

# Capstone Project: Movie Analysis

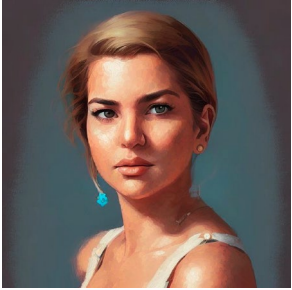
By: Git Dat Money (Group 1A)

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# Group 1A

Git Dat Money



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- Risk & Advisory Analyst – Cyber Security
  - Cyber Strategy



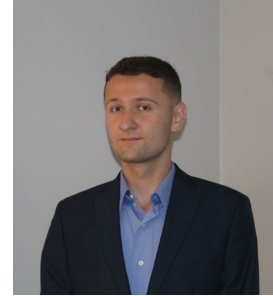
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- Risk & Advisory Analyst – Cyber Security
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- Strategy & Analytics –
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- Customer & Marketing Analyst – Advertising, Marketing & Commerce
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- Strategy & Analysis –
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# Agenda

1 | Overview  
Business understanding

2 | Data Understanding  
Data Analysis

3 | Statistical Inference

4 | Recommendations  
Next Steps

# Business Understanding

Evaluating the opportunity at hand for Computing Vision.

## MARKET TREND

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Company-original video content is on the rise, viewers are increasingly engaging more.

## BUSINESS OPPORTUNITY

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To position wisely, Computing Vision should create original content.

## STRATEGICAL APPROACH

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Analyze movies to gain insights into success factors in efforts to take a calculated approach towards allocating content creation budget.

# Data Understanding

Overview of data sources, & information gained from each.



2 Data Sets

1 Data Set

1 Data Set

1 Data Set

Used for Movie Attributes	
Important Columns	<ul style="list-style-type: none"><li>• Genre</li><li>• Director</li><li>• Writer</li></ul>
<ul style="list-style-type: none"><li>• Limited number of box office observations.</li></ul>	

Used for Movie Review / Rating Analysis	
Important Columns	<ul style="list-style-type: none"><li>• Fresh</li></ul>
<ul style="list-style-type: none"><li>• Utilized Fresh/Rotten score to standardize review analysis.</li></ul>	

Both tables were joined to analyze reviews based on movie attributes.

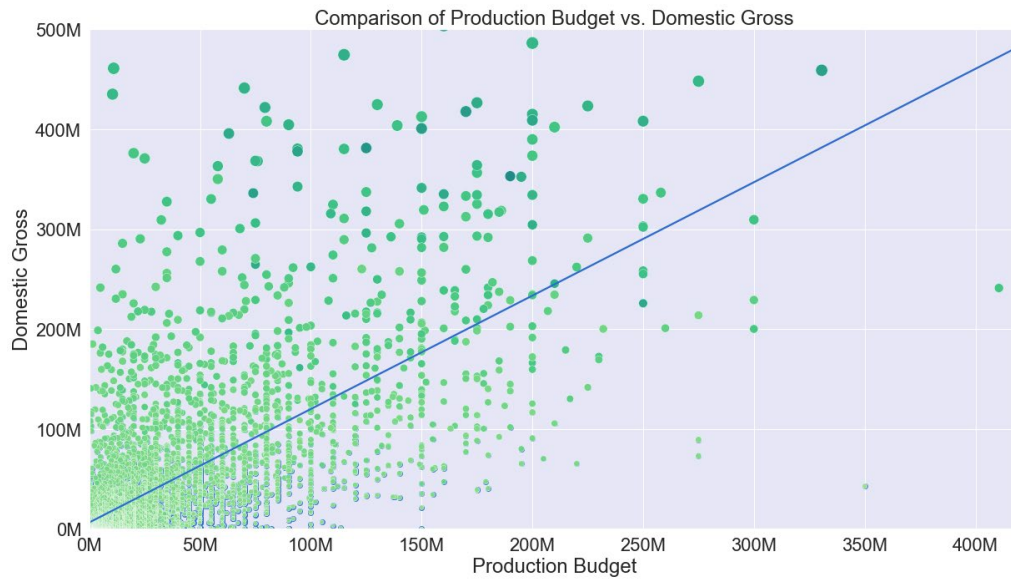
Used for Financial Analysis	
Important Columns	<ul style="list-style-type: none"><li>Title</li><li>Production Budget</li><li>Domestic Gross</li><li>Worldwide Gross</li></ul>
<ul style="list-style-type: none"><li>Domestic Gross &amp; Worldwide Gross are a sum of only box office income.</li><li>Added column: "Profit", to find difference between Worldwide Gross &amp; Production Budget.</li></ul>	

Used for Movie Characteristics & Ratings	
Important Columns	<ul style="list-style-type: none"><li>Title</li><li>Vote Average</li><li>Original Language</li></ul>

