

Exploring Movie Success: Revenue, Ratings, and Genre Analysis

Course: Data Science Phase-2-Project_Group-8

Project: Film Production Analysis

Institution: Moringa School

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Introduction

Welcome to the **Film Production Analysis** project! This project, developed for the Moringa School Phase 2 Data Science curriculum, provides strategic business insights for a new movie studio. By analyzing historical data from 2010-2018, we identify the drivers of critical acclaim and commercial success to help stakeholders make data-driven decisions.

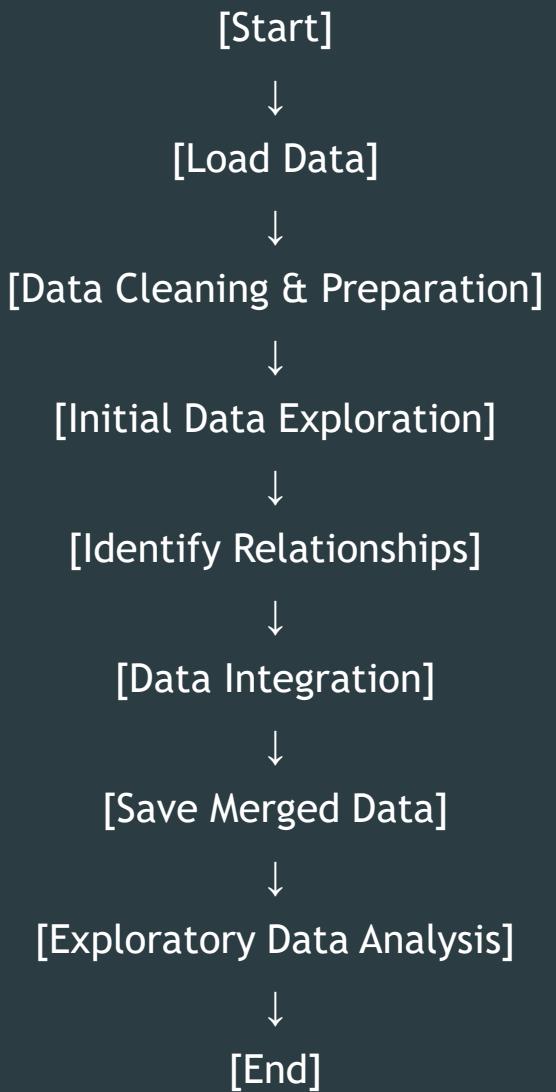
Problem Statement

Studios often struggle to predict which factors, such as genre, release timing, or ratings drive a movie's financial success. This study aims to identify the key drivers of profitability to guide better production and release decisions.

Data sources

File Name	Source
bom.movie_gross.csv	Box Office Mojo
tn.movie_budgets.csv	The Numbers
tmdb.movies.csv	TMDb
rt.movie_info.tsv	Rotten Tomatoes
im.db	IMDb (SQLite)

