Additional recommendations to increase profit

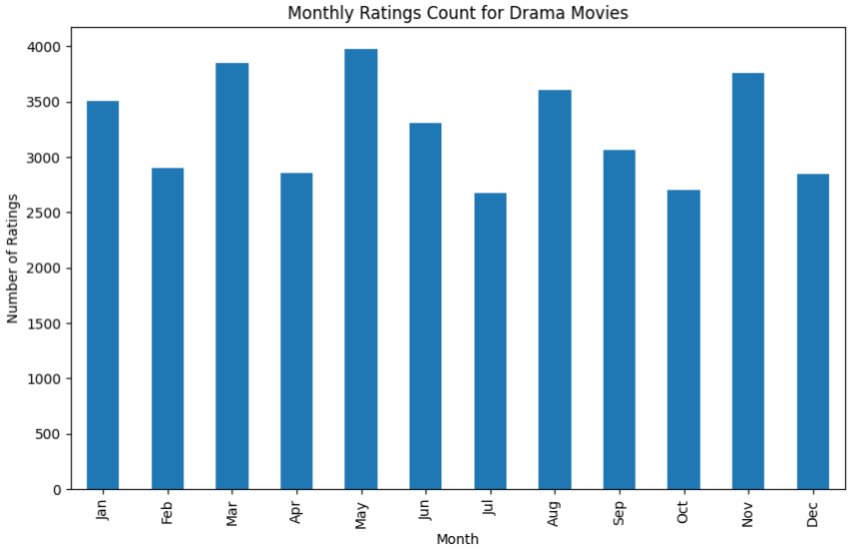
The main aspects or features which help in increasing profit were:

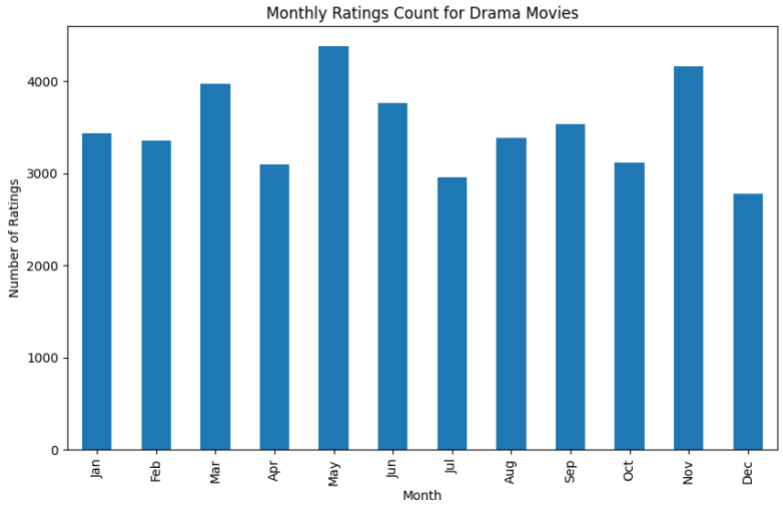
- **Movie Popularity and Ratings**: Analyzing the frequency of ratings and average rating scores for each movie can reveal popular and highly rated movies.
- **Genre Preferences**: Understanding which genres are most popular among users.
- **User Behavior**: Investigating patterns in how different users rate movies.
- **Tag Analysis**: Examining the tags to understand user perceptions and preferences about movies.

Based on the provided data and the business context, additional factors that could influence user movie rentals include:

- User Demographics: Age, gender, location, and other demographic details can influence movie preferences.
- Seasonality and Timing: Certain movies might be more popular during specific times of the year (e.g., horror movies during Halloween).
- Movie Release Dates: Newer movies or movies newly added to the platform might garner more interest.
- Social Media Trends and Publicity: Movies that are trending or being discussed on social media platforms might see increased rentals.
- User Interaction with Platform: Frequency of platform use, browsing habits, and watch history could influence future rentals.
- External Ratings and Reviews: Influence from external movie rating platforms like IMDB or Rotten Tomatoes.
- Promotional Activities: Impact of discounts, special offers, and advertising campaigns.

These factors, combined with the data analysis on movie ratings, genres, user behavior, and tags, can provide a comprehensive view to enhance strategies for increasing movie rentals.





We can clear spikes in May and Nov for comedy and drama movies. Similarly we can carry out EDA on other mentioned features and then target those features which indicate a lift.

Future work :

To further improve the performance, capabilities and profitability of the movie recommender system, several strategies can be considered. The key areas for enhancement include model refinement, data quality and diversity, and incorporating additional features.

Model Refinement

Advanced Algorithms: Beyond Singular Value Decomposition (SVD), explore more sophisticated algorithms like Non-negative Matrix Factorization (NMF), Deep Learning approaches, or Ensemble methods which might capture complex patterns more effectively.
Hyperparameter Optimization: Conduct more extensive hyperparameter tuning. Utilize techniques like Random Search or Bayesian Optimization for a more thorough exploration of the hyperparameter space.
Cross-Validation: Implement k-fold cross-validation for model evaluation instead of a single train-test split. This will provide a more robust assessment of the model's performance.
Handling Cold Start Problem: For new users or items with limited data, explore hybrid approaches that combine content-based and collaborative filtering, or utilize demographic/user information.

Data Quality and Diversity

Richer Dataset: Incorporate additional data sources, such as user demographics, temporal effects (e.g., time-based trends), and contextual information to enrich the recommendations.
Data Preprocessing: Investigate advanced preprocessing techniques like handling outliers, data normalization, or feature engineering to enhance the quality of input data.
Feedback Loop: Implement a system to capture real-time feedback from users on recommended items to refine the model iteratively.

Incorporating Additional Features

Content-Based Features: Integrate content-based features like movie genres, director, cast, and user profiles to provide more personalized recommendations.
Sentiment Analysis: Utilize sentiment analysis on movie reviews to gauge user preferences more accurately.