Netflix Data Analysis

Introduction

In this analysis, we will be working with two datasets related to Netflix. Our goal is to analyze these datasets side by side to extract meaningful insights. The datasets are:

1. **Netflix Userbase**
2. **Netflix Titles**

1. Netflix Userbase

The `Netflix Userbase` dataset contains information about the users of Netflix. This dataset includes various attributes related to the users, such as their demographics, subscription details, and usage patterns. By analyzing this dataset, we aim to understand the user demographics, their subscription preferences, and their viewing habits.

2. Netflix Titles

The `Netflix Titles` dataset includes details about the content available on Netflix. This dataset provides information about the movies and TV shows, including their titles, genres, release dates, ratings, and more. By analyzing this dataset, we aim to understand the content library of Netflix, popular genres, and trends over time.

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Loading Datasets

In [3]:
```
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np
import seaborn as sns
```

In [4]:
```
netflix_users_df = pd.read_csv('NetflixUserbase.csv', index_col='User ID')
```

In [7]:
```
netflix_users_df.head(5)
```

Out[7]:

	Subscription Type	Monthly Revenue	Join Date	Last Payment Date	Country	Age	Gender	Device	Plan Duration
User ID									
1	Basic	10	15-01-22	10-06-23	United States	28	Male	Smartphone	1 Month
2	Premium	15	05-09-21	22-06-23	Canada	35	Female	Tablet	1 Month
3	Standard	12	28-02-23	27-06-23	United Kingdom	42	Male	Smart TV	1 Month
4	Standard	12	10-07-22	26-06-23	Australia	51	Female	Laptop	1 Month
5	Basic	10	01-05-23	28-06-23	Germany	33	Male	Smartphone	1 Month

In [7]:
```
netflix_movies_df = pd.read_csv('netflixTitles.csv', index_col='show_id')
```

In [164…
```
netflix_movies_df.head(5)
```

Out[164]:

	type	title	director	cast	country	date_added	release_year	rating
show_id								
s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	NaN	United States	September 25, 2021	2020	PG-13
s2	TV Show	Blood & Water	NaN	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	September 24, 2021	2021	TV-MA
s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	NaN	September 24, 2021	2021	TV-MA
s4	TV Show	Jailbirds New Orleans	NaN	NaN	NaN	September 24, 2021	2021	TV-MA
s5	TV Show	Kota Factory	NaN	Mayur More, Jitendra Kumar, Ranjan Raj, Alam K...	India	September 24, 2021	2021	TV-MA

Success: This box indicates a successful action.

Overview of Dataset

netflix_users

In [91]:
```
duplicate_count = netflix_users_df.duplicated(keep=False).sum()
duplicate_count
```

Out[91]:
```
0
```

In [34]:
```
netflix_users_df.info()
netflix_users_df.describe()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 2500 entries, 1 to 2500
Data columns (total 9 columns):
 #   Column             Non-Null Count  Dtype 
---  ------             --------------  ----- 
 0   Subscription Type  2500 non-null   object
 1   Monthly Revenue    2500 non-null   int64 
 2   Join Date          2500 non-null   object
 3   Last Payment Date  2500 non-null   object
 4   Country            2500 non-null   object
 5   Age                2500 non-null   int64 
 6   Gender             2500 non-null   object
 7   Device             2500 non-null   object
 8   Plan Duration      2500 non-null   object
dtypes: int64(2), object(7)
memory usage: 195.3+ KB
```

Out[34]:

	Monthly Revenue	Age
count	2500.000000	2500.000000
mean	12.508400	38.795600
std	1.686851	7.171778
min	10.000000	26.000000
25%	11.000000	32.000000
50%	12.000000	39.000000
75%	14.000000	45.000000
max	15.000000	51.000000

Correcting Data type of Users Data**

In [9]:

```
netflix_users_df['Join Date'] = pd.to_datetime(netflix_users_df['Join Date
netflix_users_df['Last Payment Date'] = pd.to_datetime(netflix_users_df['L
```

In [11]:

```
netflix_users_df.head(2)
```

Out[11]:

	Subscription Type	Monthly Revenue	Join Date	Last Payment Date	Country	Age	Gender	Device	Pla Duratio
User ID									
1	Basic	10	2022-01-15	2023-06-10	United States	28	Male	Smartphone	1 Mont
2	Premium	15	2021-09-05	2023-06-22	Canada	35	Female	Tablet	1 Mont

This dataset seems ok!, because no empty rows, Dtype is right now, age max min is not outliers, will make box pplot for verification

netflix_movies

In [99]:

```
duplicate_count = netflix_movies_df.duplicated(keep = False).sum()
duplicate_count
```

Out[99]:

```
0
```

In [36]:

```
netflix_movies_df.info()
netflix_movies_df.describe()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 8807 entries, s1 to s8807
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   type          8807 non-null   object
 1   title         8807 non-null   object
 2   director      6173 non-null   object
 3   cast          7982 non-null   object
 4   country       7976 non-null   object
 5   date_added    8797 non-null   object
 6   release_year  8807 non-null   int64 
 7   rating        8803 non-null   object
 8   duration      8804 non-null   object
 9   listed_in     8807 non-null   object
 10  description   8807 non-null   object
dtypes: int64(1), object(10)
memory usage: 825.7+ KB
```

Out[36]:

	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 Issues and Handling Strategies

1. Empty Rows of Textual Data

- **Issues**: Columns like `director` and `country` have many missing values.
- **Strategy**: fill this values with strings like 'not added'

2. Missing Values in Textual Data Columns

- **Issues**: Columns like `rating` and `duration` have some missing values.
- **Strategy**:
  - **Rating**: Fill with the most frequent value or 'Unknown'.
  - **Duration**: Impute with the average duration for movies and TV shows.

3. Release Year as Date Type

- **Issues**: release_year, 'date added', 'releae_date' is not in date format.
- **Strategy**: Convert to datetime format for better chronological analysis.

Next Steps

1. **Identify Missing Values**: Quantify missing values in each column.
2. **Implement Strategies**: Apply handling strategies and convert data types.
3. **Verify Data Integrity**: Ensure data cleaning maintains data relevance.

Identify Missing Values:

In [47]:
```
netflix_movies_df[netflix_movies_df['rating'].isna()]
```

Out[47]:

	type	title	director	cast	country	date_added	release_year	r
show_id								
s5990	Movie	13TH: A Conversation with Oprah Winfrey & Ava ...	NaN	Oprah Winfrey, Ava DuVernay	NaN	January 26, 2017	2017	
s6828	TV Show	Gargantia on the Verdurous Planet	NaN	Kaito Ishikawa, Hisako Kanemoto, Ai Kayano, Ka...	Japan	December 1, 2016	2013	
s7313	TV Show	Little Lunch	NaN	Flynn Curry, Olivia Deeble, Madison Lu, Oisín ...	Australia	February 1, 2018	2015	
s7538	Movie	My Honor Was Loyalty	Alessandro Pepe	Leone Frisa, Paolo Vaccarino, Francesco Miglio...	Italy	March 1, 2017	2015	

In [53]:
```
netflix_movies_df[netflix_movies_df['duration'].isna()]
```

Out[53]:

	type	title	director	cast	country	date_added	release_year	rating	durat
show_id									
s5542	Movie	Louis C.K. 2017	Louis C.K.	Louis C.K.	United States	April 4, 2017	2017	74 min	N
s5795	Movie	Louis C.K.: Hilarious	Louis C.K.	Louis C.K.	United States	September 16, 2016	2010	84 min	N
s5814	Movie	Louis C.K.: Live at the Comedy Store	Louis C.K.	Louis C.K.	United States	August 15, 2016	2015	66 min	N

NOTE: while indentifying

> we come to figure that where duration is null in this records human error exists because instead of adding duration, mistenkly added in the rating with date of duration

Handling Missing Values

In [13]:
```
missing_duration_mask = netflix_movies_df['duration'].isna()

netflix_movies_df.loc[missing_duration_mask, 'duration'] = netflix_movies_
```

In [15]:
```
missing_duration_mask[missing_duration_mask]
```

Out[15]:
```
show_id
s5542    True
s5795    True
s5814    True
Name: duration, dtype: bool
```

In [17]:
```
netflix_movies_df.loc[missing_duration_mask, 'rating'] = np.nan
```

In [19]:
```
netflix_movies_df[netflix_movies_df['rating'].isna()]
```

Out[19]:

	type	title	director	cast	country	date_added	release_year	r
show_id								
s5542	Movie	Louis C.K. 2017	Louis C.K.	Louis C.K.	United States	April 4, 2017	2017	
s5795	Movie	Louis C.K.: Hilarious	Louis C.K.	Louis C.K.	United States	September 16, 2016	2010	
s5814	Movie	Louis C.K.: Live at the Comedy Store	Louis C.K.	Louis C.K.	United States	August 15, 2016	2015	
s5990	Movie	13TH: A Conversation with Oprah Winfrey & Ava ...	NaN	Oprah Winfrey, Ava DuVernay	NaN	January 26, 2017	2017	
s6828	TV Show	Gargantia on the Verdurous Planet	NaN	Kaito Ishikawa, Hisako Kanemoto, Ai Kayano, Ka...	Japan	December 1, 2016	2013	
s7313	TV Show	Little Lunch	NaN	Flynn Curry, Olivia Deeble, Madison Lu, Oisín ...	Australia	February 1, 2018	2015	
s7538	Movie	My Honor Was Loyalty	Alessandro Pepe	Leone Frisa, Paolo Vaccarino, Francesco Miglio...	Italy	March 1, 2017	2015	

handled human error

Filling Missing Values with dummy Values

while handling these data duration null values has been removed, or replacing of null values of rated with "not rated"

In [21]:

```
netflix_movies_df.loc[netflix_movies_df['rating'].isna(), 'rating'] = 'Not
```

In [178…

```
netflix_movies_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 8807 entries, s1 to s8807
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   type          8807 non-null   object
 1   title         8807 non-null   object
 2   director      6173 non-null   object
 3   cast          7982 non-null   object
 4   country       7976 non-null   object
 5   date_added    8797 non-null   object
 6   release_year  8807 non-null   int64 
 7   rating        8807 non-null   object
 8   duration      8807 non-null   object
 9   listed_in     8807 non-null   object
 10  description   8807 non-null   object
dtypes: int64(1), object(10)
memory usage: 825.7+ KB
```

Adding values null values of director with not added

In [23]:

```
netflix_movies_df.loc[netflix_movies_df['director'].isna(), 'director'] =
```

