

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

```
data=pd.read_csv('netflix_titles.csv')
data
```

	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, filmmaker
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 powerful drug lord.
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 coaching center known to train I.
...	...	...	...	...	...	...	...	...	...	...	...	...
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 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 girl
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.

```
data.head()
```

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

lailbirds

Feuds,

data.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,	United States	January 11, 2020	2006	PG	88 min	Children & Family Movies, Comedies	Dragged from civilian life, a former superhero...

data.info()

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8807 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column      Non-Null Count  Dtype  
--- 
 0   show_id     8807 non-null   object 
 1   type        8807 non-null   object 
 2   title       8807 non-null   object 
 3   director    6173 non-null   object 
 4   cast         7982 non-null   object 
 5   country     7976 non-null   object 
 6   date_added  8797 non-null   object 
 7   release_year 8807 non-null   int64  
 8   rating      8803 non-null   object 
 9   duration    8804 non-null   object 
 10  listed_in   8807 non-null   object 
 11  description  8807 non-null   object 
dtypes: int64(1), object(11)
memory usage: 825.8+ KB
```

data.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
```

```
data.shape
```

```
(8807, 12)
```

```
data.size
```

```
105684
```

```
data.isnull().sum()/len(data)*100
```

	0
show_id	0.000000
type	0.000000
title	0.000000
director	29.908028
cast	9.367549
country	9.435676
date_added	0.113546
release_year	0.000000
rating	0.045418
duration	0.034064
listed_in	0.000000
description	0.000000

```
dtype: float64
```

```
data.rating.unique()
```

```
array(['PG-13', 'TV-MA', 'PG', 'TV-14', 'TV-PG', 'TV-Y', 'TV-Y7', 'R',
       'TV-G', 'G', 'NC-17', '74 min', '84 min', '66 min', 'NR', nan,
       'TV-Y7-FV', 'UR'], dtype=object)
```

```
data.duplicated().sum()
```

```
np.int64(0)
```

```
data['show_id'] = data['show_id'].str.replace('s', '')
data.head()
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
0	1	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, film...
1	2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane,	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...

```
data['director'] = data['director'].fillna('Unknown')
```

Document

To protect his

```
data.groupby('country')['country'].count().sort_values(ascending=False)
```

Samuel Jouy, Nabil...

TV Shows, TV Act... lor...

country	...	...	...	...	...	...	...	...	...	...	...	Feuds,
United States	2818											
India	972											
United Kingdom	419											
Japan	245											
South Korea	199											
...	...											
Australia, Iraq	1											
Venezuela	1											
Venezuela, Colombia	1											
West Germany	1											
, South Korea	1											

748 rows × 1 columns

**dtype:** int64

```
data['country'] = data['country'].fillna(data['country'].mode()[0])
```

**data.info()**

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8807 entries, 0 to 8806
Data columns (total 12 columns):
 #   Column      Non-Null Count  Dtype  
--- 
 0   show_id     8807 non-null   object 
 1   type        8807 non-null   object 
 2   title       8807 non-null   object 
 3   director    8807 non-null   object 
 4   cast         7982 non-null   object 
 5   country     8807 non-null   object 
 6   date_added  8797 non-null   object 
 7   release_year 8807 non-null   int64  
 8   rating      8803 non-null   object 
 9   duration    8804 non-null   object 
 10  listed_in   8807 non-null   object 
 11  description  8807 non-null   object 
dtypes: int64(1), object(11)
memory usage: 825.8+ KB
```

```
data['type'].value_counts()
```

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

```
data.pivot_table(index='type', values='title', aggfunc='count')
```

```
title  
type  
Movie 6131  
TV Show 2676
```

```
data['release_year']
```

```
release_year  
0 2020  
1 2021  
2 2021  
3 2021  
4 2021  
... ...  
8802 2007  
8803 2018  
8804 2009  
8805 2006  
8806 2015
```

8807 rows × 1 columns

```
dtype: int64
```

```
data.loc[data['release_year'] == 2020]
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	des
0	1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As li
16	17	Movie	Europe's Most Dangerous Man: Otto Skorzeny in ...	Pedro de Echave García, Pablo Azorín Williams	NaN	United States	September 22, 2021	2020	TV-MA	67 min	Documentaries, International Movies	Di c l
17	18	TV Show	Falsa identidad	Unknown	Luis Ernesto Franco, Camila Sodi, Sergio Goyri...	Mexico	September 22, 2021	2020	TV-MA	2 Seasons	Crime TV Shows, Spanish-Language TV Shows, TV ...	the
32	33	TV Show	Sex Education	Unknown	Asa Butterfield, Gillian Anderson, Ncuti Gatwa...	United Kingdom	September 17, 2021	2020	TV-MA	3 Seasons	British TV Shows, International TV Shows, TV C...	Ins
34	35	TV Show	Tayo and Little Wizards	Unknown	Dami Lee, Jason Lee, Bommie Catherine Han, Jen...	United States	September 17, 2021	2020	TV-Y7	1 Season	Kids' TV	Ta
...	...	...	...	...	...	...	...	...	...	...	...	...
5972	5973	Movie	#cats_the_mewvie	Michael Margolis	NaN	Canada	February 5, 2020	2020	TV-14	90 min	Documentaries, International Movies	f doi exp
7594	7595	Movie	Norm of the North: Family Vacation	Anthony Bell	Andrew Toth, Lisa Durupt, Jonathan Holmes, Pau...	United States	May 25, 2020	2020	TV-Y7	89 min	Children & Family Movies	S hi fa
8099	8100	Movie	Straight Up	James Sweeney	James Sweeney, Katie Findlay, Randall Park, Hi...	United States	June 26, 2020	2020	TV-MA	96 min	Comedies, Independent Movies, LGBTQ Movies	W bri que
8125	8126	TV Show	Super Wings	Unknown	Luca Padovan, Evan Smolin, Junah Jang, Colin C...	United States, South Korea, China	December 1, 2020	2020	TV-Y	3 Seasons	Kids' TV, Korean TV Shows	A c tra l
8132	8133	TV Show	Surviving R. Kelly Part II: The Reckoning	Unknown	R. Kelly	United States	April 13, 2020	2020	TV-MA	1 Season	Crime TV Shows, Docuseries	wi fo

data.iloc[100:110]

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description
100	101	TV Show	Tobot Galaxy Detectives	Unknown	Austin Abell, Travis Turner, Cole Howard, Anna...	United States	September 7, 2021	2019	TV-Y7	2 Seasons	Kids' TV	An intergalactic device transforms toy cars in...
101	102	Movie	Untold: Breaking Point	Chapman Way, Maclain Way	Nan	United States	September 7, 2021	2021	TV-MA	80 min	Documentaries, Sports Movies	Under pressure to continue a winning tradition...
102	103	TV Show	Countdown: Inspiration4 Mission to Space	Jason Hehir	Nan	United States	September 6, 2021	2021	TV-14	1 Season	Docuseries, Science & Nature TV	From training to launch to landing, this all-a...
103	104	Movie	Shadow Parties	Yemi Amodu	Jide Kosoko, Omotola Jalade-Ekeinde, Yemi Blaq...	United States	September 6, 2021	2020	TV-MA	117 min	Dramas, International Movies, Thrillers	A family faces destruction in a long-running c...
104	105	TV Show	Tayo the Little Bus	Unknown	Robyn Slade, Kami Desilets	South Korea	September 6, 2021	2016	TV-Y	2 Seasons	Kids' TV, Korean TV Shows	As they learn their routes around the busy cit...
105	106	Movie	Angamaly Diaries	Lijo Jose Pellissery	Antony Varghese, Reshma Rajan, Binny Rinky Ben...	India	September 5, 2021	2017	TV-14	128 min	Action & Adventure, Comedies, Dramas	After growing up amidst the gang wars of his h...
106	107	TV Show	Bunk'd	Unknown	Peyton List, Karan Brar, Skai Jackson, Miranda...	United States	September 5, 2021	2021	TV-G	5 Seasons	Kids' TV, TV Comedies	The Ross siblings of Disney's hit series "Jess..."
107	108	Movie	A Champion Heart	David de Vos	Mandy Grace, David de Vos, Donna Rusch, Devan ...	United States	September 4, 2021	2018	G	90 min	Children & Family Movies, Dramas	When a grieving teen must work off her debt to...

