

netflix

March 22, 2025

```
[15]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
sns.set(style="darkgrid")
```

```
[6]: import os
os.getcwd() # Prints the current working directory
```

```
[6]: '/home/fb5316d2-94b1-4785-a39e-7e80770bbea0'
```

```
[34]: import pandas as pd
df = pd.read_csv("netflix_titles.csv")
df.head(50)
```

```
[34]:
```

| | show_id | type | title \ |
|----|---------|---------|---|
| 0 | s1 | Movie | Dick Johnson Is Dead |
| 1 | s2 | TV Show | Blood & Water |
| 2 | s3 | TV Show | Ganglands |
| 3 | s4 | TV Show | Jailbirds New Orleans |
| 4 | s5 | TV Show | Kota Factory |
| 5 | s6 | TV Show | Midnight Mass |
| 6 | s7 | Movie | My Little Pony: A New Generation |
| 7 | s8 | Movie | Sankofa |
| 8 | s9 | TV Show | The Great British Baking Show |
| 9 | s10 | Movie | The Starling |
| 10 | s11 | TV Show | Vendetta: Truth, Lies and The Mafia |
| 11 | s12 | TV Show | Bangkok Breaking |
| 12 | s13 | Movie | Je Suis Karl |
| 13 | s14 | Movie | Confessions of an Invisible Girl |
| 14 | s15 | TV Show | Crime Stories: India Detectives |
| 15 | s16 | TV Show | Dear White People |
| 16 | s17 | Movie | Europe's Most Dangerous Man: Otto Skorzeny in ... |
| 17 | s18 | TV Show | Falsa identidad |
| 18 | s19 | Movie | Intrusion |
| 19 | s20 | TV Show | Jaguar |
| 20 | s21 | TV Show | Monsters Inside: The 24 Faces of Billy Milligan |

| | | | |
|----|-----|---------|--|
| 21 | s22 | TV Show | Resurrection: Ertugrul |
| 22 | s23 | Movie | Avvai Shanmughi |
| 23 | s24 | Movie | Go! Go! Cory Carson: Chrissy Takes the Wheel |
| 24 | s25 | Movie | Jeans |
| 25 | s26 | TV Show | Love on the Spectrum |
| 26 | s27 | Movie | Minsara Kanavu |
| 27 | s28 | Movie | Grown Ups |
| 28 | s29 | Movie | Dark Skies |
| 29 | s30 | Movie | Paranoia |
| 30 | s31 | Movie | Ankahi Kahaniya |
| 31 | s32 | TV Show | Chicago Party Aunt |
| 32 | s33 | TV Show | Sex Education |
| 33 | s34 | TV Show | Squid Game |
| 34 | s35 | TV Show | Tayo and Little Wizards |
| 35 | s36 | Movie | The Father Who Moves Mountains |
| 36 | s37 | Movie | The Stronghold |
| 37 | s38 | TV Show | Angry Birds |
| 38 | s39 | Movie | Birth of the Dragon |
| 39 | s40 | TV Show | Chhota Bheem |
| 40 | s41 | TV Show | He-Man and the Masters of the Universe |
| 41 | s42 | Movie | Jaws |
| 42 | s43 | Movie | Jaws 2 |
| 43 | s44 | Movie | Jaws 3 |
| 44 | s45 | Movie | Jaws: The Revenge |
| 45 | s46 | Movie | My Heroes Were Cowboys |
| 46 | s47 | Movie | Safe House |
| 47 | s48 | TV Show | The Smart Money Woman |
| 48 | s49 | Movie | Training Day |
| 49 | s50 | TV Show | Castle and Castle |

| | director \ |
|----|-------------------------------|
| 0 | Kirsten Johnson |
| 1 | NaN |
| 2 | Julien Leclercq |
| 3 | NaN |
| 4 | NaN |
| 5 | Mike Flanagan |
| 6 | Robert Cullen, José Luis Ucha |
| 7 | Haile Gerima |
| 8 | Andy Devonshire |
| 9 | Theodore Melfi |
| 10 | NaN |
| 11 | Kongkiat Komesiri |
| 12 | Christian Schwochow |
| 13 | Bruno Garotti |
| 14 | NaN |
| 15 | NaN |

| | |
|----|---|
| 16 | Pedro de Echave García, Pablo Azorín Williams |
| 17 | NaN |
| 18 | Adam Salky |
| 19 | NaN |
| 20 | Olivier Megaton |
| 21 | NaN |
| 22 | K.S. Ravikumar |
| 23 | Alex Woo, Stanley Moore |
| 24 | S. Shankar |
| 25 | NaN |
| 26 | Rajiv Menon |
| 27 | Dennis Dugan |
| 28 | Scott Stewart |
| 29 | Robert Luketic |
| 30 | Ashwiny Iyer Tiwari, Abhishek Chaubey, Saket C... |
| 31 | NaN |
| 32 | NaN |
| 33 | NaN |
| 34 | NaN |
| 35 | Daniel Sandu |
| 36 | Cédric Jimenez |
| 37 | NaN |
| 38 | George Nolfi |
| 39 | NaN |
| 40 | NaN |
| 41 | Steven Spielberg |
| 42 | Jeannot Szwarc |
| 43 | Joe Alves |
| 44 | Joseph Sargent |
| 45 | Tyler Greco |
| 46 | Daniel Espinosa |
| 47 | Bunmi Ajakaiye |
| 48 | Antoine Fuqua |
| 49 | NaN |
| | cast \ |
| 0 | NaN |
| 1 | Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban... |
| 2 | Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi... |
| 3 | NaN |
| 4 | Mayur More, Jitendra Kumar, Ranjan Raj, Alam K... |
| 5 | Kate Siegel, Zach Gilford, Hamish Linklater, H... |
| 6 | Vanessa Hudgens, Kimiko Glenn, James Marsden, ... |
| 7 | Kofi Ghanaba, Oyafunmike Ogunlano, Alexandra D... |
| 8 | Mel Giedroyc, Sue Perkins, Mary Berry, Paul Ho... |
| 9 | Melissa McCarthy, Chris O'Dowd, Kevin Kline, T... |
| 10 | NaN |

