	28
TV Shows	16

dtype: int64

```
# Barplot for genres
top_genres = genre_info['genre_c'].value_counts().head(10)
plt.figure(figsize=(12, 6))
sns.barplot(x=top_genres.index, y=top_genres.values, palette='crest')
plt.xticks(rotation=60)
plt.title('Top 10 Most Common Genres')
```

```
plt.xlabel('Genre')
plt.ylabel('Count')
plt.show()
```



observation- International movies, dramas and comedies are the top 3 genres which are watched globally. This also predicts that more accommodation of top 3 genres will increase the revenue potential of netflix

netflix

	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	Unknown Actor	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
	TV Show	Blood & Water	[Unknown Director]	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries	After crossing paths at a party, a Cape Town t...
	TV Show	Ganglands	[Julien Ledercq]	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord.
	TV Show	Jailbirds New Orleans	[Unknown Director]	Unknown Actor	Unknown	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo...
	TV Show	Kota Factory	[Unknown Director]	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...
...
	Movie	Zodiac	[David Fincher]	Mark Ruffalo, Jake Gyllenhaal, Robert Downey Jr...	United States	November 20, 2019	2007	R	158 min	Cult Movies, Dramas, Thrillers	A political cartoonist, a crime reporter and a...
	TV Show	Zombie Dumb	[Unknown Director]	Unknown Actor	Unknown	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town as a young girl.
	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 zombies.
	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..
	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 family.

nns

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```
netflix["cast"] = netflix["cast"].astype(str).str.split(",")
netflix["cast"] = netflix["cast"].apply(lambda x: [name.strip() for name in x if name.strip() != ""])
netflix
```

	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	[Unknown Actor]	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
	TV Show	Blood & Water	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	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 Show	Ganglands	[Julien Ledercq]	[Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nab...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord..
	TV Show	Jailbirds New Orleans	[Unknown Director]	[Unknown Actor]	Unknown	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo..
	TV Show	Kota Factory	[Unknown Director]	[Mayur More, Jitendra Kumar, Ranjan Raj, Alam ...	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...
...
	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...
	TV Show	Zombie Dumb	[Unknown Director]	[Unknown Actor]	Unknown	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town as a young girl..
	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 zombies..
	Movie	Zoom	[Peter Hewitt]	[Tim Allen, Courteney Cox, Chevy Chase, Kate M...	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero..
	Movie	Zubaan	[Mozez Singh]	[Vicky Kaushal, Sarah-Jane Dias, Raaghav Chana...	India	March 2, 2019	2015	TV-14	111 min	Dramas, International Movies, Music & Musicals	A scrappy but poor boy worms his way into a family..

nns

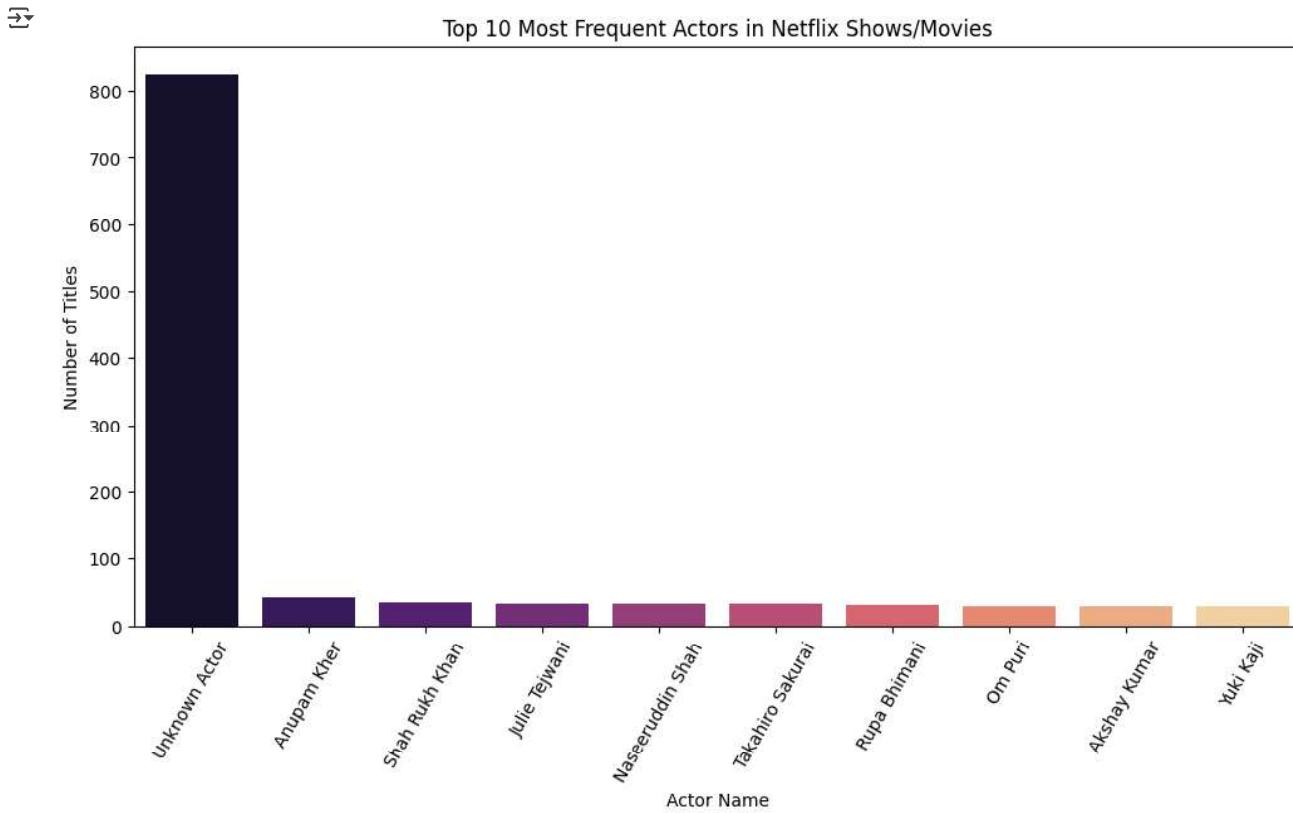
Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
netflix_exploded = netflix.explode("cast") # Expands lists into separate rows
actor_counts = netflix_exploded["cast"].value_counts().head(10)
actor_counts
```

	count
cast	
Unknown Actor	825
Anupam Kher	43
Shah Rukh Khan	35
Julie Tejwani	33
Naseeruddin Shah	32
Takahiro Sakurai	32
Rupa Bhimani	31
Om Puri	30
Akshay Kumar	30
Yuki Kaji	29

dtype: int64

```
# Create bar chart for top 10 actors
plt.figure(figsize=(12,6))
sns.barplot(y=actor_counts.values, x=actor_counts.index, palette="magma")
plt.ylabel("Number of Titles")
plt.xlabel("Actor Name")
plt.xticks(rotation=60)
plt.title("Top 10 Most Frequent Actors in Netflix Shows/Movies")
plt.show()
```



observations-1. There are many entries which are unknowns.**

2. However actor 'anupam kher' is the most frequent appeared cast in netflix movies/shows.

▼ Q4. Which genre movies are more popular or produced more?

netflix

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	s1	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	[Unknown Actor]	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
1	s2	TV Show	Blood & Water	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	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 Ledercq]	[Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nab...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord.
3	s4	TV Show	Jailbirds New Orleans	[Unknown Director]	[Unknown Actor]	Unknown	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	[Unknown Director]	[Mayur More, Jitendra Kumar, Ranjan Raj, Alam ...]	India	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, Romantic TV Shows, TV ...	In a city coaching center known to train I...
...
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...
8803	s8804	TV Show	Zombie Dumb	[Unknown Director]	[Unknown Actor]	Unknown	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 zombies.
8805	s8806	Movie	Zoom	[Peter Hewitt]	[Tim Allen, Courteney Cox, Chevy Chase, Kate M...]	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 Chana...]	India	March 2, 2019	2015	TV-14	111 min	Dramas, International Movies, Music & Musicals	A scrappy but poor boy worms his way into ity.

