# Netflix Data Visualization

## Problem Statement

Based on the Netflix dataset provided, here are several potential problem statements for data analysis and visualization:

Content Analysis by Country and Genre:
- "Explore the distribution of content (movies and TV shows) across different countries and genres to understand regional preferences and trends."

Trend Analysis Over Time:
- "Analyze the trend of content addition to Netflix over the years to identify patterns and changes in the streaming platform's offerings."

Director and Cast Influence:
- "Investigate the influence of directors and casts on the popularity and ratings of movies and TV shows available on Netflix."

Rating Distribution and Preferences:
- "Examine the distribution of content ratings on Netflix and explore viewer preferences for different rating categories."

Duration and Viewer Engagement:
- "Study the relationship between the duration of movies and TV shows available on Netflix and viewer engagement or popularity metrics."

Geographic Analysis:
- "Conduct a geographic analysis to visualize the availability of Netflix content across different countries and regions."

Content Recommendations:
- "Develop a content recommendation system based on user preferences, ratings, and viewing history from the Netflix dataset."

Content Diversity and Representation:
- "Investigate the diversity and representation of content across various genres, directors, casts, and countries available on Netflix."

Release Patterns and Strategies:
- "Explore the release patterns and strategies adopted by Netflix for adding new content to the platform and assess their impact on viewer engagement."

## Basic Info of given dataset

I named this dataframe as "netflix". The shape is (8807,12) and having some NAN values in the dataframe as follows.

```
netflix.shape

(8807, 12)

netflix.isna().sum()

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
```

Preprocessing of data: Dropped all NAN/Null values front the data. After preprocessing, the final shape of the data is (5332,12).

1. Find the counts of each categorical variable both using graphical and nongraphical analysis.
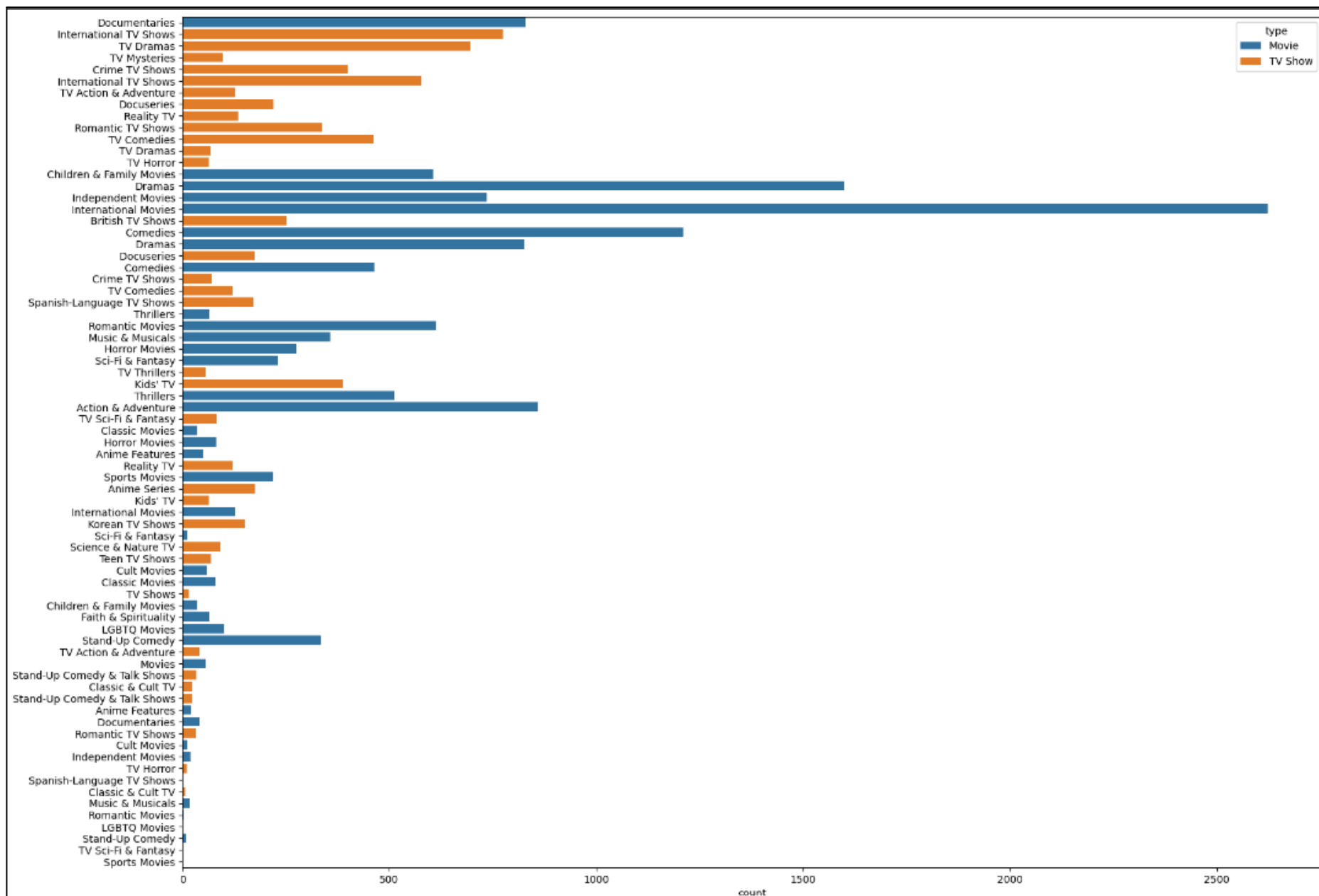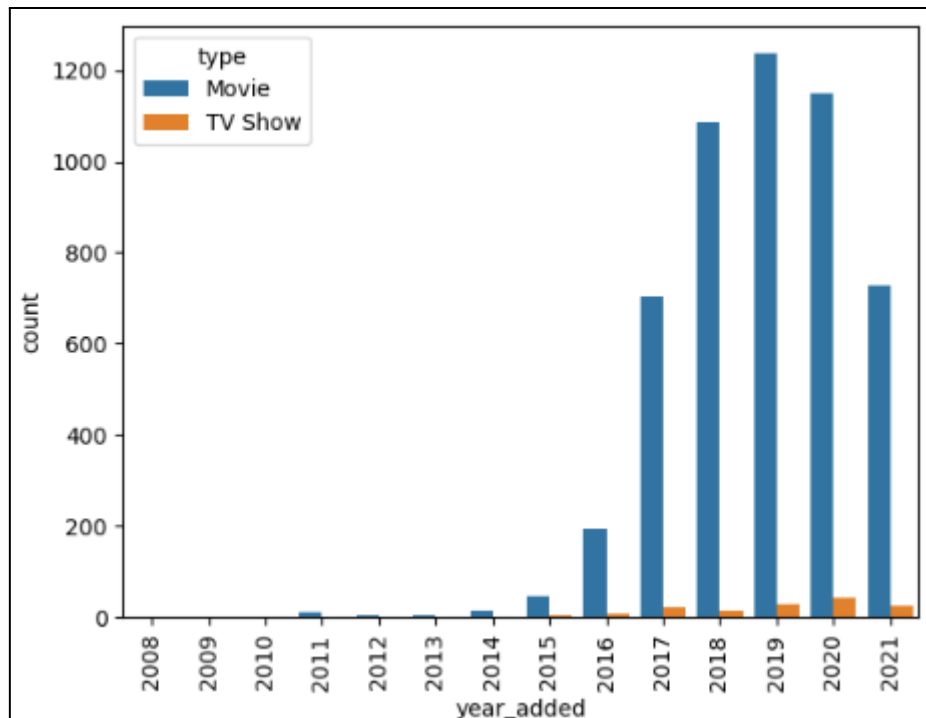   a) Quantity of contents as per data.

      Movie - 5185

      TV Show - 147

   b) Maximum and minimum Duration of the contents

      | type | max | min |
      | --- | --- | --- |
      | Movie | 99 min | 10 min |
      | TV Show | 9 Seasons | 1 Season |

   c) Genre of Contents: Find the below Chart.