11 Sukollawat Kanarot, Sushar Manaying, Pavarit M...
 12 Luna Wedler, Jannis Niewöhner, Milan Peschel, ...
 13 Klara Castanho, Lucca Picon, Júlia Gomes, Marc...
 14 NaN
 15 Logan Browning, Brandon P. Bell, DeRon Horton,...
 16 NaN
 17 Luis Ernesto Franco, Camila Sodi, Sergio Goyri...
 18 Freida Pinto, Logan Marshall-Green, Robert Joh...
 19 Blanca Suárez, Iván Marcos, Óscar Casas, Adriá...
 20 NaN
 21 Engin Altan Düzyatan, Serdar Gökhan, Hülya Dar...
 22 Kamal Hassan, Meena, Gemini Ganesan, Heera Raj...
 23 Maisie Benson, Paul Killam, Kerry Gudjohnsen, ...
 24 Prashanth, Aishwarya Rai Bachchan, Sri Lakshmi...
 25 Brooke Satchwell
 26 Arvind Swamy, Kajol, Prabhu Deva, Nassar, S.P...
 27 Adam Sandler, Kevin James, Chris Rock, David S...
 28 Keri Russell, Josh Hamilton, J.K. Simmons, Dak...
 29 Liam Hemsworth, Gary Oldman, Amber Heard, Harr...
 30 Abhishek Banerjee, Rinku Rajguru, Delzad Hiwal...
 31 Lauren Ash, Rory O'Malley, RuPaul Charles, Jil...
 32 Asa Butterfield, Gillian Anderson, Ncuti Gatwa...
 33 Lee Jung-jae, Park Hae-soo, Wi Ha-jun, Oh Youn...
 34 Dami Lee, Jason Lee, Bommie Catherine Han, Jen...
 35 Adrian Titieni, Elena Parea, Judith State, Val...
 36 Gilles Lellouche, Karim Leklou, François Civil...
 37 Antti Pääkkönen, Heljä Heikkinen, Lynne Guagli...
 38 Billy Magnussen, Ron Yuan, Qu Jingjing, Terry ...
 39 Vatsal Dubey, Julie Tejwani, Rupa Bhimani, Jig...
 40 Yuri Lowenthal, Kimberly Brooks, Antony Del Ri...
 41 Roy Scheider, Robert Shaw, Richard Dreyfuss, L...
 42 Roy Scheider, Lorraine Gary, Murray Hamilton, ...
 43 Dennis Quaid, Bess Armstrong, Simon MacCorkind...
 44 Lorraine Gary, Lance Guest, Mario Van Peebles,...
 45 NaN
 46 Denzel Washington, Ryan Reynolds, Vera Farmiga...
 47 Osas Ighodaro, Ini Dima-Okojie, Kemi Lala Akin...
 48 Denzel Washington, Ethan Hawke, Scott Glenn, T...
 49 Richard Mofe-Damijo, Dakore Akande, Bimbo Manu...

| | country | date_added \ |
|---|---------------|--------------------|
| 0 | United States | September 25, 2021 |
| 1 | South Africa | September 24, 2021 |
| 2 | NaN | September 24, 2021 |
| 3 | NaN | September 24, 2021 |
| 4 | India | September 24, 2021 |
| 5 | NaN | September 24, 2021 |

| | | | |
|----|---|----------------|--------------------|
| 6 | | NaN | September 24, 2021 |
| 7 | United States, Ghana, Burkina Faso, United Kin... | | September 24, 2021 |
| 8 | | United Kingdom | September 24, 2021 |
| 9 | | United States | September 24, 2021 |
| 10 | | NaN | September 24, 2021 |
| 11 | | NaN | September 23, 2021 |
| 12 | Germany, Czech Republic | | September 23, 2021 |
| 13 | | NaN | September 22, 2021 |
| 14 | | NaN | September 22, 2021 |
| 15 | | United States | September 22, 2021 |
| 16 | | NaN | September 22, 2021 |
| 17 | | Mexico | September 22, 2021 |
| 18 | | NaN | September 22, 2021 |
| 19 | | NaN | September 22, 2021 |
| 20 | | NaN | September 22, 2021 |
| 21 | | Turkey | September 22, 2021 |
| 22 | | NaN | September 21, 2021 |
| 23 | | NaN | September 21, 2021 |
| 24 | | India | September 21, 2021 |
| 25 | | Australia | September 21, 2021 |
| 26 | | NaN | September 21, 2021 |
| 27 | | United States | September 20, 2021 |
| 28 | | United States | September 19, 2021 |
| 29 | United States, India, France | | September 19, 2021 |
| 30 | | NaN | September 17, 2021 |
| 31 | | NaN | September 17, 2021 |
| 32 | | United Kingdom | September 17, 2021 |
| 33 | | NaN | September 17, 2021 |
| 34 | | NaN | September 17, 2021 |
| 35 | | NaN | September 17, 2021 |
| 36 | | NaN | September 17, 2021 |
| 37 | | Finland | September 16, 2021 |
| 38 | China, Canada, United States | | September 16, 2021 |
| 39 | | India | September 16, 2021 |
| 40 | | United States | September 16, 2021 |
| 41 | | United States | September 16, 2021 |
| 42 | | United States | September 16, 2021 |
| 43 | | United States | September 16, 2021 |
| 44 | | United States | September 16, 2021 |
| 45 | | NaN | September 16, 2021 |
| 46 | South Africa, United States, Japan | | September 16, 2021 |
| 47 | | NaN | September 16, 2021 |
| 48 | | United States | September 16, 2021 |
| 49 | | Nigeria | September 15, 2021 |

| | release_year | rating | duration \ |
|---|--------------|--------|------------|
| 0 | 2020 | PG-13 | 90 min |