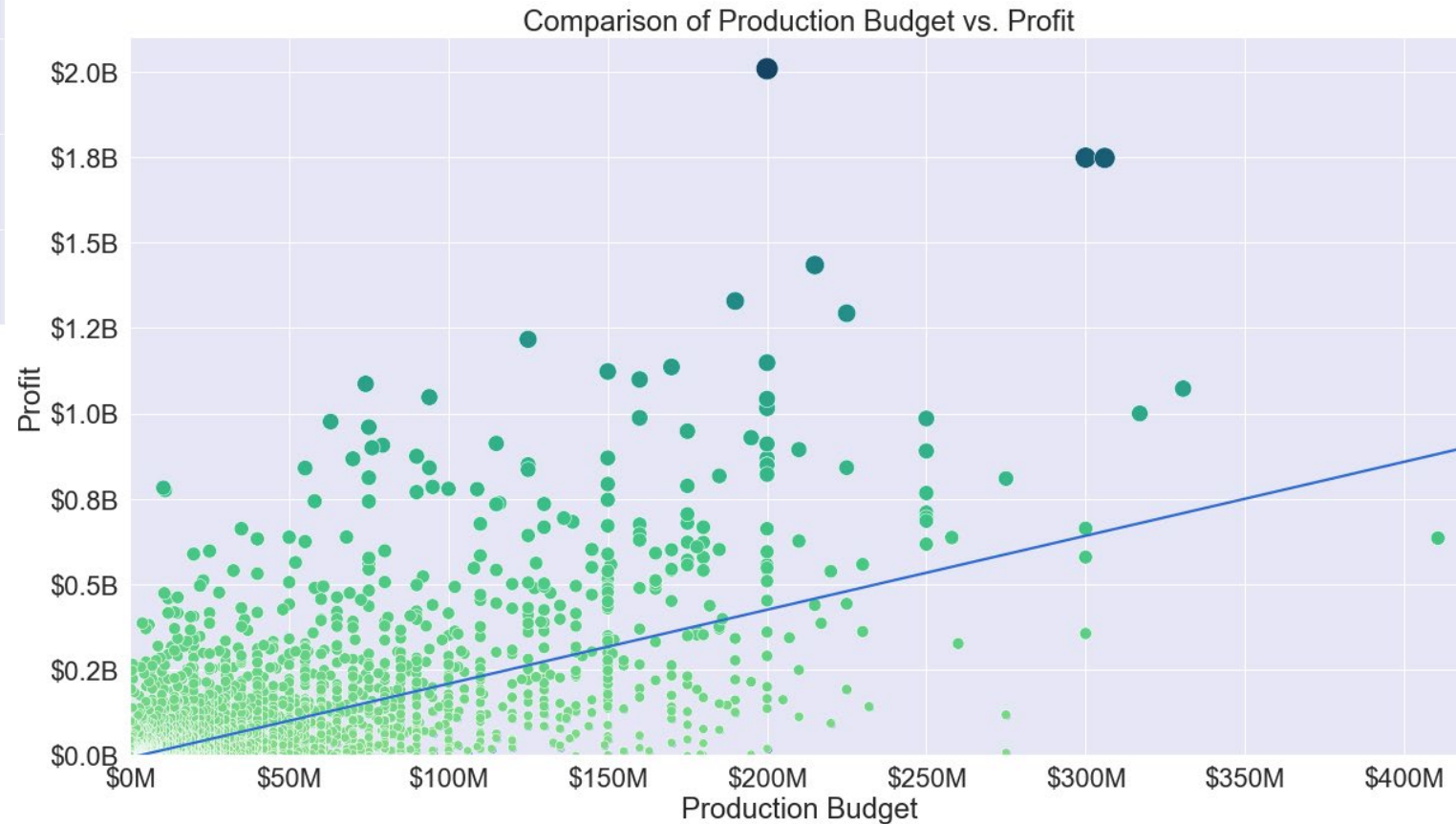
Used for Financial Analysis	
Important Columns	<ul style="list-style-type: none"><li>Title</li><li>Studio</li><li>Domestic Gross</li><li>Foreign Gross</li></ul>
<ul style="list-style-type: none"><li>Domestic Gross &amp; Foreign Gross are a sum of only box office income.</li></ul>	

# The Impact of Budget with Domestic & Worldwide Gross

The positive correlation of production budget compared to gross revenue streams.



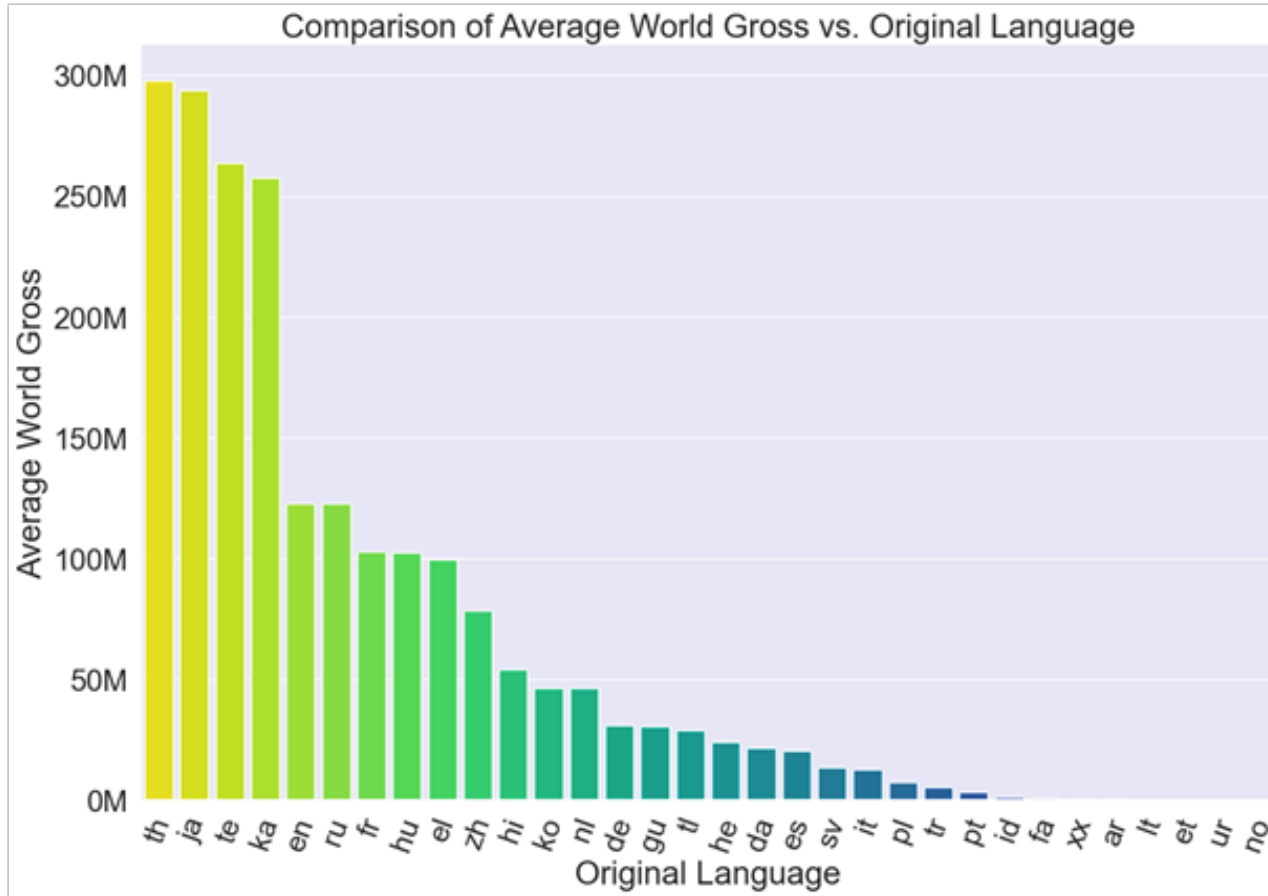
- Positive correlation on all aspects
- **Limitation:** Accuracy of a true Production Budget – 10% buffer



