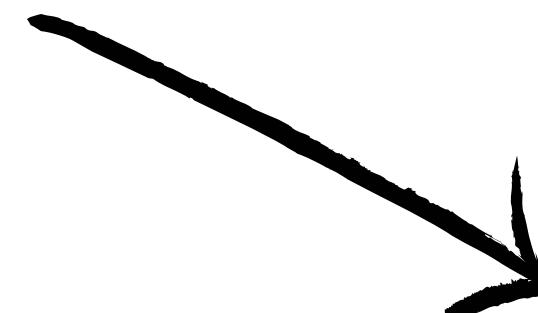


***From Scripts to
Screens: Analyzing
Revenue, Genre
Evolution and Industry
Trends in Movie
Production***



**LIGHTS
CAMERA
ACTION**

THE TEAM



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- 3 **Objectives & Recommendation**
- 4 **Conclusion**



INTRODUCTION



In recent years, the film industry has experienced rapid growth, with streaming services and traditional studios alike competing for viewers' attention. For companies entering this space, understanding the dynamics of profitability is essential.

One of the most influential factors in a movie's financial success is its genre, which can heavily influence production costs, audience appeal, and box office revenue.

This report explores the profitability of different film genres, helping new studios make data-informed decisions about which genres to focus on in future productions.

As we analyze the trends and performance metrics associated with various genres, our goal is to identify patterns and factors contributing to profitability.

This analysis not only focuses on historical box office success but also considers seasonal trends, budget requirements, and audience preferences to create a comprehensive view of genre-driven profitability.



Data Overview



In this project, we decided to use the following Datasets :

1. The Number Database (**Movie_budget**)
 2. The Rotten Tomatoes (**Movie_info**)
 3. The Rotten Tomatoes Reviews (**Movie_reviews**)
- We used **Movie_budget** dataset to evaluate the relationship between production budgets and profitability in terms of both Domestic Earnings and Worldwide Earnings.
 - We used both **Movie_info** and **Movie_budget** datasets to identify which genres are most profitable, and what key trends exist in box office performance.

- **Movie_info** and **Movie_budget** datasets were also used to identify certain directors influence, and which directors consistently contribute to higher success in box office performance
- **Movie_budget** and **Movie_reviews** datasets were as well used to understand how critic ratings and audience ratings correlate with the box office performance metrics in movies.
- We used both **Movie_info** and **Movie_budget** to identify how the market trends by year whether seasonal or annual influences box office success.

Objective 1 : Revenue Analysis

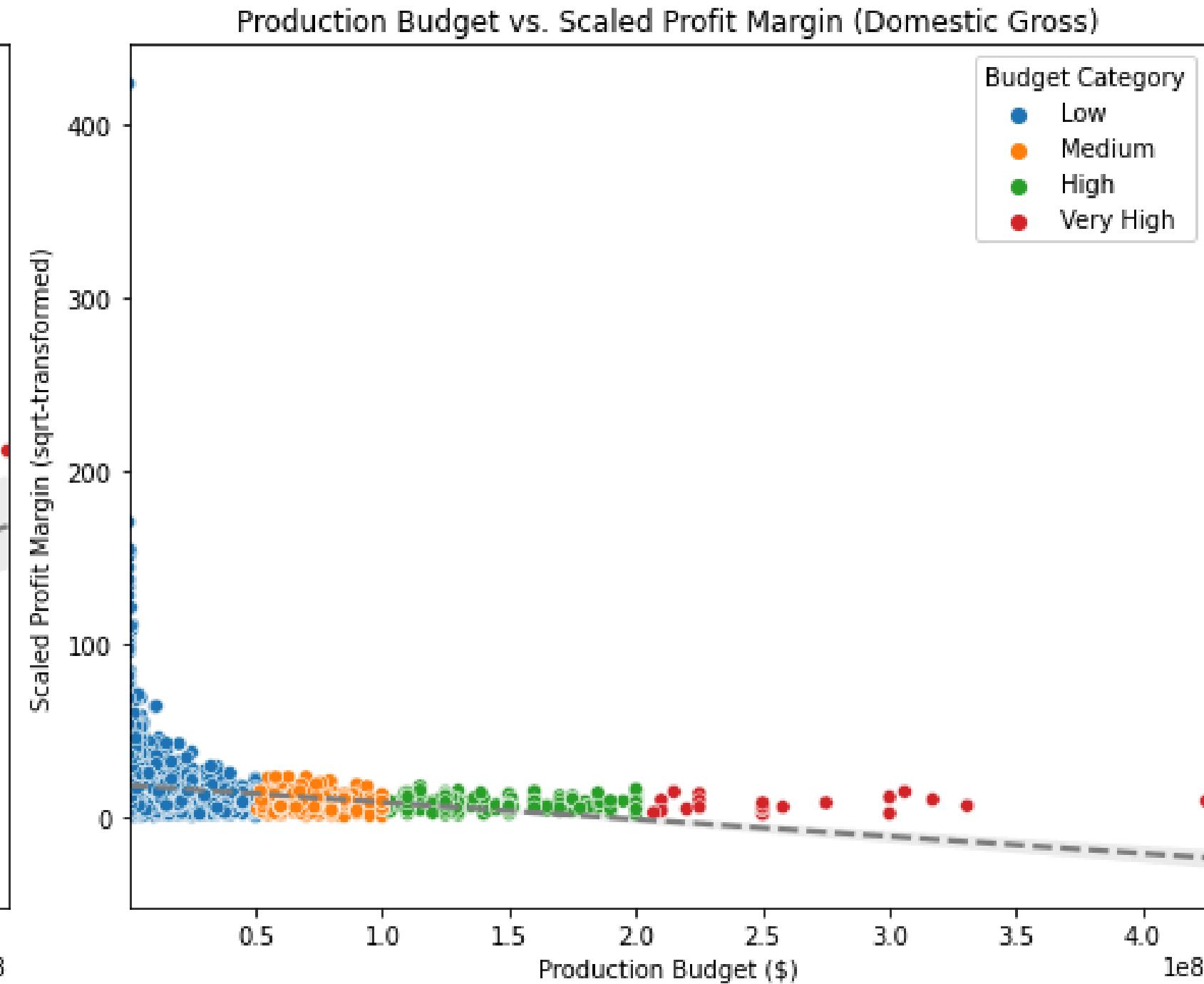
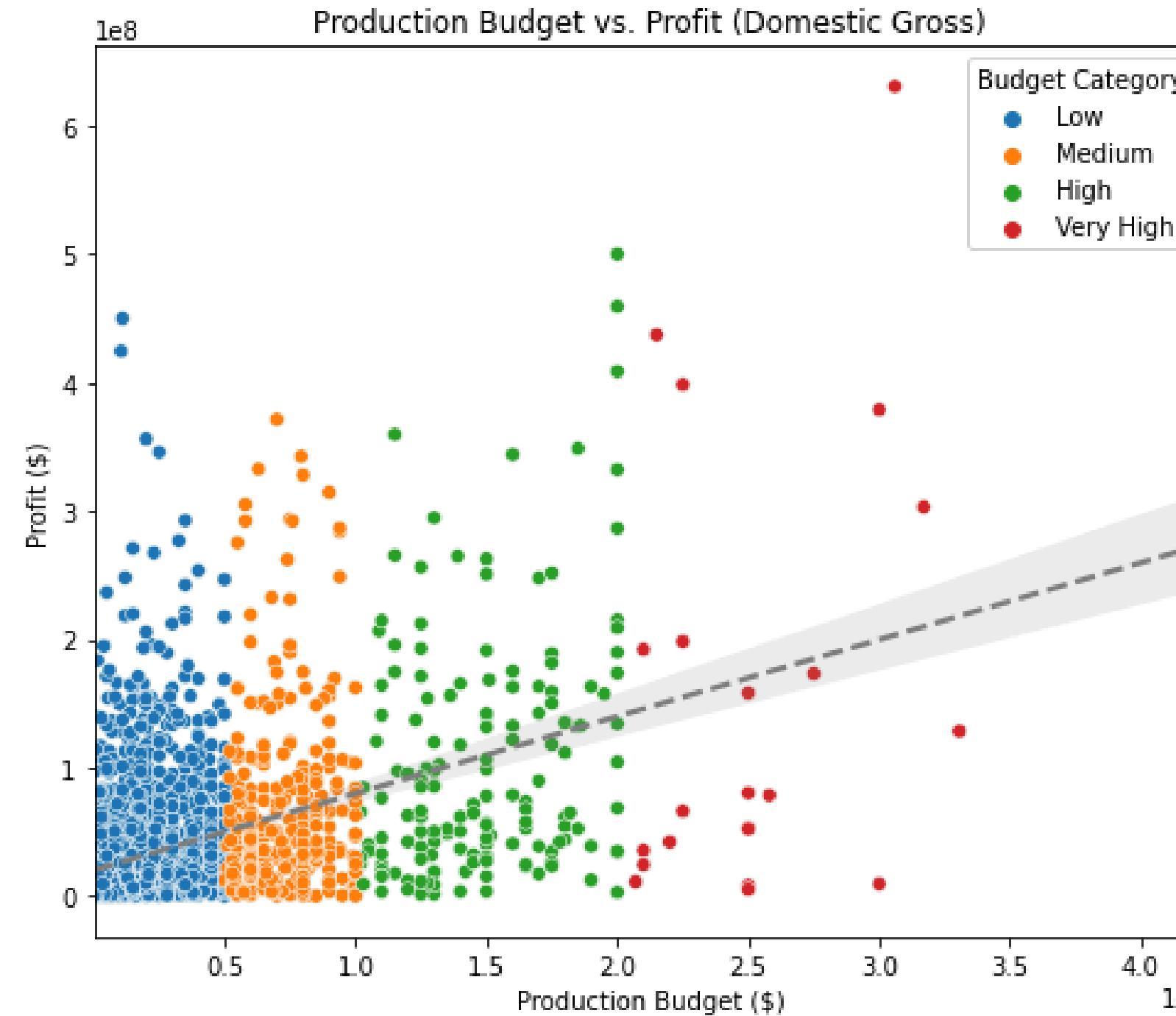


Q1.