```
data.query('release_year == 2020')
```

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	des
0	1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As li
16	17	Movie	Europe's Most Dangerous Man: Otto Skorzeny in ...	Pedro de Echave García, Pablo Azorín Williams	NaN	United States	September 22, 2021	2020	TV-MA	67 min	Documentaries, International Movies	Di c l
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...	...	...	...	...	...	...	...	...	...	...	...	...
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```
plt.plot(data['release_year'], data['title'])
```



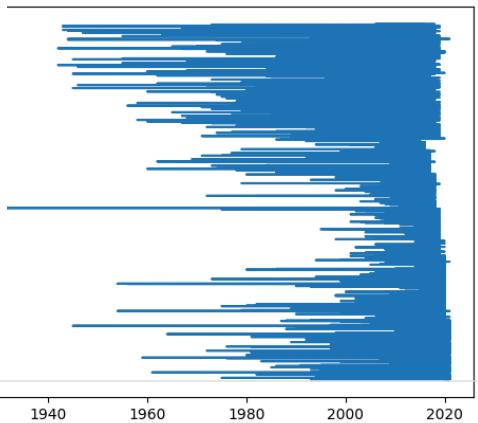
```
[<matplotlib.lines.Line2D at 0x7cbdde92f050>]
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 28023 (\N{CJK UNIFIED IDEOGRAPH-6D77}) miss
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 30340 (\N{CJK UNIFIED IDEOGRAPH-7684}) miss
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 20799 (\N{CJK UNIFIED IDEOGRAPH-513F}) miss
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 23376 (\N{CJK UNIFIED IDEOGRAPH-5B50}) miss
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  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 46300 (\N{HANGUL SYLLABLE DEU}) missing fro
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 49884 (\N{HANGUL SYLLABLE SI}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 51105 (\N{HANGUL SYLLABLE JAB}) missing fro
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 45716 (\N{HANGUL SYLLABLE NEUN}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 45796 (\N{HANGUL SYLLABLE DA}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3649 (\N{THAI CHARACTER SARA AE}) missing f
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3612 (\N{THAI CHARACTER PHO PHUNG}) missing
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3609 (\N{THAI CHARACTER NO NU}) missing fro
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3619 (\N{THAI CHARACTER RO RUA}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3657 (\N{THAI CHARACTER MAI THO}) missing f
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3634 (\N{THAI CHARACTER SARA AA}) missing f
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3618 (\N{THAI CHARACTER YO YAK}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3648 (\N{THAI CHARACTER SARA E}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3592 (\N{THAI CHARACTER CHO CHAN}) missing
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3621 (\N{THAI CHARACTER LO LING}) missing f
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3656 (\N{THAI CHARACTER MAI EK}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3627 (\N{THAI CHARACTER HO HIP}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 3660 (\N{THAI CHARACTER THANTHAKHAT}) missi
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 24525 (\N{CJK UNIFIED IDEOGRAPH-5FCD}) miss
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 32773 (\N{CJK UNIFIED IDEOGRAPH-8005}) miss
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 12495 (\N{KATAKANA LETTER HA}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 12483 (\N{KATAKANA LETTER SMALL TU}) missin
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 12488 (\N{KATAKANA LETTER TO}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 12522 (\N{KATAKANA LETTER RI}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 12367 (\N{HIRAGANA LETTER KU}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 12435 (\N{HIRAGANA LETTER N}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 47560 (\N{HANGUL SYLLABLE MA}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 45376 (\N{HANGUL SYLLABLE NYEO}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 49324 (\N{HANGUL SYLLABLE SA}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 45285 (\N{HANGUL SYLLABLE NYANG}) missing f
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 52572 (\N{HANGUL SYLLABLE COE}) missing fro
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 44053 (\N{HANGUL SYLLABLE GANG}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 51204 (\N{HANGUL SYLLABLE JEON}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 48120 (\N{HANGUL SYLLABLE MI}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 45768 (\N{HANGUL SYLLABLE NI}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 53945 (\N{HANGUL SYLLABLE TEUG}) missing fr
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 44277 (\N{HANGUL SYLLABLE GONG}) missing fr
```

```
func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 45824 (\N{HANGUL SYLLABLE DAE}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 50689 (\N{HANGUL SYLLABLE YEONG}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 50885 (\N{HANGUL SYLLABLE UNG}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 51032 (\N{HANGUL SYLLABLE YI}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 53444 (\N{HANGUL SYLLABLE TAN}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/events.py:89: UserWarning: Glyph 49373 (\N{HANGUL SYLLABLE SAENG}) missing from
  func(*args, **kwargs)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 28023 (\N{CJK UNIFIED IDEOGRAPH-6D77})
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 30340 (\N{CJK UNIFIED IDEOGRAPH-7684})
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 20799 (\N{CJK UNIFIED IDEOGRAPH-513F})
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 23376 (\N{CJK UNIFIED IDEOGRAPH-5B50})
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 48152 (\N{HANGUL SYLLABLE BAN}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 46300 (\N{HANGUL SYLLABLE DEU}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49884 (\N{HANGUL SYLLABLE SI}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 51105 (\N{HANGUL SYLLABLE JAB}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45716 (\N{HANGUL SYLLABLE NEUN}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45796 (\N{HANGUL SYLLABLE DA}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3649 (\N{THAI CHARACTER SARA AE}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3612 (\N{THAI CHARACTER PHO PHUNG}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3609 (\N{THAI CHARACTER NO NU}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3619 (\N{THAI CHARACTER RO RUA}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3657 (\N{THAI CHARACTER MAI THO}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3634 (\N{THAI CHARACTER SARA AA}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3618 (\N{THAI CHARACTER YO YAK}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3648 (\N{THAI CHARACTER SARA E}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3592 (\N{THAI CHARACTER CHO CHAN}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3621 (\N{THAI CHARACTER LO LING}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3656 (\N{THAI CHARACTER MAI EK}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3627 (\N{THAI CHARACTER HO HIP}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 3660 (\N{THAI CHARACTER THANTHAKHAT}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 24525 (\N{CJK UNIFIED IDEOGRAPH-5FCD}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 32773 (\N{CJK UNIFIED IDEOGRAPH-8005}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 12495 (\N{KATAKANA LETTER HA}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 12483 (\N{KATAKANA LETTER SMALL TU}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 12488 (\N{KATAKANA LETTER TO}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 12522 (\N{KATAKANA LETTER RI}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 12367 (\N{HIRAGANA LETTER KU}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 12435 (\N{HIRAGANA LETTER N}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 47560 (\N{HANGUL SYLLABLE MA}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45376 (\N{HANGUL SYLLABLE NYEO}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 49324 (\N{HANGUL SYLLABLE SA}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45285 (\N{HANGUL SYLLABLE NYANG}) missing
  fig.canvas.print_figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 52572 (\N{HANGUL SYLLABLE COE}) missing
  fig.canvas.print_figure(bytes_io, **kw)
```

```

data.columns
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 51204 (\N{HANGUL SYLLABLE JEUN}) missing
In [5]: fig=plt.figure(bytes_io, 'director', 'cast', 'country', 'date_added',
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 48120 (\N{HANGUL SYLLABLE MI}) missing
fig=plt.figure(bytes_io, **kw)
/usr/local/lib/python3.11/dist-packages/IPython/core/pylabtools.py:151: UserWarning: Glyph 45768 (\N{HANGUL SYLLABLE NI}) missing
px.scatter_3d(data['release_year'],data['type'])
fig.canvas.print_figure(bvtes io, **kw)
    #: Glyph 44277 (\N{HANGUL SYLLABLE GONG}) missing
    #: Glyph 45824 (\N{HANGUL SYLLABLE DAE}) missing
    #: Glyph 50689 (\N{HANGUL SYLLABLE YEONG}) missing
    #: Glyph 50885 (\N{HANGUL SYLLABLE UNG}) missing
    #: Glyph 51032 (\N{HANGUL SYLLABLE YI}) missing
    #: Glyph 53444 (\N{HANGUL SYLLABLE TAN}) missing
    #: Glyph 49373 (\N{HANGUL SYLLABLE SAENG}) missing

