```
import pandas as pd
import io
import requests
```

```
response = requests.get("https://d2beiqkhq929f0.cloudfront.net/public_assets/assets/000/000/940/original/netflix.csv")
response.raise_for_status() # Raise an exception for bad status codes
df = pd.read_csv(io.StringIO(response.content.decode('utf-8')))
```

```
df.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	unknow	United States	2021-09-25	2020	PG-13	90 min	Documentaries	As her father nears the end of his life, filmm...
1	s2	TV Show	Blood & Water	unknow	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	2021-09-24	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,	unknow	2021-09-24	2021	TV-MA	1 Season	Crime TV Shows, International	To protect his family from a powerful

```
df.shape
```

```
(8807, 12)
```

```
print(df.info(),'\n')
print(df.isnull().sum())
```

```
<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
None

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.count()
```

	0
show_id	8807
type	8807
title	8807
director	6173
cast	7982
country	7976
date_added	8797
release_year	8807
rating	8803
duration	8804
listed_in	8807
description	8807

dtype: int64

```
df.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

```
null_count=df.isnull().sum()
total_rows=len(df)
null_percentage=(null_count/total_rows)*100
null_percentage_df=pd.DataFrame({'dataset':null_percentage.index,'null_percentage':null_percentage.values})
null_percentage_df=null_percentage_df.sort_values(by='null_percentage', ascending=False)
print(null_percentage_df)
```

```
         dataset  null_percentage
3       director        29.908028
5        country         9.435676
4           cast         9.367549
6     date_added         0.113546
8         rating         0.045418
9       duration         0.034064
0        show_id         0.000000
1           type         0.000000
2          title         0.000000
7   release_year         0.000000
10     listed_in         0.000000
11   description         0.000000
```

```
columns_to_impute=['director','country','cast','rating','duration']
for column in columns_to_impute:
    df[column].fillna('unknow', inplace=True)
```

```
-input-1608122490.py:3: FutureWarning: A value is trying to be set on a copy of a DataFrame or Series through chained assignment
 will change in pandas 3.0. This inplace method will never work because the intermediate object on which we are setting values al

 when doing 'df[col].method(value, inplace=True)', try using 'df.method({col: value}, inplace=True)' or df[col] = df[col].method(


.fillna('unknow', inplace=True)
```

```
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	unknow	United States	September 25, 2021	2020	PG-13	90 min	Documentaries	As her fa nears end o life, film
1	s2	TV Show	Blood & Water	unknow	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 cros paths party, a C Tow
2	s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	unknow	September 24, 2021	2021	TV-MA	1 Season	Crime TV Shows, International TV Shows, TV Act...	To protec family fro pow drug
3	s4	TV Show	Jailbirds New Orleans	unknow	unknow	unknow	September 24, 2021	2021	TV-MA	1 Season	Docuseries, Reality TV	Fe flirtations toilet tal down ar
4	s5	TV Show	Kota Factory	unknow	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 ci coac cer know trai
...	...	...	...	...	...	...	...	...	...	...	...	

```
#1.What is the ratio of Movies vs TV Shows on Netflix?
type_counts = df['type'].value_counts()
print(type_counts)
```

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

```
#2.Which genres are most popular on Netflix globally?
genre_counts=df['listed_in'].str.split(',').explode().value_counts()
print("top 5 most popular genre",genre_counts.head(5))
```

```
top 5 most popular genre listed_in
 International Movies    2624
Dramas                   1600
Comedies                 1210
Action & Adventure        859
Documentaries             829
Name: count, dtype: int64
```