8807 rows × 15 columns

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from wordcloud import WordCloud

```
# Ensure all genre values are strings
netflix['genres'] = netflix['genres'].astype(str)

genres_df = netflix['genres'].dropna().str.split(',').explode()
# Remove leading/trailing spaces
genres_df = genres_df.str.strip()

# Combine all genre values into a single string
genre_text = " ".join(genres_df)
```

```
# Generate a word cloud
wordcloud = WordCloud(width=1000, height=500, background_color='white', colormap='cividis').generate(genre_text)
plt.figure(figsize=(10, 5))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis('off') # Hide axes for better visualization
plt.title("Most Produced Movie Genres")
plt.show()
```



observations-1. This word cloud titled "Most Produced Movie Genres" provides a visual representation of the frequency of different genres in the Netflix dataset. The larger the word, the more frequently that genre appears, suggesting it is more commonly produced.

2.- Prominent genres include "TV Shows," "International Movies," "Dramas," and "Comedies," indicating they are highly produced

Q5. Find After how many days the movie will be added to Netflix after the release of the movie

netflix

	Type	Title	Director	Cast	Country	Date Added	Release Year	Rating	Duration	Listed In	Description	
	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	[Unknown Actor]	United States	September 25, 2021		2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
	TV Show	Blood & Water	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	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 Show	Ganglands	[Julien Ledercq]	[Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nab...	Unknown	September 24, 2021		2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord.
	TV Show	Jailbirds New Orleans	[Unknown Director]	[Unknown Actor]	Unknown	September 24, 2021		2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo...
	TV Show	Kota Factory	[Unknown Director]	[Mayur More, Jitendra Kumar, Ranjan Raj, Alam ...	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...
...
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...	
TV Show	Zombie Dumb	[Unknown Director]	[Unknown Actor]	Unknown	July 1, 2019		2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town as a young g...	
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...	
Movie	Zoom	[Peter Hewitt]	[Tim Allen, Courteney Cox, Chevy Chase, Kate M...	United States	January 11, 2020		2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero..	
Movie	Zubaan	[Mozez Singh]	[Vicky Kaushal, Sarah-Jane Dias, Raaghav Chana...]	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...	

Ins

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```

movies_only = netflix[netflix["type"] == "Movie"]
movies_only['date_added'] = pd.to_datetime(movies_only['date_added'])

movies_only['days_to_netflix']=(movies_only['date_added']-pd.to_datetime(movies_only['release_year'], format="%Y")).dt.days

mode_days = movies_only["days_to_netflix"].mode()[0]

print(f"Most common number of days a movie is added to Netflix after the release is : {mode_days} days")

```

→ Most common number of days a movie is added to Netflix after the release is : 334 days

observation-most common number of days a movie is added to netflix after release is-334 days

```
# Filter dataset for Movies only
movies_only = netflix[netflix["type"] == "Movie"]
# Convert date_added to datetime format
movies_only['date_added'] = pd.to_datetime(movies_only['date_added'], errors='coerce')
# Convert release_year to datetime (assuming Jan 1st as default)
movies_only['release_year'] = pd.to_datetime(movies_only['release_year'].astype(str) + "-01-01")
# Calculate the number of days between release and Netflix addition
movies_only['days_to.netflix'] = (movies_only['date_added'] - movies_only['release_year']).dt.days
# Remove any NaN values
movies_only = movies_only.dropna(subset=['days_to.netflix'])
movies_only
```

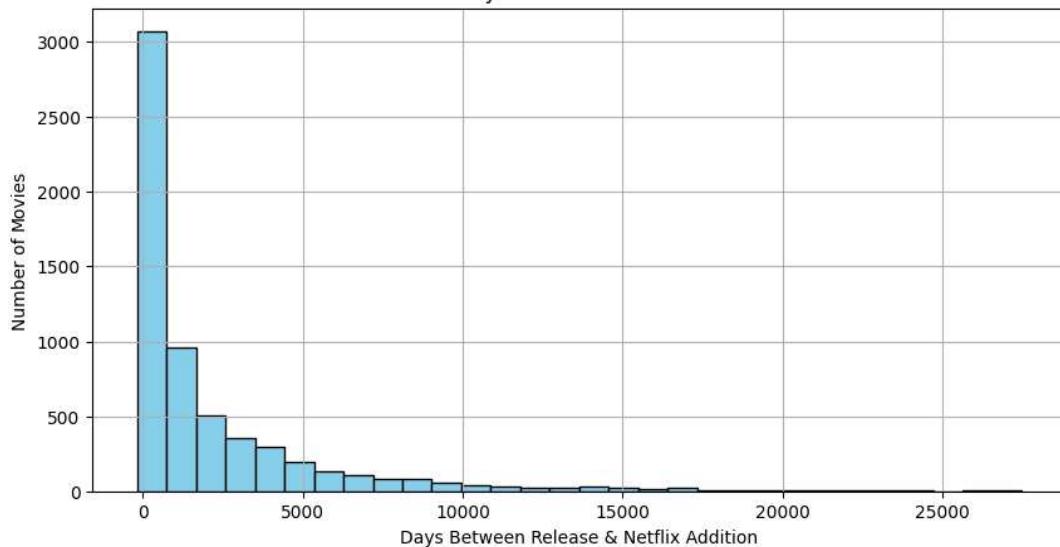
	director	cast	country	date_added	release_year	rating	duration	listed_in	descript
	[Kirsten Johnson]	[Unknown Actor]	United States	2021-09-25	2020-01-01	PG-13	90 min	Documentaries	As her fans nears end of life, film
	[Robert Cullen, José Luis Ucha]	[Vanessa Hudgens, Kimiko Glenn, James Marsden,...]	Unknown	2021-09-24	2021-01-01	PG	91 min	Children & Family Movies	Equest divided. a bright-e hero l
	[Haile Gerima]	[Kofi Ghanaba, Oyafunmike Ogunlano, Alexandra ...]	United States, Ghana, Burkina Faso, United Kin...	2021-09-24	1993-01-01	TV-MA	125 min	Dramas, Independent Movies, International Movies	On a pl sho Ghana Amer mode
	[Theodore Melfi]	[Melissa McCarthy, Chris O'Dowd, Kevin Kline, ...]	United States	2021-09-24	2021-01-01	PG-13	104 min	Comedies, Dramas	A wo adjustir life aft conte
	[Christian Schwochow]	[Luna Wedler, Jannis Niewöhner, Milan Peschel,...]	Germany, Czech Republic	2021-09-23	2021-01-01	TV-MA	127 min	Dramas, International Movies	After mo her fami murder a te
	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]	[...]
	[Majid Al Ansari]	[Ali Suliman, Saleh Bakri, Yasa, Ali Al-Jabri,...]	United Arab Emirates, Jordan	2016-03-09	2015-01-01	TV-MA	96 min	Dramas, International Movies, Thrillers	Recover alcot Talal wa up insi
	[David Fincher]	[Mark Ruffalo, Jake Gyllenhaal, Robert Downey ...]	United States	2019-11-20	2007-01-01	R	158 min	Cult Movies, Dramas, Thrillers	A pol cartooni cl reporter
	[Ruben Fleischer]	[Jesse Eisenberg, Woody Harrelson, Emma Stone,...]	United States	2019-11-01	2009-01-01	R	88 min	Comedies, Horror Movies	Lookin surviv world ta over by :
	[Peter Hewitt]	[Tim Allen, Courteney Cox, Chevy Chase, Kate M...]	United States	2020-01-11	2006-01-01	PG	88 min	Children & Family Movies, Comedies	Drag from civ life, a for superhe
	[Mozez Singh]	[Vicky Kaushal, Sarah-Jane Dias, Raaghav Chana...]	India	2019-03-02	2015-01-01	TV-14	111 min	Dramas, International Movies, Music & Musicals	A scr but poor worms way ir

[Next steps: Generate code with movies_only](#)[View recommended plots](#)[New interactive sheet](#)