```

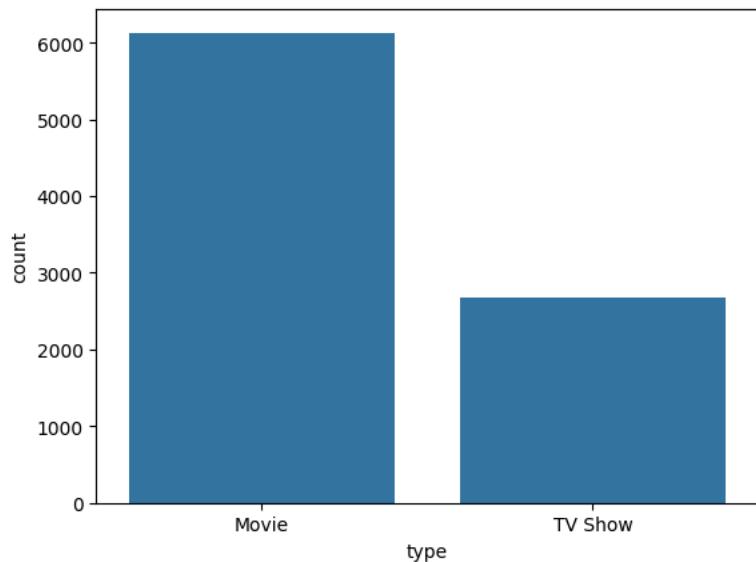


- ✓ fig showing count plot of content type

```

sns.countplot(x='type',data=data)
plt.show()

```



```

data['country'].value_counts()

```

	count
country	
<b>United States</b>	3649
<b>India</b>	972
<b>United Kingdom</b>	419
<b>Japan</b>	245
<b>South Korea</b>	199
...	...
<b>Mexico, United States, Spain, Colombia</b>	1
<b>Canada, Norway</b>	1
<b>Finland, Germany, Belgium</b>	1
<b>Argentina, United States, Mexico</b>	1

Start coding or [generate](#) with AI.

```
top_10=data['country'].value_counts().nlargest(10)
top_10
```

	count
country	
<b>United States</b>	3649
<b>India</b>	972
<b>United Kingdom</b>	419
<b>Japan</b>	245
<b>South Korea</b>	199
<b>Canada</b>	181
<b>Spain</b>	145
<b>France</b>	124
<b>Mexico</b>	110
<b>Egypt</b>	106

**dtype:** int64

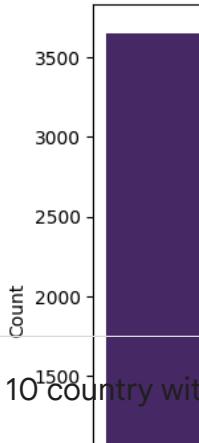
```
plt.figure(figsize=(12, 6))
sns.barplot(x=top_10.index, y=top_10.values, palette="viridis")

plt.xlabel('country')
plt.ylabel("Count")
plt.title("Top 10 country with most content on Netflix")
plt.xticks(rotation=45)
plt.show()
```

```
<ipython-input-31-4270819d1603>:2: FutureWarning:
```

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `l

Top 10 country with most content on Netflix



▼ Top 10 country with most content on Netflix

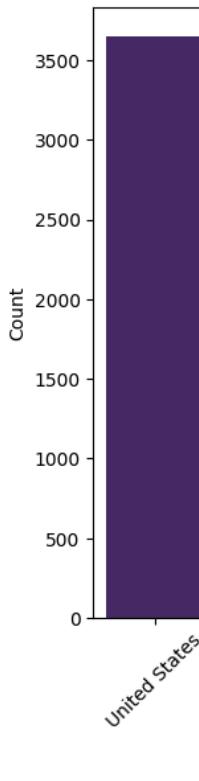
```
plt.figure(figsize=(12, 6))
sns.barplot(x=top_10.index, y=top_10.values, palette="viridis")

plt.xlabel('country')
plt.ylabel("Count")
plt.title("Top 10 country with most content on Netflix")
plt.xticks(rotation=45)
plt.show()
```

```
<ipython-input-32-4270819d1603>:2: FutureWarning:
```

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `l

Top 10 country with most content on Netflix



## ✓ Distribution of Content Type (Movies vs TV Shows)

```

sns.countplot(data=data, x="type", palette="coolwarm")
plt.title("Distribution of Content Type (Movies vs TV Shows)", fontsize=14)
plt.xlabel("Type")
plt.ylabel("Count")
plt.show()

-----
NameError                                 Traceback (most recent call last)
/tmp/ipython-input-3995000053.py in <cell line: 0>()
----> 1 sns.countplot(data=data, x="type", palette="coolwarm")
      2 plt.title("Distribution of Content Type (Movies vs TV Shows)", fontsize=14)
      3 plt.xlabel("Type")
      4 plt.ylabel("Count")
      5 plt.show()

NameError: name 'sns' is not defined