***Worldwide market does bring in more profit.***

# Worldwide Gross vs. Original Language

Analysis of Original Language

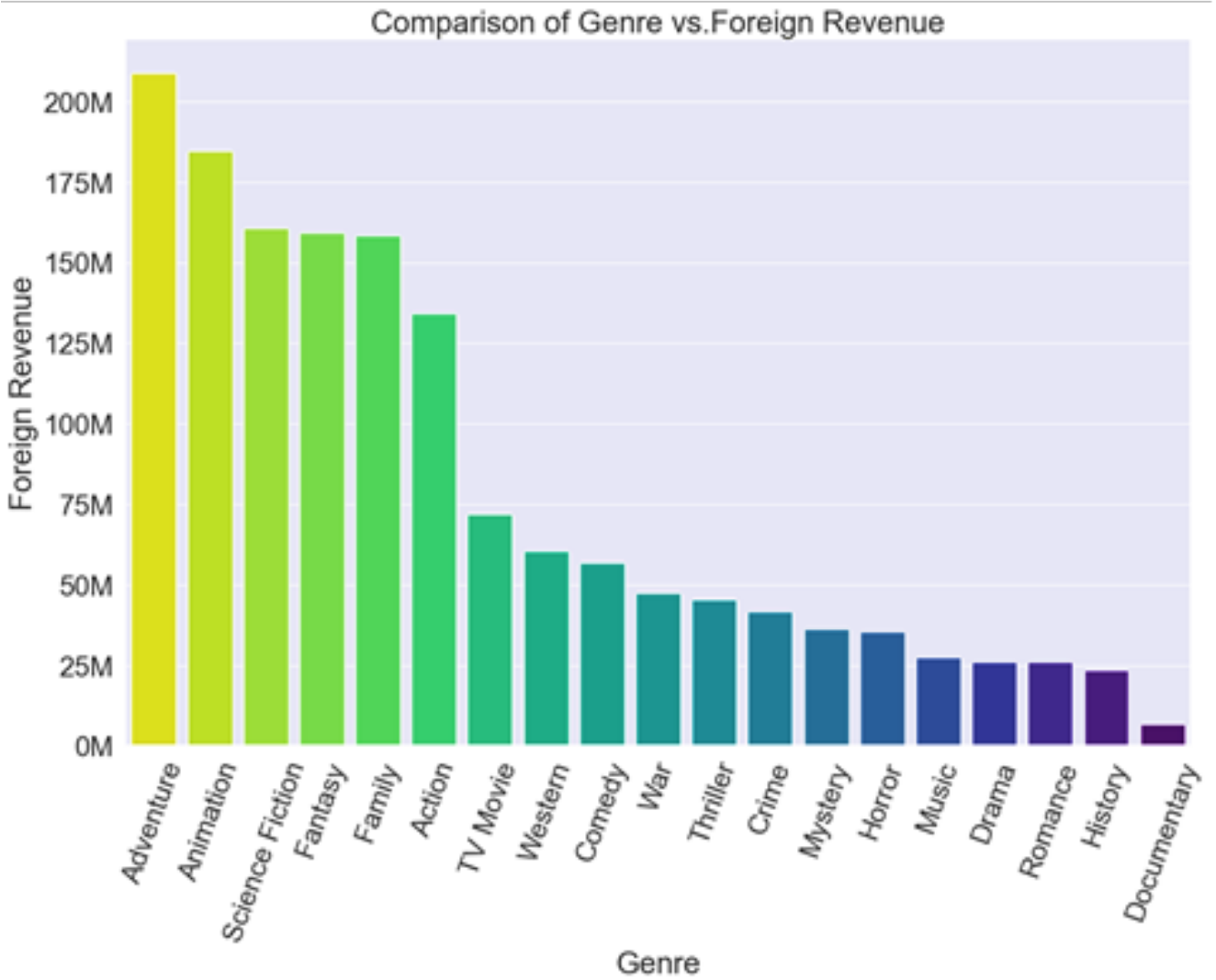


- Our Analysis found that the **Thai** had the highest Worldwide gross while English had the 5th highest.
- The Second highest language was Japanese.
- The **Top 5** languages are
  1. **Thai**
  2. **Japanese**
  3. **Telugu**
  4. **Georgian**
  5. **English**