```
# Plot Histogram
plt.figure(figsize=(10, 5))
plt.hist(movies_only['days_to_netflix'], bins=30, color='skyblue', edgecolor='black')
plt.xlabel("Days Between Release & Netflix Addition")
plt.ylabel("Number of Movies")
plt.title("Distribution of Days for Movies to be Added to Netflix")
plt.grid(True)
plt.show()
```



Distribution of Days for Movies to be Added to Netflix



observation-1. Most movies arrive quickly

2. The highest frequency of movies fall under lower range(0-1000 days), suggesting that netflix acquire most titles within the release of movies.

3. Right skewed distribution.

▼ 6. Top 10 countries producing content

netflix

→	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
	Movie	Dick Johnson Is Dead	[Kirsten Johnson]	[Unknown Actor]	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
	TV Show	Blood & Water	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	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 Show	Ganglands	[Julien Ledercq]	[Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nab...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord..
	TV Show	Jailbirds New Orleans	[Unknown Director]	[Unknown Actor]	Unknown	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo..
	TV Show	Kota Factory	[Unknown Director]	[Mayur More, Jitendra Kumar, Ranjan Raj, Alam ...	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...
...
	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...
	TV Show	Zombie Dumb	[Unknown Director]	[Unknown Actor]	Unknown	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town as a young g...
	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...
	Movie	Zoom	[Peter Hewitt]	[Tim Allen, Courteney Cox, Chevy Chase, Kate M...	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero..
	Movie	Zubaan	[Mozez Singh]	[Vicky Kaushal, Sarah-Jane Dias, Raaghav Chana...]	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..

ins

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```
categorical_columns = [ 'country']
for i in categorical_columns:
    print(f'Top categories in {i}:')
    print(netflix[i].value_counts().head(10))
    print('\n' + '-'*50 + '\n')
```

→ Top categories in country:

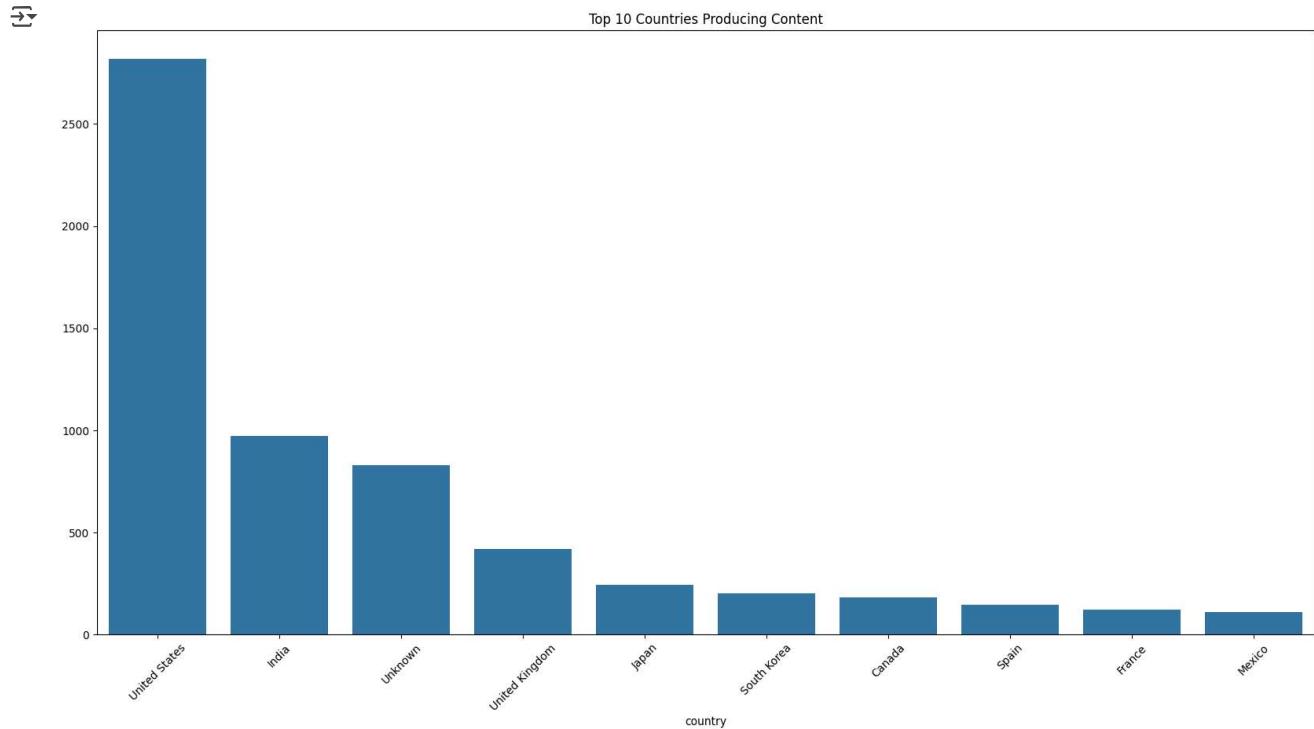
country	
United States	2818
India	972
Unknown	831
United Kingdom	419

```

Japan           245
South Korea    199
Canada          181
Spain            145
France           124
Mexico           110
Name: count, dtype: int64
-----
```

```

#Country-wise distribution
plt.figure(figsize=(20, 10))
sns.barplot(x=netflix['country'].value_counts().head(10).index,
            y=netflix['country'].value_counts().head(10).values)
plt.xticks(rotation=45)
plt.title('Top 10 Countries Producing Content')
plt.show()
```



observations-1.United states is producing more content on netflix followed by India.

2.There are some unknown entries which can be ignored.

✓ 7. Showing trends of release year and ratings of netflix movies/shows.

netflix

type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
Movie	Dick Johnson Is Dead	[Kirsten Johnson]	[Unknown Actor]	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
TV Show	Blood & Water	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	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 Show	Ganglands	[Julien Ledercq]	[Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nab...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord..
TV Show	Jailbirds New Orleans	[Unknown Director]	[Unknown Actor]	Unknown	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo..
TV Show	Kota Factory	[Unknown Director]	[Mayur More, Jitendra Kumar, Ranjan Raj, Alam ...	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...
...
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...
TV Show	Zombie Dumb	[Unknown Director]	[Unknown Actor]	Unknown	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town as a young g...
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...
Movie	Zoom	[Peter Hewitt]	[Tim Allen, Courteney Cox, Chevy Chase, Kate M...	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero..
Movie	Zubaan	[Mozez Singh]	[Vicky Kaushal, Sarah-Jane Dias, Raaghav Chana...	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..