What is the relationship between production budgets and profitability in terms of both Domestic Earnings and Worldwide Earnings?

- Evaluate Budget vs. Revenue
- Domestic Earnings vs. Worldwide Earnings Profit Analysis
- Profit Margin comparison

Domestic Earnings: Profit, Profit Margin Visualization



Domestic Earnings: Profit, Profit Margin

Observations and insights



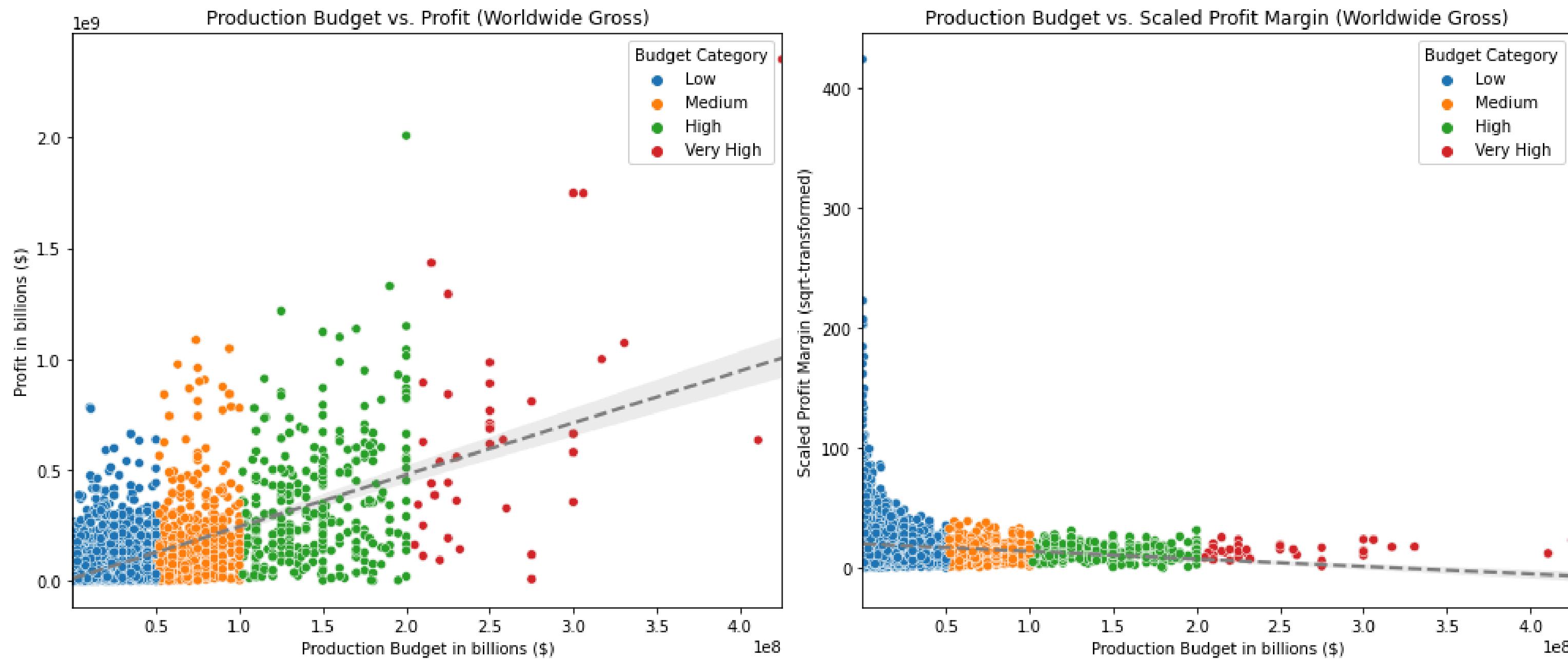
Left Plot

- The line of best fit shows a slight positive trend, indicating that higher budgets tend to yield higher profits, but the correlation is weak.
- Lower-budget movies have a broad range of profits, with many achieving significant gains,
- while higher-budget movies tend to cluster around moderate profit levels.
- This suggests that high production costs don't always guarantee high profits.

Right Plot

- The line of best fit in this plot shows a clear downward trend, indicating that scaled profit margins decrease as budgets increase.
- Lower-budget movies tend to have much higher scaled profit margins, suggesting they're more efficient at turning investments into profits.
- In contrast, larger budgets generally correlate with lower returns on investment, highlighting diminishing returns of high-budget productions.

Worldwide Earnings: Profit, Profit Margin Visualization



Worldwide Earnings: Profit, Profit Margin Observations and insights



Left Plot

- The line of best fit shows a clear positive trend, indicating that higher production budgets are generally associated with higher worldwide profits.
- This trend is more noticeable than in the Domestic Gross plot, suggesting that large-budget films perform better globally.

Right Plot

- The line of best fit here shows a strong downward trend, indicating that scaled profit margins decrease significantly as production budgets increase.
- Lower-budget films achieve the highest scaled profit margins, while higher-budget films, despite their larger profits, show much lower efficiency in generating returns relative to their budgets.
- This implies that although high-budget films may earn large absolute profits globally, they're less efficient in terms of profit margin compared to smaller.

Recommendations based on Objective 1



- Whether a domestic or worldwide project, focusing on Low and Medium Budget films while remaining open to larger projects can optimize profitability, and success will depend on careful planning, strategic marketing, and understanding audience preferences.
- Lower-budget movies have a wide range of profits, but their maximum profit values are lower than those of high-budget films which sometimes generate profits exceeding \$1.5 billion.
- This suggests that higher production budgets may be advantageous for reaching broader audiences and generating significant worldwide profits.