| | | | |
|----|------|-------|-----------|
| 1 | 2021 | TV-MA | 2 Seasons |
| 2 | 2021 | TV-MA | 1 Season |
| 3 | 2021 | TV-MA | 1 Season |
| 4 | 2021 | TV-MA | 2 Seasons |
| 5 | 2021 | TV-MA | 1 Season |
| 6 | 2021 | PG | 91 min |
| 7 | 1993 | TV-MA | 125 min |
| 8 | 2021 | TV-14 | 9 Seasons |
| 9 | 2021 | PG-13 | 104 min |
| 10 | 2021 | TV-MA | 1 Season |
| 11 | 2021 | TV-MA | 1 Season |
| 12 | 2021 | TV-MA | 127 min |
| 13 | 2021 | TV-PG | 91 min |
| 14 | 2021 | TV-MA | 1 Season |
| 15 | 2021 | TV-MA | 4 Seasons |
| 16 | 2020 | TV-MA | 67 min |
| 17 | 2020 | TV-MA | 2 Seasons |
| 18 | 2021 | TV-14 | 94 min |
| 19 | 2021 | TV-MA | 1 Season |
| 20 | 2021 | TV-14 | 1 Season |
| 21 | 2018 | TV-14 | 5 Seasons |
| 22 | 1996 | TV-PG | 161 min |
| 23 | 2021 | TV-Y | 61 min |
| 24 | 1998 | TV-14 | 166 min |
| 25 | 2021 | TV-14 | 2 Seasons |
| 26 | 1997 | TV-PG | 147 min |
| 27 | 2010 | PG-13 | 103 min |
| 28 | 2013 | PG-13 | 97 min |
| 29 | 2013 | PG-13 | 106 min |
| 30 | 2021 | TV-14 | 111 min |
| 31 | 2021 | TV-MA | 1 Season |
| 32 | 2020 | TV-MA | 3 Seasons |
| 33 | 2021 | TV-MA | 1 Season |
| 34 | 2020 | TV-Y7 | 1 Season |
| 35 | 2021 | TV-MA | 110 min |
| 36 | 2021 | TV-MA | 105 min |
| 37 | 2018 | TV-Y7 | 1 Season |
| 38 | 2017 | PG-13 | 96 min |
| 39 | 2021 | TV-Y7 | 3 Seasons |
| 40 | 2021 | TV-Y7 | 1 Season |
| 41 | 1975 | PG | 124 min |
| 42 | 1978 | PG | 116 min |
| 43 | 1983 | PG | 98 min |
| 44 | 1987 | PG-13 | 91 min |
| 45 | 2021 | PG | 23 min |
| 46 | 2012 | R | 115 min |
| 47 | 2020 | TV-MA | 1 Season |

48 2001 R 122 min
 49 2021 TV-MA 2 Seasons

```

                                listed_in \
0                                Documentaries
1      International TV Shows, TV Dramas, TV Mysteries
2  Crime TV Shows, International TV Shows, TV Act...
3                                Docuseries, Reality TV
4  International TV Shows, Romantic TV Shows, TV ...
5                                TV Dramas, TV Horror, TV Mysteries
6                                Children & Family Movies
7      Dramas, Independent Movies, International Movies
8                                British TV Shows, Reality TV
9                                Comedies, Dramas
10  Crime TV Shows, Docuseries, International TV S...
11  Crime TV Shows, International TV Shows, TV Act...
12                                Dramas, International Movies
13                                Children & Family Movies, Comedies
14      British TV Shows, Crime TV Shows, Docuseries
15                                TV Comedies, TV Dramas
16                                Documentaries, International Movies
17  Crime TV Shows, Spanish-Language TV Shows, TV ...
18                                Thrillers
19  International TV Shows, Spanish-Language TV Sh...
20  Crime TV Shows, Docuseries, International TV S...
21  International TV Shows, TV Action & Adventure,...
22                                Comedies, International Movies
23                                Children & Family Movies
24      Comedies, International Movies, Romantic Movies
25      Docuseries, International TV Shows, Reality TV
26  Comedies, International Movies, Music & Musicals
27                                Comedies
28                                Horror Movies, Sci-Fi & Fantasy
29                                Thrillers
30      Dramas, Independent Movies, International Movies
31                                TV Comedies
32  British TV Shows, International TV Shows, TV C...
33      International TV Shows, TV Dramas, TV Thrillers
34                                Kids' TV
35      Dramas, International Movies, Thrillers
36  Action & Adventure, Dramas, International Movies
37                                Kids' TV, TV Comedies
38      Action & Adventure, Dramas
39                                Kids' TV
40      Kids' TV, TV Sci-Fi & Fantasy
41      Action & Adventure, Classic Movies, Dramas
42      Dramas, Horror Movies, Thrillers

```

43 Action & Adventure, Horror Movies, Thrillers
44 Action & Adventure, Horror Movies, Thrillers
45 Documentaries
46 Action & Adventure
47 International TV Shows, Romantic TV Shows, TV ...
48 Dramas, Thrillers
49 International TV Shows, TV Dramas

description

0 As her father nears the end of his life, filmm...
1 After crossing paths at a party, a Cape Town t...
2 To protect his family from a powerful drug lor...
3 Feuds, flirtations and toilet talk go down amo...
4 In a city of coaching centers known to train I...
5 The arrival of a charismatic young priest brin...
6 Equestria's divided. But a bright-eyed hero be...
7 On a photo shoot in Ghana, an American model s...
8 A talented batch of amateur bakers face off in...
9 A woman adjusting to life after a loss contend...
10 Sicily boasts a bold "Anti-Mafia" coalition. B...
11 Struggling to earn a living in Bangkok, a man ...
12 After most of her family is murdered in a terr...
13 When the clever but socially-awkward Tetê join...
14 Cameras following Bengaluru police on the job ...
15 Students of color navigate the daily slights a...
16 Declassified documents reveal the post-WWII li...
17 Strangers Diego and Isabel flee their home in ...
18 After a deadly home invasion at a couple's new...
19 In the 1960s, a Holocaust survivor joins a gro...
20 In the late 1970s, an accused serial rapist cl...
21 When a good deed unwittingly endangers his cla...
22 Newly divorced and denied visitation rights wi...
23 From arcade games to sled days and hiccup cure...
24 When the father of the man she loves insists t...
25 Finding love can be hard for anyone. For young...
26 A tangled love triangle ensues when a man fall...
27 Mourning the loss of their beloved junior high...
28 A family's idyllic suburban life shatters when...
29 Blackmailed by his company's CEO, a low-level ...
30 As big city life buzzes around them, lonely so...
31 Chicago Party Aunt Diane is an idolized troubl...
32 Insecure Otis has all the answers when it come...
33 Hundreds of cash-strapped players accept a str...
34 Tayo speeds into an adventure when his friends...
35 When his son goes missing during a snowy hike ...
36 Tired of the small-time grind, three Marseille...
37 Birds Red, Chuck and their feathered friends h...


```

38 A young Bruce Lee angers kung fu traditionalis...
39 A brave, energetic little boy with superhuman ...
40 Mighty teen Adam and his heroic squad of misfi...
41 When an insatiable great white shark terrorize...
42 Four years after the last deadly shark attacks...
43 After the staff of a marine theme park try to ...
44 After another deadly shark attack, Ellen Brody...
45 Robin Wiltshire's painful childhood was rescue...
46 Young CIA operative Matt Weston must get a dan...
47 Five glamorous millennials strive for success ...
48 A rookie cop with one day to prove himself to ...
49 A pair of high-powered, successful lawyers fin...