Ins

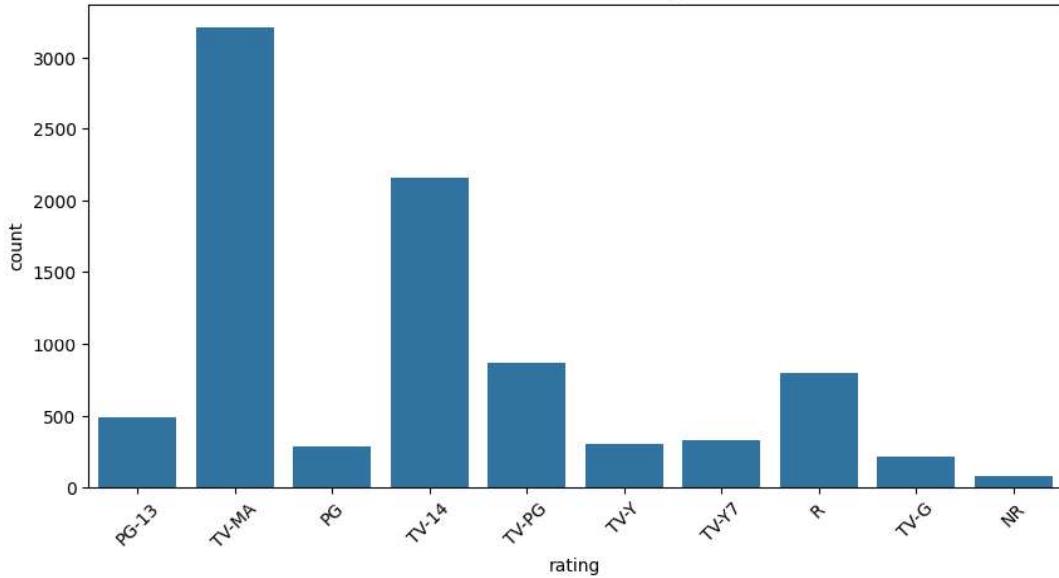
Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
#Top 10 categories in rating
plt.figure(figsize=(10, 5))
sns.countplot(data=netflix[netflix['rating'].isin(netflix['rating'].value_counts().head(10).index)], x='rating')

plt.xticks(rotation=45)
plt.title('Distribution of Ratings')
plt.show()
```



Distribution of Ratings

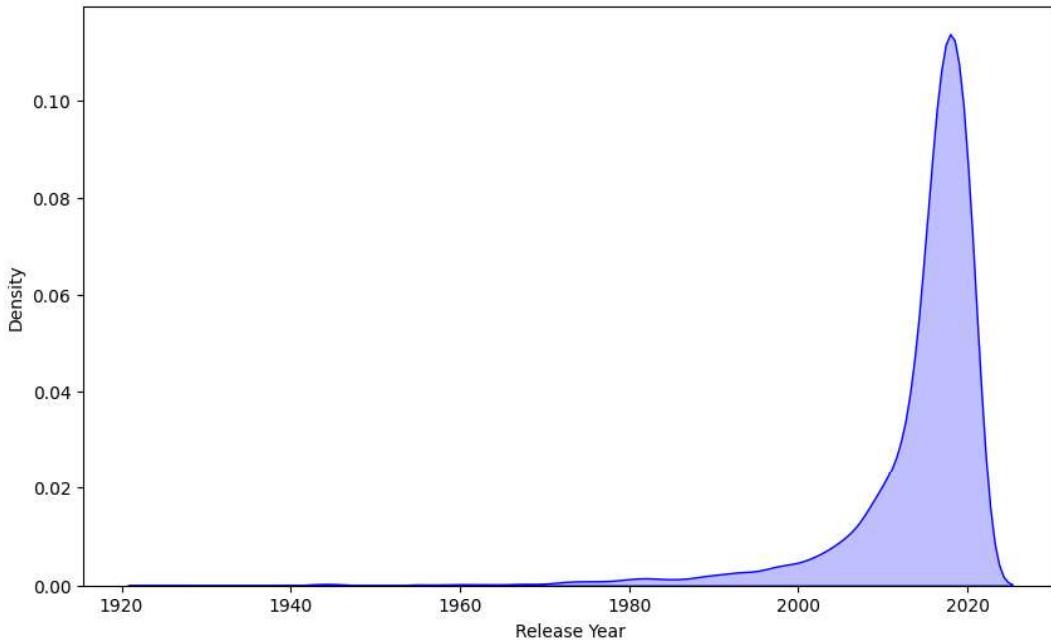


observations - count of 'TV-MA' is more as compared to other ratings. It signifies that a TV program is intended for mature audiences only, has higher count in netflix platform.

```
# Create KDE plot
plt.figure(figsize=(10, 6))
sns.kdeplot(netflix['release_year'], shade=True, color="blue")
plt.xlabel("Release Year")
plt.ylabel("Density")
plt.title("KDE Plot of Release Year in Netflix Dataset")
plt.show()
```



KDE Plot of Release Year in Netflix Dataset



observations- 1.The peak of netflix is around year 2020, suggesting a sharp increase in release of movies/shows.

2.Steady increase in releases post year 2000's, suggesting that netflix has consistently put effort for content intake.

✓ 8.percentage growth in specific genres over time

netflix

type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
Movie	Dick Johnson Is Dead	[Kirsten Johnson]	[Unknown Actor]	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, film...
TV Show	Blood & Water	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	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 Show	Ganglands	[Julien Ledercq]	[Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nab...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protect his family from a powerful drug lord..
TV Show	Jailbirds New Orleans	[Unknown Director]	[Unknown Actor]	Unknown	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Feuds, flirtations and toilet talk go down amo..
TV Show	Kota Factory	[Unknown Director]	[Mayur More, Jitendra Kumar, Ranjan Raj, Alam ...	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...
...
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...
TV Show	Zombie Dumb	[Unknown Director]	[Unknown Actor]	Unknown	July 1, 2019	2018	TV-Y7	2 Seasons	Kids' TV, Korean TV Shows, TV Comedies	While living alone in a spooky town as a young g...
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...
Movie	Zoom	[Peter Hewitt]	[Tim Allen, Courteney Cox, Chevy Chase, Kate M...	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero..
Movie	Zubaan	[Mozez Singh]	[Vicky Kaushal, Sarah-Jane Dias, Raaghav Chana...	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..

Ins

Next steps: [Generate code with netflix](#) [View recommended plots](#) [New interactive sheet](#)

```
genre_info.head()
```

	title	genre_c
0	Dick Johnson Is Dead	Documentaries
1	Blood & Water	International TV Shows
1	Blood & Water	TV Dramas
1	Blood & Water	TV Mysteries
2	Ganglands	Crime TV Shows

Next steps: [Generate code with genre_info](#) [View recommended plots](#) [New interactive sheet](#)

```
data=pd.merge(genre_info,netflix,on='title',how='left')
data.head()
```

	show_id	type	director	cast	country	date_added	release_year	rating	duration	listed_in
	s1	Movie	[Kirsten Johnson]	[Unknown Actor]	United States	September 25, 2021	2020	PG-13	90 min	Documentaries
	s2	TV Show	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries
	s2	TV Show	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries
	s2	TV Show	[Unknown Director]	[Ama Qamata, Khosi Ngema, Gail Mabalane, Thaba...	South Africa	September 24, 2021	2021	TV-MA	2 Seasons	International TV Shows, TV Dramas, TV Mysteries
	s3	TV Show	[Julien Leclercq]	[Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nab...	Unknown	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...

Next steps: [Generate code with data](#) [View recommended plots](#) [New interactive sheet](#)

✓ 9.PIE CHART FOR GENRE DISTRIBUTION OVER FOUR YEARS(2010,2015,2020,2021)