```

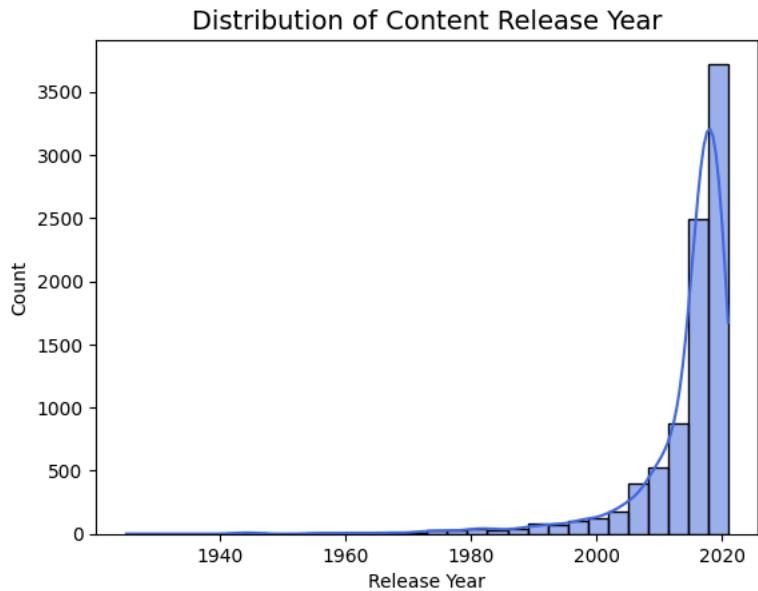
Next steps: [Explain error](#)

## ✓ Distribution of Content across Release Year

```

sns.histplot(data["release_year"], bins=30, kde=True, color="royalblue")
plt.title("Distribution of Content Release Year", fontsize=14)
plt.xlabel("Release Year")
plt.ylabel("Count")
plt.show()

```



## ✓ Top 10 Most Common Genres on Netflix

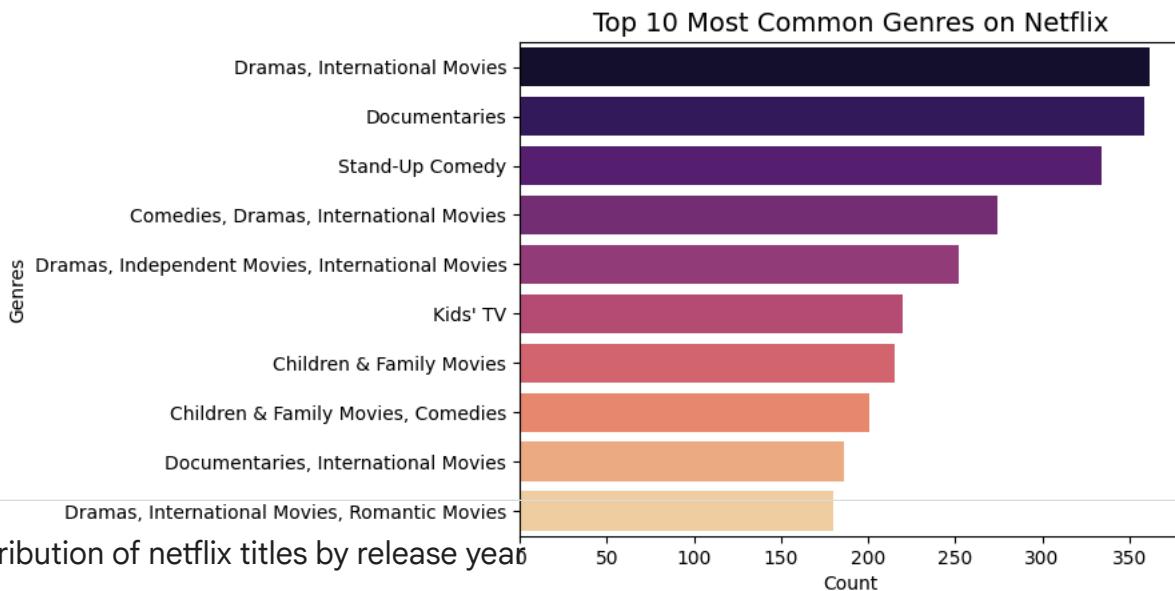
```

top_genres = data["listed_in"].value_counts().head(10)
sns.barplot(x=top_genres.values, y=top_genres.index, palette="magma")
plt.title("Top 10 Most Common Genres on Netflix", fontsize=14)
plt.xlabel("Count")
plt.ylabel("Genres")
plt.show()

```

```
<ipython-input-35-6b1e3503a096>:2: FutureWarning:
```

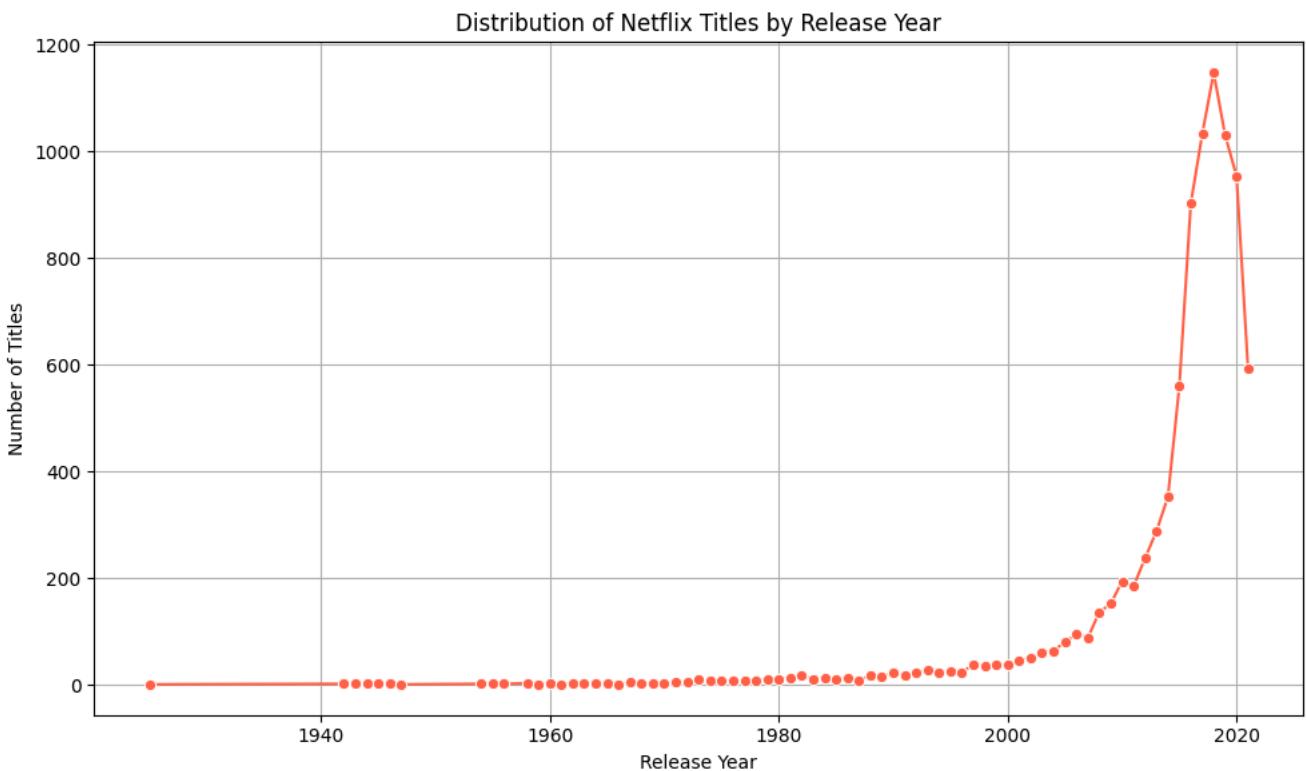
Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `l