```

```
[17]: print("shape",df.shape)
```

```
shape (8807, 12)
```

```
[18]: print("columns",df.columns)
```

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

```
[19]: print("missing values:\n",df.isnull().sum())
```

```
missing values:
 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
```

```
[20]: print("Data Types:\n",df.dtypes)
```

```
Data Types:
 show_id      object
 type         object
 title        object
 director     object
```

```

cast          object
country       object
date_added    object
release_year  int64
rating        object
duration      object
listed_in     object
description   object
dtype: object

```

```
[25]: df["director"].fillna("Unknown", inplace=True)
      df["country"].fillna("Unknown", inplace=True)
```

```
[28]: df["date_added"] = pd.to_datetime(df["date_added"], errors="coerce")
```

```
[32]: df["date_added"] = pd.to_datetime(df["date_added"], errors="coerce")

      df["year_added"] = df["date_added"].dt.year.fillna(0).astype(int) # Fill NaT
      ↪with 0
      df["month_added"] = df["date_added"].dt.month.fillna(0).astype(int)
```

```
[36]: print(df.columns)
```

```

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

```

```
[39]: df["date_added"] = pd.to_datetime(df["date_added"], errors="coerce")
```

```
[41]: df["year_added"] = df["date_added"].dt.year.fillna(0).astype(int)
      df["month_added"] = df["date_added"].dt.month.fillna(0).astype(int)
```

```
[42]: print(df.head())
      print(df.dtypes)
```

| | show_id | type | title | director \ |
|---|---------|---------|-----------------------|-----------------|
| 0 | s1 | Movie | Dick Johnson Is Dead | Kirsten Johnson |
| 1 | s2 | TV Show | Blood & Water | NaN |
| 2 | s3 | TV Show | Ganglands | Julien Leclercq |
| 3 | s4 | TV Show | Jailbirds New Orleans | NaN |
| 4 | s5 | TV Show | Kota Factory | NaN |

| | cast | country \ |
|---|---|---------------|
| 0 | NaN | United States |
| 1 | Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban... | South Africa |
| 2 | Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi... | NaN |
| 3 | NaN | NaN |
| 4 | Mayur More, Jitendra Kumar, Ranjan Raj, Alam K... | India |

| | date_added | release_year | rating | duration | \ |
|---|------------|--------------|--------|-----------|---|
| 0 | 2021-09-25 | 2020 | PG-13 | 90 min | |
| 1 | 2021-09-24 | 2021 | TV-MA | 2 Seasons | |
| 2 | 2021-09-24 | 2021 | TV-MA | 1 Season | |
| 3 | 2021-09-24 | 2021 | TV-MA | 1 Season | |
| 4 | 2021-09-24 | 2021 | TV-MA | 2 Seasons | |

| | listed_in | \ |
|---|---|---|
| 0 | Documentaries | |
| 1 | International TV Shows, TV Dramas, TV Mysteries | |
| 2 | Crime TV Shows, International TV Shows, TV Act... | |
| 3 | Docuseries, Reality TV | |
| 4 | International TV Shows, Romantic TV Shows, TV ... | |

| | description | year_added | month_added |
|---|---|------------|-------------|
| 0 | As her father nears the end of his life, filmm... | 2021 | 9 |
| 1 | After crossing paths at a party, a Cape Town t... | 2021 | 9 |
| 2 | To protect his family from a powerful drug lor... | 2021 | 9 |
| 3 | Feuds, flirtations and toilet talk go down amo... | 2021 | 9 |
| 4 | In a city of coaching centers known to train I... | 2021 | 9 |

```

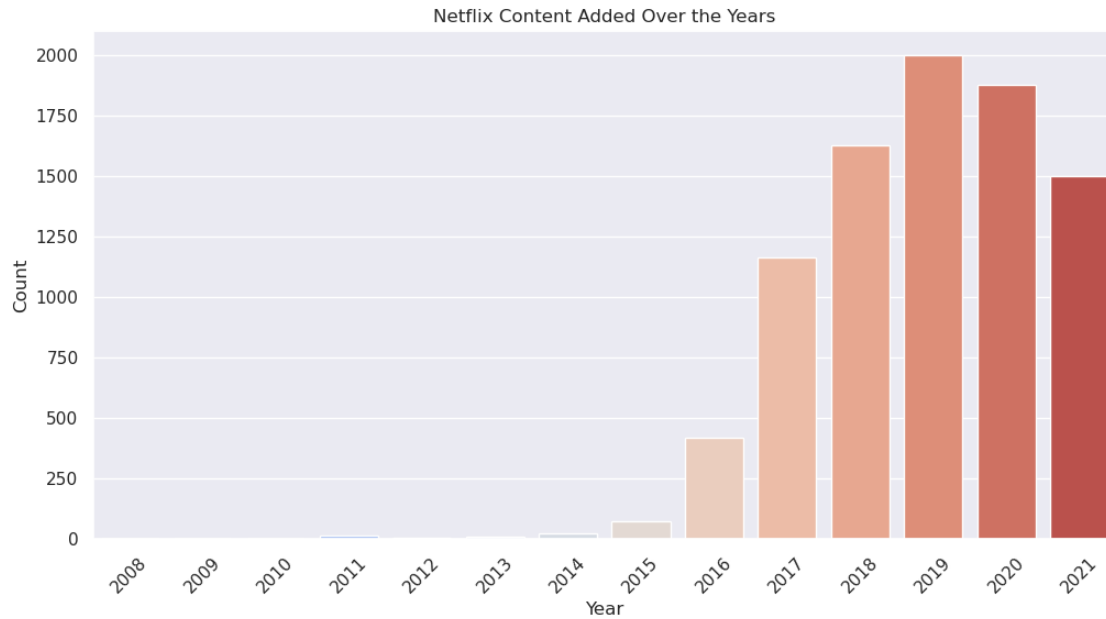
show_id      object
type         object
title        object
director     object
cast         object
country      object
date_added   datetime64[ns]
release_year  int64
rating       object
duration     object
listed_in    object
description  object
year_added   int64
month_added  int64
dtype: object