Objective 2 : Profitable Genres



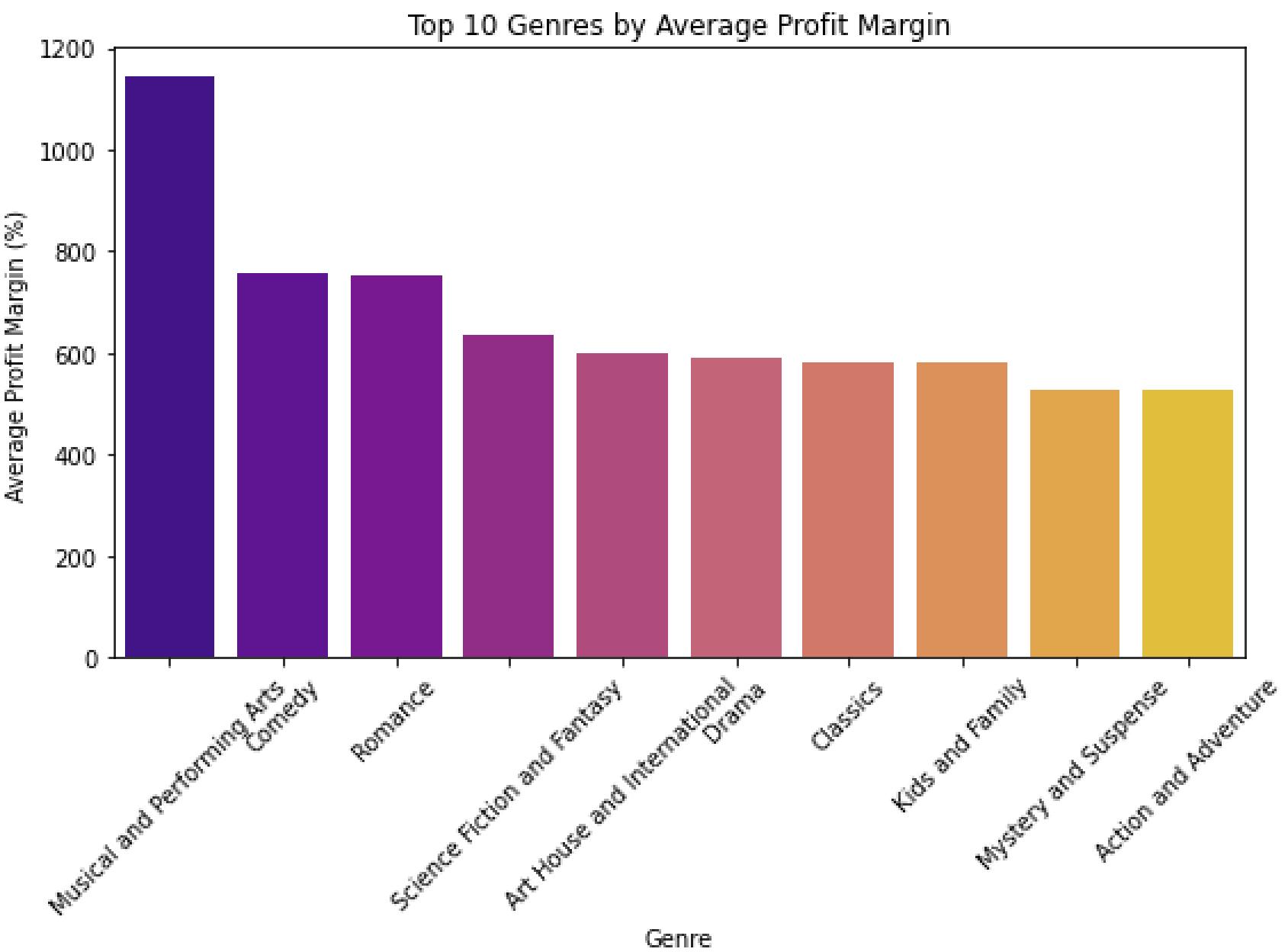
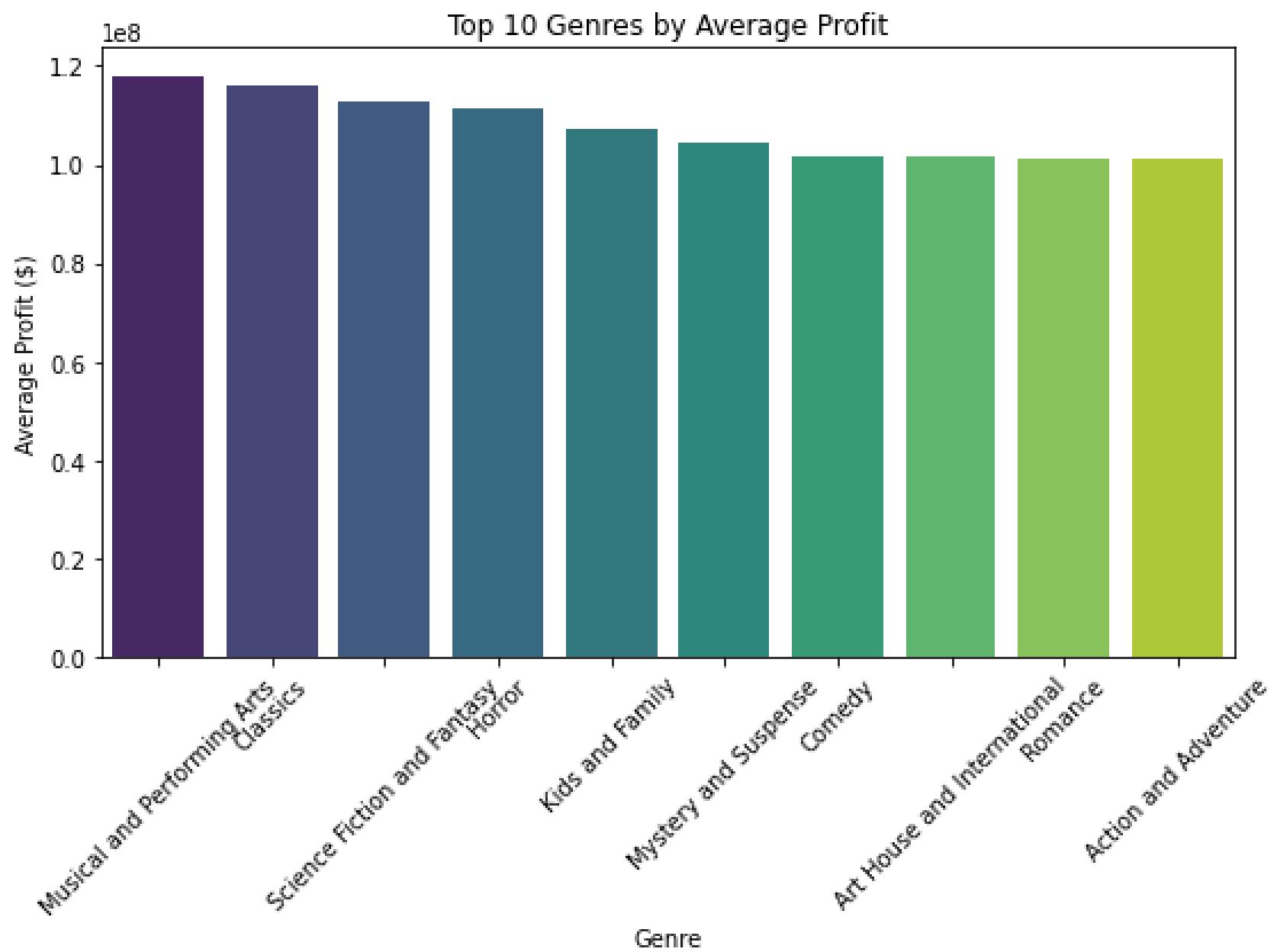
Q2.

Which Genres Are Most Profitable, and What Key Trends Exist in Box Office Performance?

- **Identify Revenue-Driving Genres**
- **Optimize Market Focus by identifying genres that perform better**

Genres by Average Profit Margin

Visualization



Genres by Average Profit Margin Visualization

Observations and insights



- Genres with high profit margins such as Musical and Performing Arts, Romance, and Comedy represent strong investment opportunities due to their efficient returns.
- Although they may not always generate the highest absolute profits, their impressive margins (e.g., 1500.82% for Musical and Performing Arts, over 700% for Romance and Comedy) make them ideal for profitable, lower-risk investments.
- Additionally, Classics, Horror, and Science Fiction and Fantasy genres show consistently high average profits (around \$130–135 million), making them strong candidates for profit-focused projects.
- In contrast, lower-margin genres like Action and Adventure may involve higher financial risk, suggesting they require careful consideration before large investments.

Recommendations based on Objective 2



Based on these insights, here are a few strategic recommendations for investment in movie genres:

- **Prioritize High-Margin Genres:** Focus on producing films in Musical and Performing Arts, Romance, and Comedy genres. These categories demonstrate high profit margins, offering significant returns relative to their budgets. This strategy minimizes risk while maximizing profitability.
- **Explore Strong Performers for Balanced Returns:** Consider investing in Classics, Horror, and Science Fiction and Fantasy. These genres yield solid average profits, providing a balance between substantial absolute returns and manageable production costs. They can serve as reliable sources of revenue without the risk levels seen in blockbuster-heavy genres.
- **Exercise Caution with Action and Adventure:** Although Action and Adventure genres might have high box office appeal, they generally yield lower profit margins relative to their high production costs. For these categories, consider a selective approach, investing in projects with strong franchises, proven fan bases, or unique elements to help mitigate risk.

Recommendations based on Objective 2



- **Diversify Across Genres:** To create a balanced portfolio, consider a mix of high-margin genres (e.g., Romance and Comedy) and moderate- to high-profit genres (e.g., Horror and Science Fiction). This approach offers both stability from high-margin films and potential high earnings from genres with proven audience demand.
-
- **Consider Low-Budget, High-Margin Opportunities:** Investing in lower-budget films within high-margin genres can maximize returns. This is particularly effective in genres like Horror and Comedy, which often achieve high profitability with modest production budgets, appealing to a broad audience.

These recommendations support a data-driven approach to genre selection, focusing on a balance of high-margin and high-demand genres to maximize returns and manage financial risk.

Objective 3 : Movie Director Performance

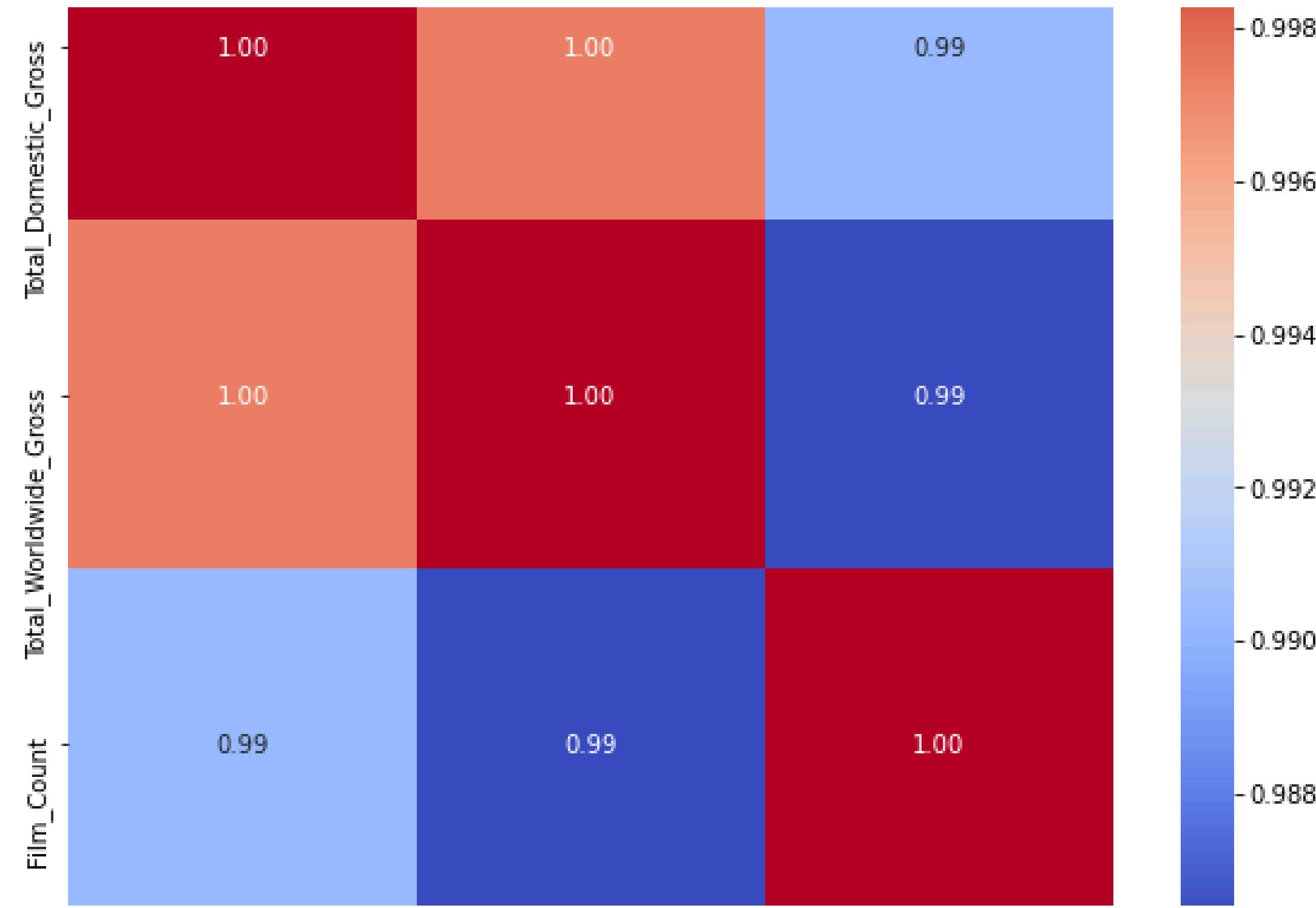


Q3.