#### ✓ distribution of netflix titles by release year

```
release_year_counts = data['release_year'].value_counts().sort_index()

plt.figure(figsize=(10, 6))
sns.lineplot(x=release_year_counts.index, y=release_year_counts.values, marker='o', color='tomato')
plt.title("Distribution of Netflix Titles by Release Year")
plt.xlabel("Release Year")
plt.ylabel("Number of Titles")
plt.grid(True)
plt.tight_layout()
plt.show()
```



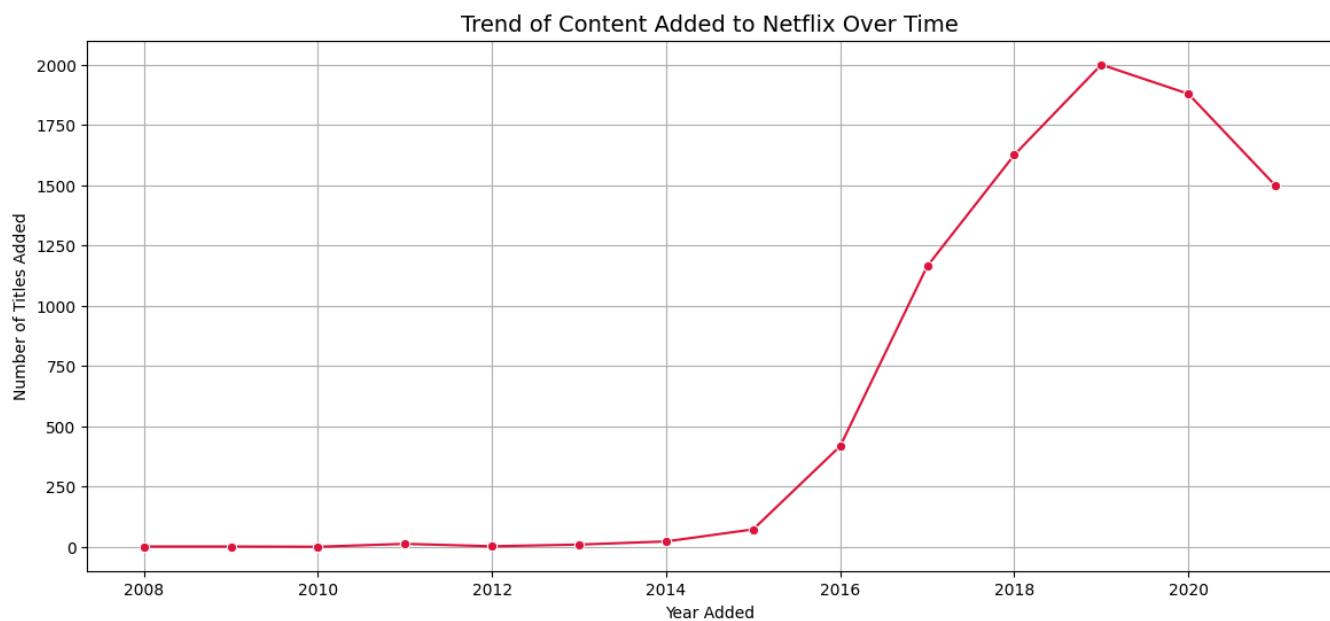
## ▼ Trend of Content Added to Netflix Over Time

```
data["date_added"] = pd.to_datetime(data["date_added"], errors='coerce', format='%B %d, %Y')

data["year_added"] = data["date_added"].dt.year

content_trend = data["year_added"].value_counts().sort_index()

plt.figure(figsize=(14, 6))
sns.lineplot(x=content_trend.index, y=content_trend.values, marker="o", color="crimson")
plt.title("Trend of Content Added to Netflix Over Time", fontsize=14)
plt.xlabel("Year Added")
plt.ylabel("Number of Titles Added")
plt.grid(True)
plt.show()
```



## ▼ Distribution of Content Ratings on Netflix

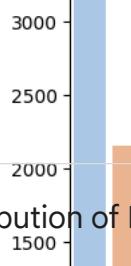
```
rating_counts = data["rating"].value_counts()

sns.barplot(x=rating_counts.index, y=rating_counts.values, palette="pastel")
plt.title("Distribution of Content Ratings on Netflix", fontsize=14)
plt.xlabel("Rating")
plt.ylabel("Count")
plt.show()
```

```
<ipython-input-38-7813ff158f49>:3: FutureWarning:
```

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `l

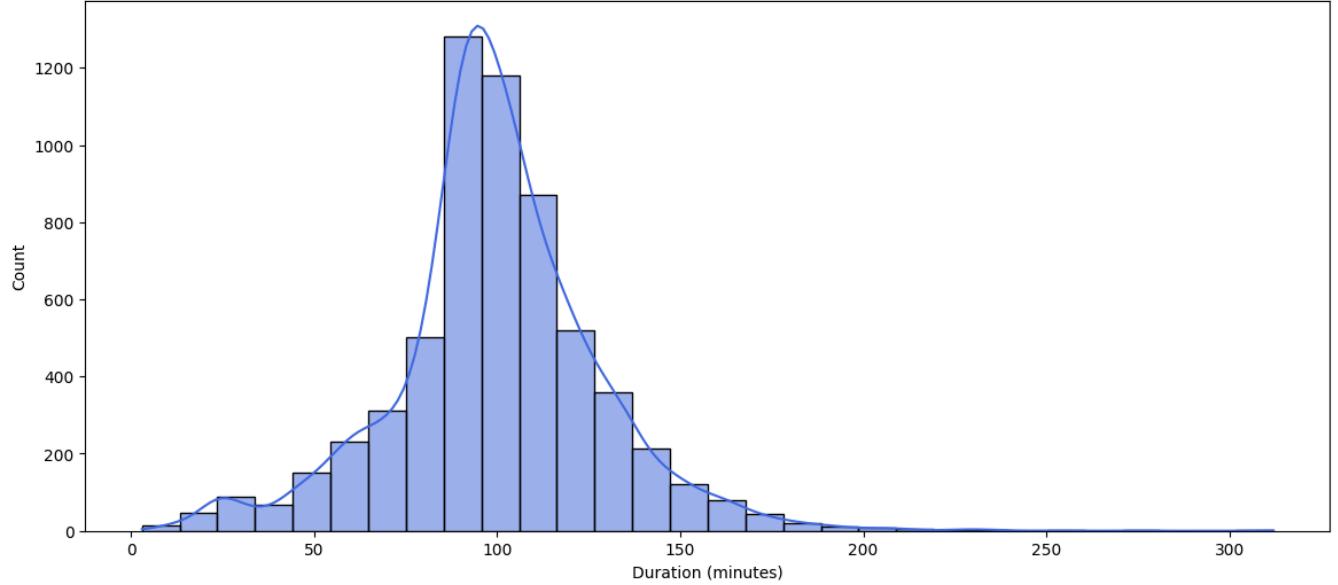
### Distribution of Content Ratings on Netflix



### Distribution of Movie Durations on Netflix

```
movies_df = data[data["type"] == "Movie"].copy()  
  
movies_df["duration"] = movies_df["duration"].str.replace(" min", "").astype(float)  
  
plt.figure(figsize=(14, 6))  
sns.histplot(movies_df["duration"], bins=30, kde=True, color="royalblue")  
plt.title("Distribution of Movie Durations on Netflix", fontsize=14)  
plt.xlabel("Duration (minutes)")  
plt.ylabel("Count")  
plt.show()
```