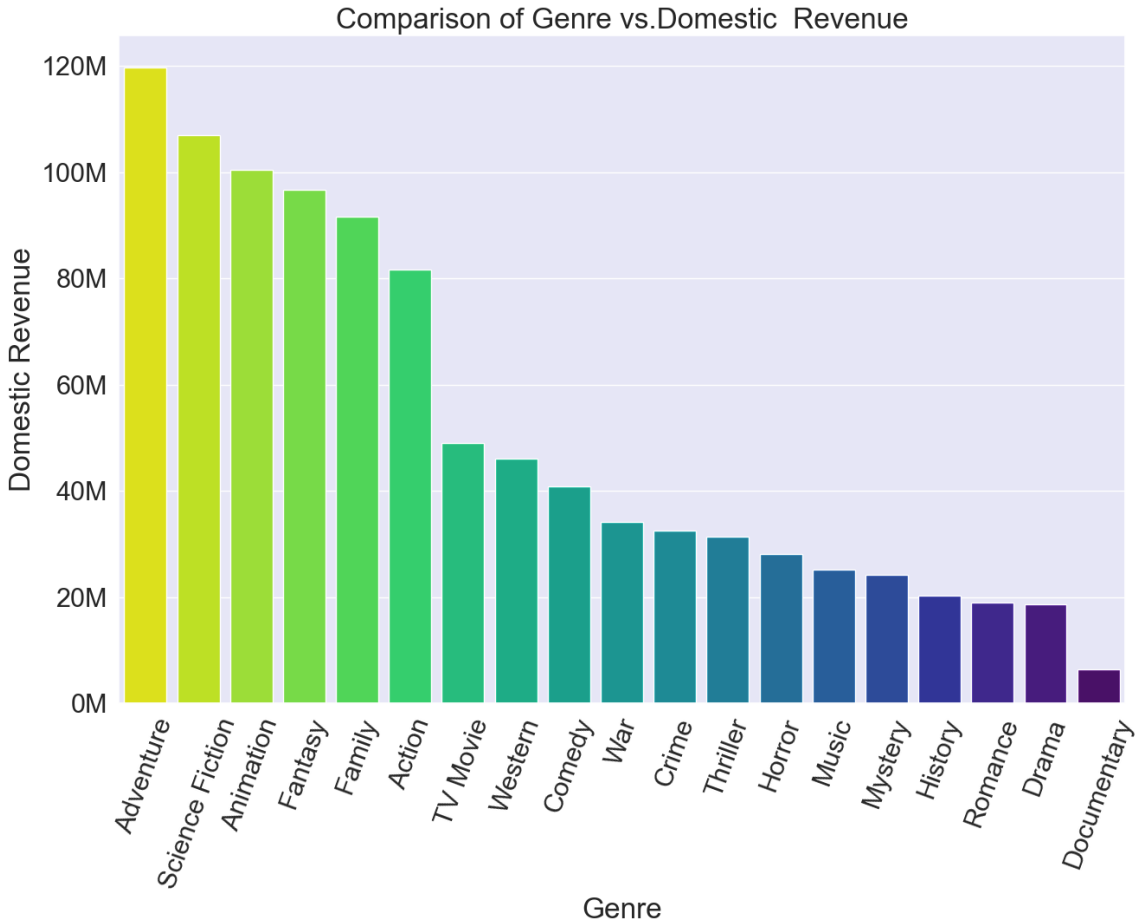


# Genre vs. Foreign Revenue

Analysis of Genre and Foreign Revenue



- **Adventure** Genre = Highest Revenue in both foreign revenue & domestic Revenue.
- **Documentary Genre** = Lowest revenue in both foreign revenue & domestic Revenue.
- Business recommendation: **Invest in the top 3 genres** for maximum returns (**Adventure, Animation, Science Fiction**)