2

Based on the provided counts of movies and TV shows, the maximum and minimum duration of contents here are the insights

Content Distribution:
- The majority of content on the streaming platform consists of movies, with a significantly larger number of movies (5185) compared to TV shows (147).
- This suggests that movies are more abundant and diverse in terms of the options for viewers.

Viewer Preferences:
- Viewers may have a greater variety of choices when it comes to selecting movies, potentially leading to more personalized viewing experiences based on individual preferences.
- TV shows, although fewer in number, might still attract viewers who prefer serialized storytelling and longer-term engagement with characters and plotlines.

Content Length:
- Movies typically have a finite duration, ranging from a few hours to several hours, while TV shows can vary significantly in length depending on the number of episodes and seasons.
- Viewers who prefer shorter, self-contained stories may gravitate towards movies, whereas those who enjoy longer narratives or episodic content might prefer TV shows.

Programming Strategy:

- The streaming platform's programming strategy may prioritize a diverse selection of movies to cater to a broad audience with varying tastes and preferences.
- The inclusion of a smaller number of TV shows may reflect a focus on quality over quantity, with curated selections that appeal to specific demographics or target markets.

Content Diversity:
- While movies offer a wide range of genres, themes, and storytelling formats, TV shows may provide opportunities for more in-depth character development, complex narratives, and serialized storytelling.
- The combination of movies and TV shows allows the streaming platform to offer a diverse and comprehensive entertainment experience to its subscribers.

Overall, the distribution of movies and TV shows on the streaming platform reflects a strategic balance between offering a broad selection of movies for diverse viewer preferences and curated TV shows for immersive, serialized storytelling experiences. Understanding viewer preferences and consumption patterns can inform content curation, acquisition, and production strategies to enhance user satisfaction and engagement.

**1.1** How has the number of movies released per year changed over the last 20-30 years?
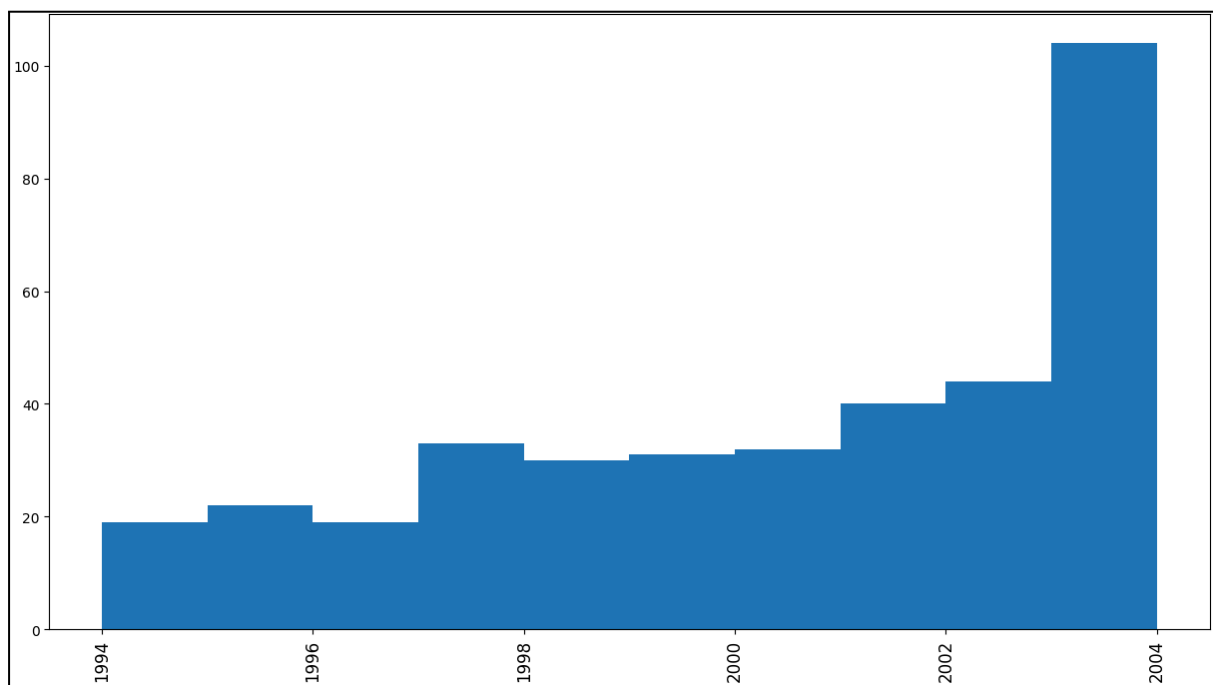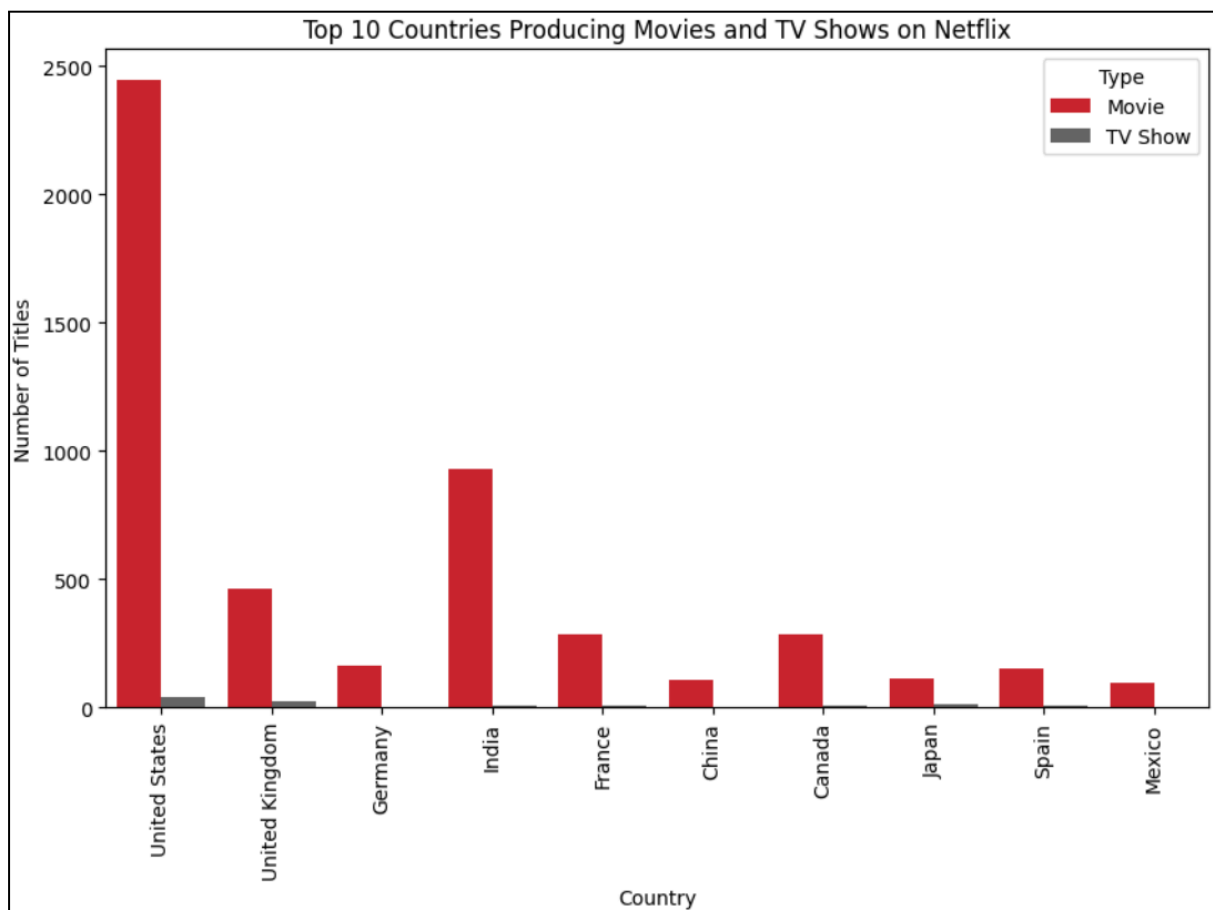
<u>Insight:</u>

The distribution of movie releases is left-skewed, indicating that the number of releases has increased over the years. This suggests a growing trend of movie production, potentially driven by factors such as increasing demand from viewers, expanding opportunities in the film industry, and the rise of online streaming platforms. The significant increase in movie content reflects the changing preferences of viewers, with more audiences turning to online streaming platforms for entertainment.