How do certain directors influence, and which directors consistently contribute to higher success in box office performance?

- Identify consistently successful movie directors to inform collaboration Decisions

Movie Directors Performance Correlation Visualization



Movie Directors Performance Correlation Visualization



Observations and Insights from Director Performance Correlation Matrix

1. High Correlation Between Domestic and Worldwide Gross:

- The correlation coefficient between **Total Domestic Gross** and **Total Worldwide Gross** is **0.996**. This indicates a very strong positive relationship, suggesting that directors who achieve high domestic revenue also tend to have high worldwide revenue.

2. Strong Influence of Film Count:

- There is a high correlation (**0.985**) between **Film Count** and **Total Domestic Gross**, and a similarly strong correlation (**0.974**) with **Total Worldwide Gross**. This suggests that directors who have directed more films are likely to have higher total grosses, both domestically and worldwide.

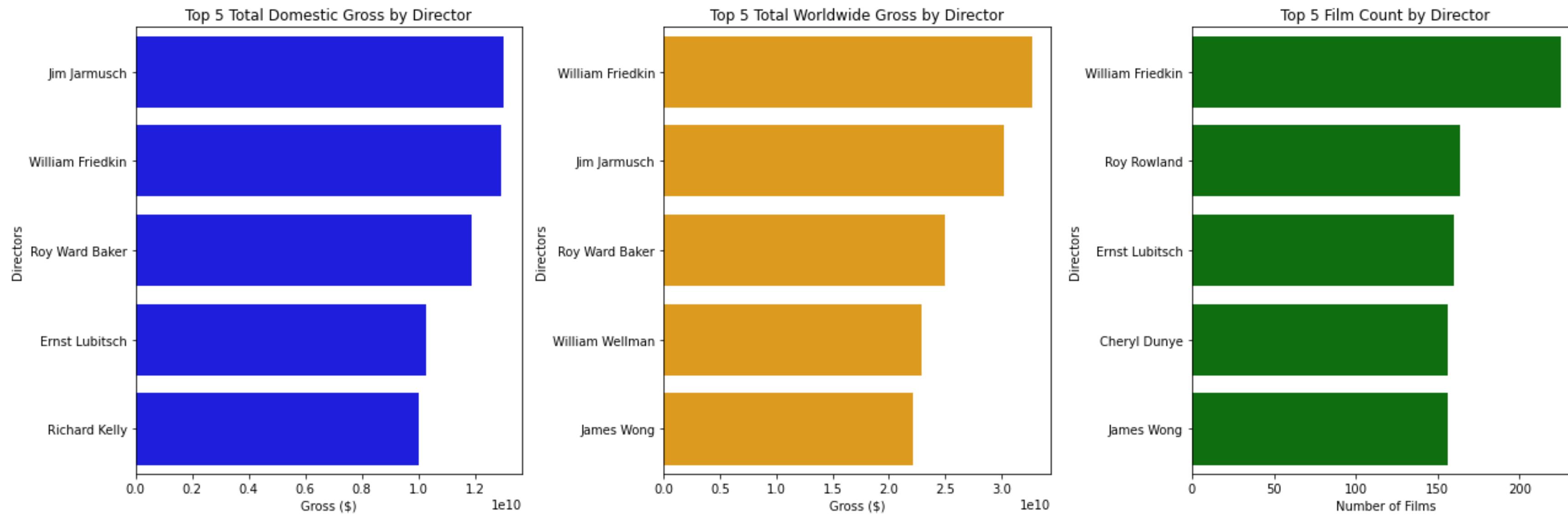
3. Implication for Studio Collaboration:

- Directors with a substantial number of films and high domestic and worldwide gross figures could be valuable collaborators for studios looking to maximize box office success.

4. Benchmarking Success:

- The strong correlations indicate that studios can use the metrics of **Film Count** and **Gross Revenues** as benchmarks for assessing the success and impact of directors when considering future projects.

Movie Director Influence On Earnings Visualization



Movie Director Influence On Earnings

Observation and Insights



Based on the domestic gross figures, the best directors were Jim Jarmusch and William Friedkin. Similar to the domestic figures plot, the worldwide gross indicates that William Friedkin and Jim Jarmusch grossed the highest.

As per the film counts, the highest grossing director once again was William Friedkin. Roy Rowland comes in second, and Ernest Lubisch is third overall.

Recommendations based on Objective 3



- 1. Partner with High-Grossing Directors**:** Studios should prioritize collaboration with directors who consistently generate high domestic and worldwide grosses, as their projects are likely to succeed across markets.
- 2. Consider Directors with Extensive Portfolios**:** Directors with a high film count demonstrate strong revenue generation, making them reliable choices for maximizing box office performance.
- 3. Use Film Count and Gross Revenue for Director Benchmarking**:** Studios can assess potential collaborations by analyzing a director's total grosses and film count to gauge their impact on box office success.