In [182…

```
netflix_movies_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 8807 entries, s1 to s8807
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   type          8807 non-null   object
 1   title         8807 non-null   object
 2   director      8807 non-null   object
 3   cast          7982 non-null   object
 4   country       7976 non-null   object
 5   date_added    8797 non-null   object
 6   release_year  8807 non-null   int64 
 7   rating        8807 non-null   object
 8   duration      8807 non-null   object
 9   listed_in     8807 non-null   object
 10  description   8807 non-null   object
dtypes: int64(1), object(10)
memory usage: 825.7+ KB
```

In [25]:

```
netflix_movies_df.loc[netflix_movies_df['cast'].isna(), 'cast'] = 'Not Add
```

In [27]:

```
netflix_movies_df.loc[netflix_movies_df['country'].isna(), 'country'] = 'N
```

Replacing all other values too, by "not Added'

In [192…

```
netflix_movies_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 8807 entries, s1 to s8807
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype 
---  ------        --------------  ----- 
 0   type          8807 non-null   object
 1   title         8807 non-null   object
 2   director      8807 non-null   object
 3   cast          8807 non-null   object
 4   country       8807 non-null   object
 5   date_added    8797 non-null   object
 6   release_year  8807 non-null   int64 
 7   rating        8807 non-null   object
 8   duration      8807 non-null   object
 9   listed_in     8807 non-null   object
 10  description   8807 non-null   object
dtypes: int64(1), object(10)
memory usage: 825.7+ KB
```

except Dates for two reasons

1. it is not text data
2. we have to find average so, we will put values accordingly

but we have to change data type of all data in the right types

null values

In [29]:
```
netflix_movies_df[netflix_movies_df['date_added'].isna()]
```

Out[29]:

	type	title	director	cast	country	date_added	release_year	ratin
show_id								
s6067	TV Show	A Young Doctor's Notebook and Other Stories	Not Added	Daniel Radcliffe, Jon Hamm, Adam Godley, Chris...	United Kingdom	NaN	2013	TV M
s6175	TV Show	Anthony Bourdain: Parts Unknown	Not Added	Anthony Bourdain	United States	NaN	2018	TV P
s6796	TV Show	Frasier	Not Added	Kelsey Grammer, Jane Leeves, David Hyde Pierce...	United States	NaN	2003	TV P
s6807	TV Show	Friends	Not Added	Jennifer Aniston, Courteney Cox, Lisa Kudrow, ...	United States	NaN	2003	TV-1
s6902	TV Show	Gunslinger Girl	Not Added	Yuuka Nanri, Kanako Mitsuhashi, Eri Sendai, Am...	Japan	NaN	2008	TV-1
s7197	TV Show	Kikoriki	Not Added	Igor Dmitriev	Not Added	NaN	2010	TV-
s7255	TV Show	La Familia P. Luche	Not Added	Eugenio Derbez, Consuelo Duval, Luis Manuel Áv...	United States	NaN	2012	TV-1
s7407	TV Show	Maron	Not Added	Marc Maron, Judd Hirsch, Josh Brener, Nora Zeh...	United States	NaN	2016	TV M
s7848	TV Show	Red vs. Blue	Not Added	Burnie Burns, Jason Saldaña, Gustavo Sorola, G...	United States	NaN	2015	N
s8183	TV Show	The Adventures of Figaro Pho	Not Added	Luke Jurevicius, Craig Behenna, Charlotte Haml...	Australia	NaN	2015	TV-Y

changing data types before adding values for missing values

In [31]:
```
netflix_movies_df['release_year'] = pd.to_datetime(netflix_movies_df['rele

netflix_movies_df['date_added'] = pd.to_datetime(netflix_movies_df['date_a
```

In [75]:
```
netflix_movies_df.head(3)
```

Out[75]:

show_id	type	title	director	cast	country	date_added	release_year	rating
s1	Movie	Dick Johnson Is Dead	Kirsten Johnson	Not Added	United States	2021-09-25	2020-01-01	PG-13
s2	TV Show	Blood & Water	Not Added	Ama Qamata, Khosi Ngema, Gail Mabalane, Thaban...	South Africa	2021-09-24	2021-01-01	TV-MA
s3	TV Show	Ganglands	Julien Leclercq	Sami Bouajila, Tracy Gotoas, Samuel Jouy, Nabi...	Not Added	2021-09-24	2021-01-01	TV-MA

In [33]:
```
avg_dateofAdded = netflix_movies_df['date_added'].mean()
avg_dateofAdded
```

Out[33]:
```
Timestamp('2019-05-23 01:45:29.452290816')
```

In [35]:
```
netflix_movies_df.loc[netflix_movies_df['date_added'].isna(), 'date_added'
```

checking by extracting one record who have not added date

In [37]:
```
netflix_movies_df.loc['s6067']
```

Out[37]:
```
type                                                      TV Show
title                    A Young Doctor's Notebook and Other Stories
director                                                Not Added
cast            Daniel Radcliffe, Jon Hamm, Adam Godley, Chris...
country                                            United Kingdom
date_added                          2019-05-23 01:45:29.452290816
release_year                                  2013-01-01 00:00:00
rating                                                      TV-MA
duration                                                2 Seasons
listed_in                 British TV Shows, TV Comedies, TV Dramas
description     Set during the Russian Revolution, this comic ...
Name: s6067, dtype: object
```

checking is there any null values?

In [226…
```
netflix_movies_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 8807 entries, s1 to s8807
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   type          8807 non-null   object
 1   title         8807 non-null   object
 2   director      8807 non-null   object
 3   cast          8807 non-null   object
 4   country       8807 non-null   object
 5   date_added    8807 non-null   datetime64[ns]
 6   release_year  8807 non-null   datetime64[ns]
 7   rating        8807 non-null   object
 8   duration      8807 non-null   object
 9   listed_in     8807 non-null   object
 10  description   8807 non-null   object
dtypes: datetime64[ns](2), object(9)
memory usage: 1.1+ MB
```

data is clean now an ready to work for further analysis

Netflix Movies Analysis

Basic Analysis:

In [416…

```
titleCount = netflix_movies_df['title'].count()

fig, ax = plt.subplots(figsize=(1,1))

# Hide the axes
ax.axis('off')

# Display the total discounted price as a large text
ax.text(0.5, 0.5, f'The Title Count is : {titleCount:,}',
        fontsize=20, ha='center', va='center')

plt.show()
```

The Title Count is : 8,807

what type of movies have, what movies have highest count?

In [65]:

```
sns.set_style('whitegrid')
typeofMovies = netflix_movies_df.groupby('type')['title'].count()
typeofMovies
```

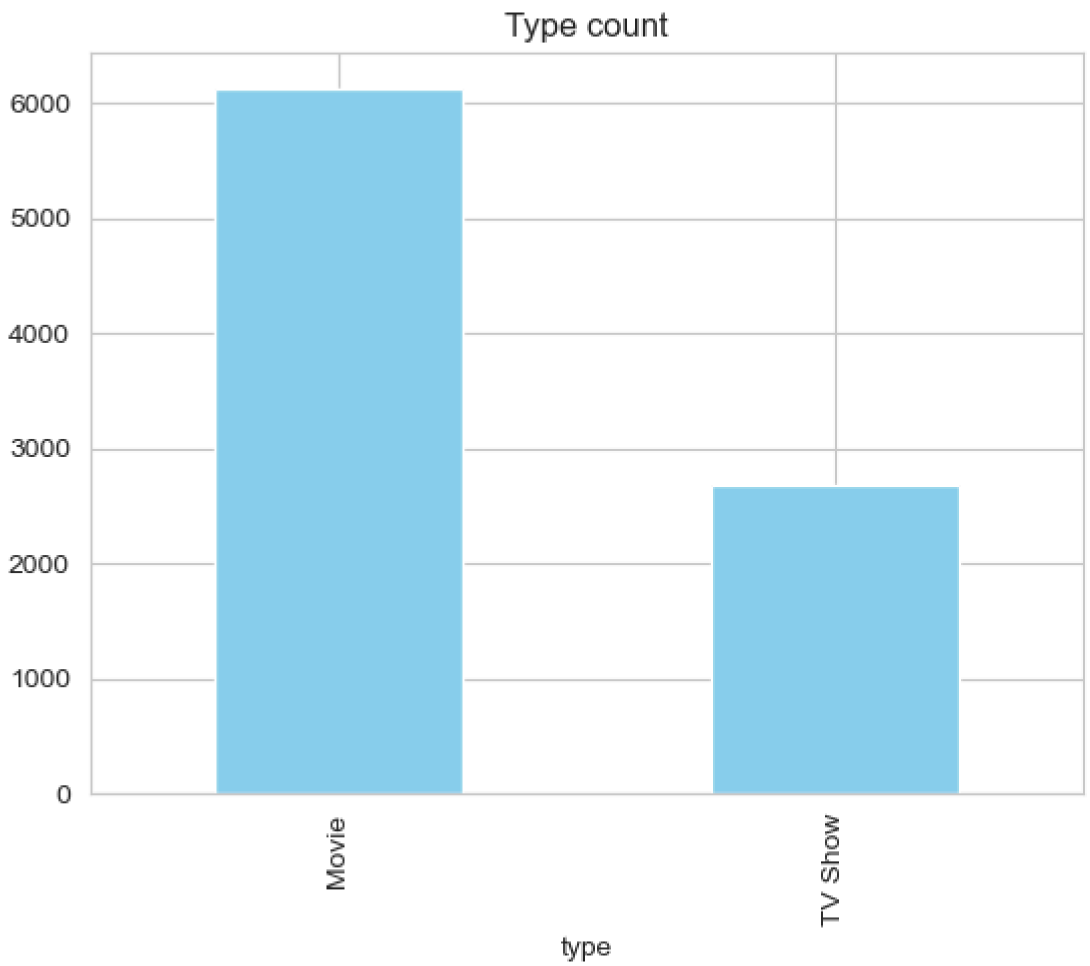
Out[65]:

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

In [125…

```
typeofMovies.plot(kind = 'bar', color='skyblue')
plt.title('Type count')
```

```
Out[125]: Text(0.5, 1.0, 'Type count')
```