**2**. Comparison of TV shows vs Movies.
Finding the top 10 of the number of TV shows and Movies produced in each country.



Insight and recommendations:

Based on the plot above, it is evident that the majority of movies and TV shows are produced in the USA. However, it might be beneficial to produce more movies in countries with larger populations, such as India and China, as this could potentially lead to increased business opportunities.

**3**. What is the best time to launch a TV show or Movie?
 Plots are in the following sequence
   a. Finding the best week to release a TV show
   b. Finding the best week to release a Movie
   c. Finding the best months to release a TV show
   d. Finding the best months to release a Movie

**Finding the best week to release a TV show**



TV Shows added per week
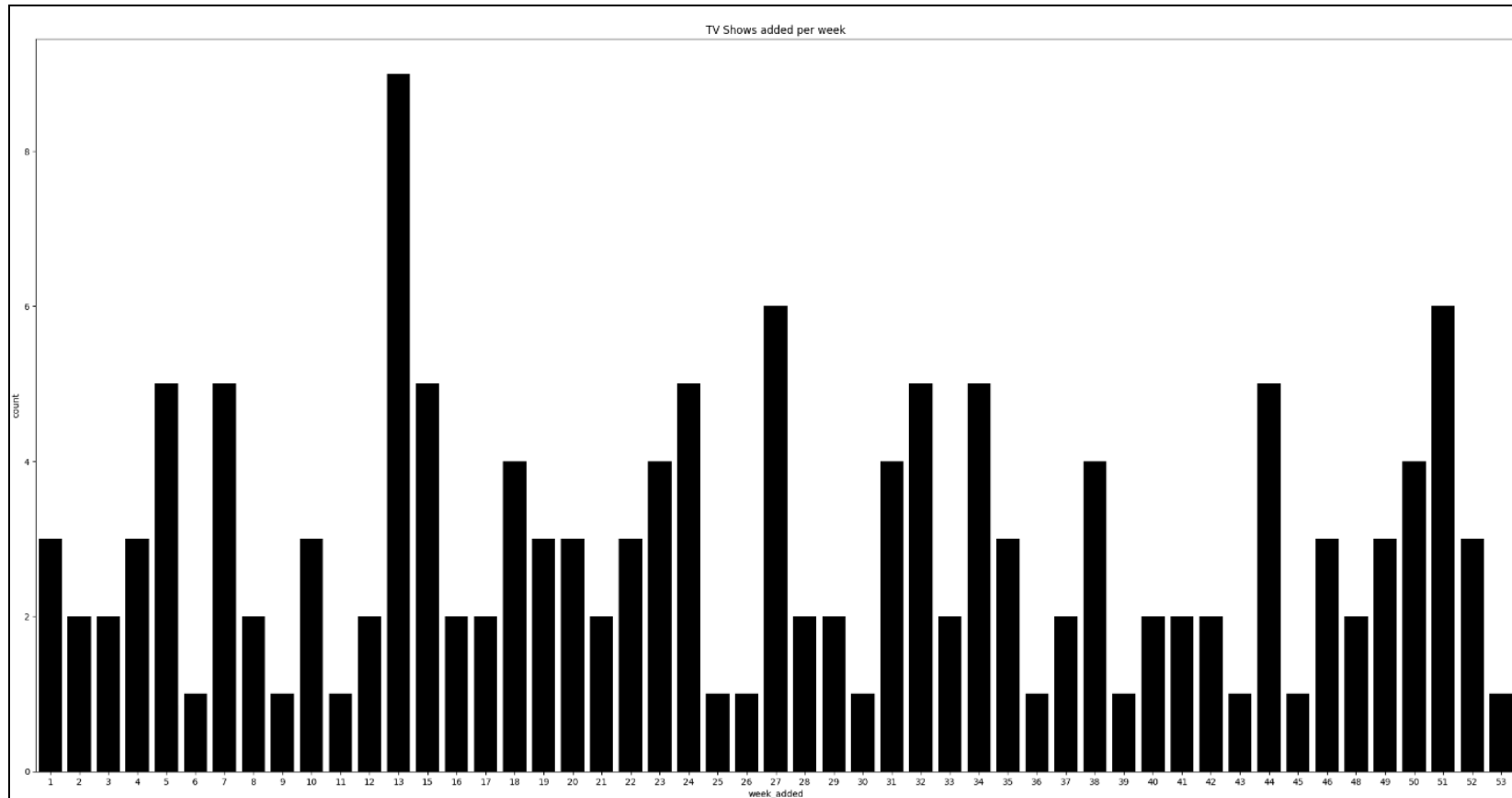
Insight:

During weeks numbered 6, 9, 11, 25, 26, 30, 36, 39, 43, 45, and 53, there appears to be a notable decrease in the number of releases. This trend might be attributed to the following factors:

Seasonal Patterns: TV show releases often exhibit seasonal fluctuations, resulting in fewer releases during specific periods of the year.

Strategic Timing: Production companies and networks may strategically avoid releasing TV shows during weeks with high competition or significant events, such as the launch of blockbuster movies or major TV specials.

Viewer Preferences: The timing of TV show releases can also be influenced by viewer behavior and preferences, which may vary depending on factors like holidays, sports events, or cultural festivities.

Recommendation:

Given the observed decrease in TV show releases during these weeks, it may be beneficial to explore the possibility of increasing TV show releases during these periods. However, any recommendation should be carefully evaluated, taking into account the following considerations:

Audience Demand: Assess the level of audience demand for TV shows during these weeks to determine if there is sufficient interest to support increased releases.

Competition and Timing: Consider the competitive landscape and timing of other major events or releases during these weeks to ensure that TV show releases can effectively capture viewer attention.

Quality and Relevance: Maintain high standards of quality and relevance for TV show releases to ensure continued viewer engagement and satisfaction.

Production Capacity: Evaluate the production capacity and resources available to support increased TV show releases during these weeks.

Marketing and Promotion: Develop comprehensive marketing and promotion strategies to support the increased TV show releases and maximize audience awareness and engagement.

Long-Term Strategy: Align any decision to increase TV show releases with long-term content strategy goals and business objectives to ensure sustained success and audience growth.

**Finding the best week to release a Movie**


Movies added per week
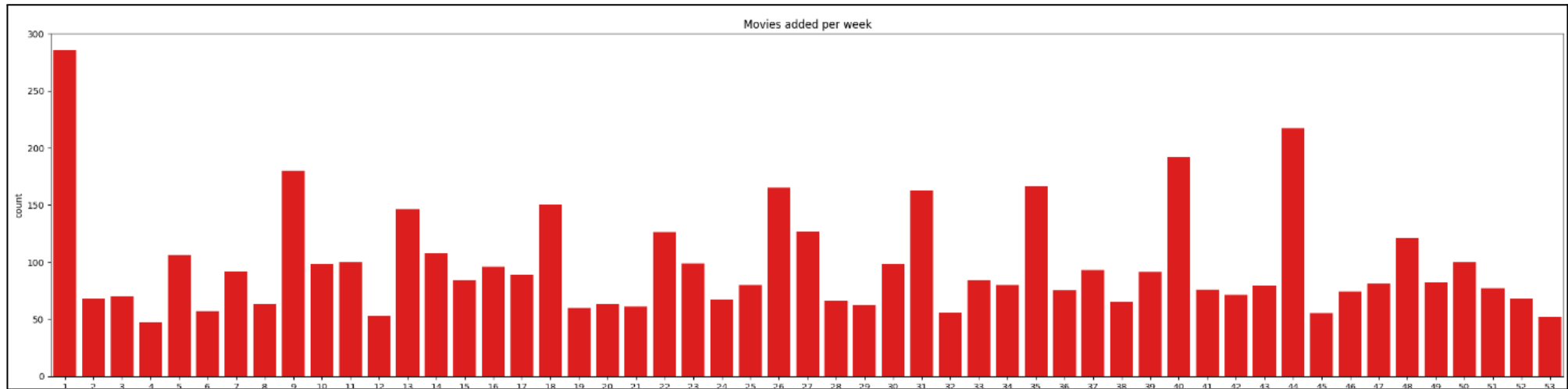
Insights
During weeks 4, 6, 8, 12, 19, 20, 21, 24, 28, 29, 32, 38, 41, 42, 43, 45, 52, and 53, there are fewer movies added to Netflix. These fluctuations indicate that the pattern of adding movies may not adhere to a consistent trend. Factors influencing these fluctuations could include varying acquisition schedules, licensing agreements, content production cycles, and strategic decisions made by Netflix.