Objective 4 : Sentiment Analysis

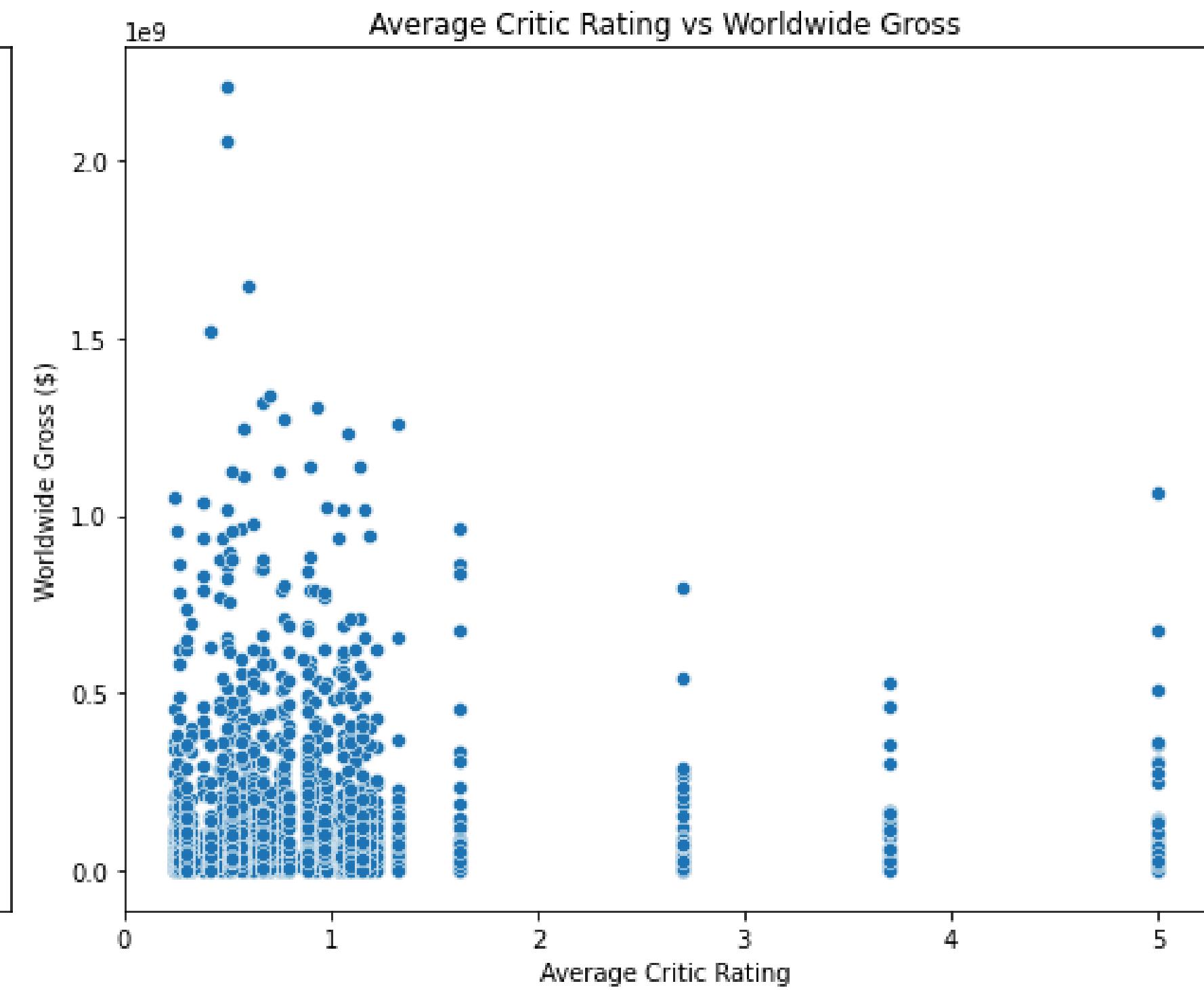
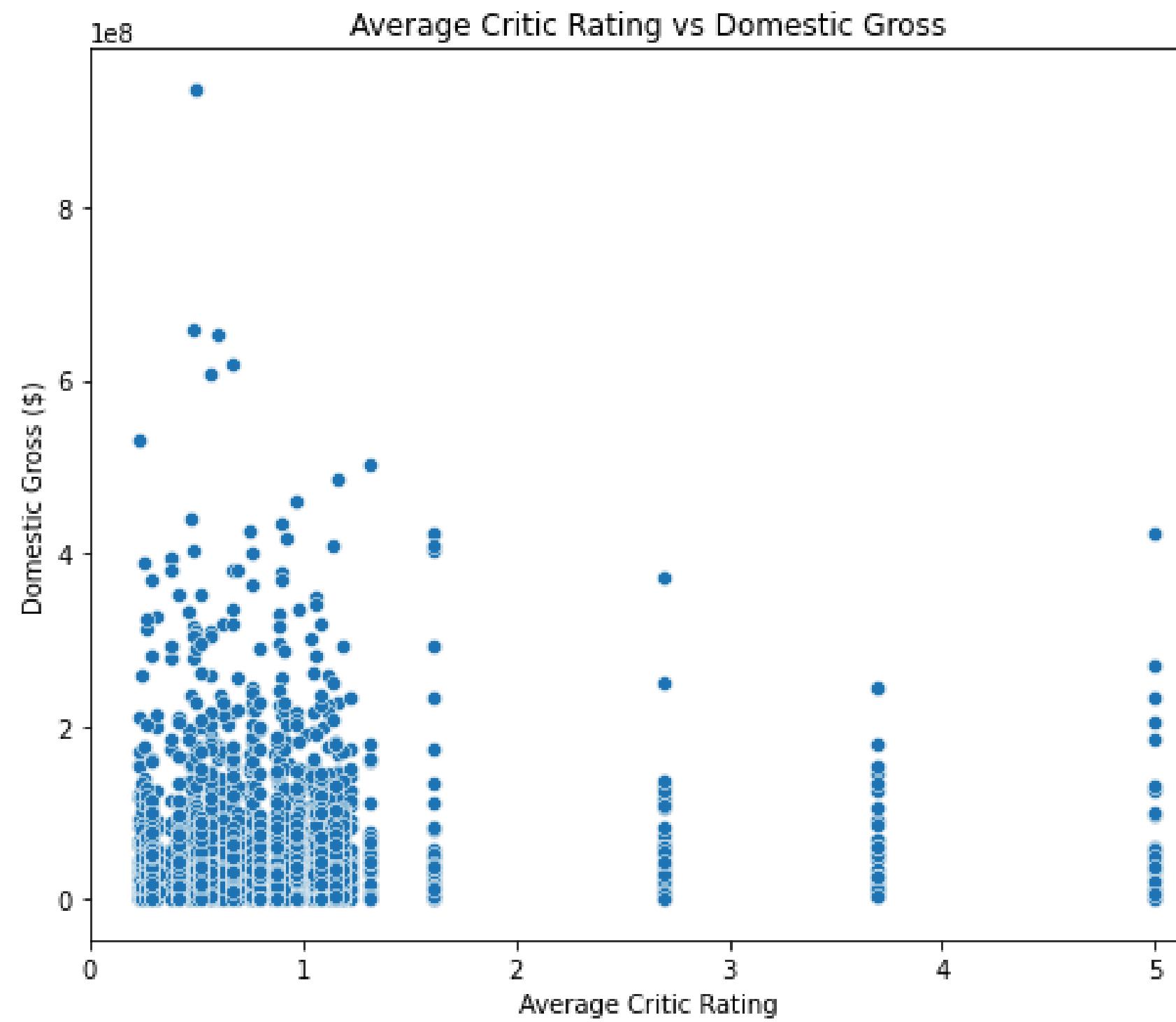


Q4.

How do critic ratings and audience ratings correlate with the box office performance metrics movies?

- Find out if highly-rated movies also perform better financially.
- Understanding this relationship can guide decisions on prioritizing quality and target audiences.

Sentiment Analysis Visualization



Sentiment Analysis

Insights

1. Average Critic Rating:

- The correlation between **Average Critic Rating** and **Domestic Gross** is **-0.0039**, indicating no significant relationship. The correlation with **Worldwide Gross** is **-0.0188**, also showing a negligible inverse relationship. This suggests that higher critic ratings do not lead to better box office performance.

2. Domestic and Worldwide Gross:

- A strong positive correlation (**0.9443**) exists between **Domestic Gross** and **Worldwide Gross**, indicating that films performing well domestically also tend to succeed globally.

3. Overall Implications:

- The weak correlation between critic ratings and box office performance implies that audience preferences may differ from critical acclaim, allowing movies to thrive despite low ratings from critics.



Recommendations Average Critic Rating



Studios should prioritize understanding audience preferences over achieving high critic ratings, as the data shows no significant impact of critic ratings on box office revenue.

Hypothesis testing for objective 4



- **Domestic_gross:**

Null Hypothesis(H_0) : There is no statistically significant relationship between Average Critic Rating and Domestic Gross.

p_value = 0

Alternative Hypothesis(H_1): There is a statistically significant relationship between Average Critic Rating and Domestic Gross.

p_value != 0

- **Worldwide_gross:**

Null Hypothesis(H_0) : There is no statistically significant relationship between Average Critic Rating and Worldwide Gross.

p_value = 0

Alternative Hypothesis(H_1): There is a statistically significant relationship between Average Critic Rating and Worldwide Gross.

p_value != 0



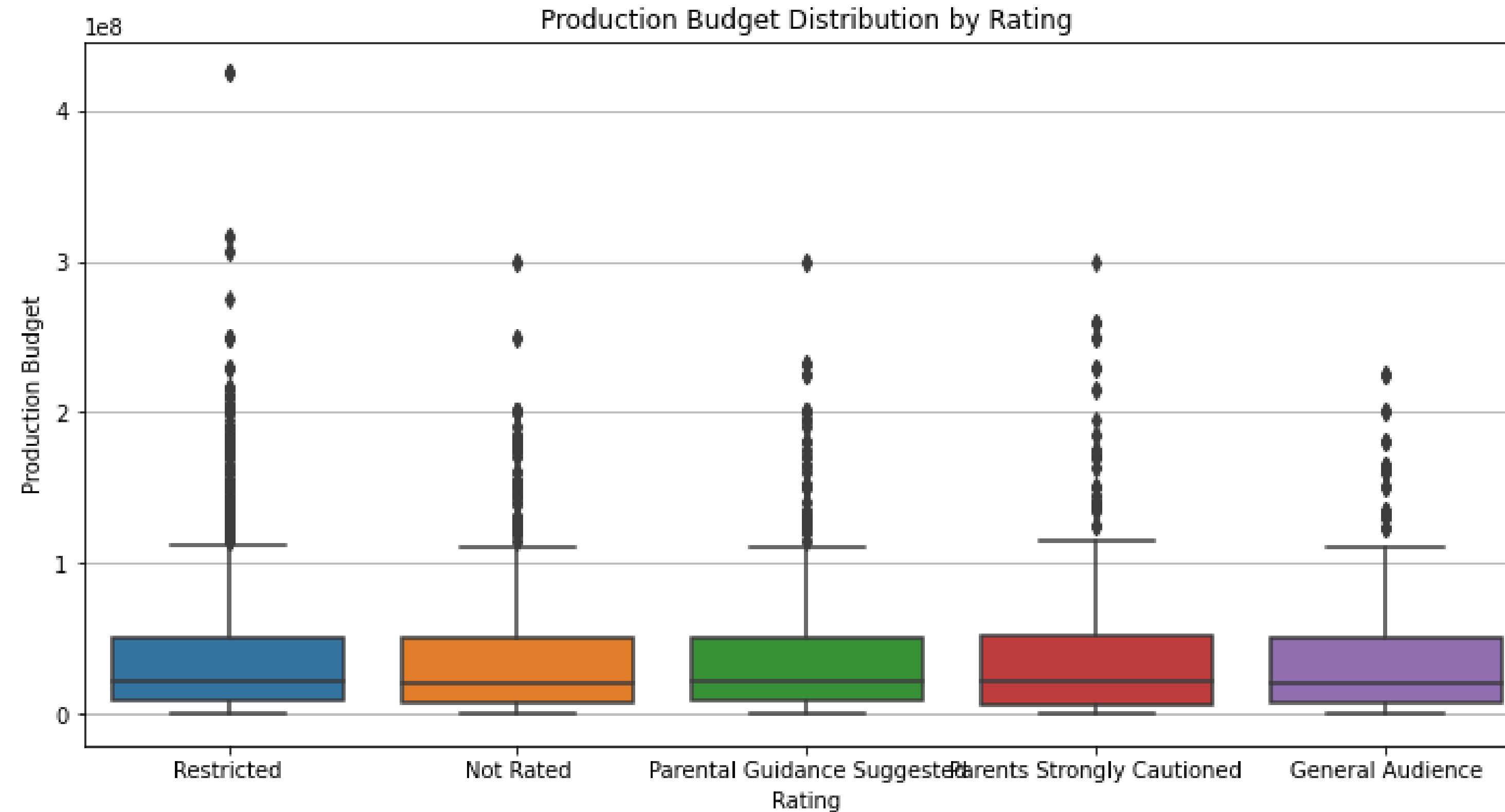
Insight

Based on the hypothesis testing the calculated p_value is greater than the normal p_value(0.05): therefore we fail to reject the null hypothesis.