### Distribution of Movie Durations on Netflix



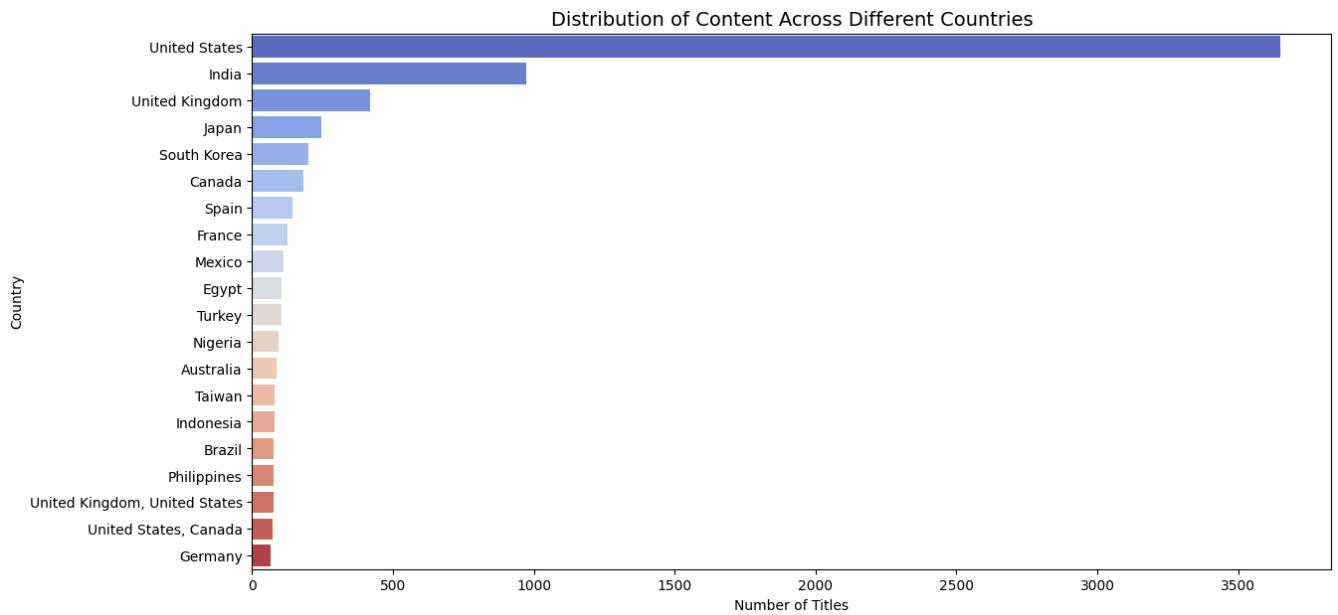
### Distribution of Content Across Different Countries

```
country_distribution = data["country"].value_counts().head(20)

plt.figure(figsize=(14, 7))
sns.barplot(y=country_distribution.index, x=country_distribution.values, palette="coolwarm")
plt.title("Distribution of Content Across Different Countries", fontsize=14)
plt.xlabel("Number of Titles")
plt.ylabel("Country")
plt.show()
```

<ipython-input-40-aa5105470190>:4: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `l



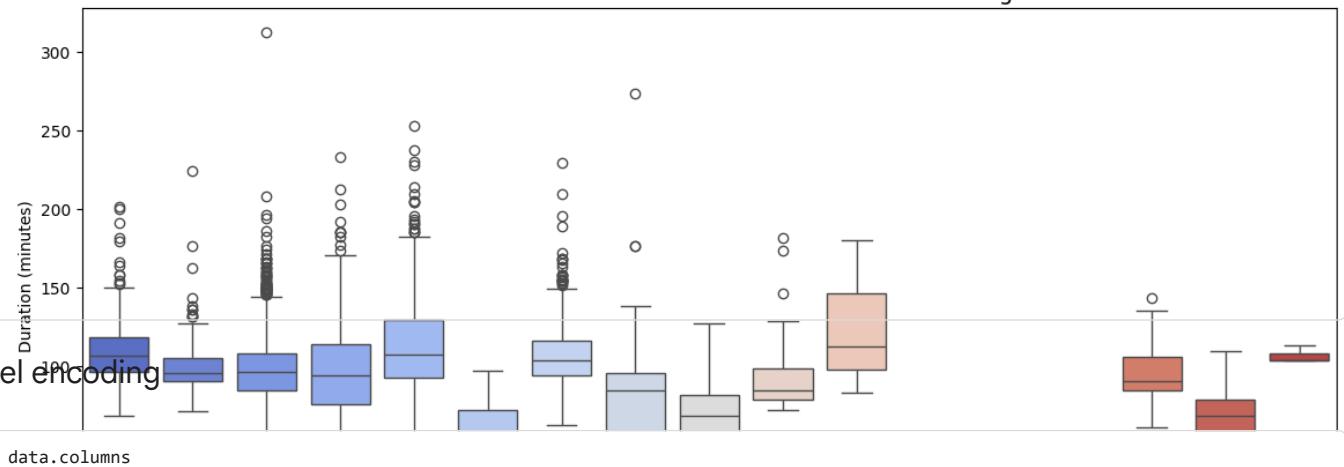
## ▼ Distribution of Movie Durations Across Different Ratings

```
plt.figure(figsize=(14, 6))
sns.boxplot(data=movies_df, x="rating", y="duration", palette="coolwarm")
plt.title("Distribution of Movie Durations Across Different Ratings", fontsize=14)
plt.xlabel("Rating")
plt.ylabel("Duration (minutes)")
plt.xticks(rotation=45)
plt.show()
```

```
<ipython-input-41-c3679ec005be>:2: FutureWarning:
```

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `x` variable to `hue` and set `l

Distribution of Movie Durations Across Different Ratings



#### label encoding

```
from sklearn.preprocessing import LabelEncoder # Use LabelEncoder instead of labelencoder
le=LabelEncoder() # Use LabelEncoder instead of labelencoder
a=['show_id','type','director','title','country','date_added','cast','rating','duration','listed_in','description']
for i in a:
    data[i]=le.fit_transform(data[i])
```

Double-click (or enter) to edit

data.head()