EDA approach & process



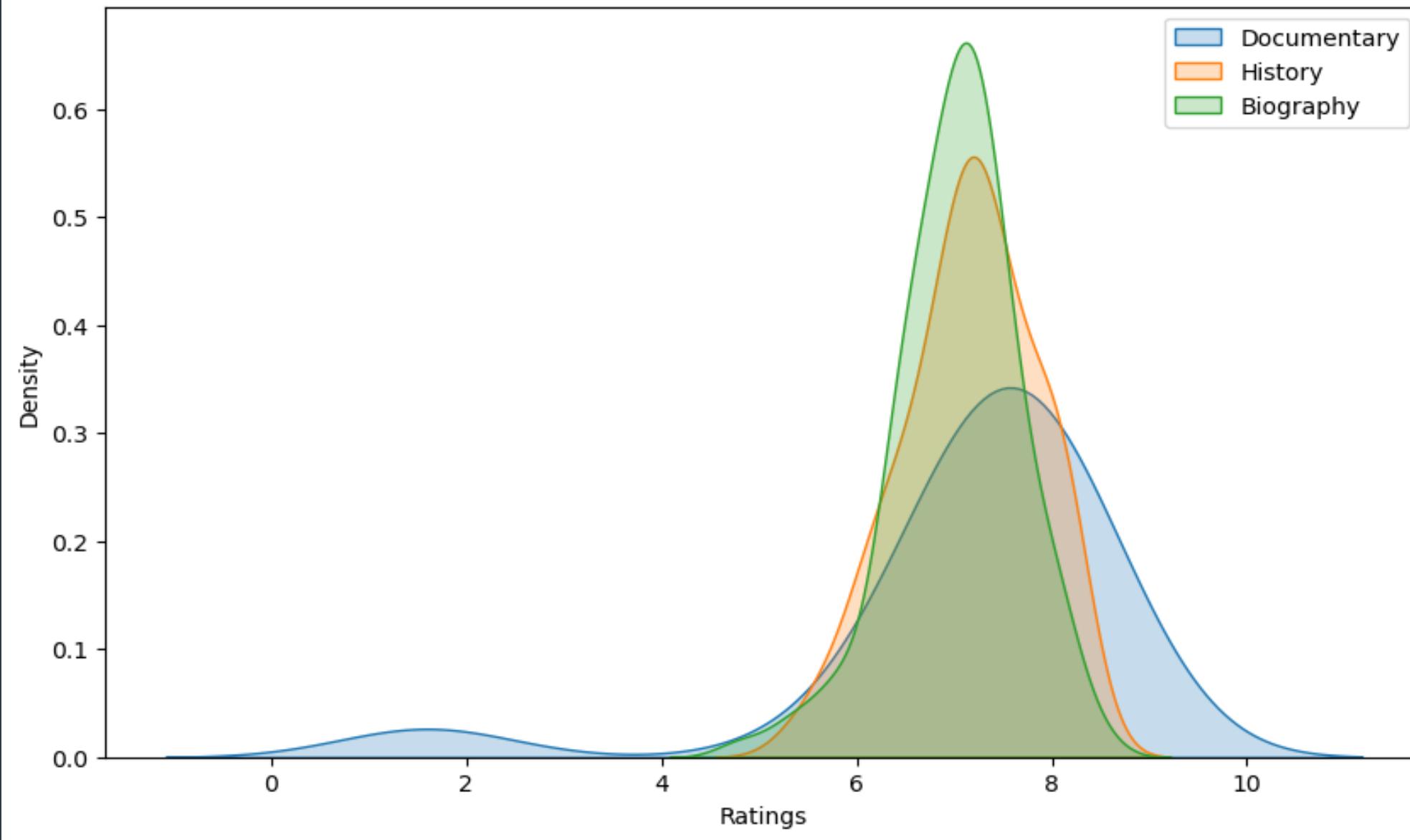
Key Findings

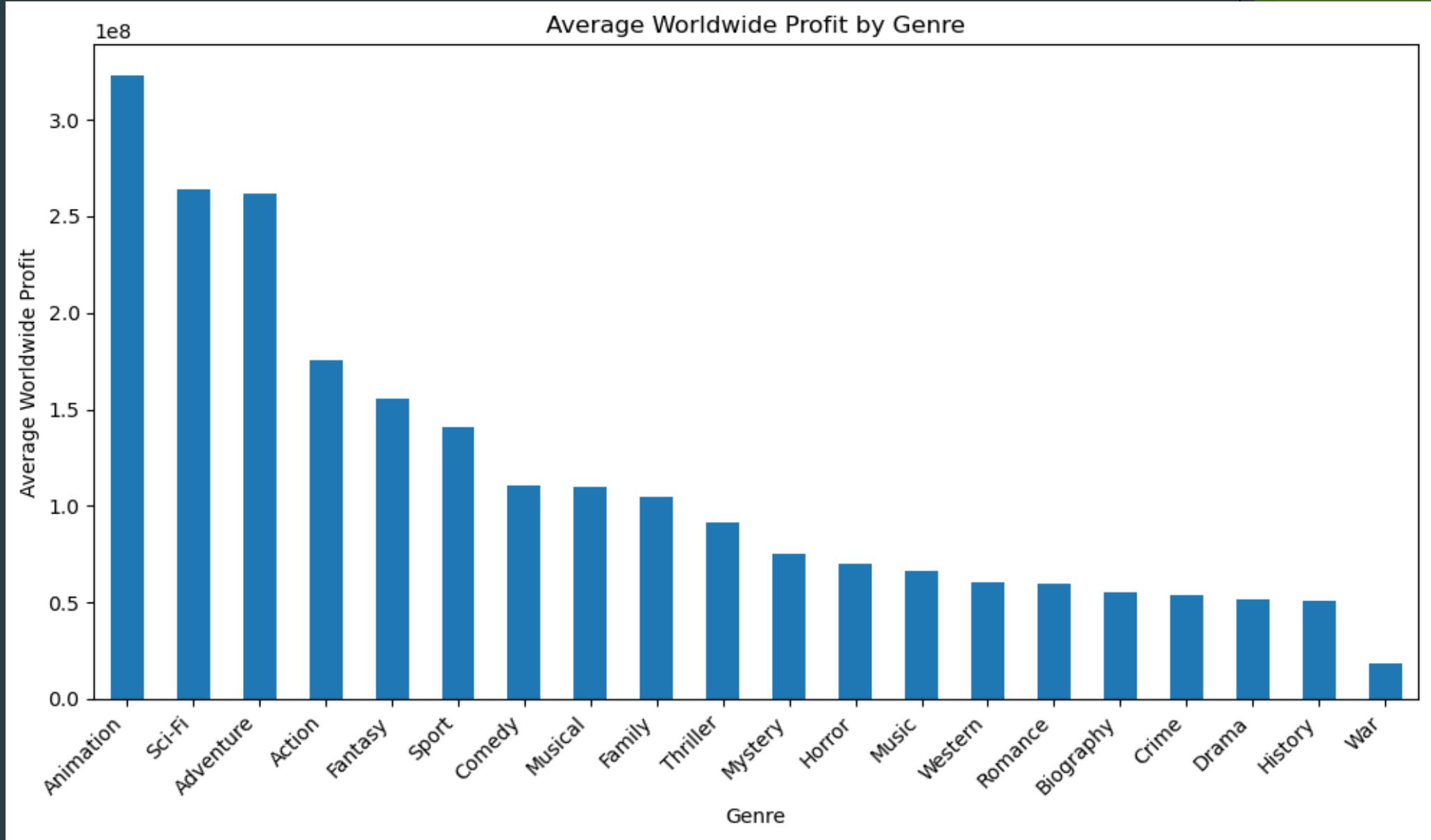
- ▶ **Genre and Quality Parity:** Statistical testing (ANOVA) confirms that high ratings are achievable across a variety of genres. There is no statistically significant difference in quality scores between "prestige" genres like Documentary or History and commercial ones like Animation ($p = 0.5967$), proving that quality is not limited to a single category.
- ▶ **Weak Link Between Ratings and Profit:** While a positive relationship exists, it is statistically weak. Higher-rated movies do not automatically guarantee high profits; ratings should be viewed as a secondary metric for brand reputation rather than a primary driver for financial investment.
- ▶ **Commercial Powerhouses:** Animation, Sci-Fi, and Adventure films generate the highest average worldwide profits. These genres demonstrate the strongest global appeal and represent the most reliable categories for sustainable revenue generation.
- ▶ **The Critical Importance of Timing:** The month of release is a major driver of profitability ($p < 0.05$). February, May, June, July, November, and December are peak months for profit, while "dump months" like January and September typically show much lower potential.