Various market factors, such as the performance of existing movies, competition from other forms of entertainment, or economic conditions, could influence the number of movie releases in a given week.

Recommendation:

Increasing the number of movie releases in specific weeks can be influenced by various factors and may require strategic planning.

Content Acquisition: Netflix can actively seek out and acquire the rights to a diverse range of movies, including both new releases and catalog titles, to ensure a steady stream of content throughout the year. This could involve licensing agreements with studios, independent filmmakers, and distributors.
Strategic Partnerships: Collaborating with other content providers, production companies, or international distributors can help Netflix access a wider range of movies for its platform. Partnerships can involve co-productions, content sharing agreements, or exclusive licensing deals to secure access to desirable titles.
Global Content Acquisition: Since Netflix operates in multiple countries and regions, it can leverage its global presence to acquire movies from international markets. Offering a diverse selection of foreign-language films and regional cinema can appeal to a broader audience and enhance the platform's global appeal.

Targeted Marketing and Promotion: Netflix can promote specific movies or curated collections to highlight new releases and drive viewer engagement. Tailored recommendations, personalized algorithms, and targeted marketing campaigns can help surface relevant content to subscribers and increase viewership.

Content Diversity: Ensuring a diverse and inclusive library of movies can cater to the varied interests and preferences of Netflix subscribers. By offering a wide range of genres, themes, and perspectives, Netflix can appeal to a broader audience and maintain engagement over time.

Overall, increasing the availability of movies on Netflix during weeks with fewer releases involves a combination of content acquisition, production, partnerships, and marketing strategies to ensure a compelling and diverse selection of titles for subscribers to enjoy.

Finding the best month to add TV shows.
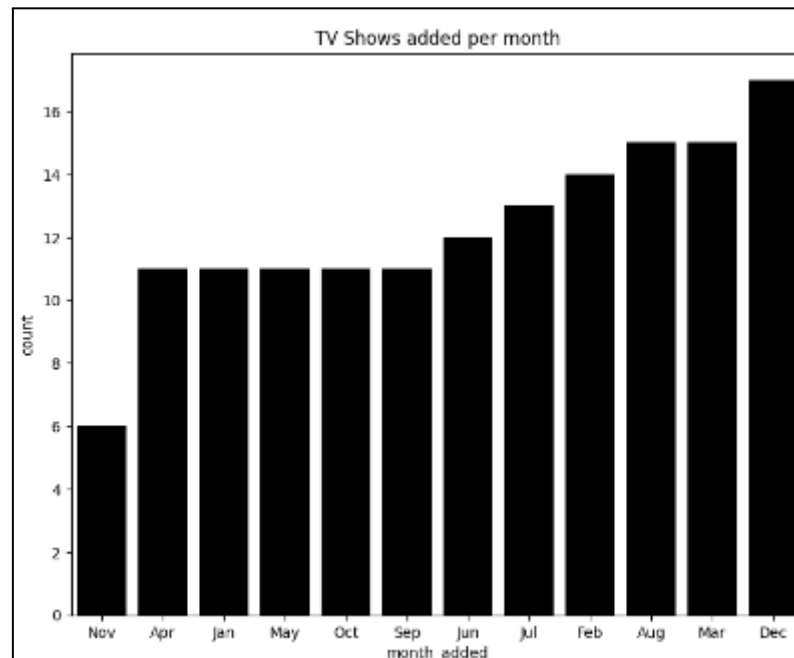


Insights:

TV shows being added to Netflix and noticing a trend of fewer additions during November, here are some potential reasons for this observation:
Similar to movies, November marks the beginning of the holiday season. Viewers may be less inclined to start new TV series or binge-watch shows during this time due to holiday preparations, travel, and spending time with family. As a result, Netflix might strategically adjust its release schedule to align with lower viewer demand during this period.
The television industry also experiences fluctuations in content releases throughout the year. Studios and production companies may hold back on releasing new TV shows during November, reserving major releases for other times of the year when competition is lower and viewership is higher.
Netflix's ability to acquire and add new TV shows to its platform can be influenced by the availability of licensing agreements with content creators and distributors. Fewer attractive licensing opportunities may be available during November, leading to a decrease in the number of TV shows added during this month.

Overall, the lower number of TV shows added to Netflix during November could be influenced by a combination of seasonal trends, industry dynamics, content availability, production schedules, and strategic considerations by Netflix.

<u>Recommendations:</u>

To increase the addition of TV shows during lower months, especially considering the festival months in Asian countries like November and December, Netflix can implement several strategies:

> Strategic Planning: Netflix can strategically plan its content acquisition and release schedules to align with periods of higher viewer engagement, such as festival months. By identifying cultural events and holidays in Asian countries, Netflix can prioritize the release of TV shows that cater to the preferences and interests of viewers during these festive periods.
> Localized Content: Netflix can focus on acquiring and producing TV shows that resonate with audiences in Asian countries. This could involve investing in localized content that reflects the cultural diversity and traditions of different regions, thereby attracting a larger audience during festival months.
> Exclusive Partnerships: Netflix can forge exclusive partnerships with local production companies, content creators, and distributors in Asian countries to secure access to high-quality TV shows. By collaborating with industry insiders, Netflix can gain insights into regional preferences and trends, enabling the platform to offer a compelling lineup of TV shows during festival months.
> Promotional Campaigns: Netflix can launch targeted marketing and promotional campaigns to raise awareness about new TV show releases during festival months. Leveraging social media, digital advertising, and influencer partnerships, Netflix can generate buzz and excitement around upcoming releases, enticing subscribers to engage with the platform during these festive periods.
> Content Diversity: Offering a diverse range of TV shows across different genres, languages, and formats can appeal to a wider audience base. Netflix can curate a varied selection of content that caters to the preferences of viewers in Asian countries, ensuring that there is something for everyone to enjoy during festival months.
> User Engagement Initiatives: Netflix can implement user engagement initiatives such as interactive features, watch parties, and fan events to foster community engagement and promote TV shows during festival months. By creating opportunities for viewers to connect with each other and share their favorite content, Netflix can enhance the overall viewing experience and drive subscriber retention.

By implementing these recommendations, Netflix can capitalize on festival months in Asian countries to increase the addition of TV shows and enhance viewer engagement on the platform.

Finding the best months to add movies:
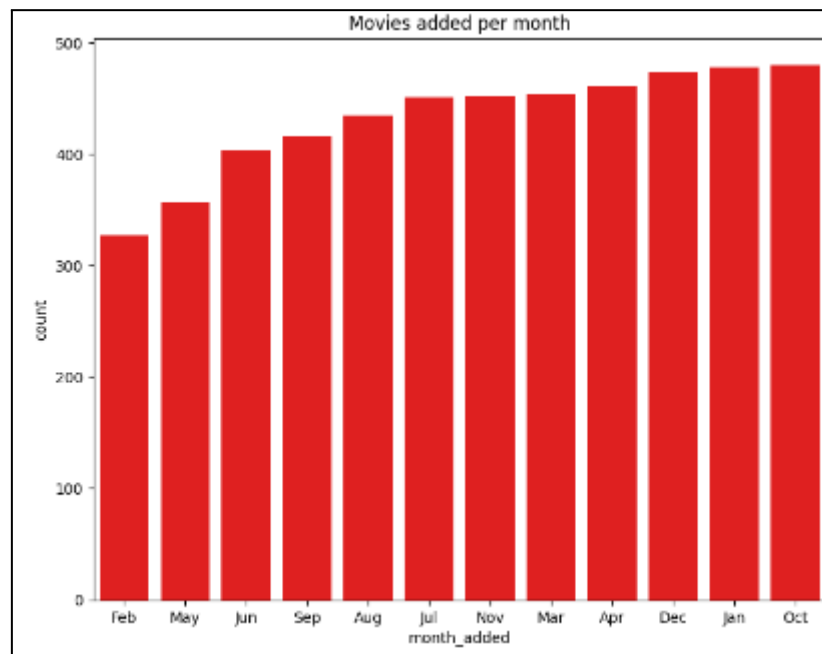


The observations of relatively lower additions of movies to Netflix in the months of February and May, despite the potential for increased viewership during summer vacation in May, suggest several insights and recommendations:

<u>Insights:</u>

Seasonal Factors: February is often a period when people may be less inclined to spend time outdoors due to colder weather in many regions. However, it's also a time when viewers may be less inclined to stay indoors and watch movies, as they may be recovering from holiday spending or focusing on other activities.