```

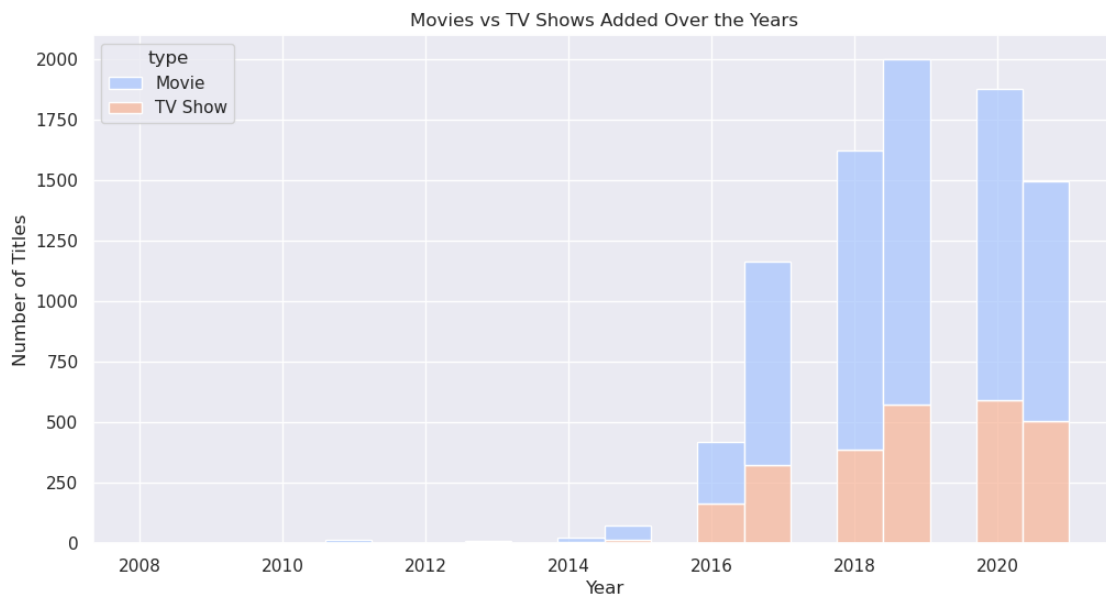
```

[43]: plt.figure(figsize=(12, 6))
      sns.countplot(x="year_added", data=df[df["year_added"] > 0], palette="coolwarm")
      plt.title("Netflix Content Added Over the Years")
      plt.xlabel("Year")
      plt.ylabel("Count")
      plt.xticks(rotation=45)
      plt.show()

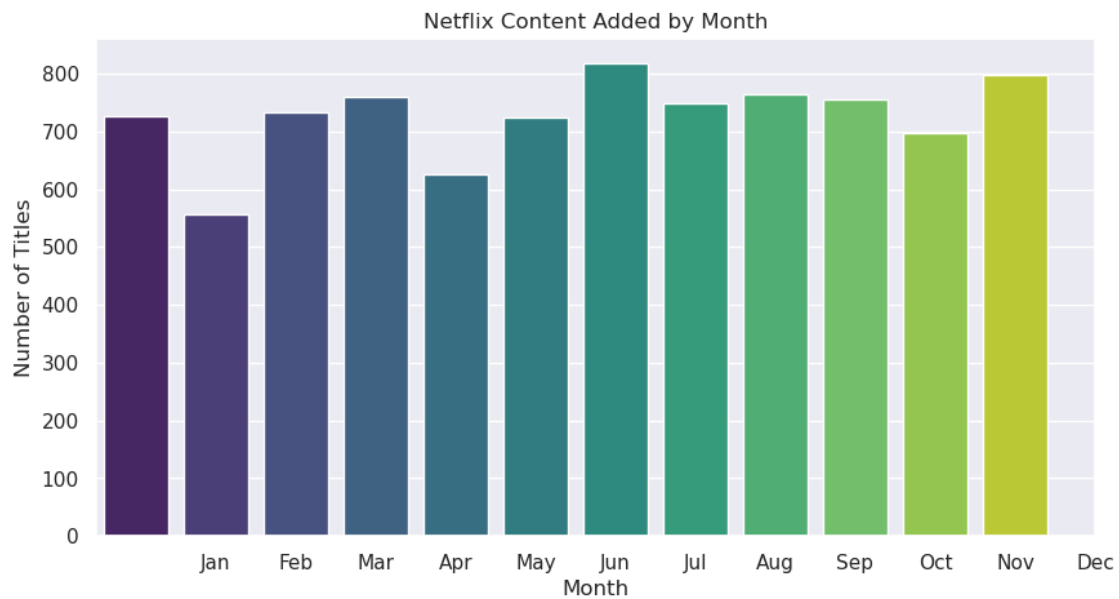
```