The results confirm our previous observation that Average Critic Ratings do not have a statistically significant effect on the box office performance of movies, both domestically and internationally.

Production Budget By Rating

Visualization



Observations and Insights based on Movie Ratings



1. Average Critic Rating:

- The correlation between **"Average Critic Rating"** and **"Domestic Gross"** is **"-0.0039"**, indicating no significant relationship. The correlation with **"Worldwide Gross"** is **"-0.0188"**, also showing a negligible inverse relationship. This suggests that higher critic ratings do not lead to better box office performance.

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3. Overall Implications:

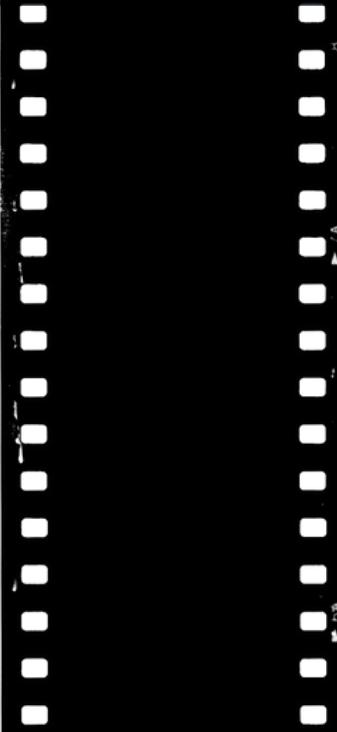
- The weak correlation between critic ratings and box office performance implies that audience preferences may differ from critical acclaim, allowing movies to thrive despite low ratings from critics.

Recommendations based on Objective 4



Therefore, studios should prioritize understanding audience preferences over achieving high critic ratings, as the data shows no significant impact of critic ratings on box office revenue.

Objective 5 : Market Trends for optimization



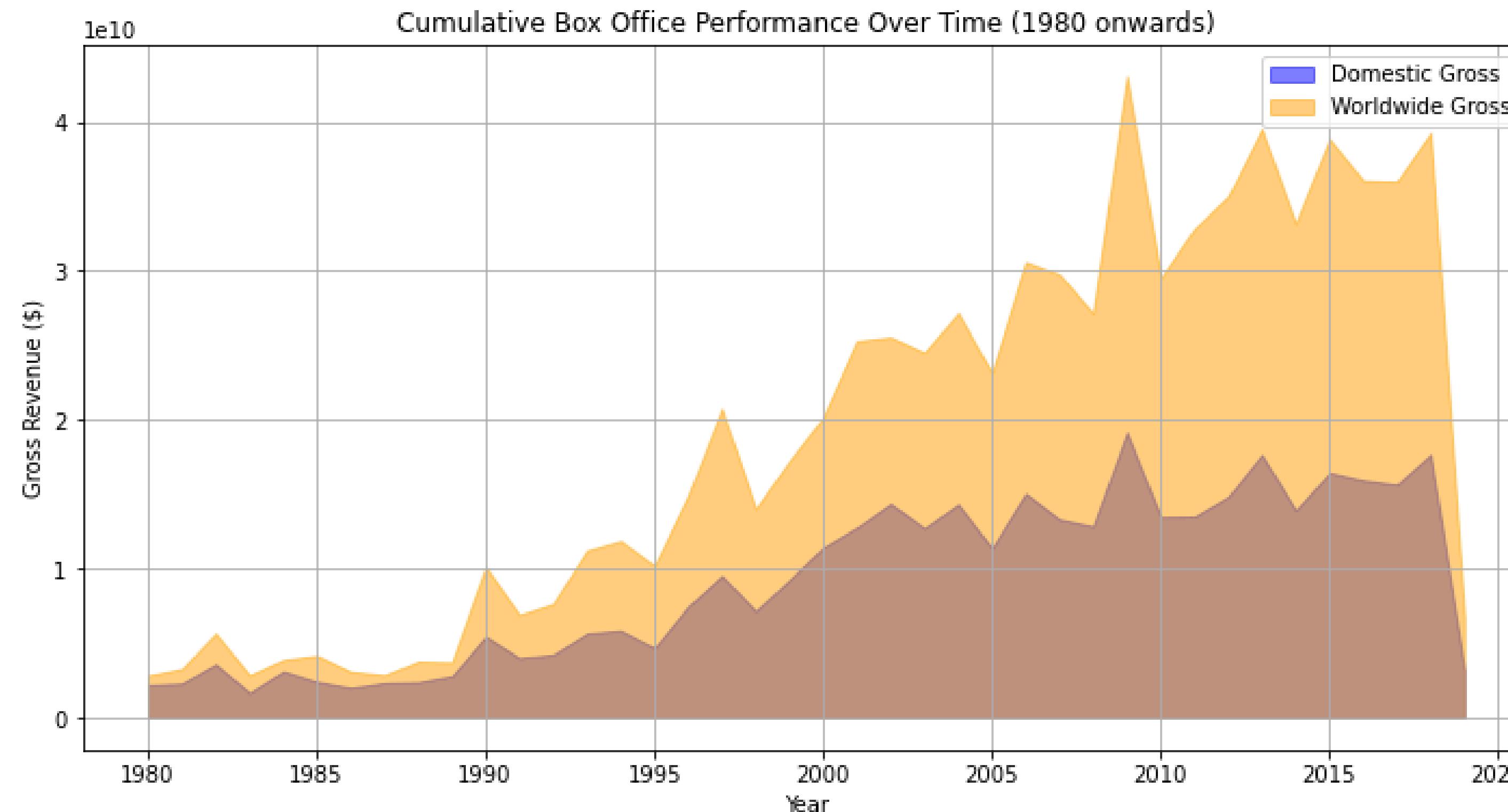
Q5.

What are the market trends by year whether seasonal or annual that influences box office success? What insights can be gained to inform optimal release timing and production focus based on historical trends?

- Identify peak seasons to optimize on release timing

Earnings Overtime At The Box Office

Visualization



Observations and Insights from Box Office Data



1. Overall Box Office Trends

- **Increasing Revenue***: Both Domestic Gross and Worldwide Gross show a general upward trend, especially from the early 1980s to the mid-2000s.

2. Production Budget Insights

- **Rising Budgets**: Average Production Budgets have increased significantly, from around 29.8 million dollars in 2000 to approximately 47.7 million dollars by 2015.
- **Budget vs. Gross Performance**: Correlating production budgets with gross revenues could reveal ROI trends.

3. Volatility in Performance

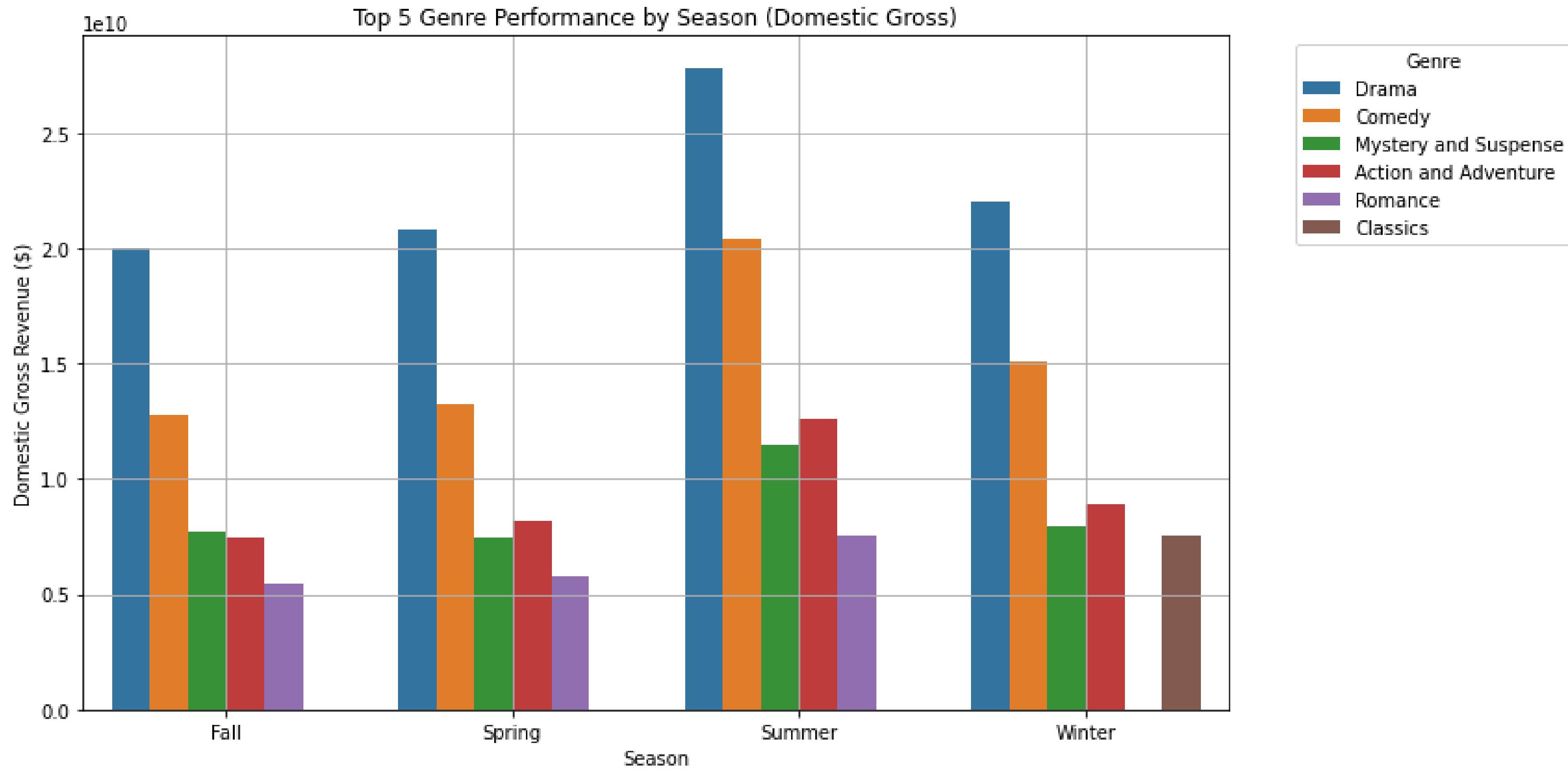
- **Fluctuation***: Notable drops in Domestic Gross since 2019 indicate potential market challenges, possibly due to external factors like the COVID-19 pandemic.