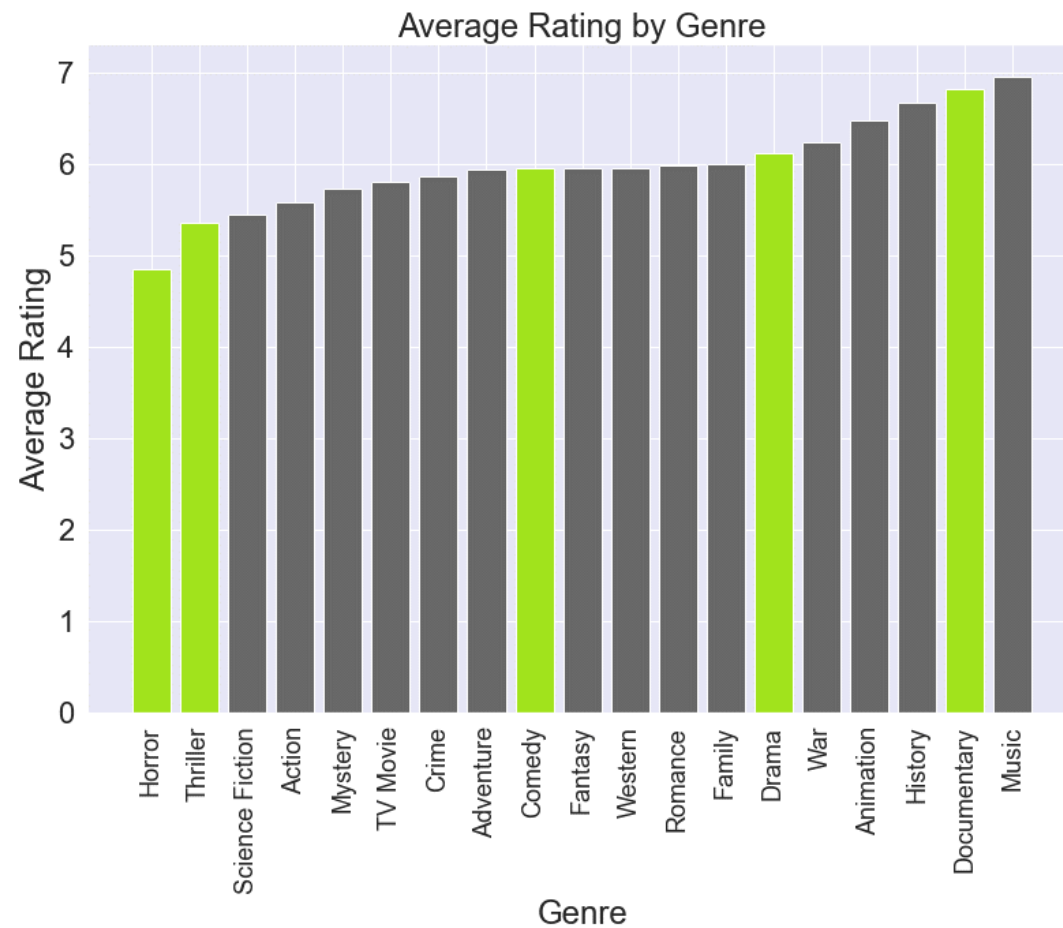
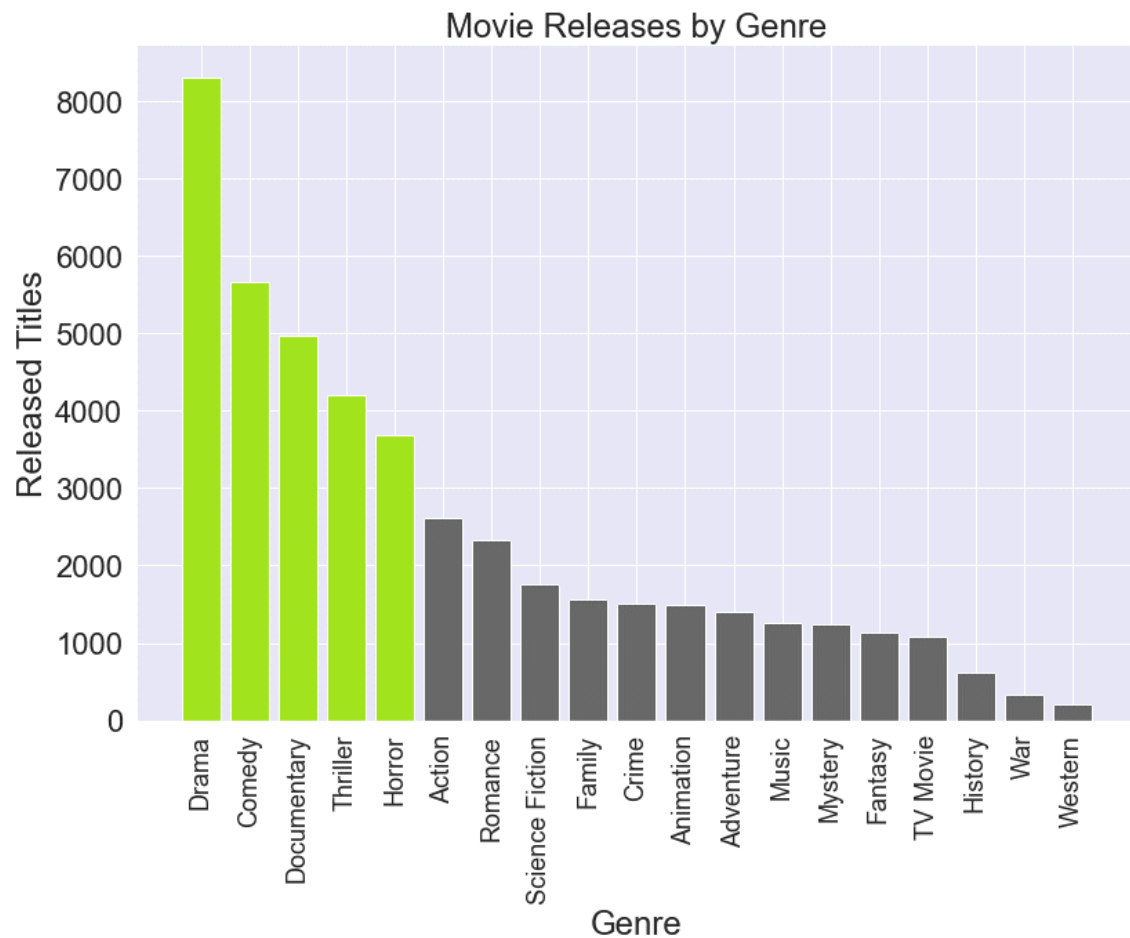




# Genre vs. Popularity Analysis

- Top 5 most produced genres: **Drama, Comedy, Documentary, Horror, Thriller**
- **Genre recommendation:** *Adventure* has great ratings & *is not* a saturated market