```
#PIE CHART FOR GENRE DISTRIBUTION OVER FOUR YEARS(2010,2015,2020,2021)

genre_col = "genre_c"
release_year_col = "release_year"

# Select top 10 genres
top_genres = data[genre_col].value_counts().head(10).index
df_filtered = data[data[genre_col].isin(top_genres)]

# Group by year and genre
genre_counts_by_year = df_filtered.groupby([release_year_col, genre_col]).size().unstack().fillna(0)

years_to_plot = [2010, 2015, 2020, 2021]

for year in years_to_plot:
    plt.figure(figsize=(3, 3))
    yearly_genre_counts = genre_counts_by_year.loc[year]
    plt.pie(yearly_genre_counts, labels=yearly_genre_counts.index, autopct=".1f%%", startangle=140)
    plt.title(f"Genre Distribution in {year}")
    plt.show()
```

```
#PIE CHART FOR GENRE DISTRIBUTION OVER FOUR YEARS(2010,2015,2020,2021)

genre_col = "genre_c"
release_year_col = "release_year"

# Select top 10 genres
top_genres = data[genre_col].value_counts().head(10).index
df_filtered = data[data[genre_col].isin(top_genres)]

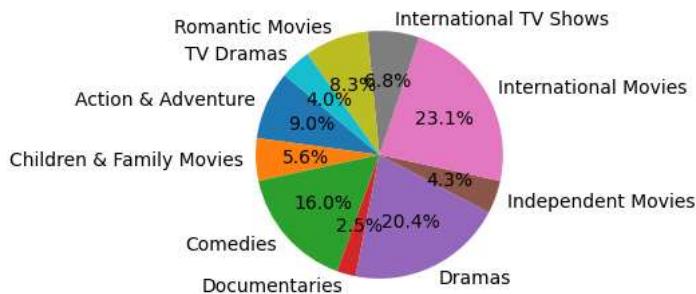
# Group by year and genre
genre_counts_by_year = df_filtered.groupby([release_year_col, genre_col]).size().unstack().fillna(0)

years_to_plot = [2010, 2015, 2020, 2021]

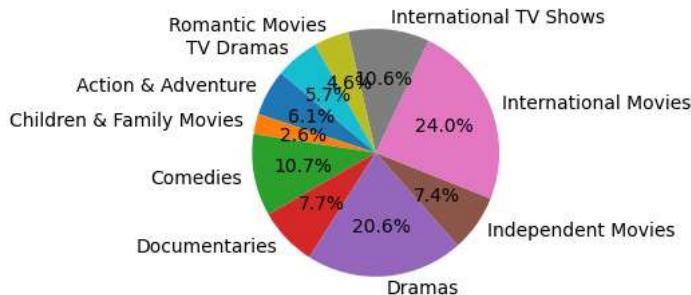
for year in years_to_plot:
    plt.figure(figsize=(3, 3))
    yearly_genre_counts = genre_counts_by_year.loc[year]
    plt.pie(yearly_genre_counts, labels=yearly_genre_counts.index, autopct=".1f%%", startangle=140)
    plt.title(f"Genre Distribution in {year}")
    plt.show()
```



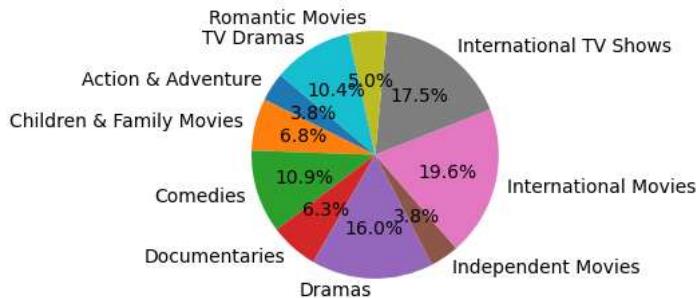
Genre Distribution in 2010



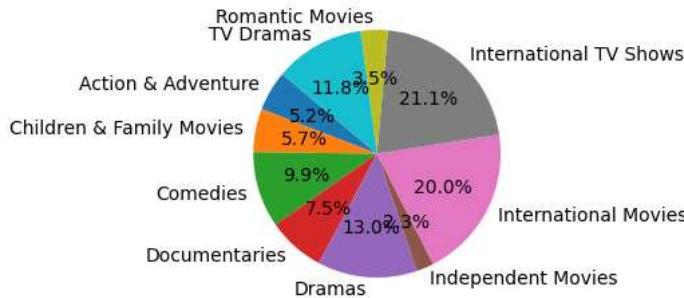
Genre Distribution in 2015



Genre Distribution in 2020



Genre Distribution in 2021



observations-YEAR 2010-1.dominance of international movies

2.Dramas and comedies were strong.

3.Intenational Tv shows were limited.

YEAR 2015-1.international movies and Tv dramas dominant.

2.Balanced distribution across categories i.e dramas, documentaries and comedies also have sinificant share.

YEAR 2020-1.global entertainment dominates i.e international movies and international movies together contributes to 37%.

2.dramatic storytelling thrives.

YEAR 2021-1.Dominance of international content i.e - International TV Shows (21.1%) and International Movies (20.0%) together account for over 41% of total content.

2.- Dramatic Storytelling Remains Strong

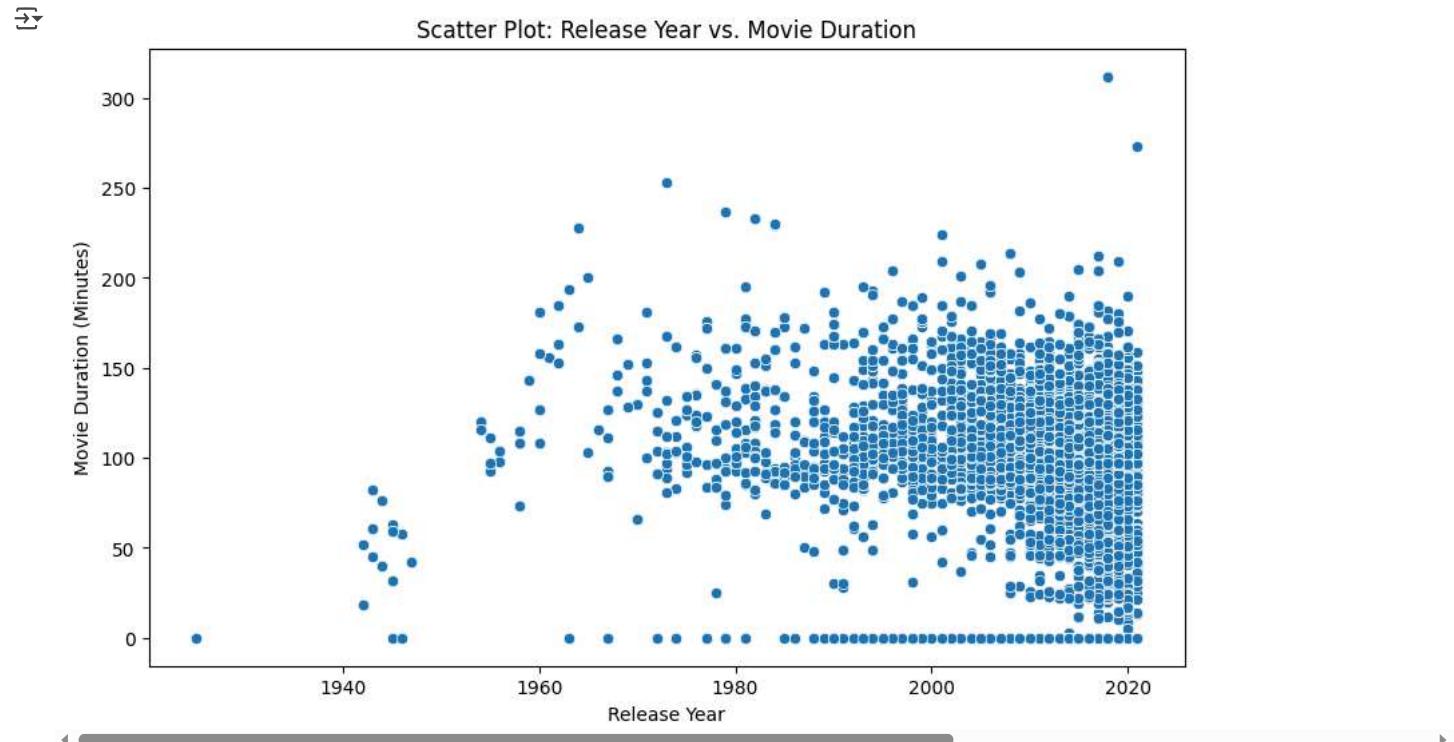
- Dramas (13.0%) and TV Dramas (11.8%) make up over 24%, reinforcing the genre's consistent popularity.

10. Scatter plot for release year vs movie minutes shows how movie durations vary across different years.