4. Market Changes and Viewer Behavior

- **Impact of Streaming**: The rise of streaming services is shifting consumer behavior, necessitating adaptations in production and marketing strategies.

SEASONS AND GENRES

Visualization



Key Insights from Seasonal Genre Performance



1. Dominance of Drama;

- Drama consistently outperforms other genres across all seasons, indicating a strong audience appeal year-round.

2. Strong Performance of Comedy:

- Comedy ranks as the second-best genre in all seasons, especially in Summer, suggesting broad appeal and profitability.

3. Seasonal Trends:

- Fall: Action and Adventure and Mystery and Suspense also show strong performances.
- Spring: Similar to Fall, with consistent interest in these genres.
- Summer: Blockbuster releases thrive alongside Drama and Comedy.
- Winter: Classics emerge, indicating nostalgia-driven viewing.

4. Market Strategy:

- Focusing on high-quality dramatic films year-round and timing releases for specific genres according to seasonal preferences can maximize audience engagement.

5. Diversity in Genre Performance:

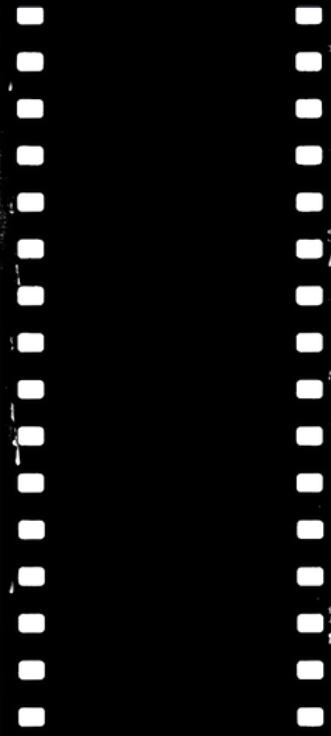
- Genres like Mystery and Suspense maintain top positions but are less dominant than Drama and Comedy, indicating opportunities for targeted marketing.

Recommendations based on Objective 5



- Align release schedules with genre performance trends for maximum impact.
- Conduct audience analysis to refine marketing strategies based on seasonal preferences.
- Explore unique narratives in niche genres to capture a wider audience base.

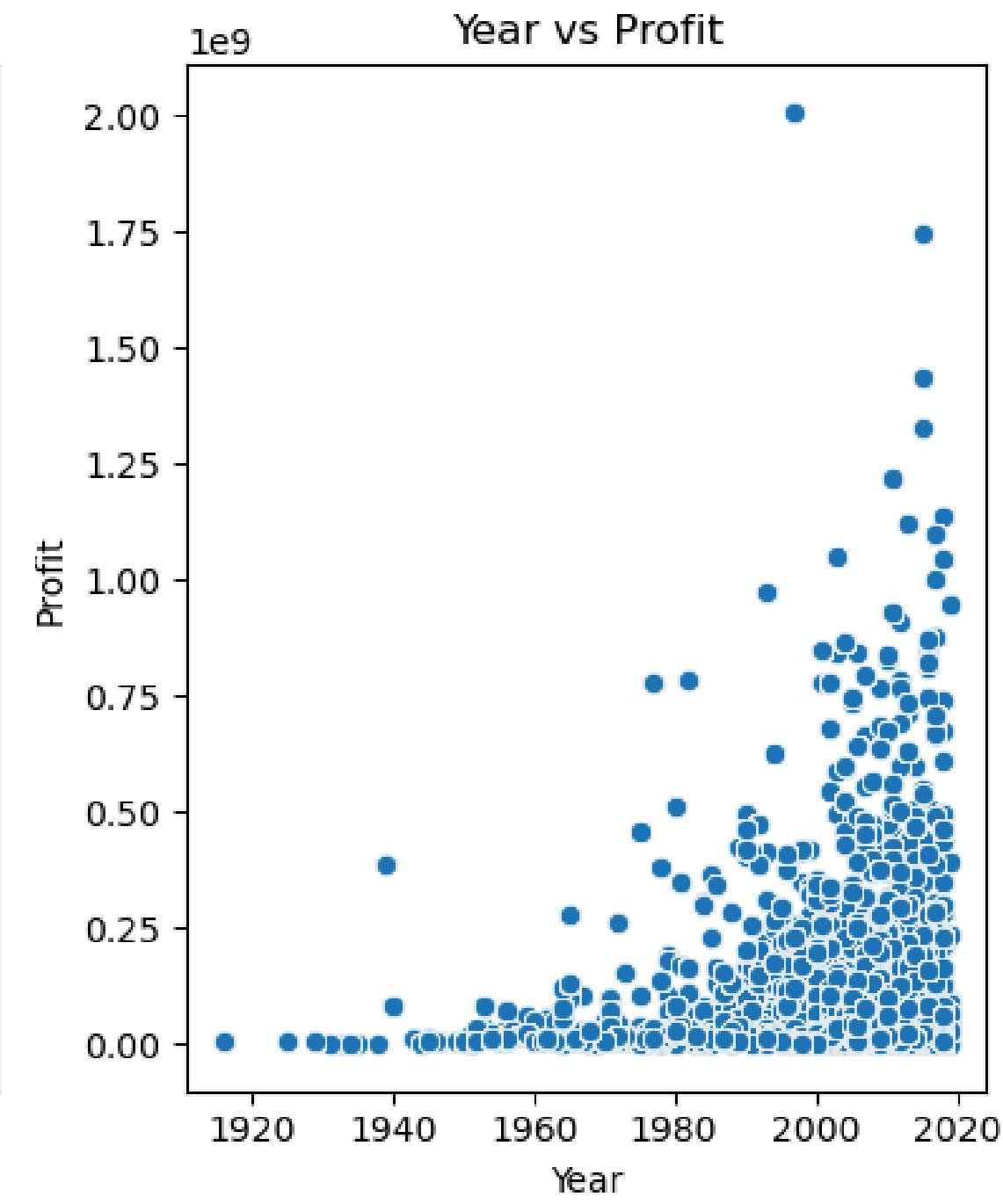
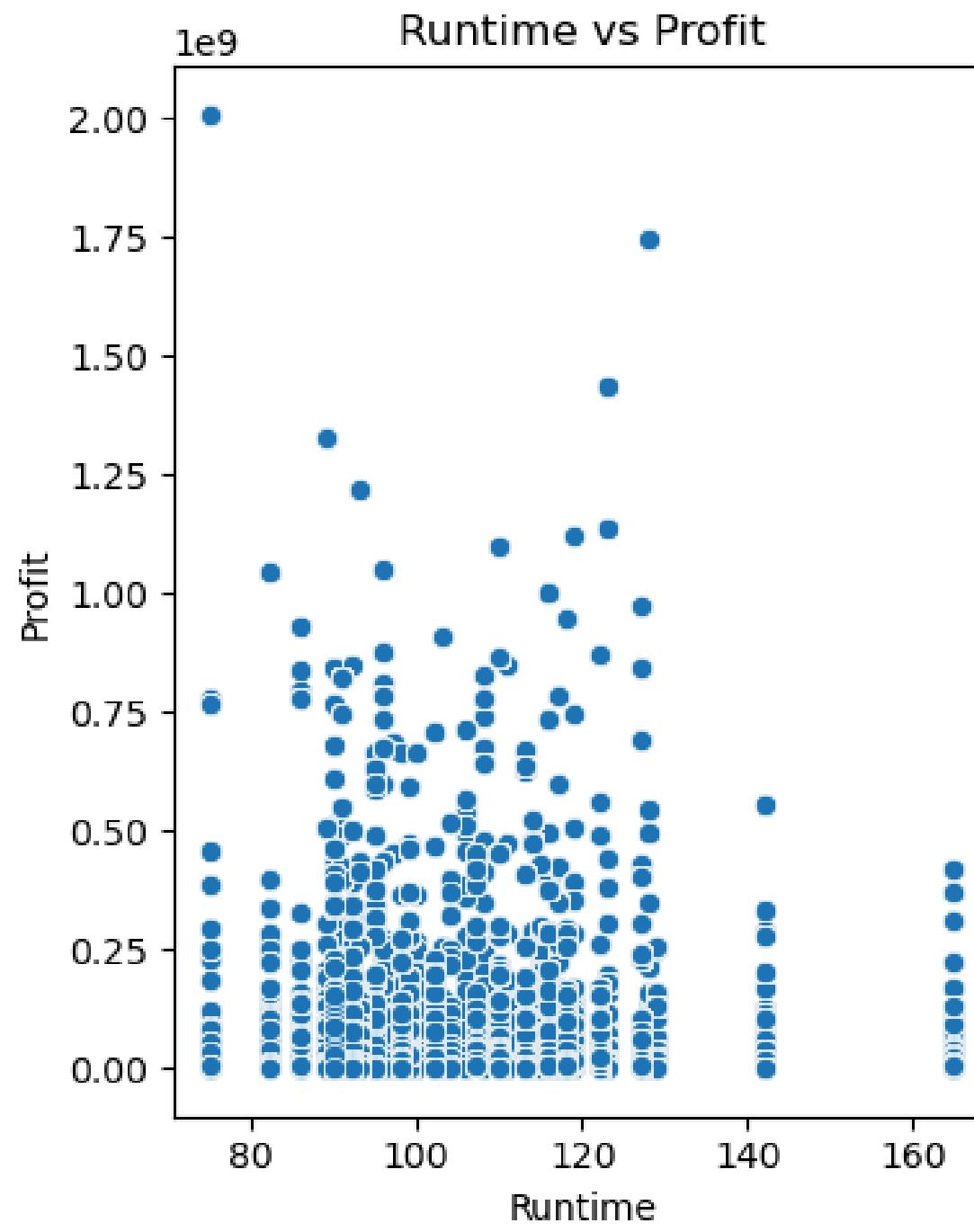
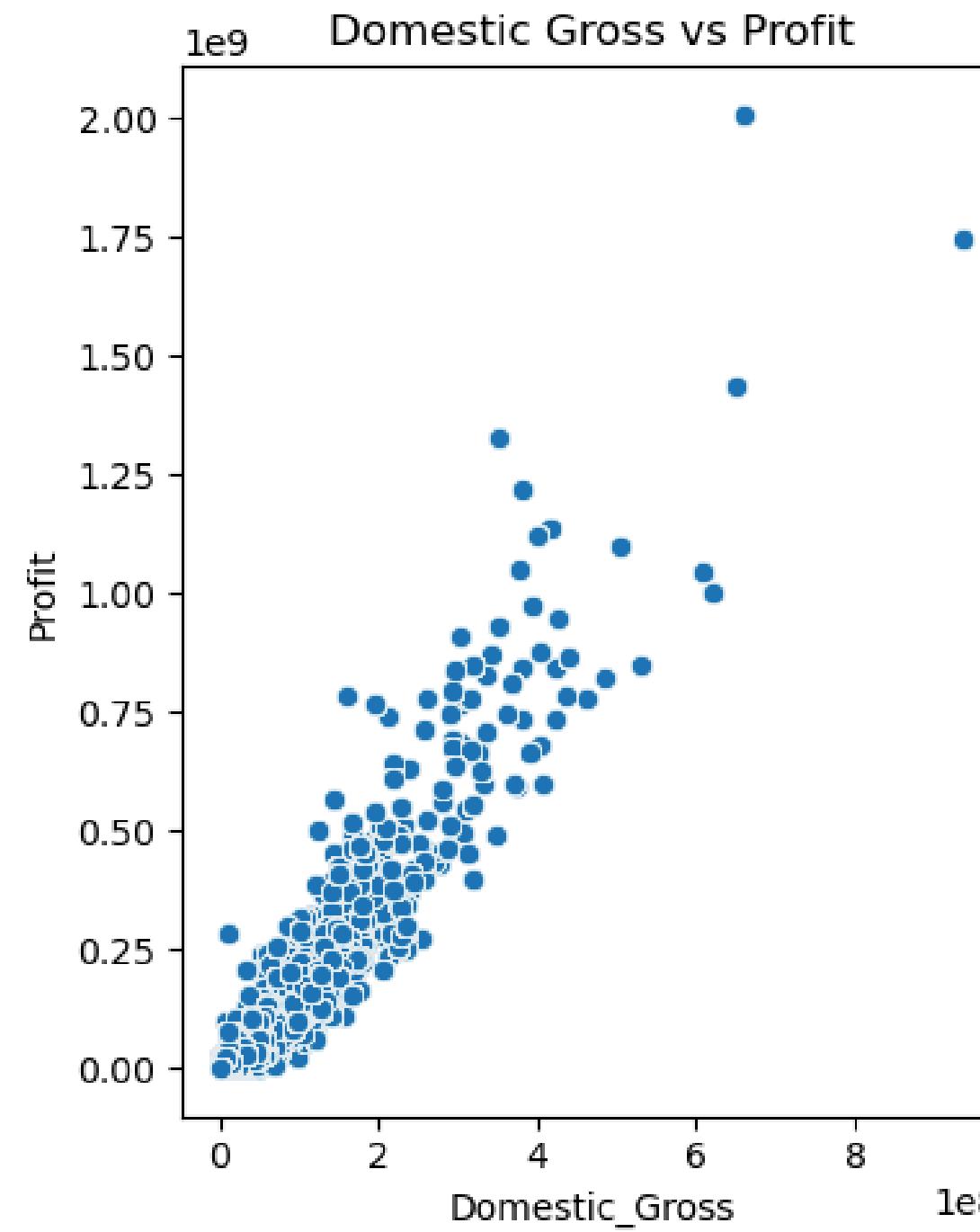
Objective 6 : Modeling