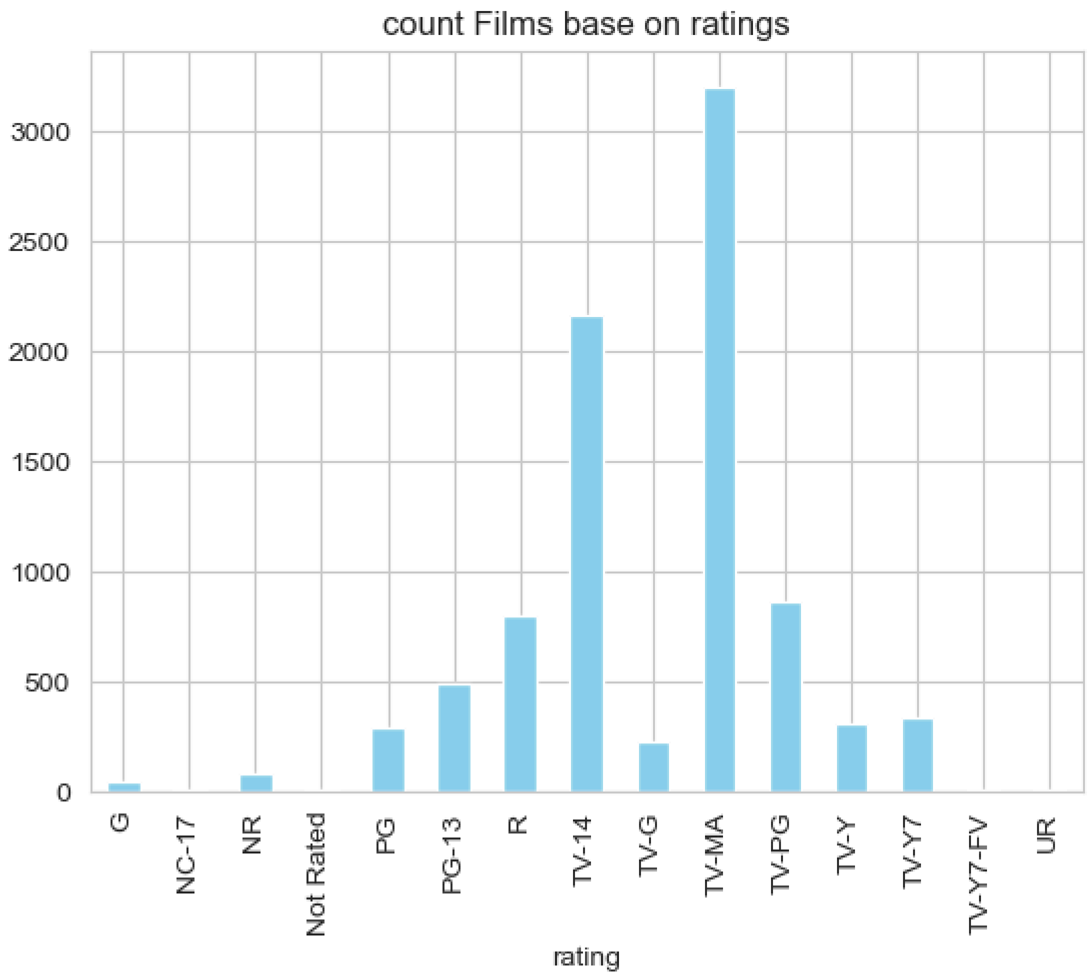
what type of rating have, what rating movies have highest count?

```
In [129…  rating_movie_count = netflix_movies_df.groupby('rating')['title'].count()
          rating_movie_count
```

```
Out[129]: rating
          G               41
          NC-17            3
          NR              80
          Not Rated        7
          PG             287
          PG-13          490
          R              799
          TV-14         2160
          TV-G           220
          TV-MA         3207
          TV-PG          863
          TV-Y           307
          TV-Y7          334
          TV-Y7-FV         6
          UR               3
          Name: title, dtype: int64
```

```
In [131…  rating_movie_count.plot(kind = 'bar', color = 'skyblue')
          plt.title('count Films base on ratings')
```

```
Out[131]: Text(0.5, 1.0, 'count Films base on ratings')
```



Deep Analysis:

what year has more movies added the most?

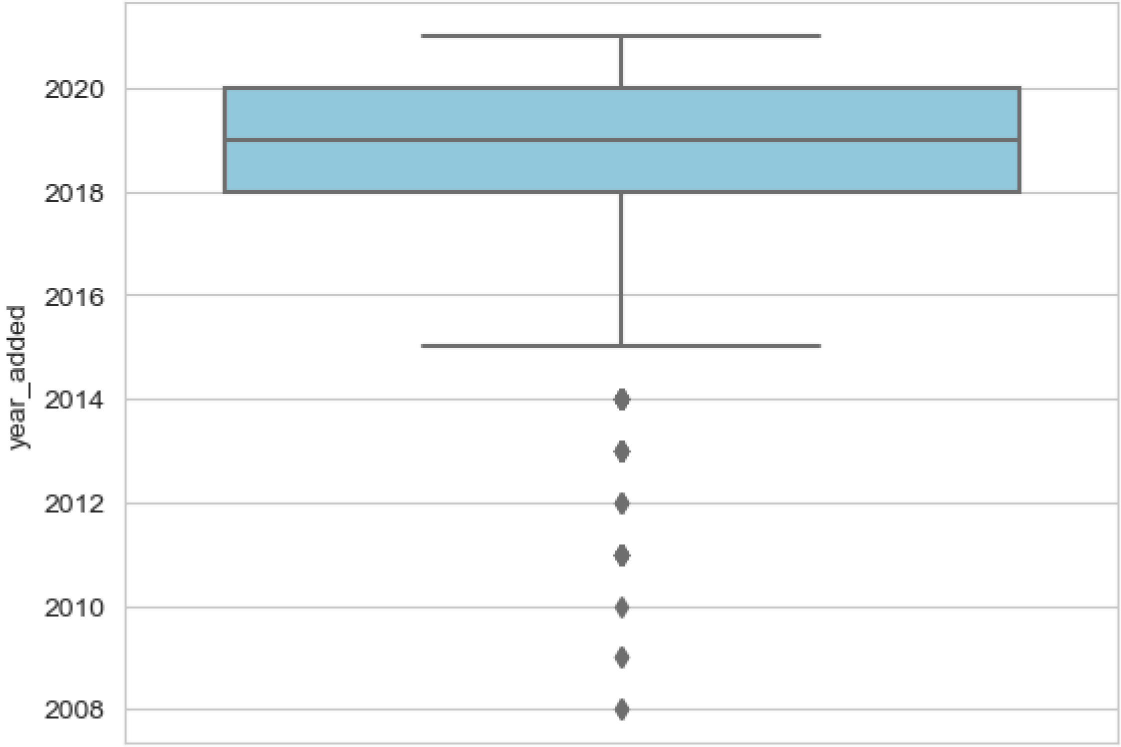
first what are outliers

In [153…

```
sns.boxplot(y=netflix_movies_df['year_added'], color='skyblue')
```

Out[153]:

```
<Axes: ylabel='year_added'>
```



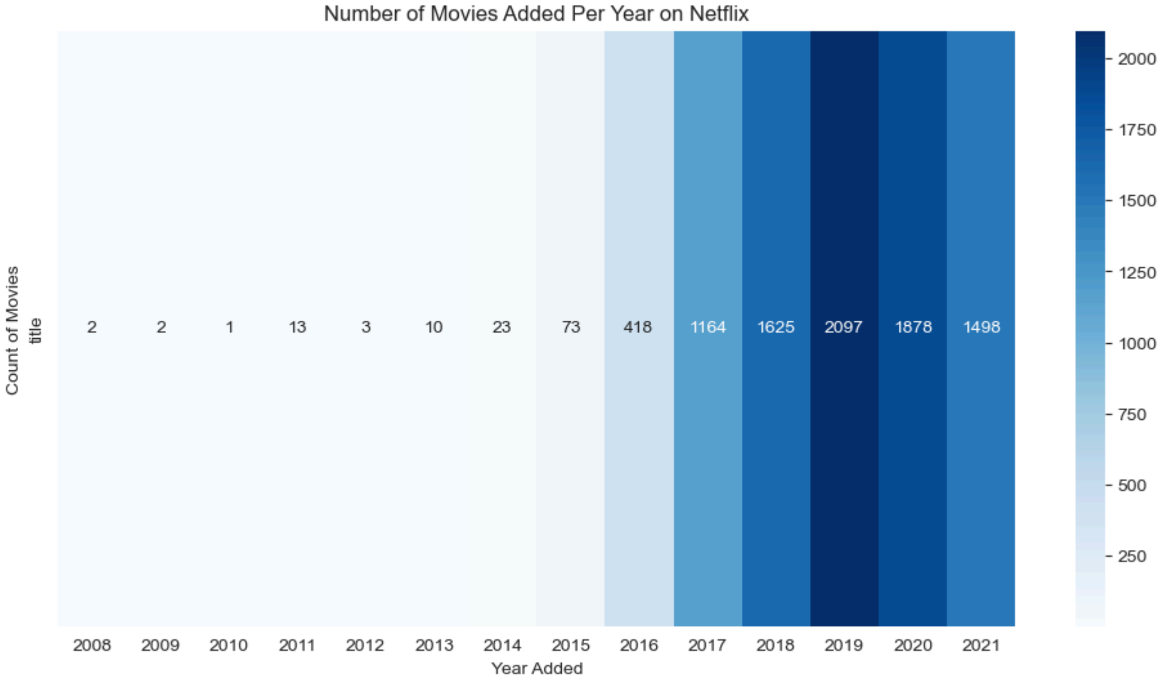
what years movies added count

```
In [159…  netflix_movies_df['year_added'] = netflix_movies_df['date_added'].dt.year

          year_movie_count = netflix_movies_df.groupby('year_added')['title'].count(

          # Step 3: Pivot the DataFrame for heatmap
          year_movie_count_pivot = year_movie_count.set_index('year_added').T

          # Step 4: Plot the heatmap
          plt.figure(figsize=(12, 6))
          sns.heatmap(year_movie_count_pivot, annot=True, fmt="d", cmap="Blues", cba
          plt.title('Number of Movies Added Per Year on Netflix')
          plt.xlabel('Year Added')
          plt.ylabel('Count of Movies')
          plt.show()
```



what will be the month with most movies added?