```
#3.Which years saw the highest release of content on Netflix?
highest_release=df['release_year'].value_counts().sort_index(ascending=False)
print(highest_release,"\n")
highest_release.max()
```

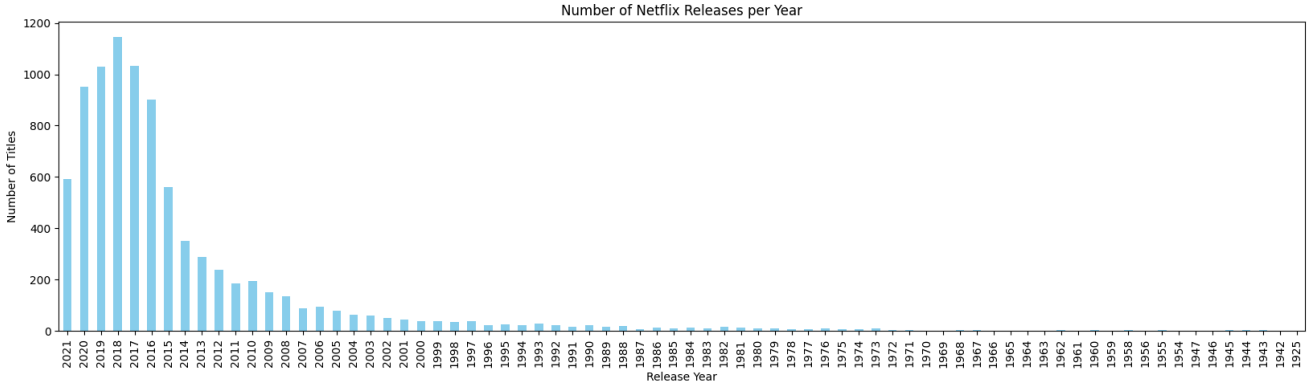
```
release_year
2021     592
2020     953
2019    1030
2018    1147
2017    1032
        ...
1945       4
1944       3
1943       3
1942       2
1925       1
Name: count, Length: 74, dtype: int64

1147
```

```
import matplotlib.pyplot as plt

plt.figure(figsize=(20,5))
```

```
highest_release.plot(kind='bar', color='skyblue')
plt.title('Number of Netflix Releases per Year')
plt.xlabel('Release Year')
plt.ylabel('Number of Titles')
plt.show()
```




```
#4. Which countries produce the most Netflix content?
max_country_realease=df['country'].str.split(',').dropna().explode().value_counts()