Feature Engineering

We are calculating profit, and scaling numerical features.

Modeling Visualization



Intercept

- **Value:** -700829610.6939986
- **Meaning**:** Represents the expected profit when all independent variables (Domestic Gross, Runtime, Year) are zero. A negative value suggests a baseline profit that is not realistic in practical scenarios.



Coefficients

- **Domestic Gross: 2.04**
 - Interpretation: For each additional dollar in domestic gross, profit increases by approximately \$2.04, indicating a strong positive relationship.
- **Runtime: -268,006.52**
 - Interpretation: Each additional minute of runtime decreases profit by about \$268,006.52, suggesting longer movies may be less profitable.
- **Year: 355,830.57**
 - Interpretation: Each additional year increases profit by approximately \$355,830.57, indicating that more recent films tend to be more profitable.
- **Summary**
 - Key Insights: Domestic Gross is a significant predictor of profit, Runtime negatively impacts profit, and newer films generally show increased profitability.

SUMMARY

- Key Insights: Domestic Gross is a significant predictor of profit, Runtime negatively impacts profit, and newer films generally show increased profitability
- Based on the above results, the model provides reasonably close estimates to actual values, especially in terms of mean and maximum profits.
- However, the presence of negative predictions like the minimum value suggests the model may need further refinement to improve accuracy, particularly for lower-grossing films.

INSIGHTS

- While the MAE provides a manageable average error, the extremely high MSE indicates that some predictions are very far from the actual values, skewing the metric.
- The RMSE supports this finding, showing that significant mispredictions are impacting the model's performance.
- Overall, while the model gives reasonable average predictions, it struggles with accuracy for certain films, especially at the extremes (either very low or very high profits).



IMPROVING ON THE MODEL

- Including Production_Budget and Worldwide_Gross in the feature set and rerun the model to see if they improve the predictive power.



KEY INSIGHTS

- Better Model Fit: The improved model demonstrates an almost perfect fit, as shown by near-zero error metrics and matching statistics between Actual and Predicted.
- Strong Predictors: Including 'Production_Budget' and 'Worldwide_Gross' as features improved the model significantly, indicating these variables are highly predictive of 'Profit'.
- Linear Relationship: The nearly exact relationship between 'Profit', 'Production_Budget', and 'Worldwide_Gross' reflects a strong linear dependency, where profit is almost exactly the difference between 'Worldwide_Gross' and 'Production_Budget'.

In conclusion, adding 'Production_Budget' and 'Worldwide_Gross' as predictors transformed the model from an approximate fit to an almost perfect predictor of 'Profit', revealing the importance of these two variables in determining profit outcomes in this dataset.

RECOMMENDATIONS

- For both domestic and worldwide projects, focusing more on Low and Medium Budget films with selective high-budget ventures can optimize profitability, as larger budgets have a small profit margin.
- However, for higher overall revenue the frequency of low and medium films should increase to match the revenue of high and very high categories.
- To maximize profitability and manage risk, prioritize high-margin genres like Musical and Performing Arts, Romance, and Comedy.
- Diversify investments across balanced and high-profit genres, and consider low-budget, high-margin opportunities, especially in Horror and Comedy.
- To enhance box office success, the studio should collaborate with high-grossing directors, consider those with extensive portfolios for reliable revenue generation, and use film count and gross revenue metrics for effective benchmarking.
- The studio should prioritize understanding audience preferences over critic ratings and consider the budget distribution across different movie ratings to inform budget allocation strategies effectively.
- The studio should align their release schedules with seasonal genre performance trends, focusing on high-quality dramatic and comedic films to maximize audience engagement and refine marketing strategies based on audience preferences.



CONCLUSION

In conclusion, the new movie studio should adopt a strategic approach that emphasizes the production of low and medium-budget films, particularly in high-margin genres such as Musical and Performing Arts, Romance, and Comedy, while selectively investing in high-budget projects to ensure optimal profitability. By prioritizing audience preferences over critic ratings and aligning release schedules with seasonal genre performance trends, the studio can maximize box office success and effectively allocate budgets. Collaborating with high-grossing directors will further enhance revenue generation, enabling the studio to navigate the competitive landscape of original video content successfully.





THANK YOU