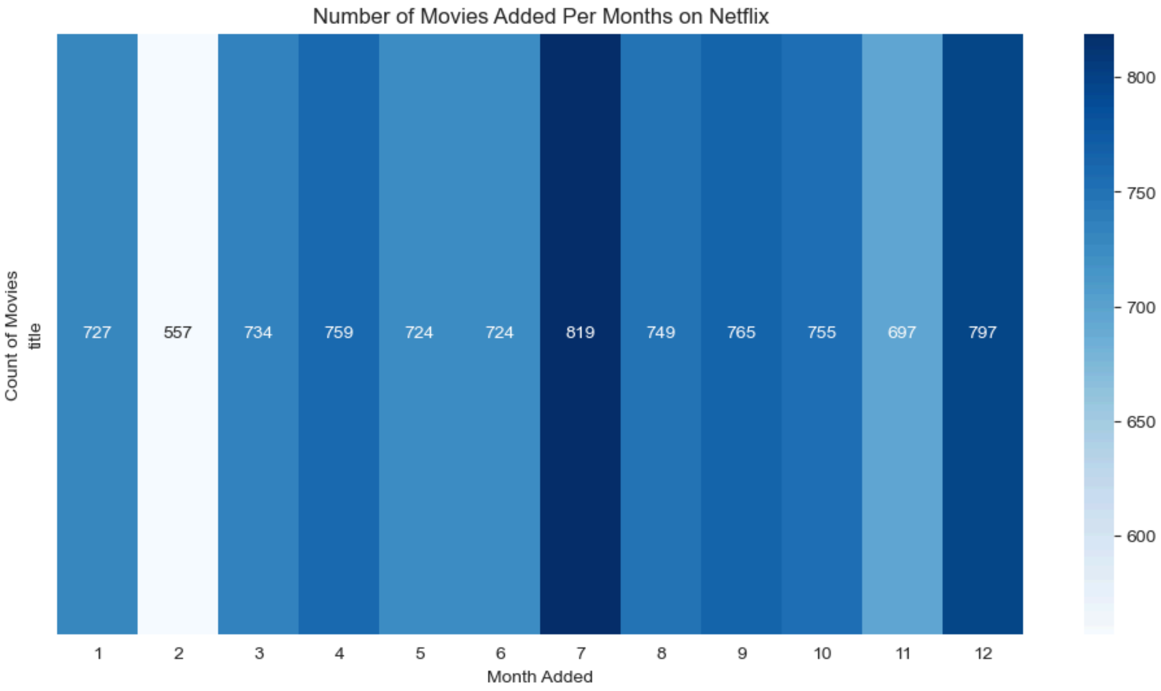
In [95]:

```
netflix_movies_df['months_added'] = netflix_movies_df['date_added'].dt.mon

month_movie_count = netflix_movies_df.groupby('months_added')['title'].cou

# Step 3: Pivot the DataFrame for heatmap
month_movie_count_pivot = month_movie_count.set_index('months_added').T

# Step 4: Plot the heatmap
plt.figure(figsize=(12, 6))
sns.heatmap(month_movie_count_pivot, annot=True, fmt="d", cmap="Blues", cb
plt.title('Number of Movies Added Per Months on Netflix')
plt.xlabel('Month Added')
plt.ylabel('Count of Movies')
plt.show()
```



This shows movies adding in every month except february

In [145…

```
netflix_movies_df['duration'] = (netflix_movies_df['date_added'].dt.year -
```

In [147…

```
netflix_movies_df['duration'].describe()
```

Out[147]:

```
count    8807.000000
mean        4.708981
std         8.785874
min        -3.000000
25%         0.000000
50%         1.000000
75%         5.000000
max        93.000000
Name: duration, dtype: float64
```

here min is in negative because we added assumption of date_added that is before than release year so that is why it shows negative

This year Analysis of Movies [latest in dataset]

In [129…

```
filtered_df = netflix_movies_df[(netflix_movies_df['date_added'] >= '2021-
```

Sliced the Data 2021:2022

In [69]:

```
filtered_countType_df = filtered_df.groupby('type')['title'].count()
filtered_countType_df
```

Out[69]:

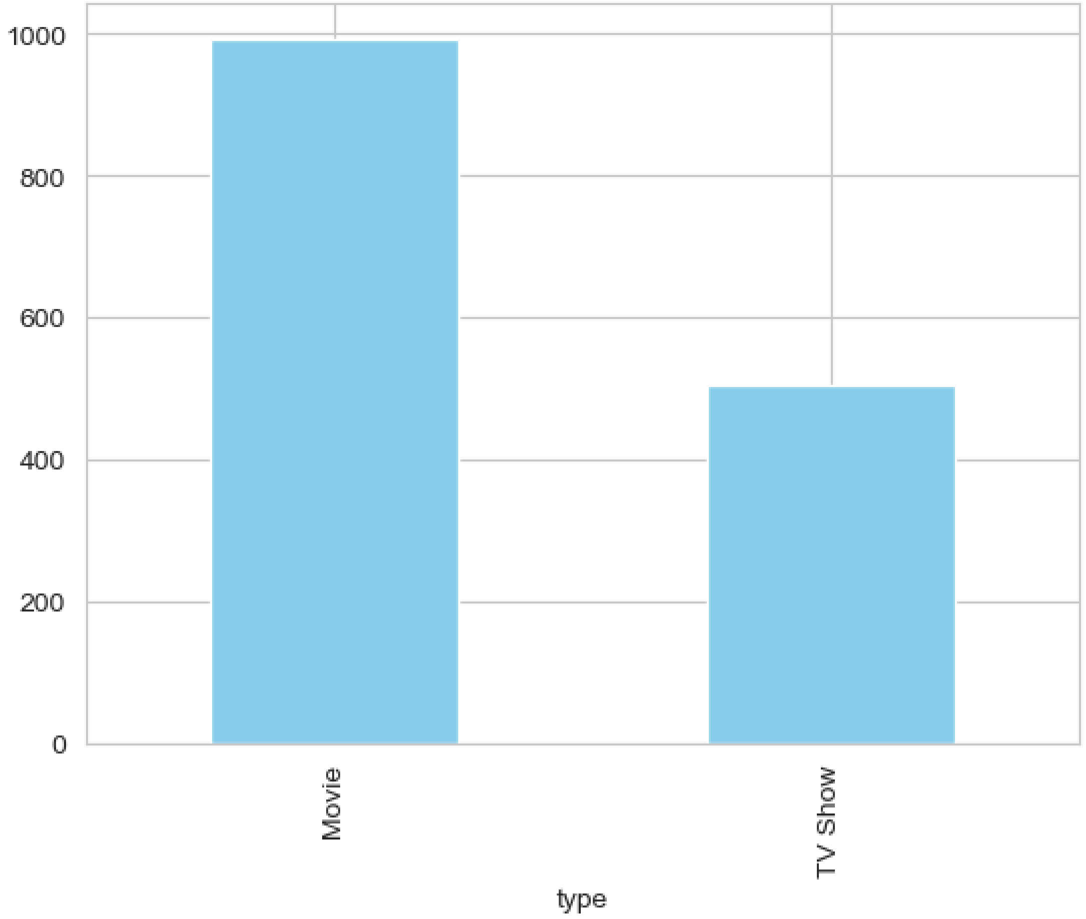
```
type
Movie      993
TV Show    505
Name: title, dtype: int64
```

In [71]:

```
filtered_countType_df.plot(kind = 'bar', color='skyblue')
```

Out[71]:

```
<Axes: xlabel='type'>
```



In [75]:

```
filtered_countRating_df = filtered_df.groupby('rating')['title'].count()
filtered_countRating_df
```

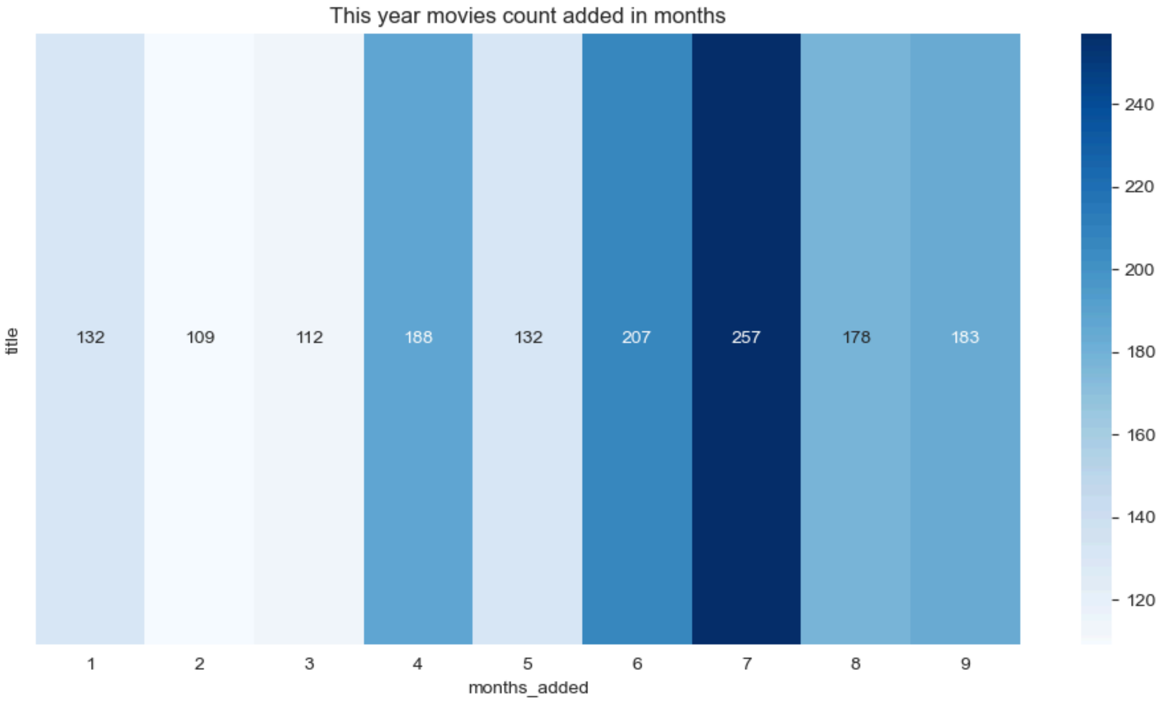
Out[75]:
```
rating
G           4
PG         58
PG-13     146
R         190
TV-14     326
TV-G       44
TV-MA     489
TV-PG      97
TV-Y       57
TV-Y7      87
Name: title, dtype: int64
```

In [93]:
```
plt.figure(figsize=(12,6))
filtered_monthlyRevenueThisYEar = filtered_df.groupby('months_added')['tit

filtered_monthlyRevenueThisYEar_df = filtered_monthlyRevenueThisYEar.set_i

sns.heatmap(filtered_monthlyRevenueThisYEar_df, annot=True, fmt="d", cmap=
plt.title('This year movies count added in months')
```