Key Findings

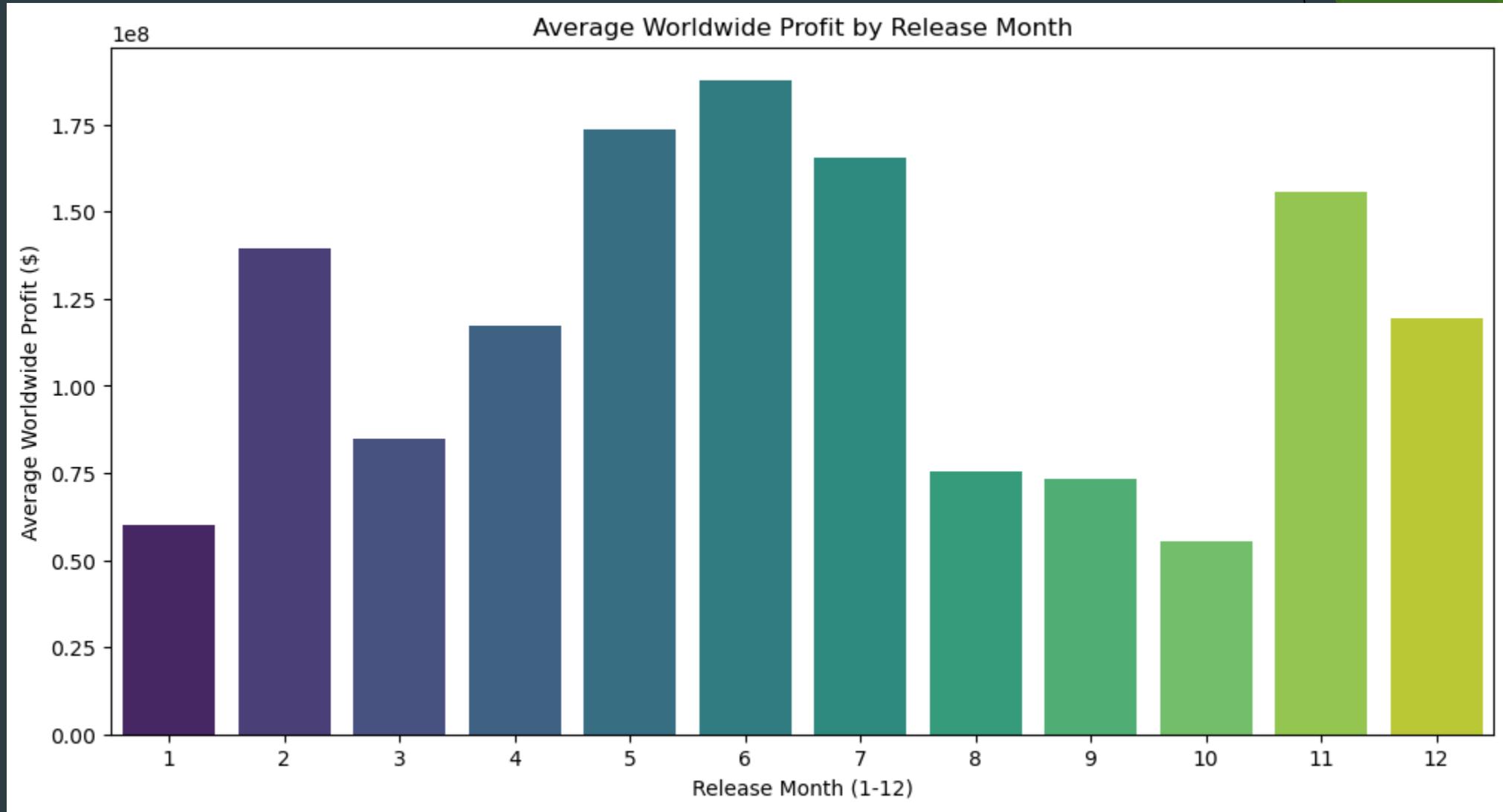
- ▶ **Domestic Success Predicts Global Reach:** We identified a strong positive correlation ($R \approx 0.73$) between domestic and worldwide gross. This makes domestic box-office performance a reliable leading indicator for a film's eventual global success.
- ▶ **Market Reach vs. Critical Acclaim:** Analysis suggests that a film's financial success is more heavily influenced by its genre selection and market reach than by its numeric critic rating alone.
- ▶ **Genre Consistency:** High audience ratings are not exclusive to any single genre; quality is achievable across diverse categories.
- ▶ **Budget Impact:** While blockbuster budgets drive massive worldwide gross, mid-range budgets often offer safer ROI margins.
- ▶ **Seasonal Trends:** Profitability fluctuates significantly by release month, with clear "peak seasons" for high-return films.