Competition and Release Patterns: February is also known for hosting major events like the Oscars, which can lead to a concentration of new movie releases in theaters rather than on streaming platforms. Additionally, studios may strategically release blockbuster films during other times of the year, leaving fewer high-profile titles available for streaming in February.

Viewer Preferences: While summer vacation in May presents an opportunity for increased viewership among kids and students, it's important to consider that entertainment preferences may vary during this time. Some viewers may prefer outdoor activities or travel during summer vacation, leading to lower demand for streaming content.

Recommendations:

Content Acquisition and Promotion: Netflix can prioritize the acquisition of family-friendly and blockbuster movies leading up to the summer vacation period in May. By securing licensing agreements for popular titles and promoting them heavily on the platform, Netflix can attract viewers, including kids and students, who are looking for entertainment options during their break.

Original Content: In addition to acquiring existing movies, Netflix can invest in the production of original movies tailored to the preferences of viewers during the summer vacation period. By creating exclusive content that appeals to families and audiences of all ages, Netflix can differentiate its offerings and drive engagement during lower months like February and May.

Strategic Partnerships: Collaborating with studios, production companies, and distributors to secure exclusive releases or early access to upcoming movies can help Netflix maintain a competitive edge during slower months. By leveraging partnerships and industry relationships, Netflix can ensure a steady stream of high-quality content for subscribers throughout the year.

Personalized Recommendations: Netflix can use its data-driven algorithms and recommendation engines to surface relevant movie titles to subscribers based on their viewing history, preferences, and demographic information. By delivering personalized recommendations, Netflix can help viewers discover new movies that align with their interests, driving engagement and retention.

Seasonal Programming: Introducing themed movie collections or curated playlists focused on summer vacation themes can enhance the viewer experience and encourage binge-watching during May. By highlighting movies suitable for family viewing, outdoor adventures, or travel inspiration, Netflix can cater to the diverse interests of its subscriber base during the summer months.

Overall, by strategically aligning content acquisition, promotion, and viewer engagement initiatives with seasonal trends and viewer preferences, Netflix can optimize its movie offerings and drive increased viewership during traditionally lower months like February and May.

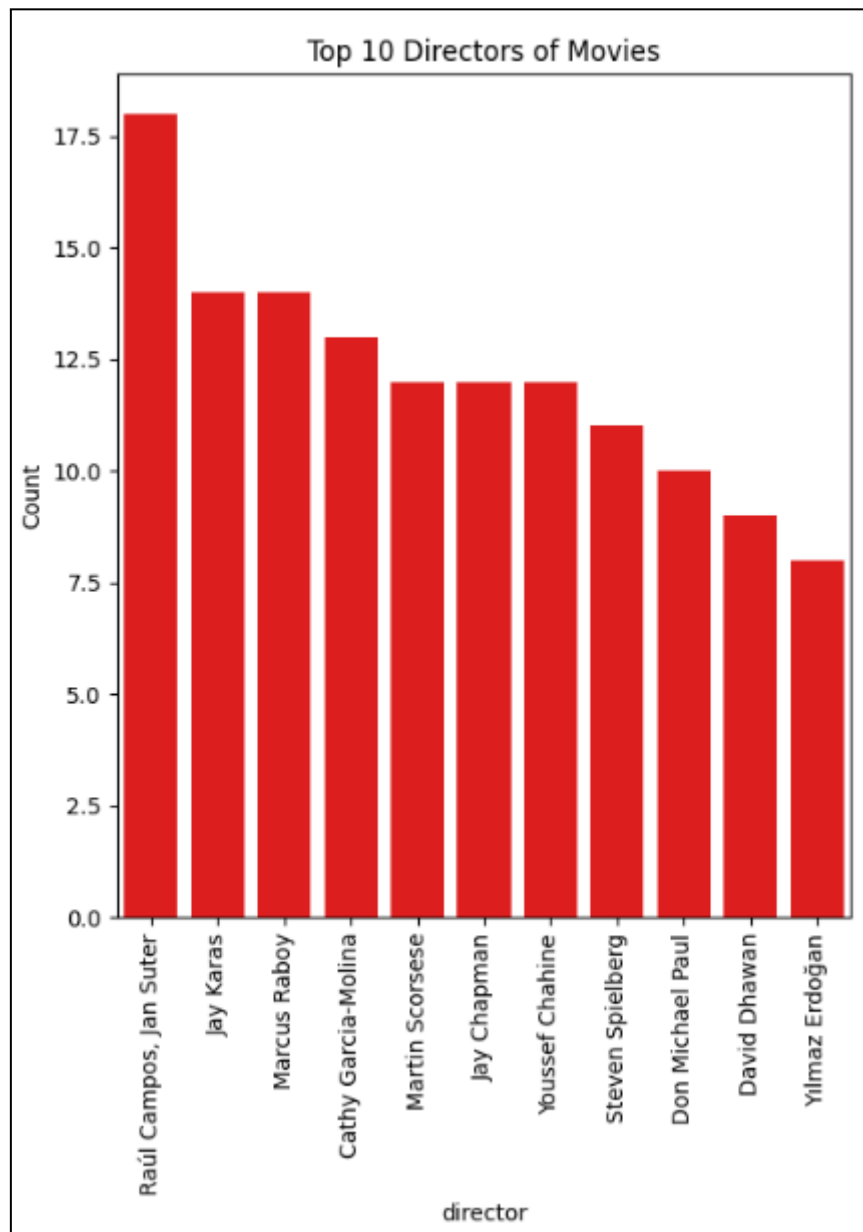**4**. Analysis of actors/directors of different types of shows/movies.