Out[93]:
```
Text(0.5, 1.0, 'This year movies count added in months')
```



so most movies added in this year in june or july

In [151…
```
filtered_df['duration'].describe()
```

Out[151]:
```
count    1498.000000
mean        5.750334
std         9.178211
min         0.000000
25%         0.000000
50%         1.000000
75%         8.000000
max        76.000000
Name: duration, dtype: float64
```

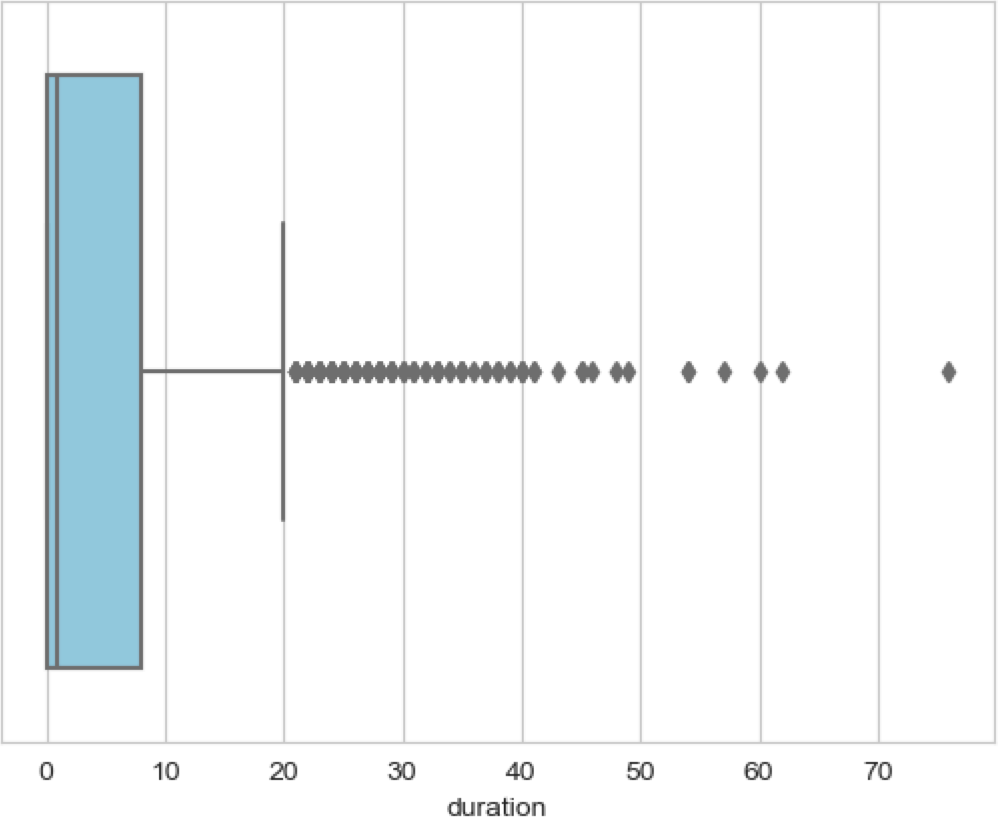
this shows even this year many old movies also added, that is affecting average time period to added the movie

In [163…

```
sns.boxplot(x=filtered_df['duration'], color='skyblue')
```

Out[163]:

```
<Axes: xlabel='duration'>
```



this helps graphically helps us to understand that mostly movies added within year, the average timestamp of movie added is affective due to old movies added this year including older than 20 year or more old movies

In [225…

```
Q3 = filtered_df['duration'].quantile(0.75)
Q1 = filtered_df['duration'].quantile(0.25)

IQR = Q3 - Q1

upper_bound = Q3 + 1.5 * IQR
lower_bound = Q1 - 1.5 * IQR
```

In [255…

```
outlirsDuration_df = filtered_df[filtered_df['duration'] >= upper_bound]
outlirsDuration_df.head(5)
```

Out[255]:

show_id	type	title	director	cast	country	date_added	release_year	ra
s8	Movie	Sankofa	Haile Gerima	Kofi Ghanaba, Oyafunmike Ogunlano, Alexandra D...	United States, Ghana, Burkina Faso, United Kin...	2021-09-24	1993-01-01	
s23	Movie	Avvai Shanmughi	K.S. Ravikumar	Kamal Hassan, Meena, Gemini Ganesan, Heera Raj...	Not Added	2021-09-21	1996-01-01	
s25	Movie	Jeans	S. Shankar	Prashanth, Aishwarya Rai Bachchan, Sri Lakshmi...	India	2021-09-21	1998-01-01	T
s27	Movie	Minsara Kanavu	Rajiv Menon	Arvind Swamy, Kajol, Prabhu Deva, Nassar, S.P....	Not Added	2021-09-21	1997-01-01	
s42	Movie	Jaws	Steven Spielberg	Roy Scheider, Robert Shaw, Richard Dreyfuss, L...	United States	2021-09-16	1975-01-01	

so these are outliers let's move forward

In [232…

```
outlirsDuration_df['duration'].mean()
```

Out[232]:

```
27.694267515923567
```

this shows outliers average is 27 years to added the movie

In [250…

```
filtered_outliersDuration_df = (filtered_df[(filtered_df['duration'] <= up
filtered_outliersDuration_df['duration'].describe()
```

Out[250]:

```
count    1381.000000
mean        3.636495
std         5.105093
min         0.000000
25%         0.000000
50%         1.000000
75%         6.000000
max        20.000000
Name: duration, dtype: float64
```

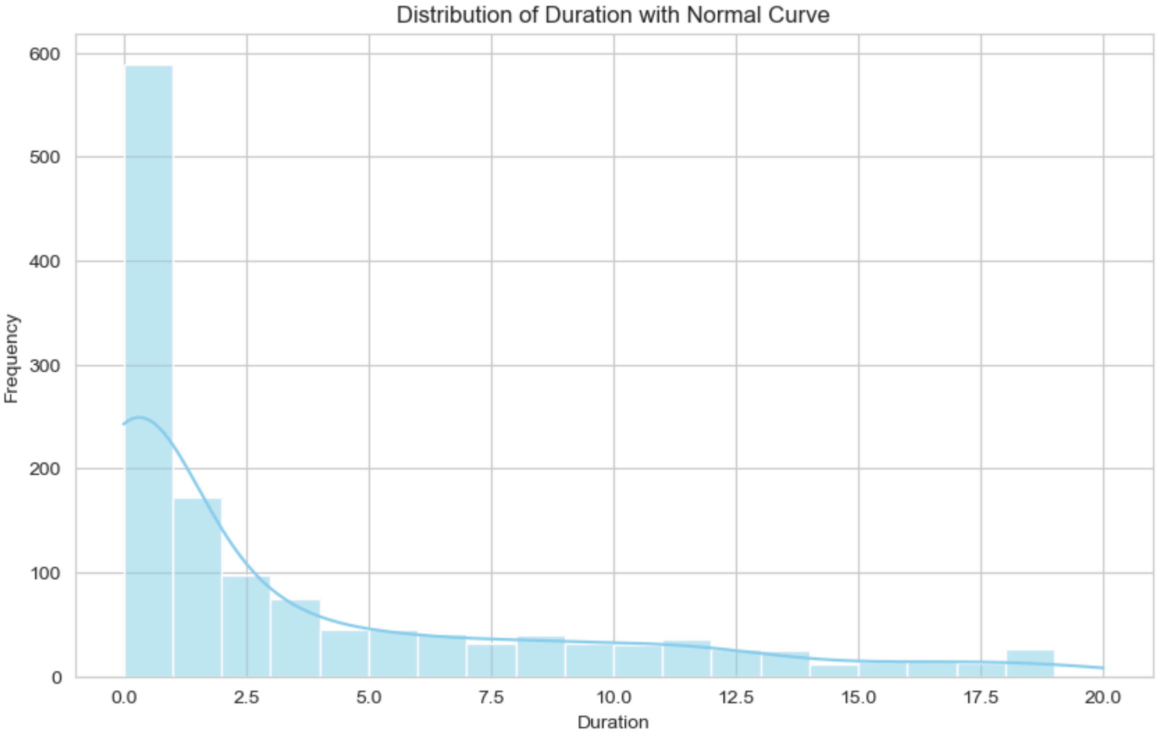
In [265…

```
# Plotting the histogram with a density curve
plt.figure(figsize=(10, 6))
binsSize = np.arange(0, 20, 1)
```

```
sns.histplot(filtered_outliersDuration_df['duration'], kde=True, bins=bins

# Adding labels and title
plt.title('Distribution of Duration with Normal Curve')
plt.xlabel('Duration')
plt.ylabel('Frequency')

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



so now you can after removing outlier, average decreases so now movies added very quickly average also decrease to 3.6 years with less more outliers and variation way less

> and more than 500 films added within year

In [ ]:

```
# Calculate Q1 (25th percentile) and Q3 (75th percentile)
Q1 = emp_df['Salary'].quantile(0.25)
Q3 = emp_df['Salary'].quantile(0.75)

# Calculate IQR
IQR = Q3 - Q1


upper_bound = Q3 + 1.4 * IQR
```

Netflix Users Analysis

In [395…

```
netflix_users_df.head(5)
```

Out[395]:

	Subscription Type	Monthly Revenue	Join Date	Last Payment Date	Country	Age	Gender	Device	P Durat
User ID									
1	Basic	10	2022-01-15	2023-06-10	United States	28	Male	Smartphone	1 Mo
2	Premium	15	2021-09-05	2023-06-22	Canada	35	Female	Tablet	1 Mo
3	Standard	12	2023-02-28	2023-06-27	United Kingdom	42	Male	Smart TV	1 Mo
4	Standard	12	2022-07-10	2023-06-26	Australia	51	Female	Laptop	1 Mo
5	Basic	10	2023-05-01	2023-06-28	Germany	33	Male	Smartphone	1 Mo

Basic Analysis:

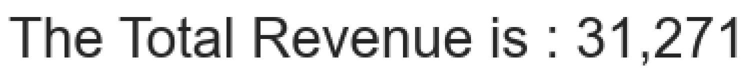
In [462…

```
monthlyRevenueTotal = netflix_users_df['Monthly Revenue'].sum()
monthlyRevenueAvg = netflix_users_df['Monthly Revenue'].mean()
fig, ax = plt.subplots( figsize=(1,1))

# Hide the axes
ax.axis('off')

# Display the total discounted price as a large text
ax.text(0.5, 0.5, f'The Total Revenue is : {monthlyRevenueTotal:,}',
        fontsize=20, ha='center', va='center')


plt.show()
```



The Total Revenue is : 31,271

In [496…

```
last_month = netflix_users_df['Join Date'].dt.to_period('M').max()