```
data.columns
```

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

```
#Scatter plot for release year vs movie minutes shows how movie durations vary across different years
plt.figure(figsize=(10, 6))
sns.scatterplot(x=data["release_year"], y=data["Movie_Mins"])
plt.xlabel("Release Year")
plt.ylabel("Movie Duration (Minutes)")
plt.title("Scatter Plot: Release Year vs. Movie Duration")
plt.show()
```



Key Insights for above scatter plot

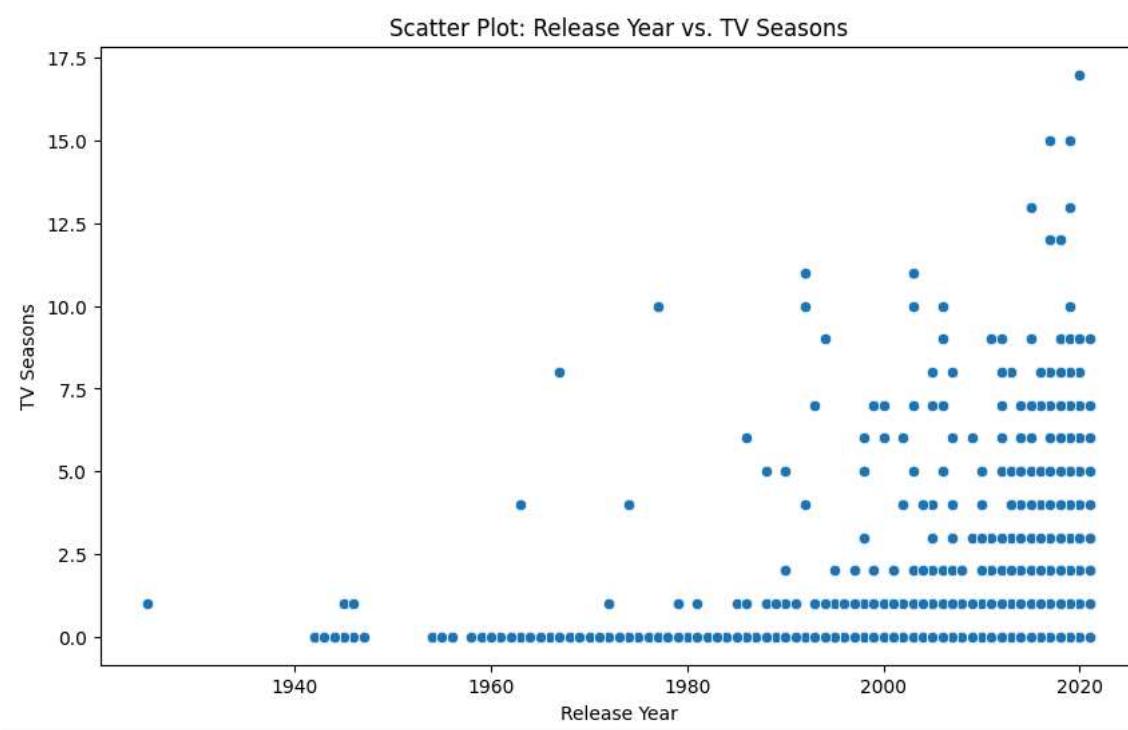
- Increase in Movie Releases Over Time: Movies released before 1980 are sparse, indicating fewer productions. After 1980, the number of movies significantly increases, showing industry growth.
 - Movie Duration Distribution: Older movies (pre-1960) tend to have shorter durations, mostly under 100 minutes. Recent movies (post-2000) have more varied lengths, often between 80-150 minutes.
 - Standardization in Movie Lengths: From 2000 onwards, most movies cluster around 90-120 minutes, suggesting a standardization trend.
 - Outliers (Long Movies): Some movies exceed 200 minutes, scattered across decades, but becoming more frequent in modern years.
- Possible Interpretations:
- Industry Growth: More movies are produced in recent decades due to technological advancements and streaming platforms.
 - Shorter Movies in Early Years: Earlier films had lower production budgets, which may have led to shorter durations.
 - Longer Movies Becoming Rare: While long films still exist, most follow a standard range (~90-120 minutes) for commercial appeal.

✓ 11.Scatterplot for Release year vs TV Seasons Analyzes trends in the number of TV seasons over time.

```
#Scatterplot for Release year vs TV Seasons Analyzes trends in the number of TV seasons over time.
plt.figure(figsize=(10, 6))
sns.scatterplot(x=data["release_year"], y=data["TV_Seasons"])

plt.xlabel("Release Year")
plt.ylabel("TV Seasons")
plt.title("Scatter Plot: Release Year vs. TV Seasons")