  a.  Top Directors in TV Shows
  b.  Top Directors in  Movies
  c.  Top Actors in TV shows
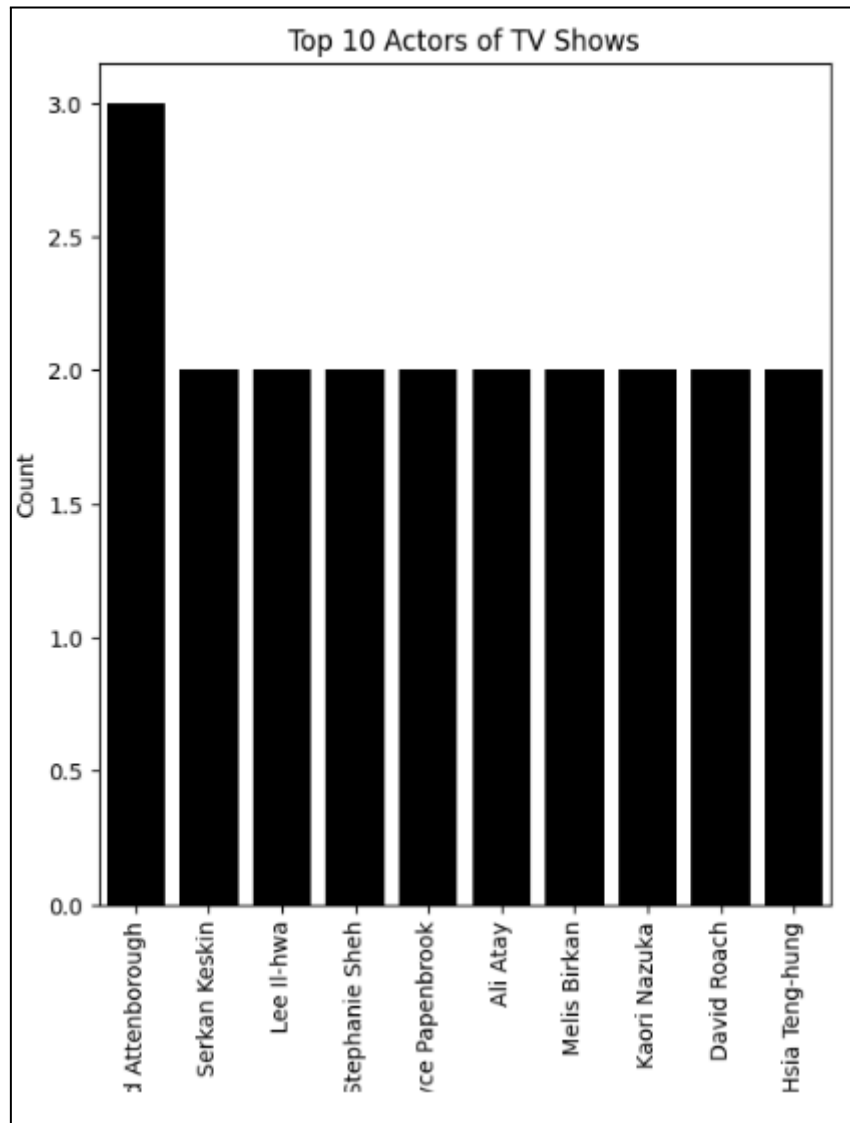  d.  Tops Actors in Movies

Top Directors in TV Shows
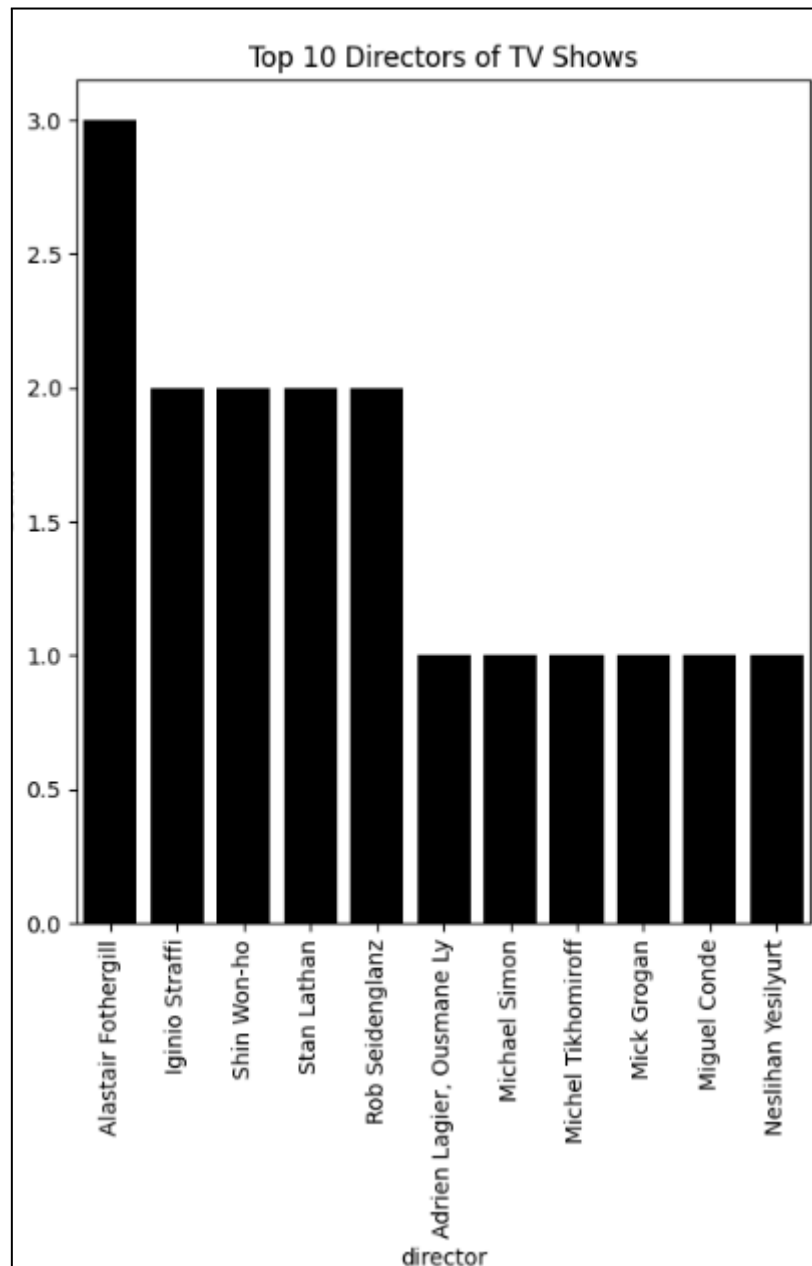


Observation, Alastair Fothgill is the top-1 director and Neslhan Yesilurt is the top-10 directors in TV shows.
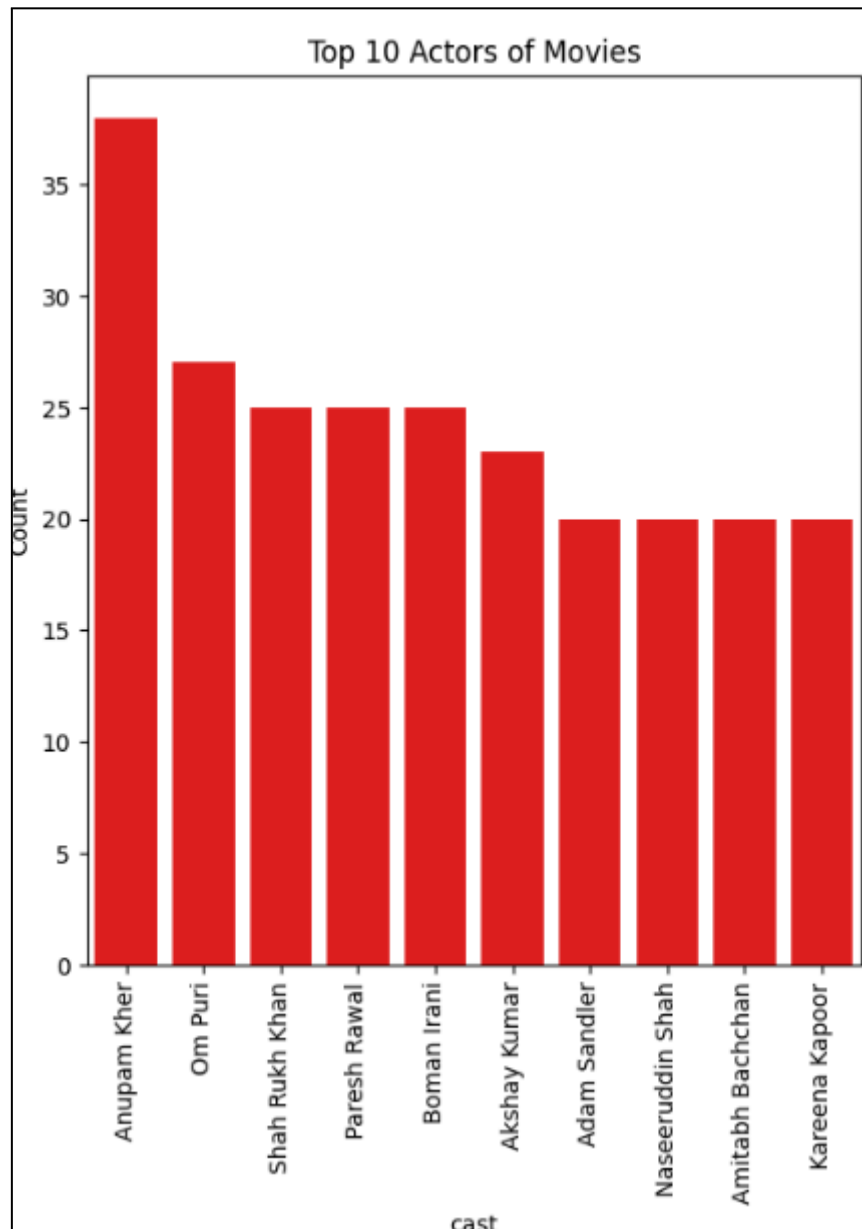
Top Directors in Movies



Observation, Raul Campos, and Jan Suter's combo stand in the top -1 directors, and Yilmax Erdogan is in the top 10 directors in movies.