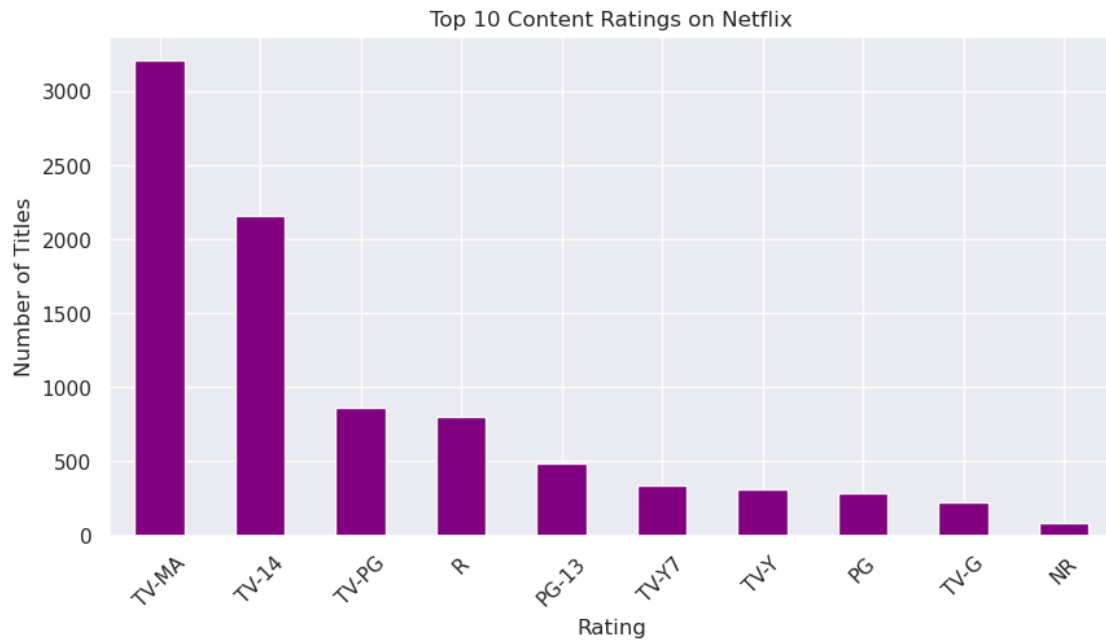
```
[44]: plt.figure(figsize=(12, 6))
sns.histplot(data=df[df["year_added"] > 0], x="year_added", hue="type",
             multiple="stack", bins=20, palette="coolwarm")
plt.title("Movies vs TV Shows Added Over the Years")
plt.xlabel("Year")
plt.ylabel("Number of Titles")
plt.show()
```



```
[45]: plt.figure(figsize=(10, 5))
sns.countplot(x="month_added", data=df[df["month_added"] > 0],
             palette="viridis")
plt.title("Netflix Content Added by Month")
plt.xlabel("Month")
plt.ylabel("Number of Titles")
plt.xticks(range(1, 13),
           ["Jan", "Feb", "Mar", "Apr", "May", "Jun", "Jul", "Aug", "Sep",
            "Oct", "Nov", "Dec"])
plt.show()
```

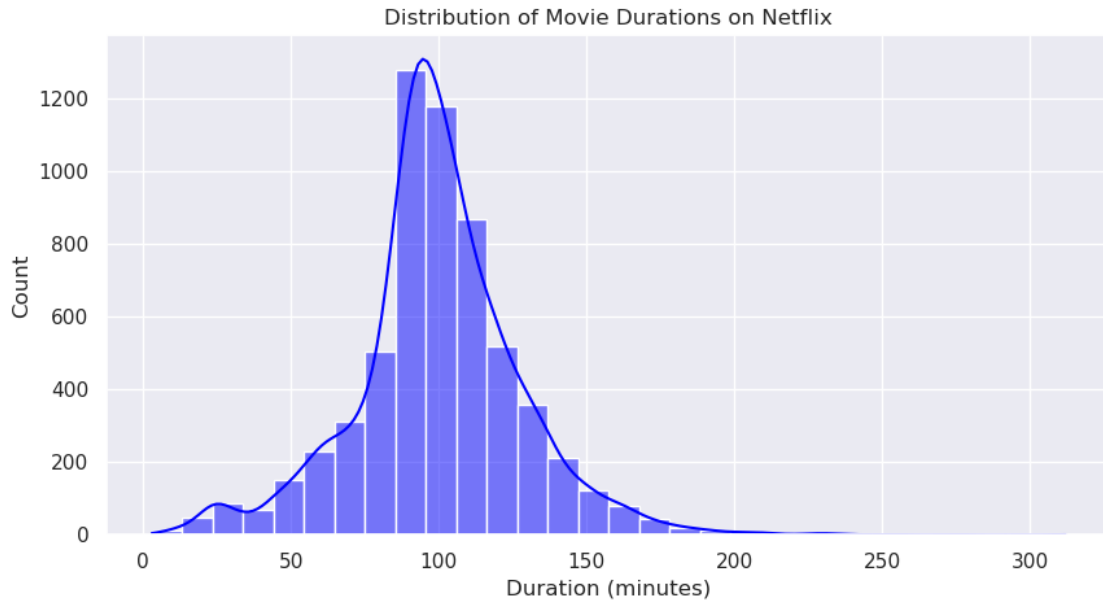


```
[46]: plt.figure(figsize=(10, 5))
df["rating"].value_counts().nlargest(10).plot(kind="bar", color="purple")
plt.title("Top 10 Content Ratings on Netflix")
plt.xlabel("Rating")
plt.ylabel("Number of Titles")
plt.xticks(rotation=45)
plt.show()
```