max_country_realease.head(20)
```

country	count
United States	3211
India	1008
unknow	831
United Kingdom	628
United States	479
Canada	271
Japan	259
France	212
South Korea	211
France	181
Spain	181
United Kingdom	178
Canada	174
Mexico	134
Germany	123
Australia	117
Egypt	112
Turkey	111
Germany	103
China	100

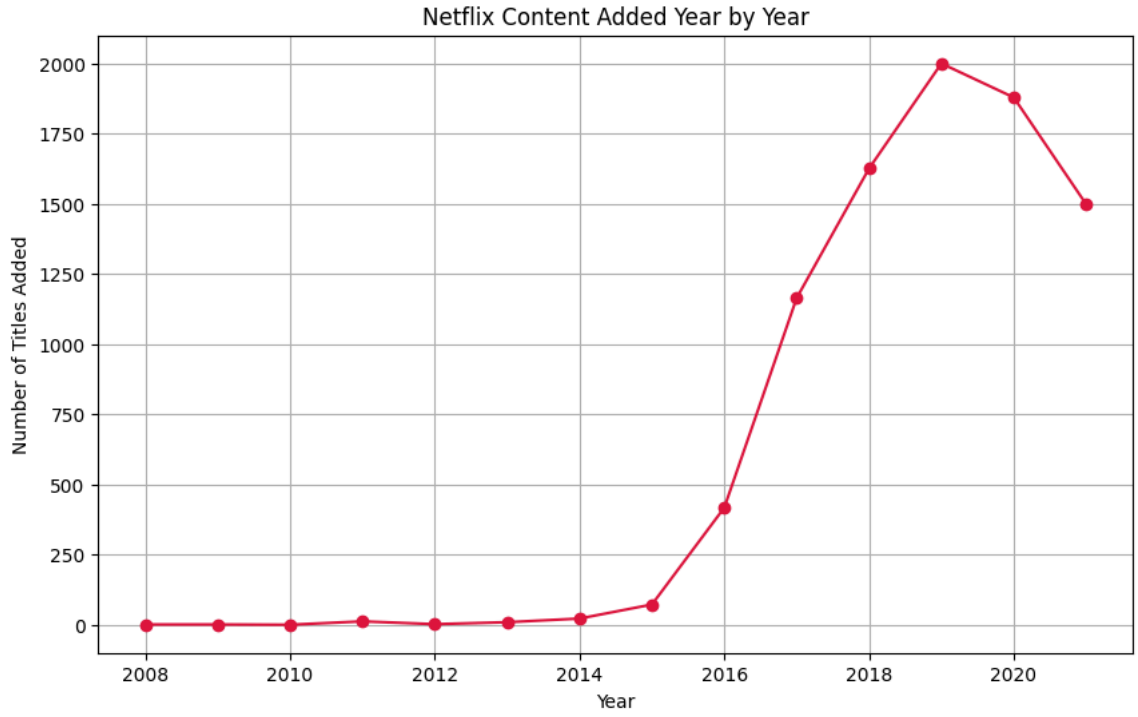
dtype: int64

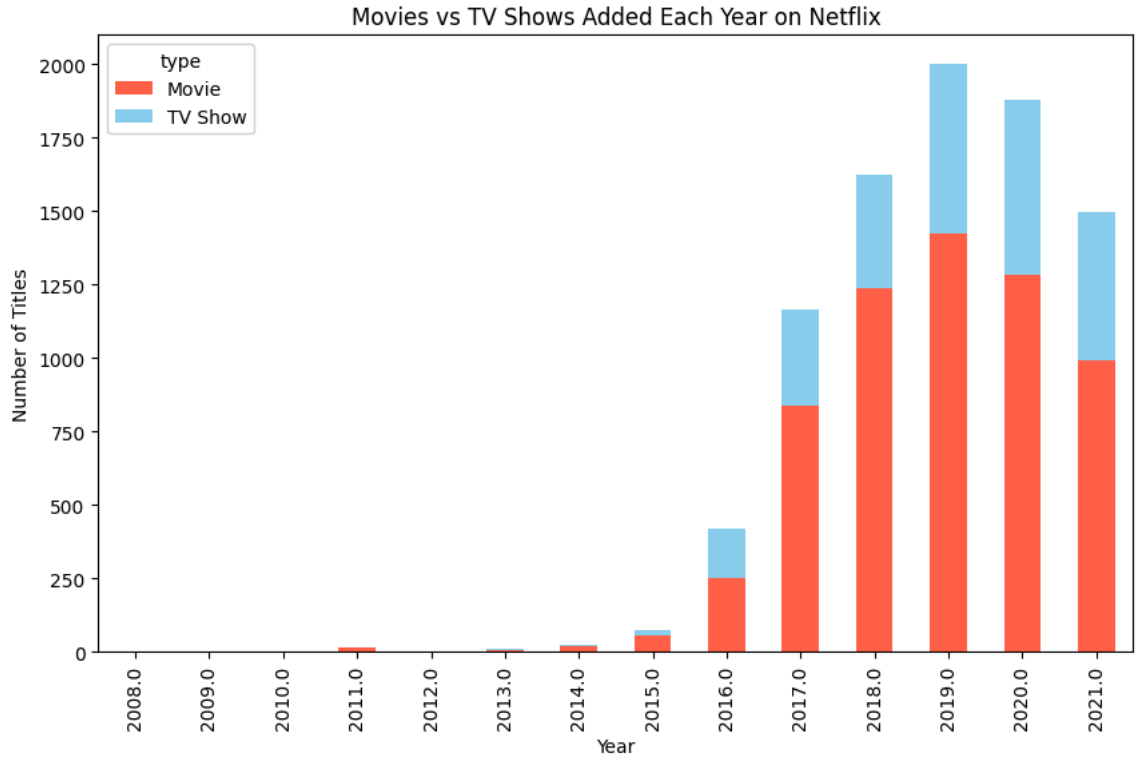
```
#5. How has the trend of adding new content evolved year by year?
df['date_added'] = pd.to_datetime(df['date_added'], errors='coerce')
df['year_added'] = df['date_added'].dt.year
year_counts = df['year_added'].value_counts().sort_index()
print(year_counts)
import matplotlib.pyplot as plt
```

```
plt.figure(figsize=(10,6))
year_counts.plot(kind='line', marker='o', color='crimson')
plt.title('Netflix Content Added Year by Year')
plt.xlabel('Year')
plt.ylabel('Number of Titles Added')
plt.grid(True)
plt.show()
type_year = df.groupby(['year_added', 'type']).size().unstack(fill_value=0)

type_year.plot(kind='bar', stacked=True, figsize=(10,6), color=['tomato', 'skyblue'])
plt.title('Movies vs TV Shows Added Each Year on Netflix')
plt.xlabel('Year')
plt.ylabel('Number of Titles')
plt.show()
```

```
year_added
2008.0       2
2009.0       2
2010.0       1
2011.0      13
2012.0       3
2013.0      10
2014.0      23
2015.0      73
2016.0     418
2017.0    1164
2018.0    1625
2019.0    1999
2020.0    1878
2021.0    1498
Name: count, dtype: int64
```