Top Actors in TV Shows



Observation, Attenborough casted in more TV shows stands in top-1 and Hsia Teng-Hung stands in top-10 cast in TV shows.

Top Actors  in Movies



Top 10 Actors of Movies

Observation, Anupam Kher acted in more movies and stands in top-1 and Kareena Kapoor in top-10 actors in movies.

By leveraging insights from the plot of the top 10 directors and actors of TV shows and movies, Netflix can make informed decisions and strategic investments to strengthen its content portfolio and enhance viewer satisfaction and engagement.

**5.** Which genre movies are more popular or produced more?

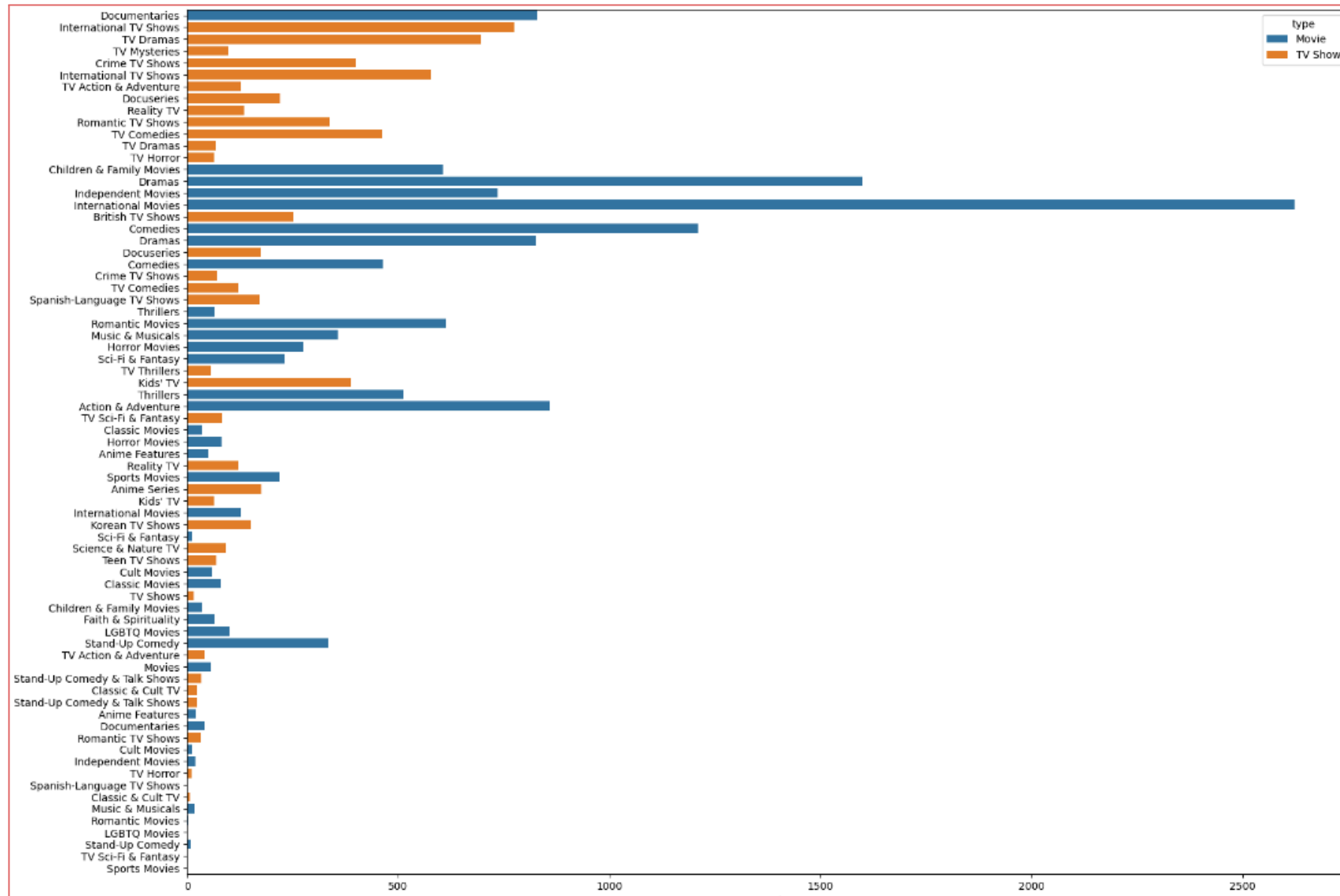For better analysis, here I am considering both TV shows and Movies.

For TV Shows.



International TV shows, TV Dramas, and Crime TV shows are highlighting Genres of TV shows.
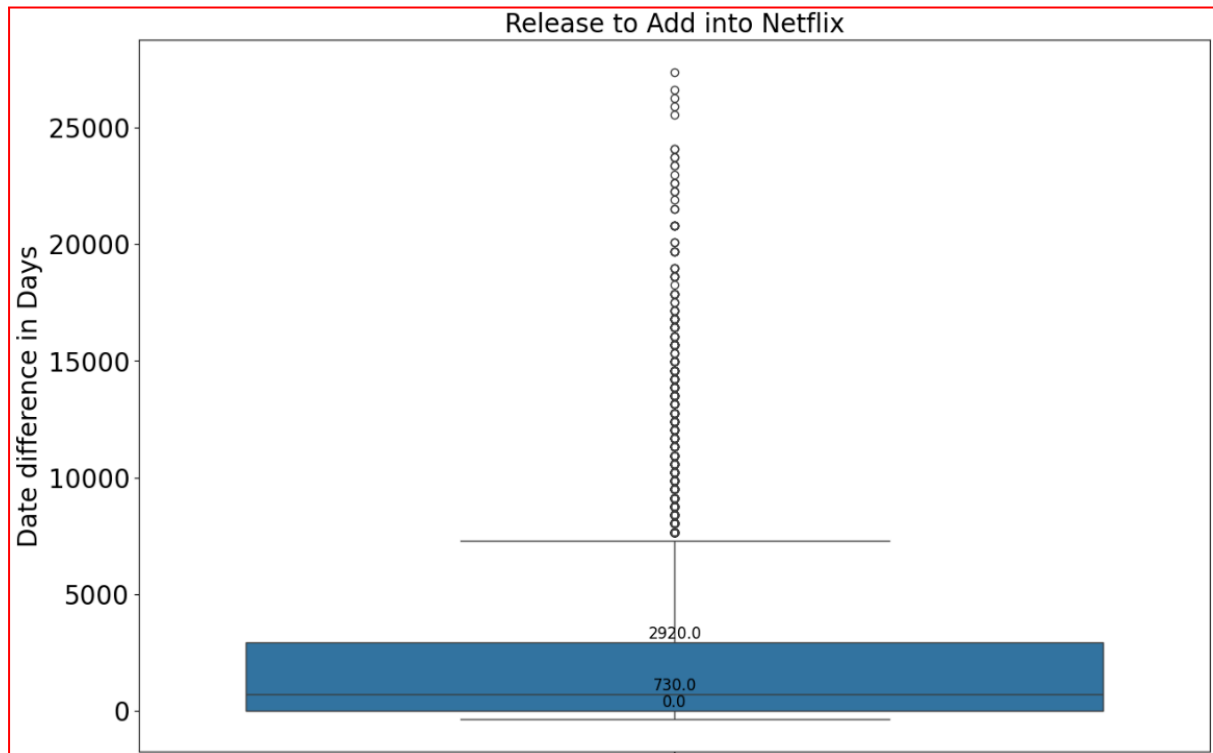
For Movies



Internation Movies, Dramas, Children and Family, Comedies are playing more in the movie Genres.