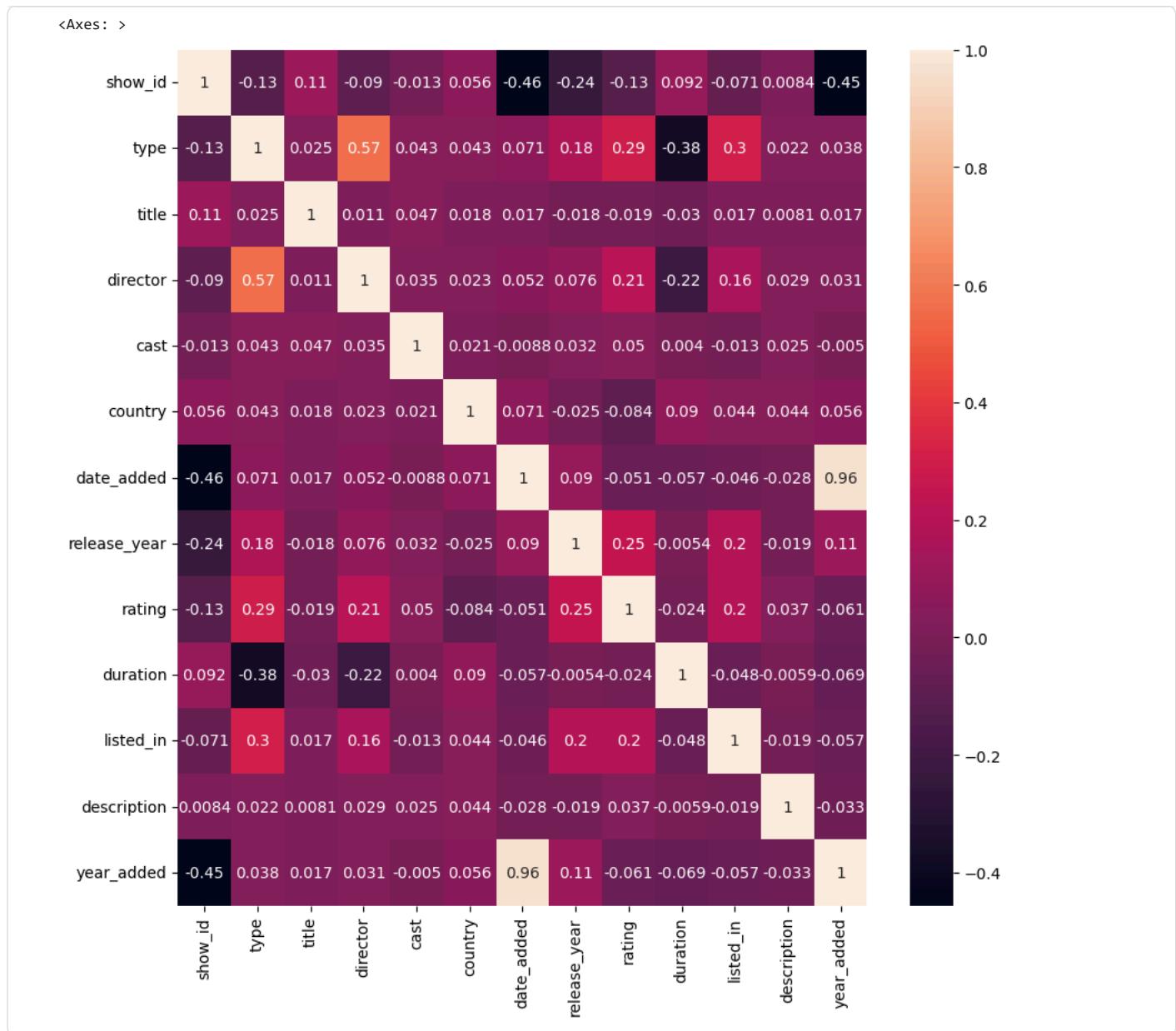
	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in	description	year_added
0	0	0	1975	2295	7692	603	1698	2020	7	210	274	2577	2021.0
1	1111	1	1091	4303	409	426	1697	2021	11	110	414	1762	2021.0
2	2222	1	2651	2105	6296	603	1697	2021	11	0	242	7341	2021.0
3	3333	1	3506	4303	7692	603	1697	2021	11	0	297	3617	2021.0
4	4444	1	3861	4303	4815	251	1697	2021	11	110	393	4416	2021.0

data.corr()

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	listed_in
show_id	1.000000	-0.125233	0.108167	-0.089648	-0.013146	0.056135	-0.456119	-0.243885	-0.125198	0.092160	-0.071455
type	-0.125233	1.000000	0.025439	0.565083	0.042650	0.043375	0.071344	0.181710	0.290270	-0.381413	0.304750
title	0.108167	0.025439	1.000000	0.010589	0.046875	0.017883	0.016898	-0.017802	-0.018915	-0.029891	0.017286
director	-0.089648	0.565083	0.010589	1.000000	0.034754	0.023019	0.051858	0.075545	0.212479	-0.218428	0.156962
cast	-0.013146	0.042650	0.046875	0.034754	1.000000	0.021356	-0.008806	0.032078	0.050108	0.004037	-0.013119
country	0.056135	0.043375	0.017883	0.023019	0.021356	1.000000	0.070544	-0.024981	-0.084055	0.089660	0.044170
date_added	-0.456119	0.071344	0.016898	0.051858	-0.008806	0.070544	1.000000	0.090124	-0.050539	-0.057102	-0.045645
release_year	-0.243885	0.181710	-0.017802	0.075545	0.032078	-0.024981	0.090124	1.000000	0.248826	-0.005388	0.197579
rating	-0.125198	0.290270	-0.018915	0.212479	0.050108	-0.084055	-0.050539	0.248826	1.000000	-0.024212	0.198331
duration	0.092160	-0.381413	-0.029891	-0.218428	0.004037	0.089660	-0.057102	-0.005388	-0.024212	1.000000	-0.048183
listed_in	-0.071455	0.304750	0.017286	0.156962	-0.013119	0.044170	-0.045645	0.197579	0.198331	-0.048183	1.000000
description	0.008412	0.021813	0.008079	0.028852	0.024997	0.043845	-0.028377	-0.018933	0.037065	-0.005908	-0.018920
year_added	-0.449700	0.038007	0.017175	0.031440	-0.005048	0.055627	0.962871	0.110473	-0.060942	-0.068653	-0.057050