plt.show()
```

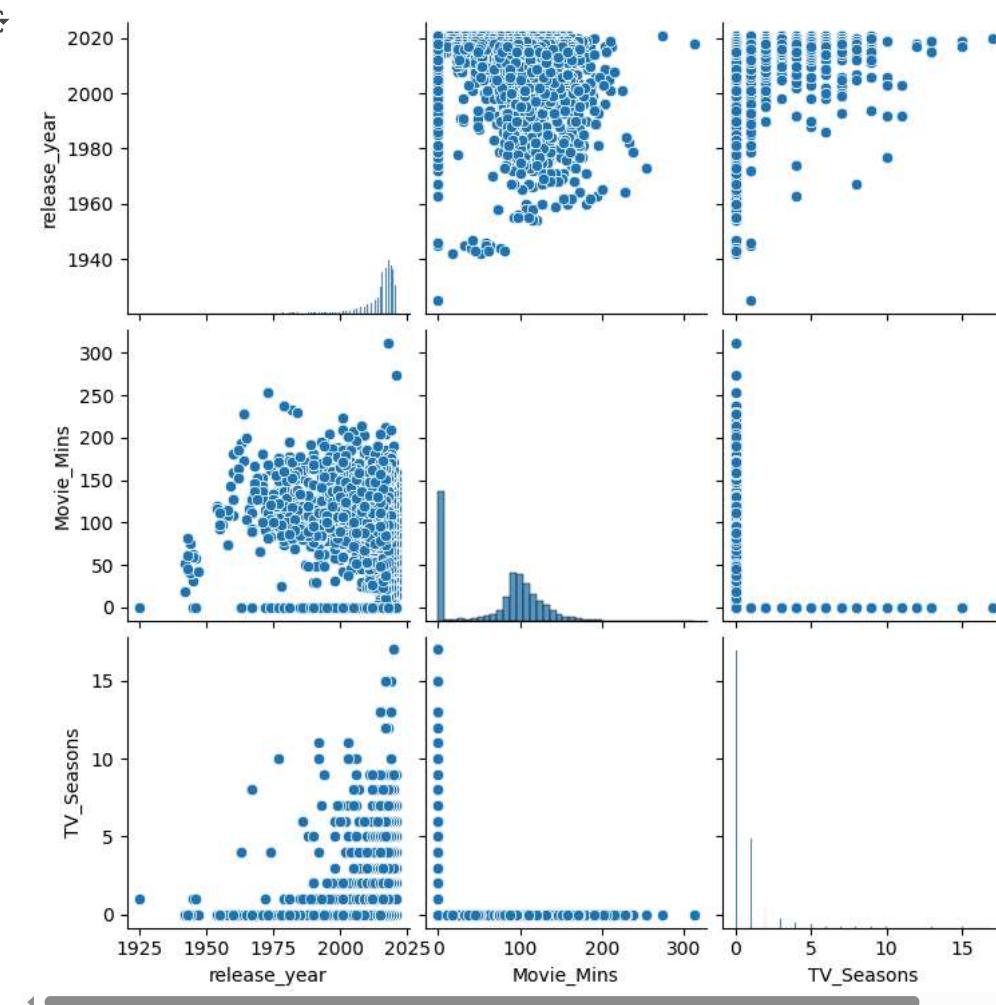


Key Insights of above scatter plot are:

- Increase in TV Shows Over Time: Early years (before 1980) have fewer data points, suggesting lower production volume. After 2000, there is a noticeable increase in TV productions.
- TV Shows with More Seasons: Some shows have multiple seasons, clustering in recent years. A few long-running TV shows stand out as outliers with high season counts.
- Trend in Limited Series & Shorter Shows: More recent years show a mix of both single-season and multi-season shows. The presence of many single-season series suggests an increase in limited series formats. Possible Interpretations: Growth in Streaming Content: The surge in TV shows post-2000 coincides with the rise of streaming platforms. Shift in Production Strategy: TV networks and streaming services produce more limited series, rather than long-running shows. Outliers Represent Iconic Long-Running Shows: Some dots far above the trend line likely represent famous, long-running series.

✓ 12.#Pair plot#

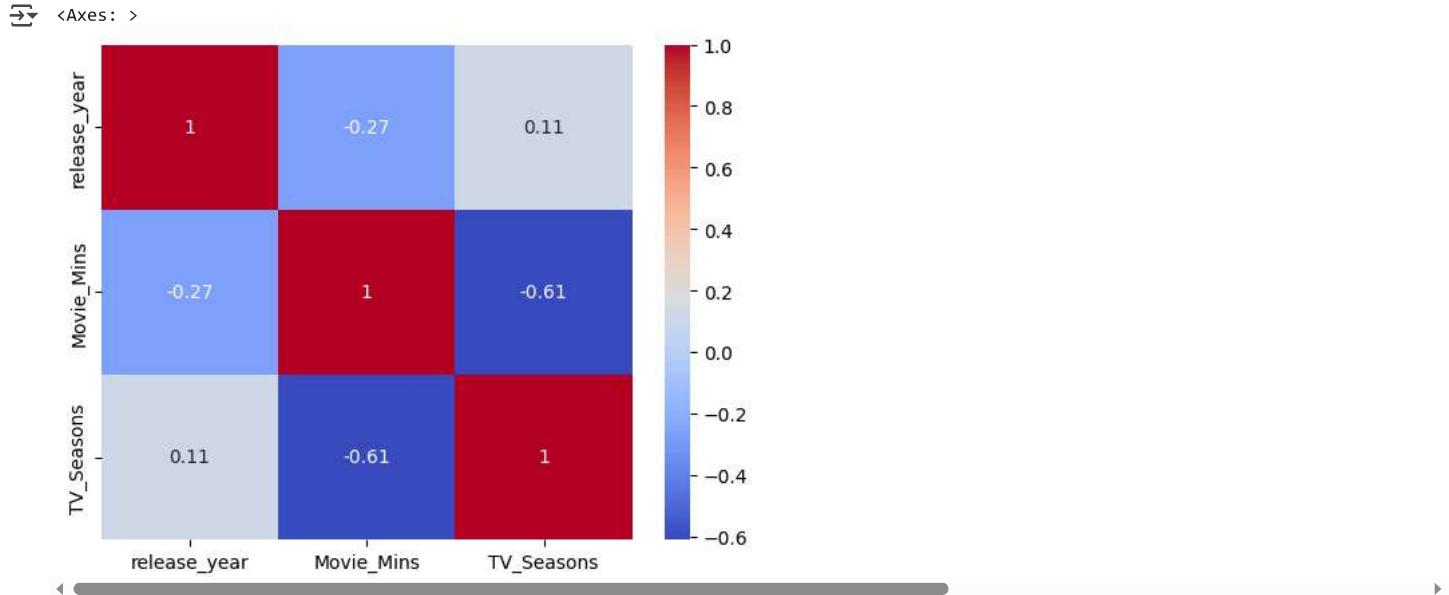
```
sns.pairplot(data=data)
plt.show()
```



1. Release Year vs. Movie Duration (Scatter Plot) 📌 Movie duration clusters between 50-150 minutes, especially for films released after 1950. 📌 A few long-duration outliers (>200 mins) exist, but they are rare. 📌 Recent releases (post-2000) show diverse runtime variations, indicating flexibility in storytelling.
2. Release Year vs. TV Seasons (Scatter Plot) 📌 Most multi-season TV shows appear post-1980, aligning with increased TV production. 📌 TV shows with more than 5 seasons have become more frequent after 2000, possibly due to streaming services and franchise expansions. 📌 Shows from early years (<1950) rarely have more than 2-3 seasons, reflecting the shorter formats of early television.
3. Movie Duration vs. TV Seasons (Scatter Plot) 📌 Clear distinction: Movies have a fixed duration, while TV shows span multiple seasons. 📌 Long-duration movies do not overlap with high-season TV shows, reinforcing their separate storytelling structures.
4. Histograms (Distribution of Each Variable)
 - 📌 Release Year Histogram: Most content is produced in recent decades, with a surge post-1980.
 - 📌 Movie Duration Histogram: Peaks around 100 minutes, reinforcing standard film length trends.
 - 📌 TV Seasons Histogram: Most TV shows have ≤5 seasons, but a few long-running series exist.
 Key Takeaways ✓ Rise in Movie & TV Production: Content releases have significantly increased post-1950. ✓ TV Show Longevity: More multi-season TV series appear in recent decades. ✓ Standardization in Movies: Most films stay within the 90-120 minute range, aligning with industry norms.

▼ 13.#HEAT MAP#