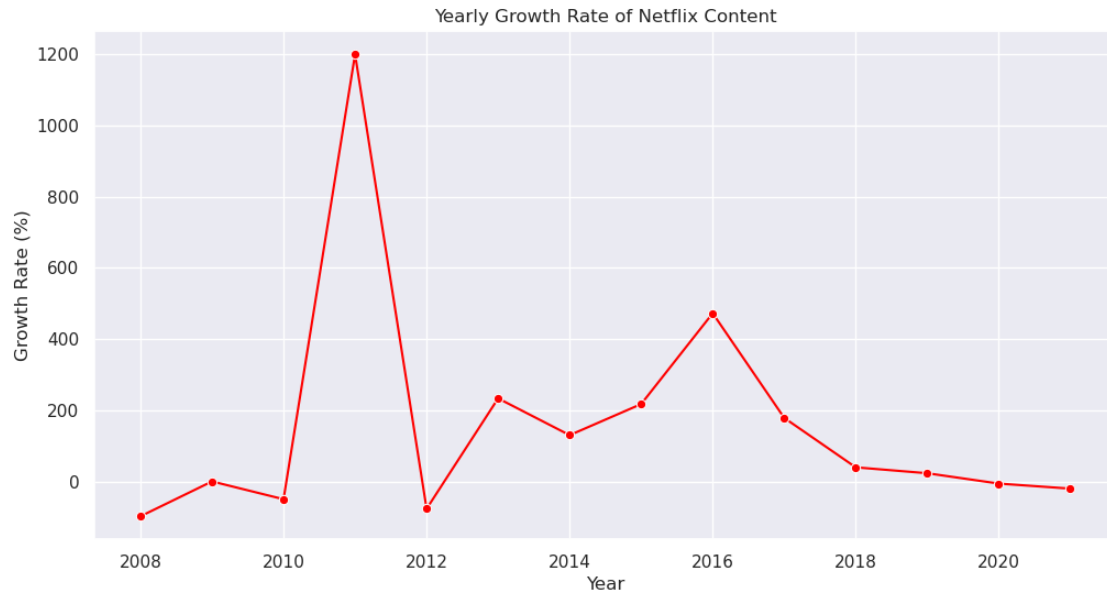
```
[47]: df["duration"] = df["duration"].str.extract("(\d+)").astype(float) # Extract numbers from 'duration'
movies_df = df[df["type"] == "Movie"]

plt.figure(figsize=(10, 5))
sns.histplot(movies_df["duration"].dropna(), bins=30, kde=True, color="blue")
plt.title("Distribution of Movie Durations on Netflix")
plt.xlabel("Duration (minutes)")
plt.ylabel("Count")
plt.show()
```

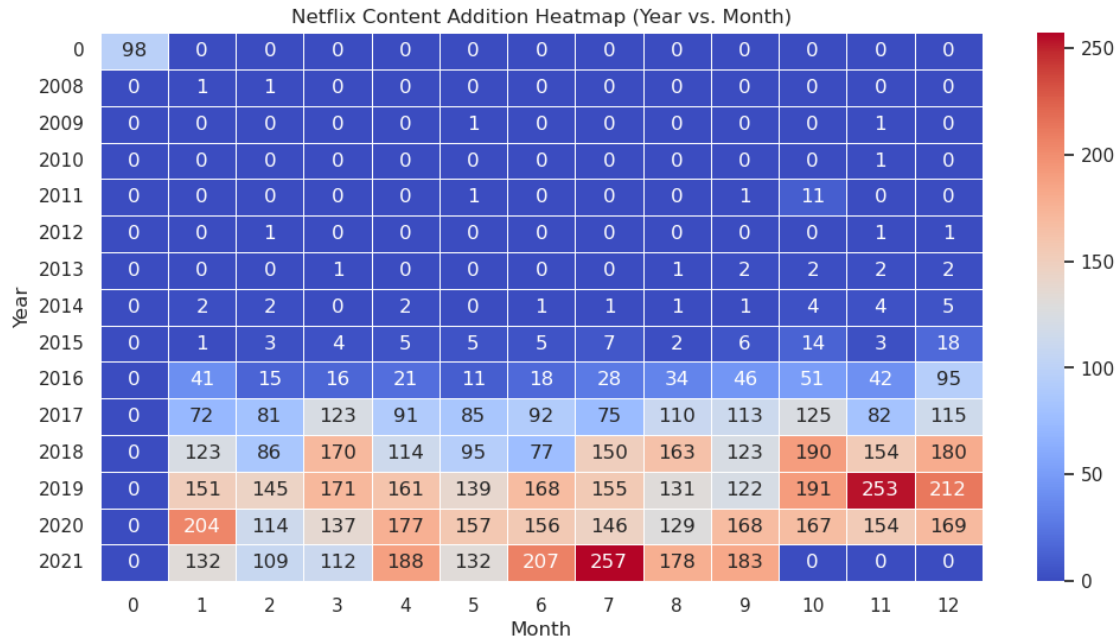


```
[48]: yearly_counts = df["year_added"].value_counts().sort_index()
      growth_rate = yearly_counts.pct_change() * 100 # Percentage change year over
      ↳ year

      plt.figure(figsize=(12, 6))
      sns.lineplot(x=yearly_counts.index, y=growth_rate, marker="o", color="red")
      plt.title("Yearly Growth Rate of Netflix Content")
      plt.xlabel("Year")
      plt.ylabel("Growth Rate (%)")
      plt.grid(True)
      plt.show()
```