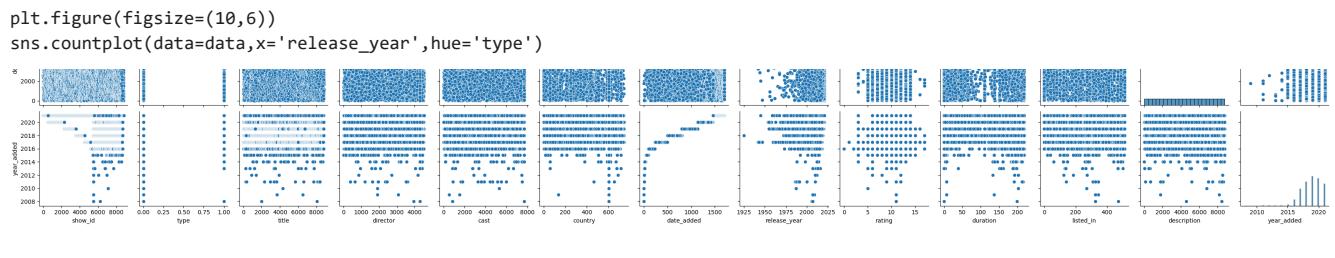
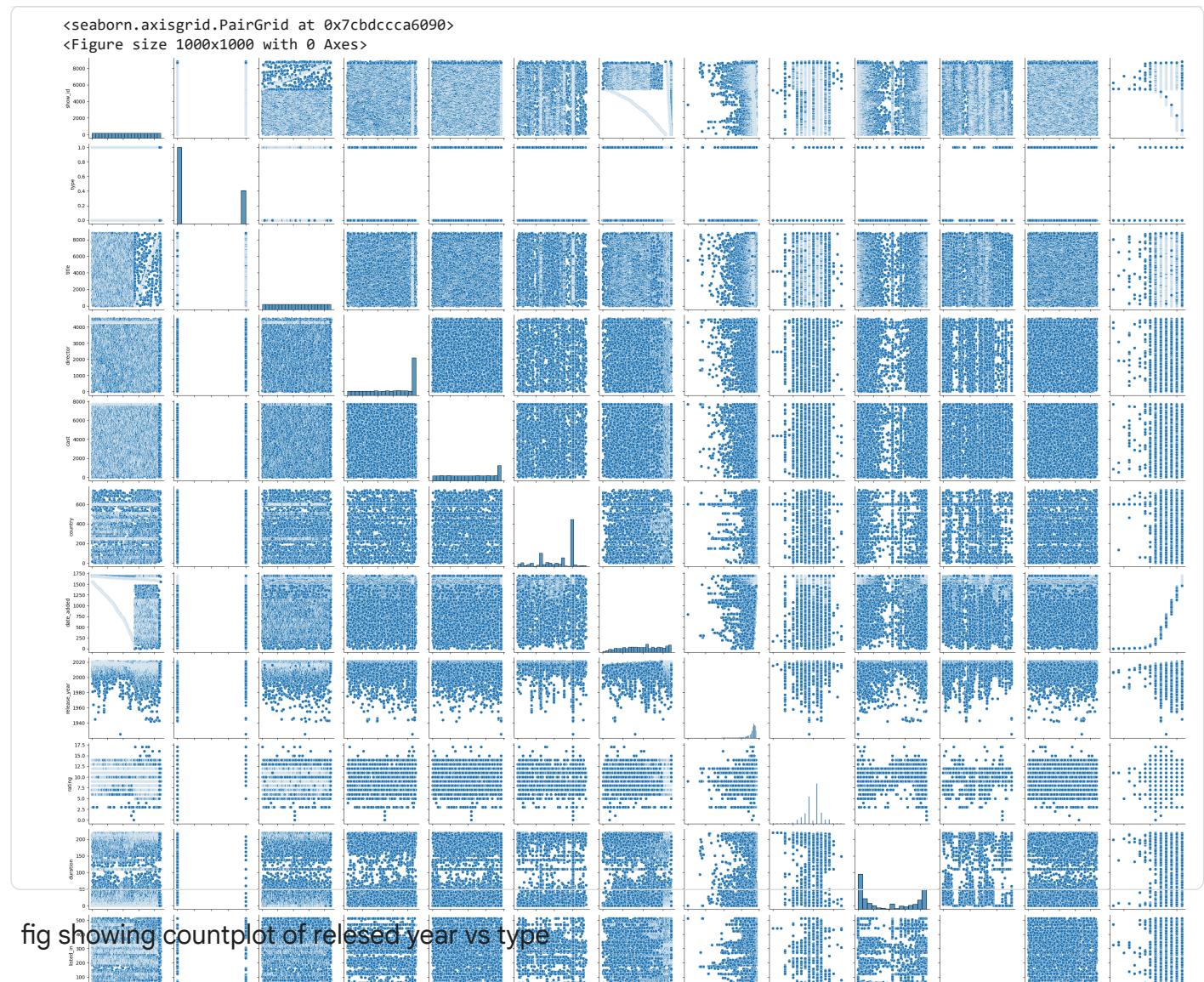
## heatmaps

```
plt.figure(figsize=(10,10))
sns.heatmap(data.corr(), annot=True)
```

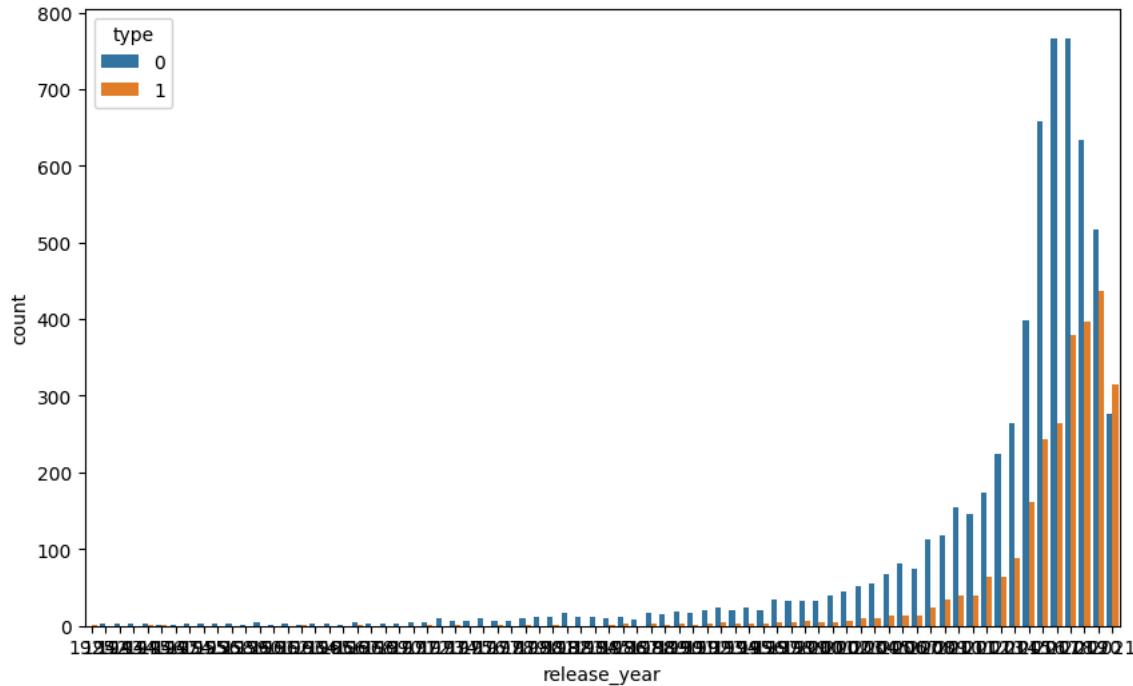


## ▼ pairplot

```
plt.figure(figsize=(10,10))
sns.pairplot(data)
```



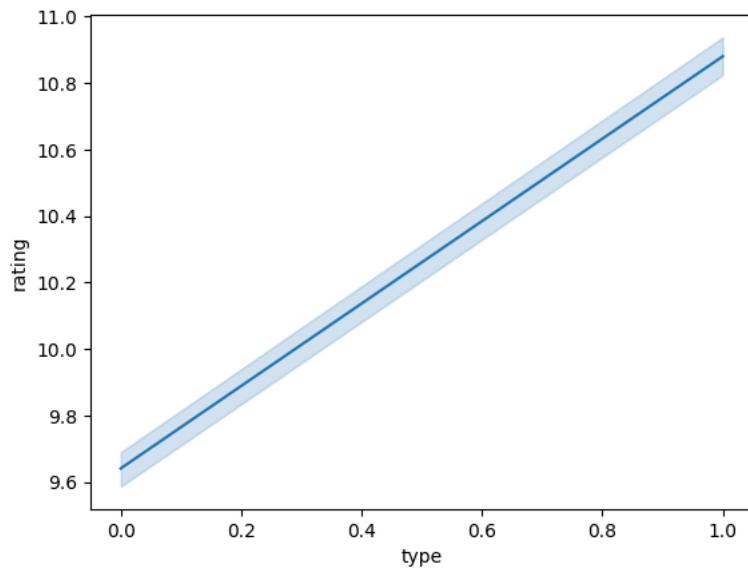
```
<Axes: xlabel='release_year', ylabel='count'>
```



## ✓ lineplot of type vs rating

```
sns.lineplot(x='type', y='rating', data=data)
```

```
<Axes: xlabel='type', ylabel='rating'>
```



```
sns.lineplot(x='rating', y='duration', data=data)
```