```
sns.heatmap(data.corr(numeric_only=True), annot=True, cmap='coolwarm')
```



Key Insights from the above Heatmap:

- Negative Correlation Between Release Year & Movie Duration (-0.27): Indicates that newer movies tend to have slightly shorter durations than older ones. This could be due to changing audience preferences, where shorter films dominate modern cinema.
 - Very Weak Positive Correlation Between Release Year & TV Seasons (0.11) Suggests that newer TV shows have slightly more seasons, but the relationship is weak. The slight increase may be influenced by streaming platforms supporting longer-running series.
 - Moderate Negative Correlation Between Movie Duration & TV Seasons (-0.61): Implies that as TV shows have more seasons, their individual episode durations may be shorter. This aligns with modern trends where long-running TV series focus on shorter, fast-paced episodes.
- Key Takeaways:** Movies Are Getting Shorter: Modern films lean toward concise storytelling, reducing runtime. TV Shows Are Expanding: Some series have longer episode counts instead of movie-like runtimes. Shifting Industry Trends: Streaming platforms may have influenced TV formats and movie duration choices.

14. Boxplot of movies duration(last 10 years)

```
data.columns
Index(['title', 'genre_c', 'show_id', 'type', 'director', 'cast', 'country',
       'date_added', 'release_year', 'rating', 'duration', 'listed_in',
       'description', 'Movie_Mins', 'TV_Seasons', 'genres'],
      dtype='object')

release_year_col = "release_year"
movie_duration_col = "Movie_Mins"

# Filter the dataset for release years between 2010 and 2021
df_filtered = data[(data[release_year_col] >= 2010) & (data[release_year_col] <= 2021)].dropna(subset=[movie_duration_col])

# Create the boxplot
plt.figure(figsize=(12, 6))
sns.boxplot(x=df_filtered[release_year_col], y=df_filtered[movie_duration_col])

# Label the axes
plt.xlabel("Release Year")
plt.ylabel("Movie Duration (Minutes)")
plt.title("Boxplot of Movie Duration (2010-2021)")

# Rotate x-axis labels for better visibility
plt.xticks(rotation=45)

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

```

release_year_col = "release_year"
movie_duration_col = "Movie_Mins"

# Filter the dataset for release years between 2010 and 2021
df_filtered = data[(data[release_year_col] >= 2010) & (data[release_year_col] <= 2021)].dropna(subset=[movie_duration_col])

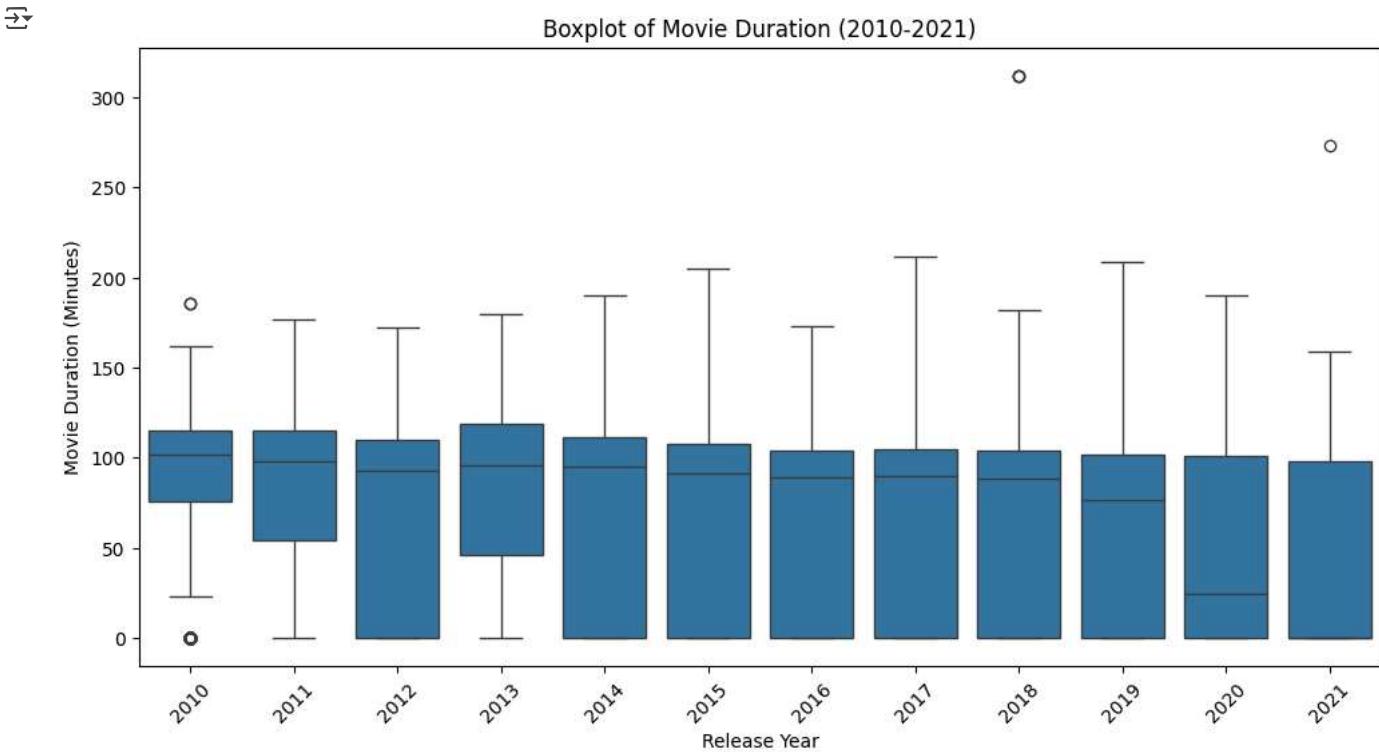
# Create the boxplot
plt.figure(figsize=(12, 6))
sns.boxplot(x=df_filtered[release_year_col], y=df_filtered[movie_duration_col])

# Label the axes
plt.xlabel("Release Year")
plt.ylabel("Movie Duration (Minutes)")
plt.title("Boxplot of Movie Duration (2010-2021)")

# Rotate x-axis labels for better visibility
plt.xticks(rotation=45)

# Show the plot
plt.show()

```



Key observations of above boxplot:

1. Median Movie Duration:

- The median duration of movies remains fairly consistent around 100 minutes across most years.
- A few years have slightly longer or shorter medians, but there is no drastic shift over time.

2. Spread of Movie Durations (Interquartile Range - IQR):

- The middle 50% (IQR) of movie durations typically ranges between 75 and 125 minutes, suggesting a common runtime preference.
- Some years show wider variations, indicating increased diversity in movie lengths.

3. Outliers & Extremes:

- Several outliers exist—especially for movies exceeding 200 minutes, seen in 2010, 2016, 2019, and 2020.
- A few very short-duration movies also appear as lower outliers in certain years.

4. Consistency Over Time:

- The general shape and spread remain steady from 2010 to 2021, showing no major industry-wide trend toward longer or shorter movies.
- The presence of outliers each year suggests ongoing experimentation with movie lengths, but mainstream films generally stick to industry norms. Possible Interpretations are:
 - ✓ Industry Standardization: Most movies fall within the 90-120 minute range, likely due to audience engagement and commercial success.
 - ✓ Occasional Long Films: Outliers represent special cases, such as epics, documentaries, or unique storytelling formats.
 - ✓ Stable Trends Over the Years: Despite the rise of streaming platforms, movie lengths have remained relatively consistent.

Final Recommendations

- ✓ Continue focusing on international content—it drives global engagement.
- ✓ Leverage drama, comedy, and international films to enhance revenue.
- ✓ Increase movie acquisitions while maintaining a balance with TV series.
- ✓ Prioritize mature content (TV-MA) as it aligns with Netflix's viewer preferences.
- ✓ Optimize movie length standards based on audience retention trends.
- ✓ Strengthen early content acquisition, securing releases within the first year for better engagement.