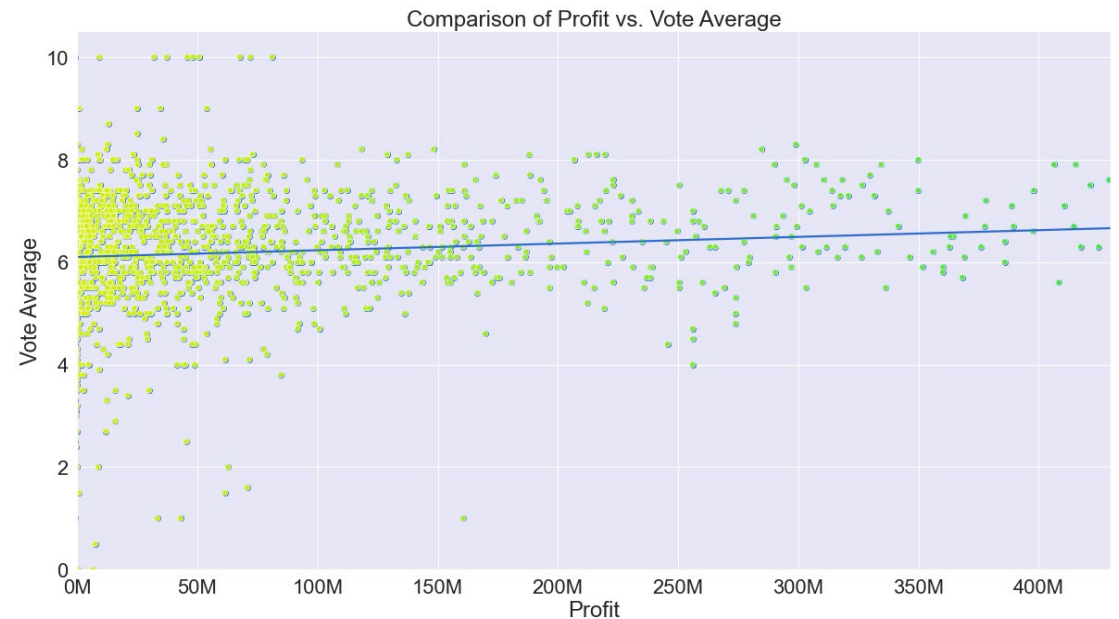
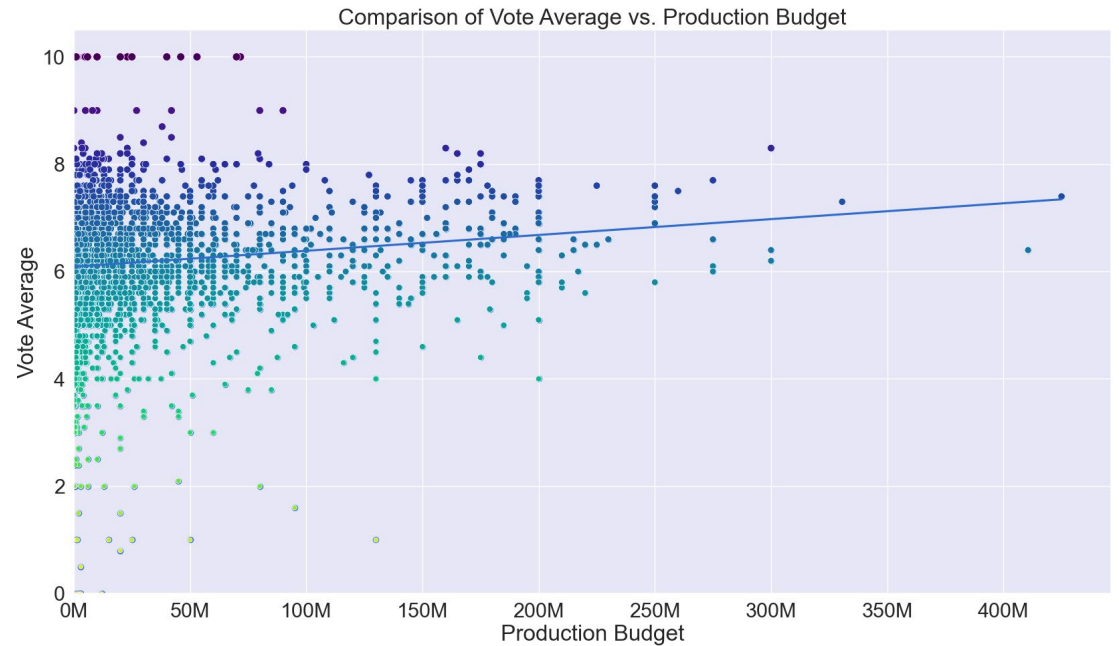
Extracted from Box Office and Rotten Tomatoes.\*



# Vote Average Analysis

Analysis of relationship between financial outcomes of a movie & ratings.

- Visible positive relationship between vote average & production budget.
  - Higher production budgets lead to movies with higher ratings.
- **Slight positive relationship between profit\* & vote average (movie rating).**
  - **Movies with high ratings bring in more profit**
  - Movies on the higher end of the profit scale generally *do not* have a vote average less than 6



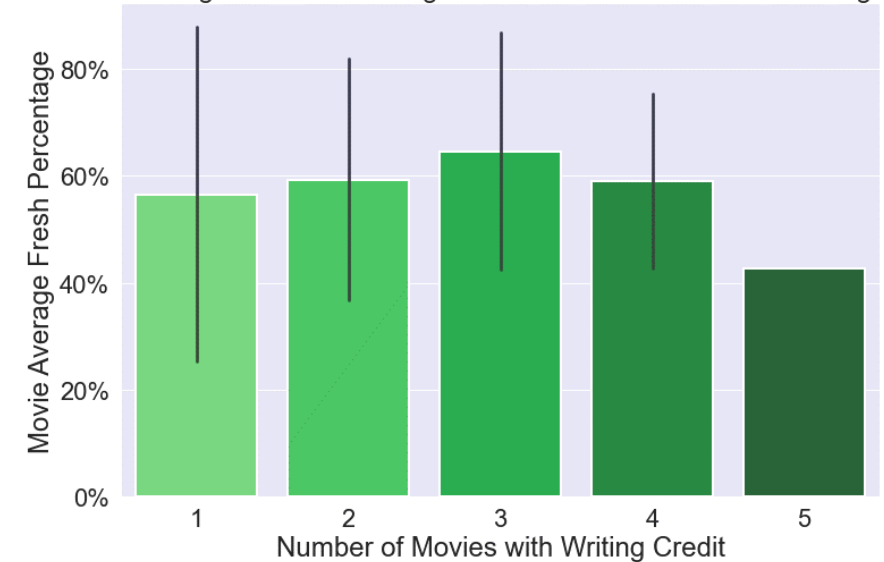
# Director & Writer Analysis

Analysis of relationship between ratings & individual directors /writers.