```
#6. Which ratings (e.g., TV-MA, PG, etc.) are most frequent on Netflix?
frequent_rating=df['rating'].value_counts()
frequent_rating
```

rating	count
TV-MA	3207
TV-14	2160
TV-PG	863
R	799
PG-13	490
TV-Y7	334
TV-Y	307
PG	287
TV-G	220
NR	80
G	41
TV-Y7-FV	6
unknow	4
NC-17	3
UR	3
66 min	1
74 min	1
84 min	1

dtype: int64

```
#7. Do some countries tend to produce more mature content (TV-MA)?
mature = df[df['rating'] == 'TV-MA']
mature.loc[:,'country'] = mature['country'].dropna().str.split(', ')
mature_countries = mature.explode('country')
mature_counts = mature_countries['country'].value_counts()
print(mature_counts.head(10))
```

```
country
United States     1100
India              266
United Kingdom     251
Spain              170
France             163
Canada             107
Mexico             102
Japan              101
South Korea         92
Germany             79
Name: count, dtype: int64
```

```
#8. Which genres are more associated with TV Shows vs Movies?
df['genre'] = df['listed_in'].str.split(', ')
df_exploded = df.explode('genre')
genre_counts = df_exploded.groupby(['genre', 'type']).size().unstack(fill_value=0)
print(genre_counts.head())
```

```
type                      Movie  TV Show
genre
Action & Adventure          859        0
Anime Features               71        0
Anime Series                  0      176
British TV Shows              0      253
Children & Family Movies    641        0
```

```
#10.What genres are most popular in the last 3 years?
df['year_added'] = df['date_added'].dt.year
recent_df = df[df['year_added'] >= (df['year_added'].max() - 2)]
recent_df.loc[:,'genre'] = recent_df['listed_in'].str.split(', ')
recent_genres = recent_df.explode('genre')
genre_trend = (
    recent_genres['genre']
    .value_counts()
```

```
    .head(10)
)
print(genre_trend)
```

```
genre
International Movies        1593
Dramas                      1511
Comedies                    1135
International TV Shows       836
Action & Adventure           568
TV Dramas                    463
Children & Family Movies     439
Independent Movies           438
Romantic Movies              437
Documentaries                405
Name: count, dtype: int64
```

```
#11.  Who are the top 10 directors with the most Netflix content?
df['director'] = df['director'].str.split(', ')
df_exploded = df.explode('director')
director_counts = (
    df_exploded['director']
    .value_counts()
    .head(10)
)
print(director_counts)
```

```
director
Rajiv Chilaka          22
Jan Suter              21
Raúl Campos            19
Suhas Kadav            16
Marcus Raboy           16
Jay Karas              15
Cathy Garcia-Molina    13
Martin Scorsese        12
Youssef Chahine        12
Jay Chapman            12
Name: count, dtype: int64
```

```
#12. Which actors appear most frequently in Netflix shows?
df['cast'] = df['cast'].fillna('Unknown').str.split(', ')
df_exploded = df.explode('cast')
actor_counts = (df_exploded['cast'].value_counts().head(10))
print(actor_counts)
```

```
cast
Unknown    8807
Name: count, dtype: int64
```

```
#13. Which director-genre pairs are most frequent?

df_exploded = df.explode('director').explode('genre')
director_genre_counts = (
    df_exploded.groupby(['director', 'genre'])
    .size()
    .reset_index(name='count')
    .sort_values(by='count', ascending=True)
    .head(10)
)
print(director_genre_counts)
```

```
   director                 genre  count
60  Unknown      Romantic TV Shows      1
55  Unknown           LGBTQ Movies      1
58  Unknown             Reality TV      1
67  Unknown              TV Horror      1
42  Unknown      Classic & Cult TV      2
66  Unknown              TV Dramas      2
64  Unknown  TV Action & Adventure      2
2   Unknown      Classic & Cult TV      2
34  Unknown           TV Thrillers      3
15  Unknown               Kids' TV      3
```

```
#14. How many titles have unknown directors or cast members?
```

```
#15. What is the average duration of Movies on Netflix?
movies = df[df['type'] == 'Movie']
# Extract numbers from duration and convert to integer
movies.loc[:,'duration_min'] = movies['duration'].str.replace(' min', '').astype(float)
average_duration = movies.loc[:,'duration_min'].mean()
print(f"Average movie duration on Netflix: {average_duration:.2f} minutes")
```