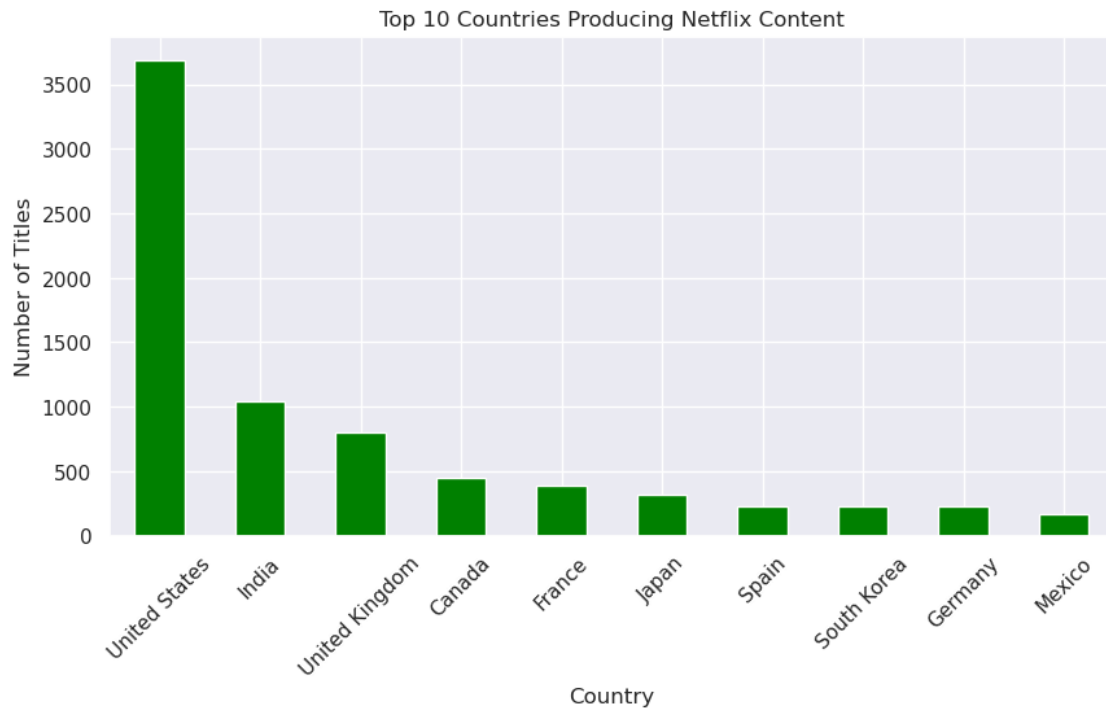
```
[49]: heatmap_data = df.pivot_table(index="year_added", columns="month_added",  
    aggfunc="size", fill_value=0)  
  
plt.figure(figsize=(12, 6))  
sns.heatmap(heatmap_data, cmap="coolwarm", linewidths=0.5, annot=True, fmt="d")  
plt.title("Netflix Content Addition Heatmap (Year vs. Month)")  
plt.xlabel("Month")  
plt.ylabel("Year")  
plt.show()
```

```
[50]: from collections import Counter

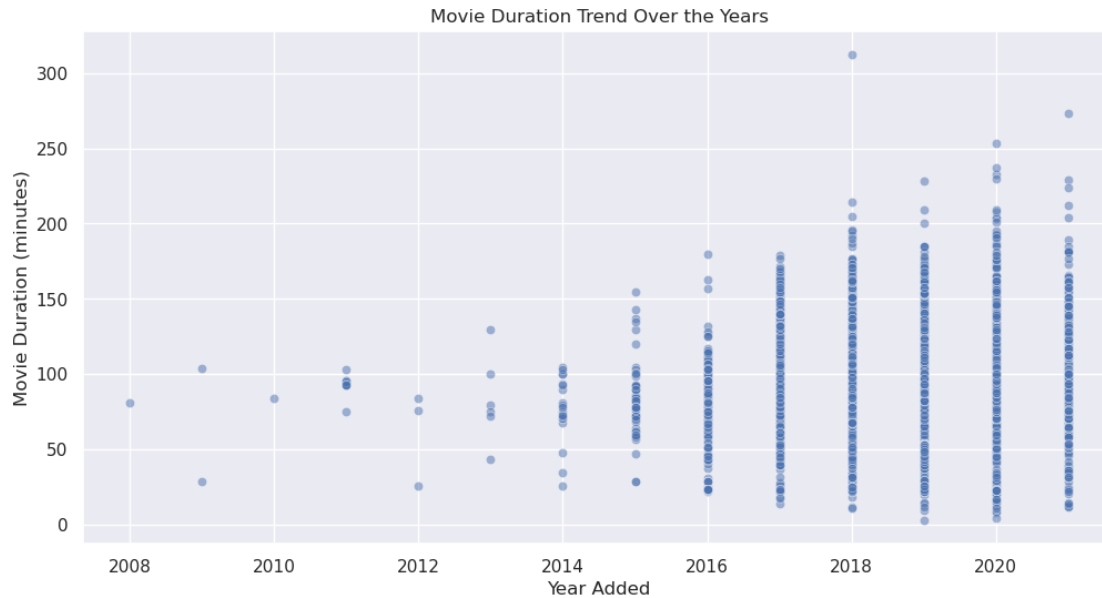
countries_list = df["country"].dropna().str.split(", ").explode() # Handle
      ↪ multiple countries per row
top_countries = pd.Series(Counter(countries_list)).nlargest(10)

plt.figure(figsize=(10, 5))
top_countries.plot(kind="bar", color="green")
plt.title("Top 10 Countries Producing Netflix Content")
plt.xlabel("Country")
plt.ylabel("Number of Titles")
plt.xticks(rotation=45)
plt.show()
```



```
[51]: movies_df = df[df["type"] == "Movie"].dropna(subset=["duration", "year_added"])

plt.figure(figsize=(12, 6))
sns.scatterplot(x=movies_df["year_added"], y=movies_df["duration"], alpha=0.5)
plt.title("Movie Duration Trend Over the Years")
plt.xlabel("Year Added")
plt.ylabel("Movie Duration (minutes)")
plt.show()
```



```
[55]: summary = pd.DataFrame({
    "Total Titles": [df.shape[0]],
    "Total Movies": [df[df['type'] == 'Movie'].shape[0]],
    "Total TV Shows": [df[df['type'] == 'TV Show'].shape[0]],
    "Earliest Content Added": [df["date_added"].min()],
    "Latest Content Added": [df["date_added"].max()],
    "Most Common Rating": [df["rating"].mode()[0]],
    "Top Producing Country": [df["country"].mode()[0]]
})

summary.T # Transpose for better readability
```

```
[55]:
```

| | |
|------------------------|---------------------|
| Total Titles | 0 |
| Total Movies | 8807 |
| Total TV Shows | 6131 |
| Earliest Content Added | 2008-01-01 00:00:00 |
| Latest Content Added | 2021-09-25 00:00:00 |
| Most Common Rating | TV-MA |
| Top Producing Country | United States |

```
[56]: df.to_csv("cleaned_netflix_data.csv", index=False)
```

```
[ ]:
```