# Filter the DataFrame for the last month
last_month_df = netflix_users_df[netflix_users_df['Join Date'].dt.to_perio
LMRevenue = last_month_df['Monthly Revenue'].sum()

fig, ax = plt.subplots( figsize=(1,1))

# Hide the axes
ax.axis('off')

# Display the total discounted price as a large text
ax.text(0.5, 0.5, f'The Last Month Revenue is : {LMRevenue :,}',
        fontsize=20, ha='center', va='center')


plt.show()
```

The Last Month Revenue is : 35

In [513…

```
unique_months = netflix_users_df['Join Date'].dt.to_period('M').unique()
unique_months = sorted(unique_months, reverse=True)

# Get the second-to-last month
second_last_month = unique_months[1]
second_last_month

SecondLast_month_df = netflix_users_df[netflix_users_df['Join Date'].dt.to

SecondLastMR_month_df = SecondLast_month_df['Monthly Revenue'].sum()

fig, ax = plt.subplots( figsize=(1,1))

# Hide the axes
ax.axis('off')

# Display the total discounted price as a large text
ax.text(0.5, 0.5, f'The Second Last Month Revenue is : {SecondLastMR_month
        fontsize=20, ha='center', va='center')


plt.show()
```

The Second Last Month Revenue is : 52

In [468…

```
monthlyRevenueAvg = netflix_users_df['Monthly Revenue'].mean()
fig, ax = plt.subplots( figsize=(1,1))

ax.axis('off')

# Display the total discounted price as a large text
ax.text(0.5, 0.5, f'The Revenue generated by each person is : {monthlyReve
        fontsize=20, ha='center', va='center')

plt.show()
```

The Revenue generated by each person is : 12.5084

Deep Analysis:

In [87]:

```
user_typeCount_df = netflix_users_df.groupby('Subscription Type')['Monthly
user_typeCount_df
```

Out[87]:

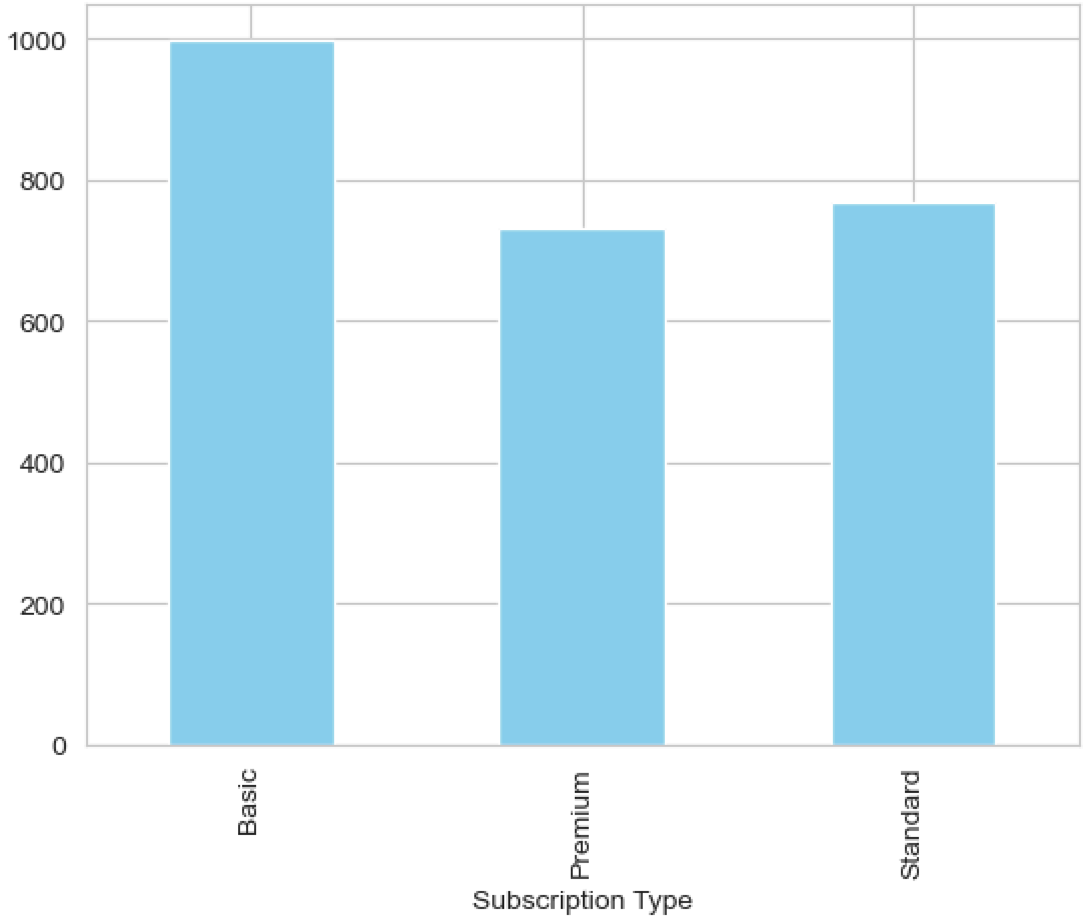
```
Subscription Type
Basic       999
Premium     733
Standard    768
Name: Monthly Revenue, dtype: int64
```

In [89]:

```
user_typeCount_df.plot(kind = 'bar', color='skyblue')
```

Out[89]:

```
<Axes: xlabel='Subscription Type'>
```



In [91]:

```
user_typeMR_df = netflix_users_df.groupby('Subscription Type')['Monthly Re
user_typeMR_df
```

Out[91]:

```
Subscription Type
Basic       12469
Premium      9229
Standard     9573
Name: Monthly Revenue, dtype: int64
```

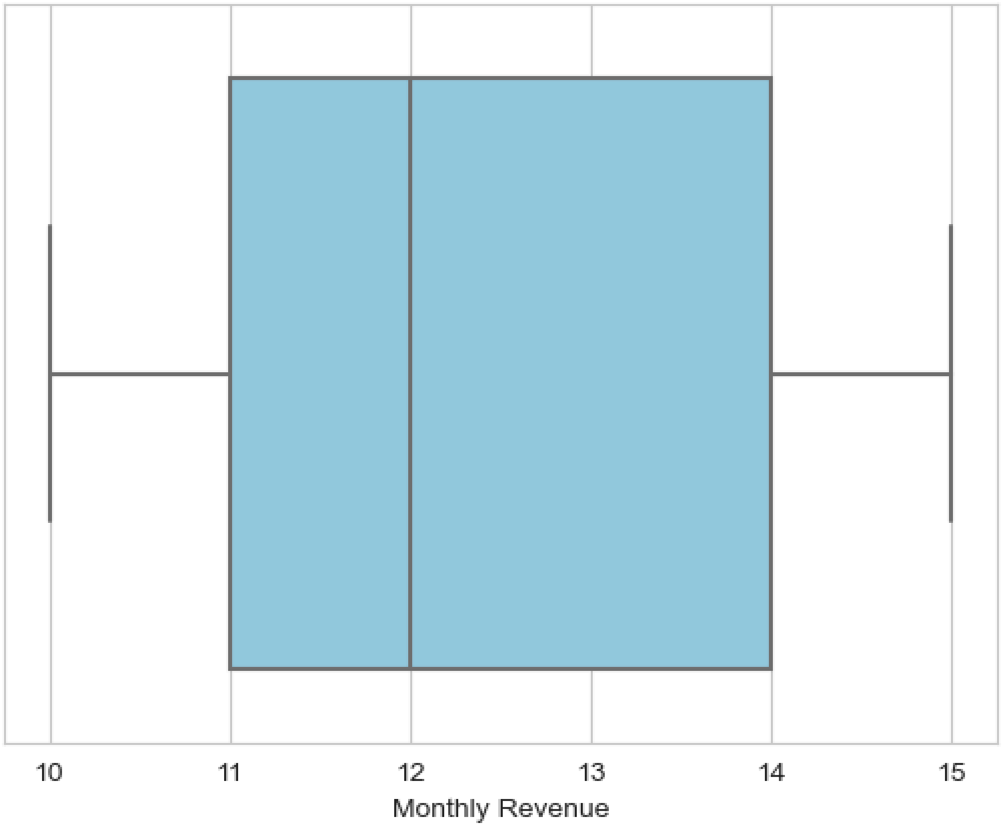
Checking for outliers

In [168…

```
sns.boxplot(x=netflix_users_df['Monthly Revenue'], color='skyblue')
```

Out[168]:

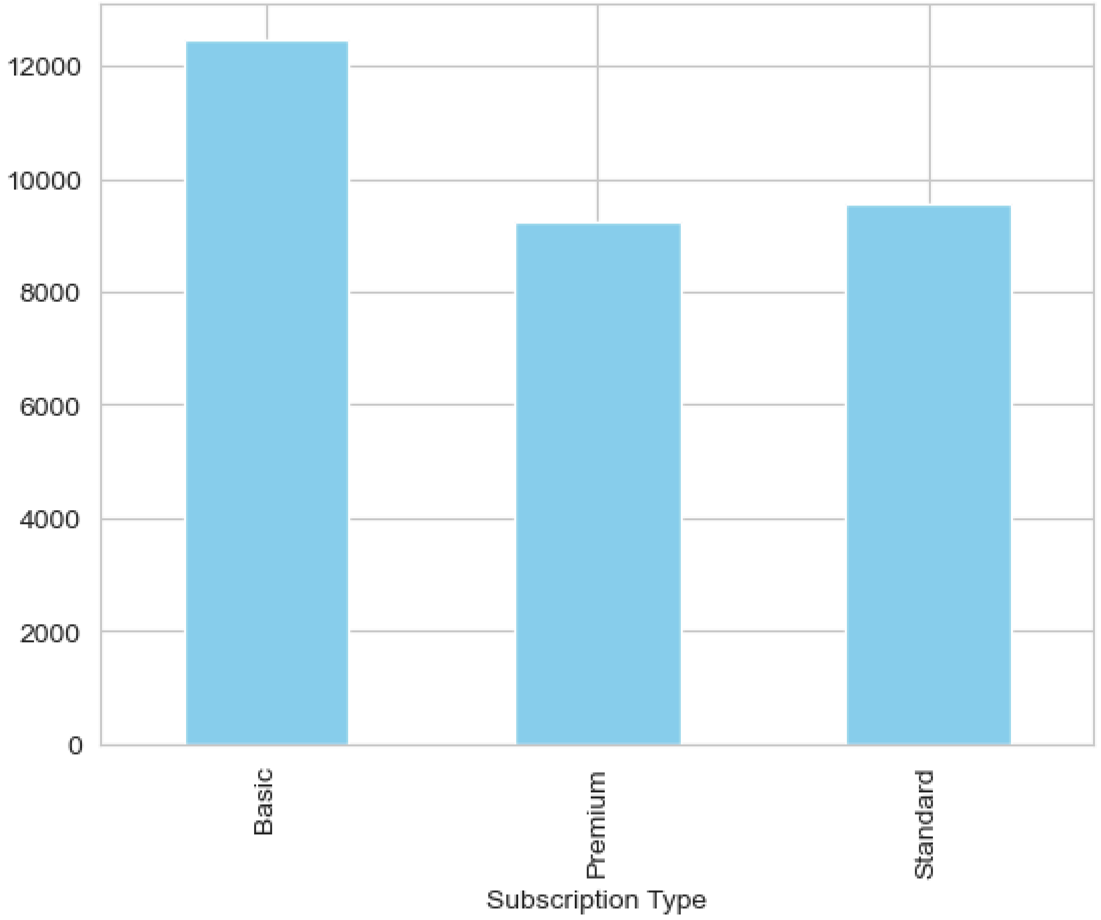
```
<Axes: xlabel='Monthly Revenue'>
```



so no outliers exists, let's move forward