- Appears to be a **positive relationship** between average movie Fresh (good) percentage & number of films a director has made.
- 1st time directors have the largest variance in average Fresh percentage.
- The number of movies a writer has worked on does not seem to have a relationship with average movie Fresh rating.
- **Recommendation: More experienced directors lead to higher rated movies.**

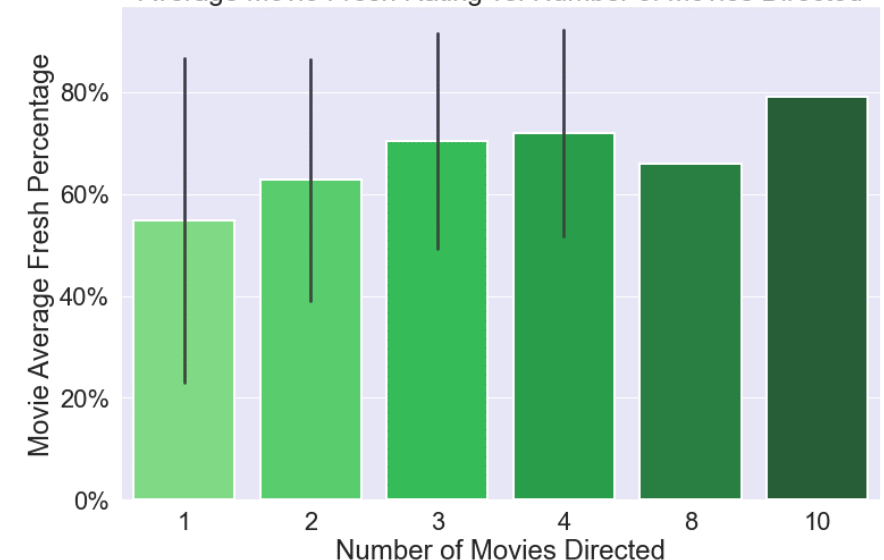
## Writer Comparison:

Movie Average Fresh Percentage vs. Number of Movies with Writing Credit



## Director Comparison:

Average Movie Fresh Rating vs. Number of Movies Directed



# Hypothesis Testing

Does director experience lead to a higher average percentage of Fresh ratings on Rotten Tomatoes?

- **Null Hypothesis:** Distributions of movie Fresh percentage for first time directors are *statistically similar* to experienced directors.
- **Alternative Hypothesis:** Distributions of movie average Fresh percentage for experienced directors are *higher than* for first time directors.

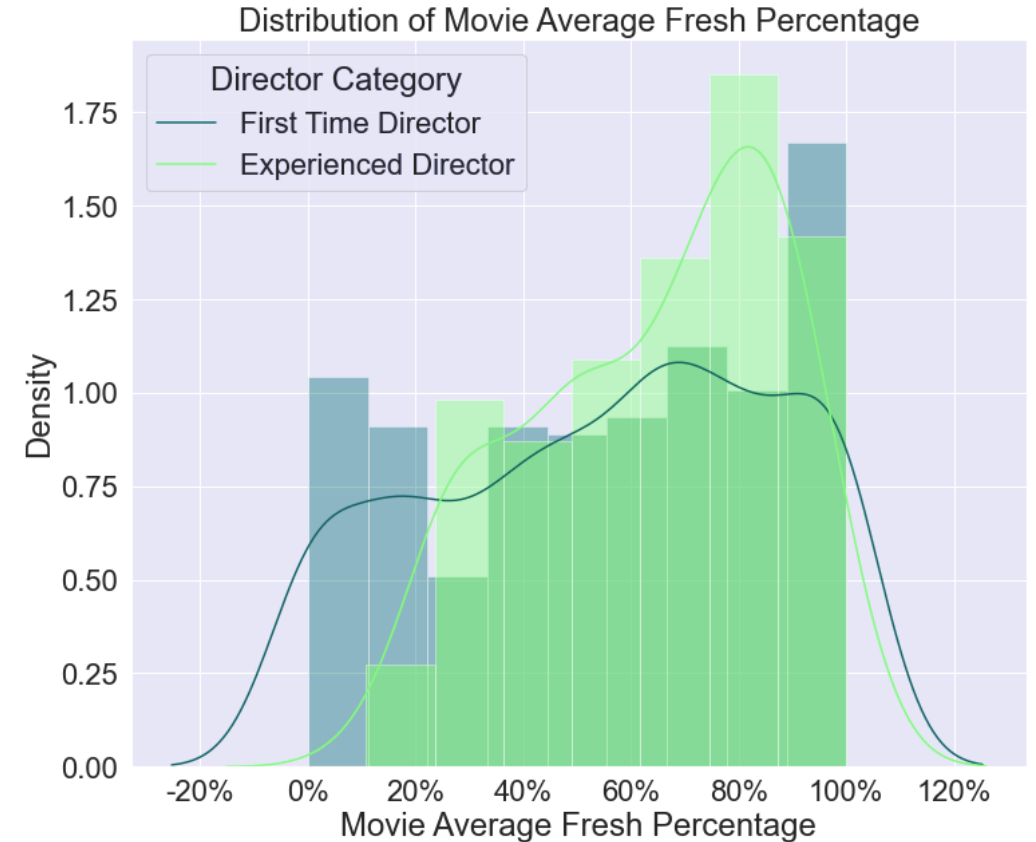
## Testing Conclusion:

**Mann-Whitney U test:** Conclude that the movie average fresh percentage is significantly greater for movies that were directed by a director who has worked on 2 or more movies.

## Linear Regression Results:

**Model 1:** As a **director gains one movie** in experience, the **fresh percentage is expected to increase by 5%**

**Model 2:** For every **fresh percentage point gained**, we can expect to see **box office revenue increase by \$16.7K**



Key Variable: *Fresh Percentage*

- Sum of Fresh (good) reviews/total number of reviews.

Key Variable: *Movie Average Fresh Percentage*

- Average of fresh percentage = All percentages/number of movies directed.

Rotten Tomatoes Reviews\*

# Recommendations for Computing Vision

To maximize profitability the company should implement the following recommendations.



## GO GLOBAL

Not only does this impact profit but also essential to language variety worldwide.



## HIRE EXPERIENCED DIRECTORS

Directors with more than one movie under their belt tend to have better rated movies.



## PRODUCE AN ADVENTURE MOVIE

Our analysis indicates it is the most profitable genre and is averagely reviewed.