PDF of Ratings for Top-Rated Genres

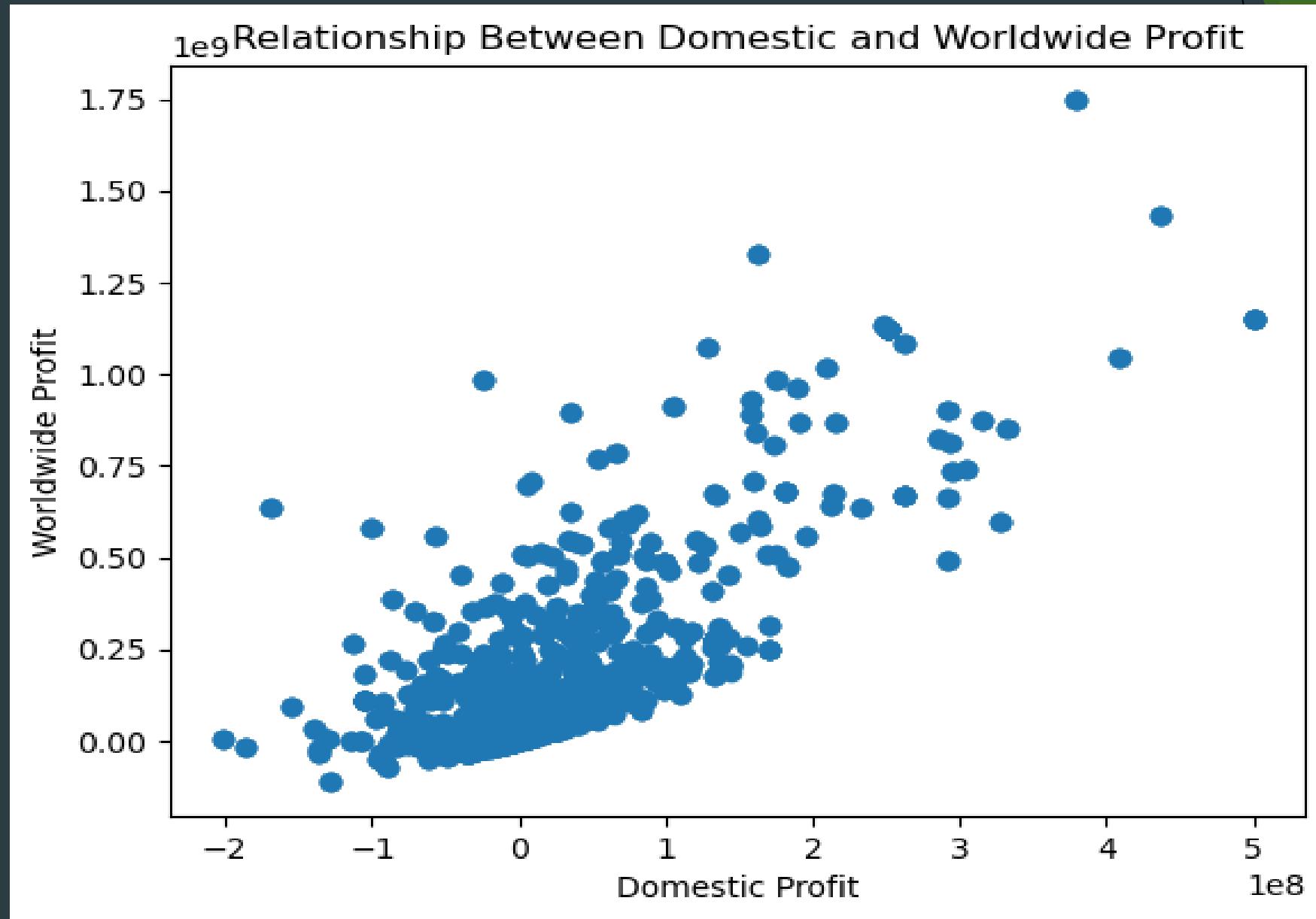




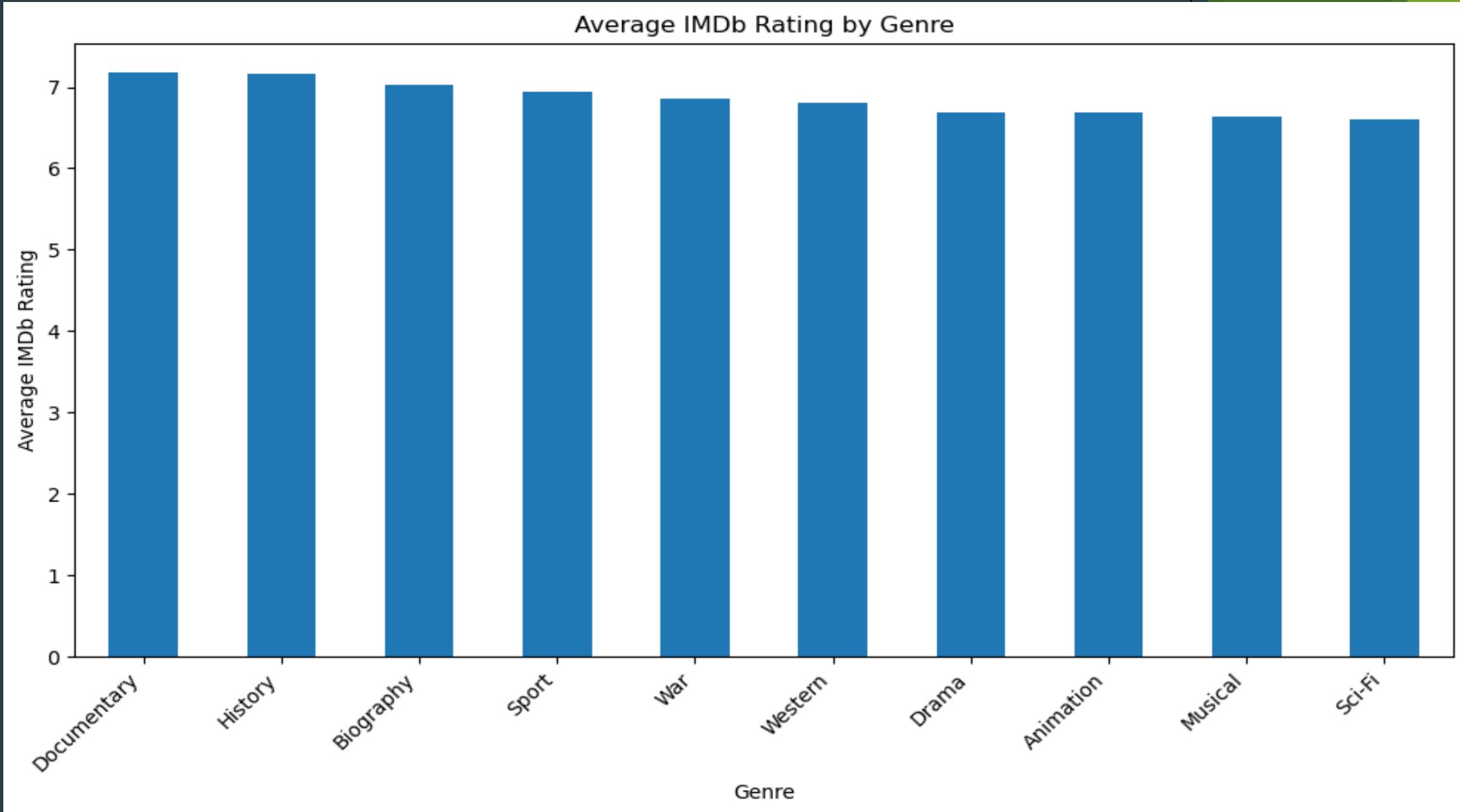
Average Worldwide Profit by Release Month



Relationship between Domestic and Worldwide Profit



Average IMDb Rating by Genre



Recommendations and Summary of Findings

Ratings vs Genre

Documentary, History, and Biology films receive the highest average ratings. However, an ANOVA test across genres shows no statistically significant difference in average ratings ($F = 0.6941$, $p = 0.5967$). This indicates that high ratings can occur in any genre, and ratings alone are not a reliable measure of a movie's success.

Ratings vs Profit

The relationship between movie ratings and profit is positive but weak. Higher-rated movies tend to earn more, but ratings alone do not strongly determine profitability. This suggests that while good ratings help, they do not guarantee high financial success.

Genre vs Worldwide Profit

Animation, Sci-Fi, and Adventure films generate the highest average worldwide profits, demonstrating strong global appeal. This indicates that genre choice has a greater impact on revenue than ratings. Action and Adventure films, in particular, should be prioritized by the studio.

Recommendations and Summary of Findings

Release Month vs Profit

Statistical analysis shows that release month has a significant effect on movie profit ($p < 0.05$). Movies released in February, May, June, July, November, and December perform best, while releases in January, August, September, and October perform poorly. Timing is therefore a critical factor in maximizing profitability.

Domestic vs Worldwide Performance

There is a very strong positive correlation between domestic and worldwide gross ($r \approx 0.73$, $p \approx 0$). This means that movies that perform well domestically are very likely to perform well internationally. Domestic performance can be used as a leading indicator of global success.

Recommendations

- ▶ Prioritize Genre for Profitability: Focus on producing Action, Adventure, Animation, and Sci-Fi movies, as these genres consistently generate the highest worldwide profits. Ratings are helpful but should not be the primary measure of expected success.
- ▶ Optimize Release Timing: Schedule movie releases in months with historically high profits: February, May, June, July, November, and December. Avoid releasing in January, August, September, and October, which show lower profit potential.
- ▶ Use Domestic Performance as a Predictor: Monitor domestic box office performance closely, as it is a strong indicator of worldwide success. Strong domestic earnings can help predict and maximize global revenue.
- ▶ Leverage Ratings Strategically: While high ratings do not guarantee profit, they can enhance a movie's marketability. Use ratings as a secondary metric to guide marketing and audience targeting rather than as the primary decision factor for production or release strategy.