```
In [93]: user_typeMR_df.plot(kind = 'bar', color='skyblue')
```

```
Out[93]: <Axes: xlabel='Subscription Type'>
```



In [95]:

```
user_countryCount_df = netflix_users_df.groupby('Country')['Monthly Revenu
user_countryCount_df
```

Out[95]:

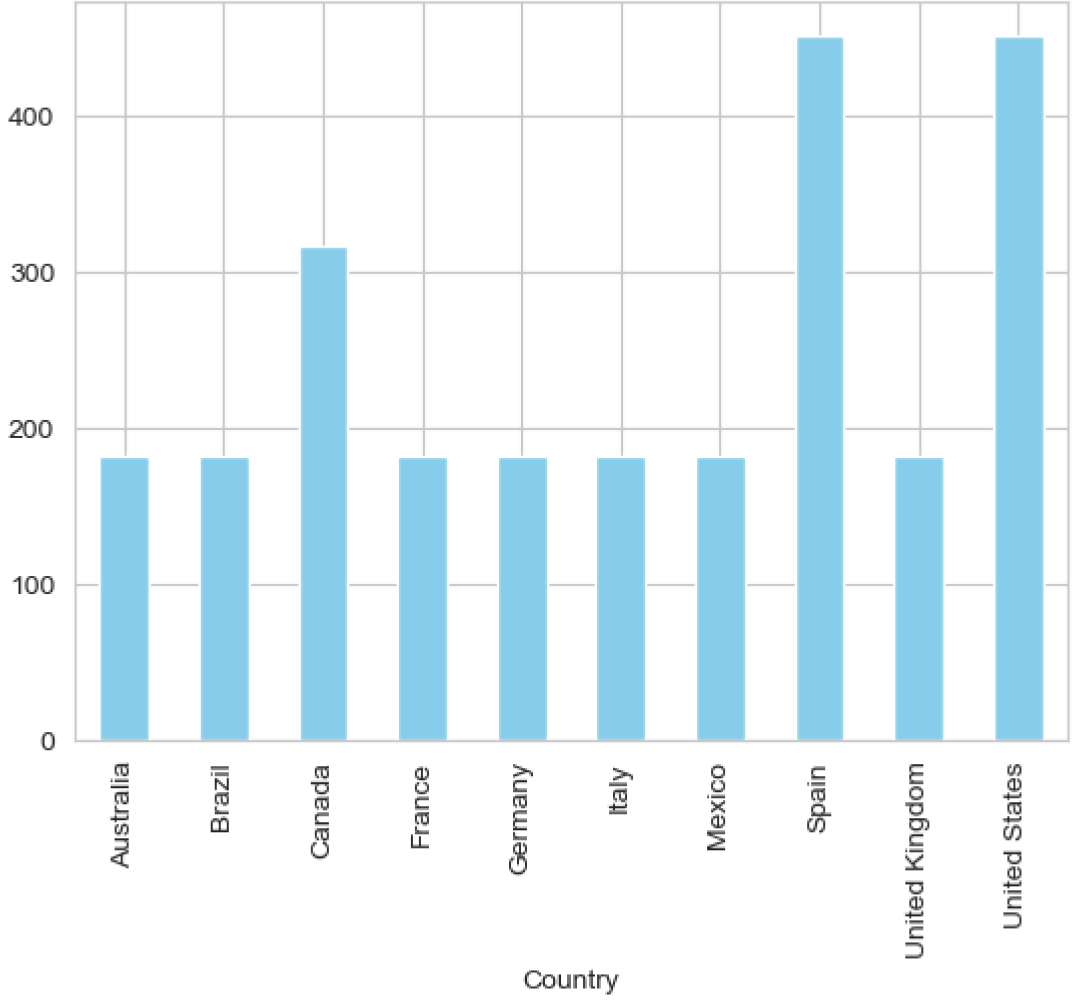
```
Country
Australia         183
Brazil            183
Canada            317
France            183
Germany           183
Italy             183
Mexico            183
Spain             451
United Kingdom    183
United States     451
Name: Monthly Revenue, dtype: int64
```

In [97]:

```
user_countryCount_df.plot(kind = 'bar', color='skyblue')
```

Out[97]:

```
<Axes: xlabel='Country'>
```



In [376…

```
netflix_usersDevCount_df = netflix_users_df.groupby('Device')['Join Date']
netflix_usersDevCount_df
```

Out[376]:

```
Device
Laptop        636
Smart TV      610
Smartphone    621
Tablet        633
Name: Join Date, dtype: int64
```

In [405…

```
netflix_usersPlanDuration_df = netflix_users_df.groupby('Plan Duration')['
```

```
netflix_usersPlanDuration_df
```

Out[405]:

```
Plan Duration
1 Month    2500
Name: Join Date, dtype: int64
```

This year User Analysis {latest}

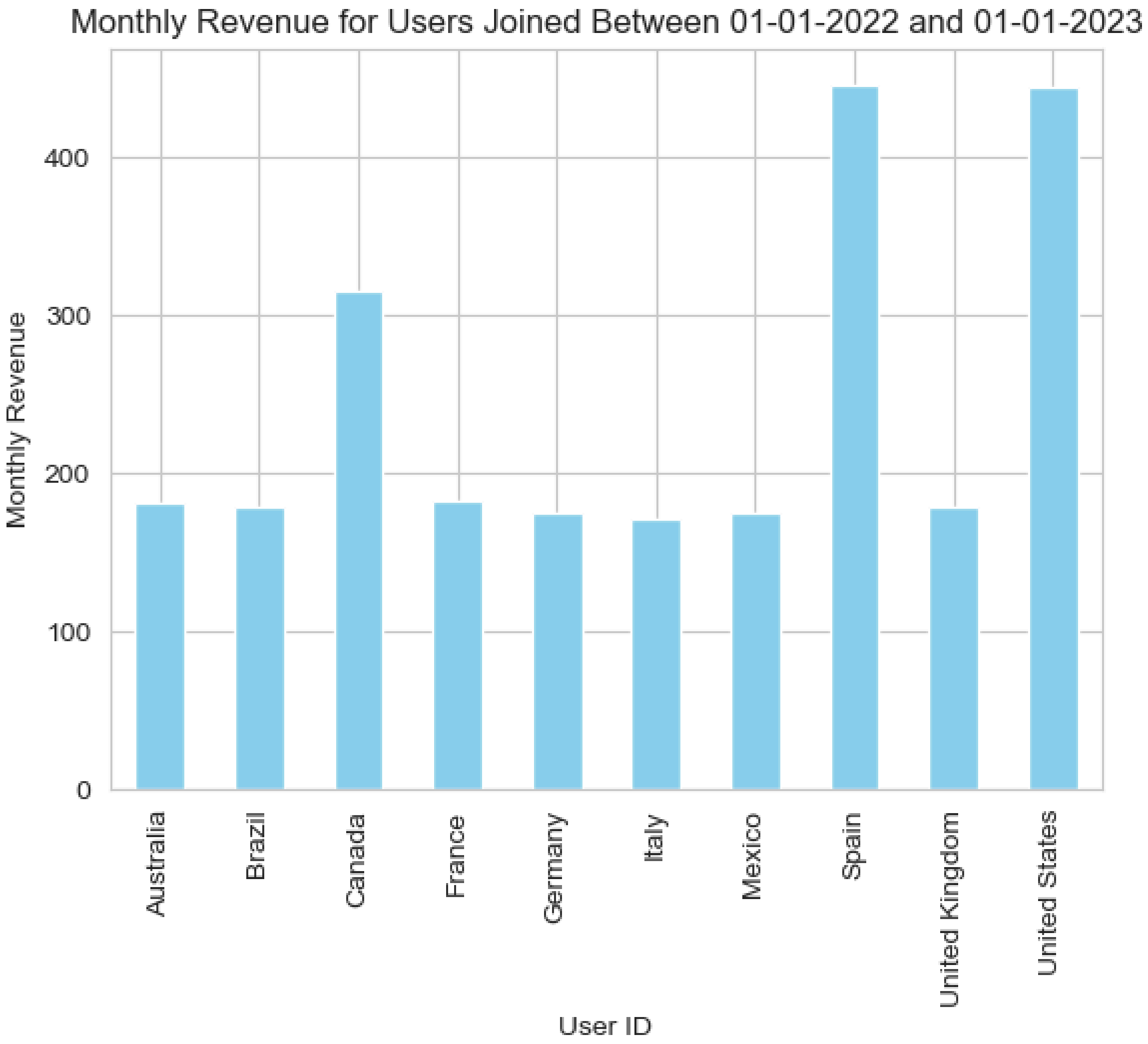
In [388…

```
filtered_users_df = netflix_users_df[(netflix_users_df['Join Date'] >= '20
```

Sliced the data for 2022:2023

In [390…

```
filtered_country_df = filtered_users_df.groupby('Country')['Monthly Revenu
# Plot the 'Monthly Revenue' of the filtered data
filtered_country_df.plot(kind='bar', title='Monthly Revenue for Users Join
plt.xlabel('User ID')
plt.ylabel('Monthly Revenue')
plt.show()
```



In [322…

```
filtered_users_df = filtered_users_df.copy()
```

In [335…

```
filtered_users_df['month_join'] = filtered_users_df['Join Date'].dt.month
```

In [345…

```
filtered_users_df['month_till_next_pay'] = filtered_users_df['Last Payment
```

In [371…