## FOCUS ON THAI AND JAPANESE LOCALIZATIONS

For an international release, the Asian market should be prioritized.

# Next Steps

Further Analysis



## AI APPLICATION

- Prediction model for movie ratings & financial outcomes.



## IN-DEPTH TIMELINE ANALYSIS

- Trends over time & the impact → revenue.

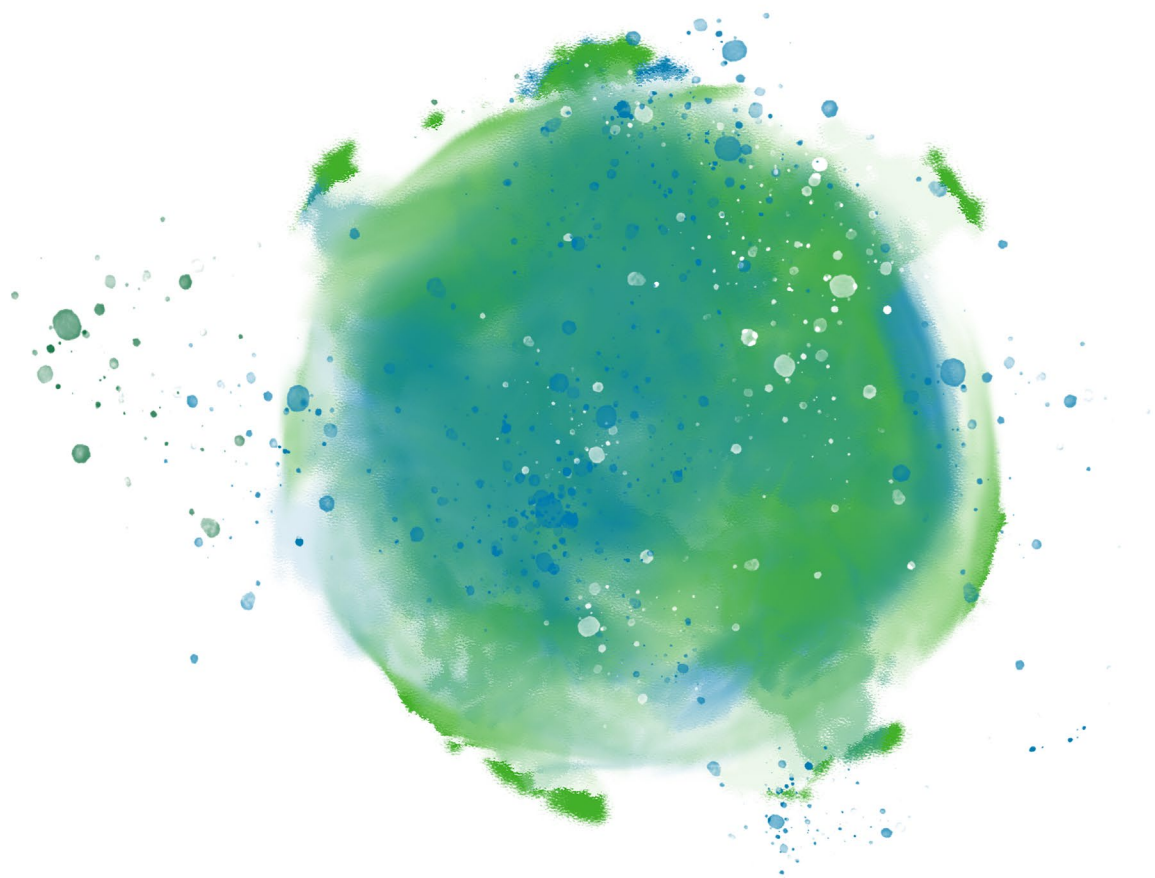


## DEMOGRAPHIC ANALYSIS

- Demographic analysis of reviewers & overall popularity demographic based on genres.

# Q&A

Thank you for your time & we hope you gained valuable insight from the presentation.



## Contact Information

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# Appendix

Further analysis on Budget / Worldwide Earnings / ROI.

## Biggest Budgets

Release Date	Movie	Production Budget	Domestic Gross	Worldwide Gross
1 Dec 16, 2022	Avatar: The Way of Water	\$460,000,000	\$666,680,980	\$2,264,822,501
2 Apr 26, 2019	Avengers: Endgame	\$400,000,000	\$858,373,000	\$2,794,731,755
3 May 20, 2011	Pirates of the Caribbean: On Stranger Tides	\$379,000,000	\$241,071,802	\$1,045,713,802
4 May 1, 2015	Avengers: Age of Ultron	\$365,000,000	\$459,005,868	\$1,395,316,979

## Most Profitable Movies, Based on Return on Investment

Release Date	Movie	Approx. Profit	Production Budget	Roi
1 Mar 21, 1980	Mad Max	\$49,675,000	\$200,000	24,738%
2 Sep 29, 2006	Facing the Giants	\$24,769,205	\$100,000	24,669%
3 Sep 25, 2009	Paranormal Activity	\$89,948,399	\$450,000	19,889%
4 Feb 26, 1993	El Mariachi	\$1,013,964	\$7,000	14,385%
5 Jul 14, 1999	The Blair Witch Project	\$83,224,000	\$600,000	13,771%

## Biggest Money Losers, Based on Absolute Loss on Worldwide Earnings

Release Date	Movie	Approx. Income	Approx. Expense	Profit
1 Mar 11, 2022	Turning Red	\$7,602,225	\$175,000,000	-\$167,397,775
2 Jul 30, 2021	Jungle Cruise	\$113,953,046	\$264,216,000	-\$150,262,954
3 Mar 11, 2011	Mars Needs Moms	\$26,781,069	\$170,166,000	-\$143,384,931
4 Sep 4, 2020	Mulan	\$59,282,037	\$200,000,000	-\$140,717,963
5 Feb 4, 2022	Moonfall	\$32,581,195	\$170,784,000	-\$138,202,805