```
Average movie duration on Netflix: 99.58 minutes
/tmp/ipython-input-2054666297.py:4: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ver
  movies.loc[:,'duration_min'] = movies['duration'].str.replace(' min', '').astype(float)
```

```
#16.  What's the most common number of seasons for TV shows?
tv_shows = df[df['type'] == 'TV Show']
tv_shows.loc[:,'seasons'] = tv_shows['duration'].str.replace(' Season', '').str.replace('s', '').astype(int)
most_common_seasons = tv_shows['seasons'].mode()[0]
print("Most common number of seasons for TV shows:", most_common_seasons)
```

```
Most common number of seasons for TV shows: 1
/tmp/ipython-input-3400637077.py:2: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ver
  tv_shows.loc[:,'seasons'] = tv_shows['duration'].str.replace(' Season', '').str.replace('s', '').astype(int)
```

```
genre_split=df.assign(genre=df['listed_in'].str.split(',')).explode('genre')
genre_type_counts = genre_split.groupby(['type', 'genre']).size().unstack(fill_value=0)
```

```
genre_type_counts.loc['Movie'].sort_values(ascending=False).head(10)
```

genre	Movie
International Movies	2624
Dramas	1600
Comedies	1210
Action & Adventure	859
Documentaries	829
Dramas	827
Independent Movies	736
Romantic Movies	613
Children & Family Movies	605
Thrillers	512

dtype: int64

```
genre_country = df.dropna(subset=['country', 'listed_in']).assign(
    country=df['country'].str.split(', '),
    genre=df['listed_in'].str.split(', ')
).explode('country').explode('genre')
```

```
genre_country_counts = genre_country.groupby(['genre', 'country']).size().reset_index(name='count')
```

```
top_countries_per_genre = genre_country_counts.loc[
    genre_country_counts.groupby('genre')['count'].idxmax()
].sort_values('count', ascending=False)
print(top_countries_per_genre)
```

```
                          genre         country  count
683          International Movies           India    864
```

```
501                       Dramas   United States    835
232                      Comedies   United States    680
372                 Documentaries   United States    511
57              Action & Adventure   United States    404
139       Children & Family Movies   United States    390
643             Independent Movies   United States    390
1459                    Thrillers   United States    292
1240                 TV Comedies   United States    258
1301                   TV Dramas   United States    232
90               British TV Shows  United Kingdom    225
994               Romantic Movies   United States    225
813         International TV Shows         unknow    223
1159              Stand-Up Comedy   United States    216
842                      Kids' TV   United States    214
574                 Horror Movies   United States    201
406                    Docuseries   United States    192
1073             Sci-Fi & Fantasy   United States    181
921              Music & Musicals   United States    147
285                Crime TV Shows   United States    145
68                   Anime Series           Japan    143
850               Korean TV Shows     South Korea    132
942                    Reality TV   United States    123
1137                Sports Movies   United States    113
1198         TV Action & Adventure   United States     94
168                Classic Movies   United States     81
1025             Romantic TV Shows     South Korea     77
873                  LGBTQ Movies   United States     63
61                 Anime Features           Japan     61
1369           TV Sci-Fi & Fantasy   United States     60
303                  Cult Movies   United States     52
1352                 TV Mysteries   United States     51
1086           Science & Nature TV   United States     49
1094     Spanish-Language TV Shows         Mexico     47
526            Faith & Spirituality   United States     42
1325                    TV Horror   United States     37
1406                Teen TV Shows   United States     33
1170  Stand-Up Comedy & Talk Shows   United States     33
1392                 TV Thrillers   United States     27
887                        Movies         unknow     23
146              Classic & Cult TV   United States     17
1375                    TV Shows         unknow      7
```

```
import matplotlib.pyplot as plt

# Pick top 5 genres to visualize
top_genres = ['Dramas', 'International TV Shows', 'Action', 'TV Dramas', 'Romantic TV Shows']

for genre in top_genres:
    data = genre_country_counts[genre_country_counts['genre'] == genre].sort_values('count', ascending=True)
    plt.figure(figsize=(8,20))
    plt.barh(data['country'], data['count'], color='teal')
    plt.title(f'Number of {genre} Titles by Country')
    plt.xlabel('Number of Titles')
    plt.show()
```