```
fig, ax = plt.subplots(nrows=2, figsize=(12, 6))
```

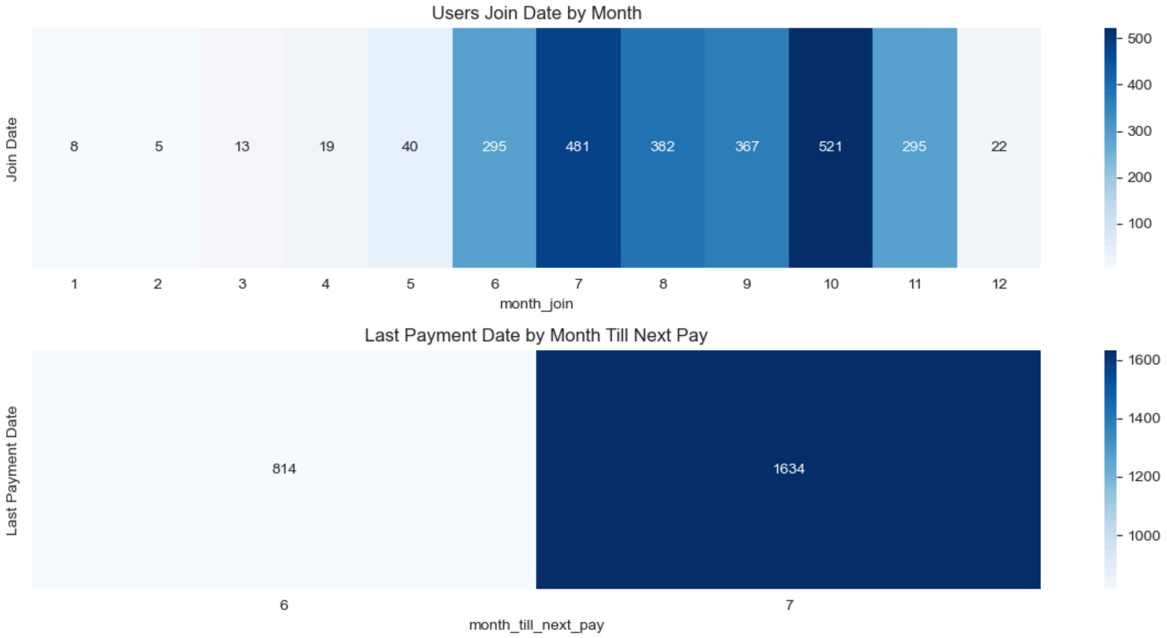
```
# Group and pivot the data for the first heatmap (Join Date by month)
filtered_usersMonthlyJoin_df = filtered_users_df.groupby('month_join')['Jo
filtered_usersMonthlyJoin_pivot_df = filtered_usersMonthlyJoin_df.set_inde

# Plot the first heatmap
sns.heatmap(filtered_usersMonthlyJoin_pivot_df, ax=ax[0], annot=True, fmt=
ax[0].set_title('Users Join Date by Month')

# Group and pivot the data for the second heatmap (Last Payment Date by mo
filtered_usersMonthlyLP_df = filtered_users_df.groupby('month_till_next_pa
filtered_usersMonthlyLP_pivot_df = filtered_usersMonthlyLP_df.set_index('m

# Plot the second heatmap
sns.heatmap(filtered_usersMonthlyLP_pivot_df, ax=ax[1], annot=True, fmt='d
ax[1].set_title('Last Payment Date by Month Till Next Pay')

# Display the plot
plt.tight_layout()
plt.show()
```



In [378…

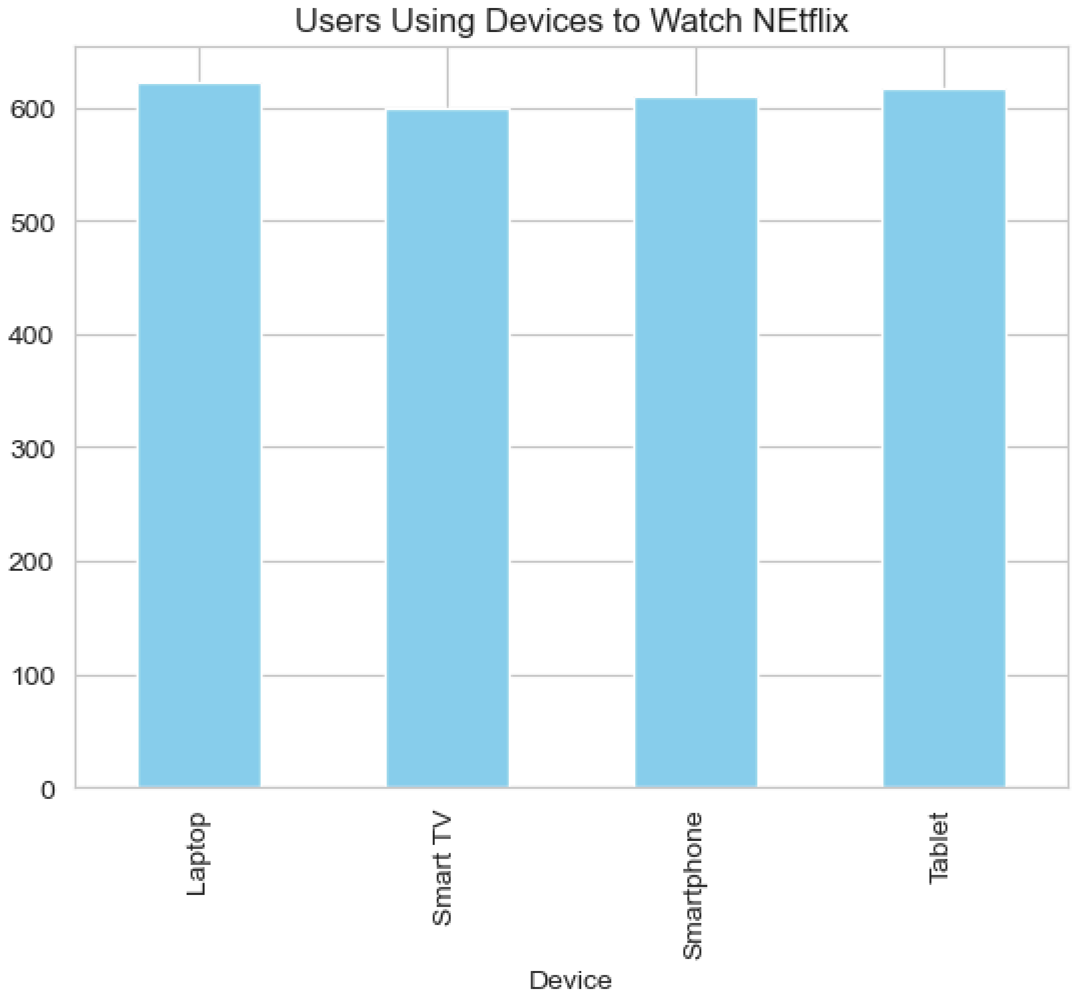
```
filtered_usersDevCount_df = filtered_users_df.groupby('Device')['Join Date
```

In [386…

```
filtered_usersDevCount_df.plot(kind='bar', color='skyblue')
plt.title('Users Using Devices to Watch NEtflix')
```

Out[386]:

```
Text(0.5, 1.0, 'Users Using Devices to Watch NEtflix')
```



Netflix Data Analysis

Introduction

In this analysis, we explore two datasets related to Netflix to extract meaningful insights. The datasets analyzed are:

1. **Netflix Userbase**
2. **Netflix Movies**

---

1. Netflix Userbase Analysis

Demographics and Subscription Details

- **Age Distribution**:
    - The age distribution of Netflix users reveals which age brackets are most represented. This can help tailor content and marketing strategies to target these specific groups.
- **Geographical Distribution**:

  - Users are distributed across various countries, with some regions contributing more significantly to the subscriber base and revenue. This segmentation allows Netflix to understand regional preferences and adjust its offerings accordingly.

Subscription Trends

- **Monthly Revenue Analysis**:

  - We filtered the user data for those who joined between January 2022 and January 2023. Analyzing the monthly revenue from these new users helps identify seasonal trends in sign-ups and their impact on overall revenue.

- **Churn Analysis**:

  - By examining the last payment dates and correlating them with user activity, we can identify patterns in user churn. This analysis is crucial for developing strategies to reduce churn rates and improve retention.

Device Usage

- **Device Popularity**:
  - The analysis shows which devices are most popular among Netflix users (e.g., mobile, tablet, desktop, smart TVs). Understanding device preferences is essential for optimizing the viewing experience across different platforms.

---

2. Netflix Movies Analysis

Content Library Overview

- **Genre Popularity**:

  - The breakdown of Netflix's content library by genre helps identify the most popular genres among users. This insight is valuable for content acquisition and production decisions to keep the library appealing to a broad audience.

- **Ratings and Reviews**:

  - Analyzing the distribution of ratings across different titles provides insights into user satisfaction. High-rated content can be promoted more heavily, while low-rated content can be evaluated for improvement or removal.

Trends Over Time

- **Release Date Analysis**:

  - By examining the release dates of titles, we can identify trends in how frequently new content is added to Netflix. This analysis can also show how the frequency of new releases correlates with user engagement.

- **Content Longevity**:
  - Some content remains popular long after its release, while others quickly lose viewership. Analyzing content longevity helps understand what keeps certain shows or movies popular over time.

Content Performance

- **Top-Performing Titles**:
  - Identifying the top-performing titles in terms of viewership and ratings offers insights into the types of content that resonate most with the audience. These titles can serve as benchmarks for future content strategies.
- **Underperforming Content**:
  - Analyzing underperforming titles helps Netflix avoid similar content pitfalls in the future. Understanding why certain content fails to attract viewers is crucial for refining content strategies.

Conclusion

The comprehensive analysis of the Netflix Userbase and Titles datasets reveals critical insights that can inform Netflix's business strategies:

- **Enhance User Retention**:
  - By understanding churn patterns and device usage, Netflix can develop strategies to keep users engaged and improve retention rates.
- **Optimize Content Offerings**:
  - Detailed analysis of genre trends and content ratings can guide Netflix in acquiring or producing content that aligns with viewer preferences.
- **Drive Revenue Growth**:
  - Identifying revenue patterns and seasonal trends helps Netflix time its marketing efforts and promotions effectively, maximizing revenue potential.

This analysis underscores the importance of data-driven decision-making in optimizing both user experience and content strategy for sustained growth.

```
In [ ]:
```