For Better Analysis, the Bar Plot gives more database visualization.

**6**. Find after how many days the movie will be added to Netflix after the release of the movie (you can consider the recent past data).



Observation: From the plot, the average duration from movie release to addition on the Netflix platform is approximately 730 days.

With the current trend suggesting that an 8-week gap is suitable for adding movies to streaming platforms to maximize revenue, it benefits both producers and streaming platforms. This window allows an optimal balance between capitalizing on theatrical release revenues and tapping into the streaming audience.

**7** . What type of Rating are popular in the content from Netflix
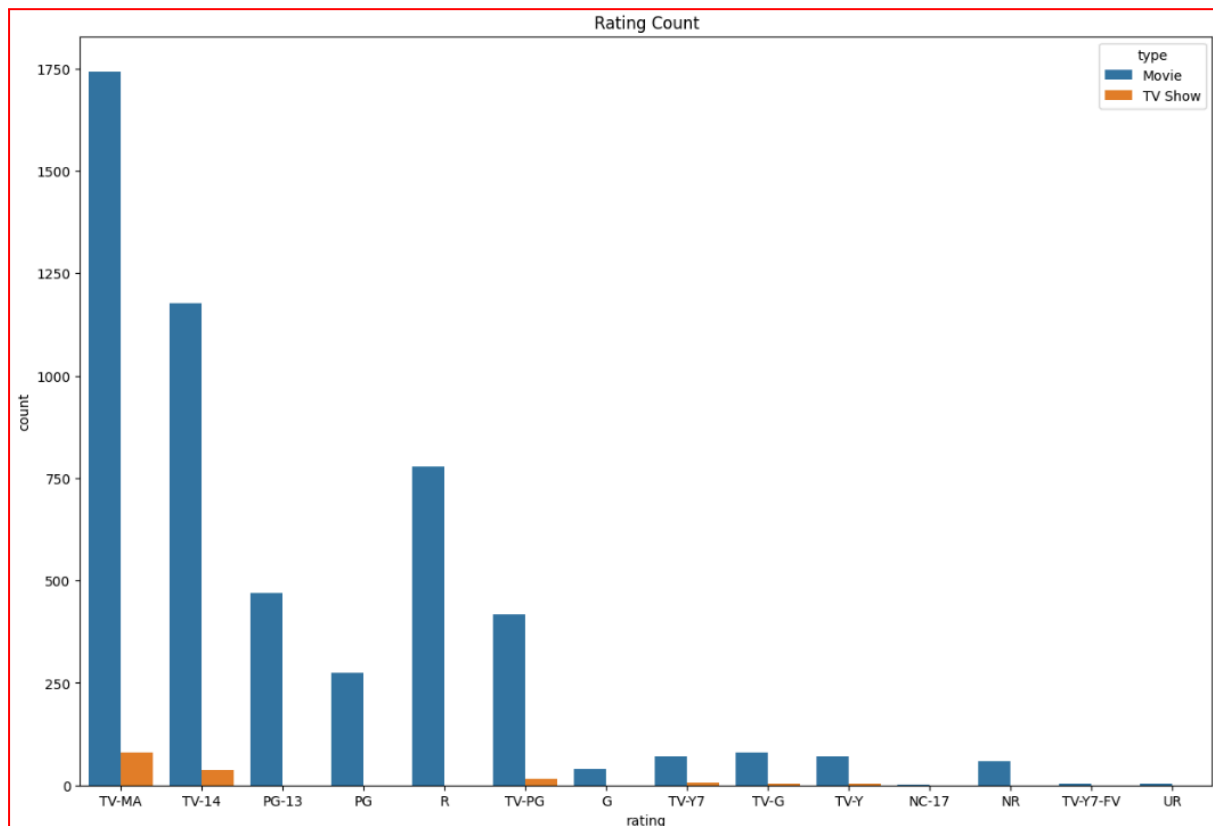


Based on the provided counts of ratings for TV shows and movies on Netflix, we can derive several insights and make recommendations:

Insights:

>Distribution of Ratings: The counts indicate the distribution of different content ratings available on Netflix. The majority of the content seems to have ratings suitable for mature audiences, such as TV-MA, TV-14, and R. This suggests that Netflix offers a diverse range of content catering to various age groups and preferences.
>
>Popular Ratings: TV-MA and TV-14 are among the most common ratings, with counts of 1750 and 1250 respectively. This indicates a significant portion of content is targeted towards mature audiences, reflecting the platform's focus on adult-oriented programming.
>
>Parental Guidance Ratings: Ratings like PG-13, PG, and TV-PG have moderate counts, suggesting that Netflix also provides content suitable for family viewing and younger audiences. This aligns with Netflix's efforts to offer a broad spectrum of content catering to different demographics and viewing preferences.

Limited Counts for Certain Ratings: Ratings like G, TV-Y7, TV-Y, and NC-17 have relatively low counts compared to other ratings. This may indicate a narrower selection of content targeted towards specific age groups or genres, or it could reflect the overall demand and availability of content with these ratings.

Recommendations:

Content Diversity: Netflix should continue to diversify its content library to cater to a wide range of audience preferences and demographics. This includes acquiring and producing content with diverse ratings to ensure there is something for everyone on the platform.

Audience Targeting: Netflix can leverage viewer data and preferences to tailor its content offerings based on audience demographics and interests. This can help identify opportunities to acquire or produce content with specific ratings that align with viewer preferences.

Investment in Original Content: Investing in original content across different genres and ratings can help Netflix differentiate itself and attract subscribers. Original programming allows Netflix to have more control over content creation and distribution, enabling it to cater to specific audience segments and preferences.

Promotion and Recommendation: Netflix can promote and recommend content based on ratings to help subscribers discover new shows and movies that match their preferences. Implementing personalized recommendation algorithms can enhance the user experience and increase engagement with content across different ratings.

Compliance and Rating Transparency: Netflix should ensure compliance with industry standards and regulations regarding content ratings. Transparently displaying ratings and providing parental controls can help users make informed decisions about the content they choose to watch, especially for families and younger viewers.

Overall, by strategically curating its content library, investing in original programming, and leveraging viewer data and preferences, Netflix can continue to offer a diverse range of content across different ratings while catering to the varied interests of its global audience.

**Summary**:

The available data provides only limited insights, hindering the effectiveness of recommendations. Key missing information includes viewers' time consumption, budget comparisons between films and streaming rights, subscription data, device usage per subscription, and precise movie release dates. Additionally, TV show durations listed in minutes would enhance analysis. The absence of comprehensive data diminishes the depth of insights provided. However, based on the available data, recommendations are as follows:

- TV shows are significantly less prevalent than movies, suggesting an opportunity to increase TV show production to attract more viewers.
- Screen time statistics indicate that individuals aged 55 and above spend a minimum of 3 hours per day watching content, with a preference for serial-type TV shows. TV show offerings could potentially boost viewership in this demographic.
- Content suitable for children under 10, particularly categorized as TV-Y and TV-Y7, is limited. Given that children as young as 3-4 years old are engaging with content, there's a recommendation to expand children's programming.

Moreover, aligning with the current trend, an 8-week gap between theatrical releases and streaming platform availability appears optimal for maximizing revenue for both producers and streaming platforms.

Moreover, while the top 10 cast members across all content primarily consist of Indian actors based on the data, there's an opportunity to appeal to audiences in different regions, particularly those with a preference for Hollywood productions. Diversifying content to include more offerings featuring Hollywood stars could enhance audience engagement and satisfaction, broadening the appeal of the platform.

Closing Points:

1. Emphasize the importance of comprehensive data for more accurate analysis and informed decision-making in the entertainment industry.
2. Highlight the potential benefits of adjusting release strategies, such as the 8-week gap between theatrical releases and streaming availability, to optimize revenue streams.
3. Stress the significance of diversifying content to cater to varied audience preferences, potentially tapping into untapped markets and expanding viewer demographics.

For Further reference, the Colab link is attached here.

https://drive.google.com/file/d/1u0tBEAHLPzOadNw8AoZ5ZeY_H597fRt_/view?usp=sharing

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