

REGRESSION PROJECT

EXPORTING AMERICAN MOVIE ADAPTATIONS



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INTRODUCTION

- ▶ **Motivation:** Movies Worldwide, Inc., wants a decision tool to guide their choice on which American movie adaptations to export.
- ▶ **Research Question:** Can a model predict international gross revenue based on readily available movie data?
- ▶ **Recommendation:** Explore country-specific box office sales to predict understand what movie factors contribute to high international gross revenue.



Photo by Photo by Alamy.com

BOXOFFICEMOJO.COM DATA

METHODOLOGY

- ▶ Web-scraped movie dataset from [boxofficemojo.com](https://www.boxofficemojo.com)

- ▶ Adaptations, include:

- ▶ Books, television shows *
- ▶ Plays
- ▶ Events, video games

- ▶ Movies from 1978 to 2022

*Books include young adult novels, contemporary novels, children's books, and comic books. Television shows include children shows and cartoons.

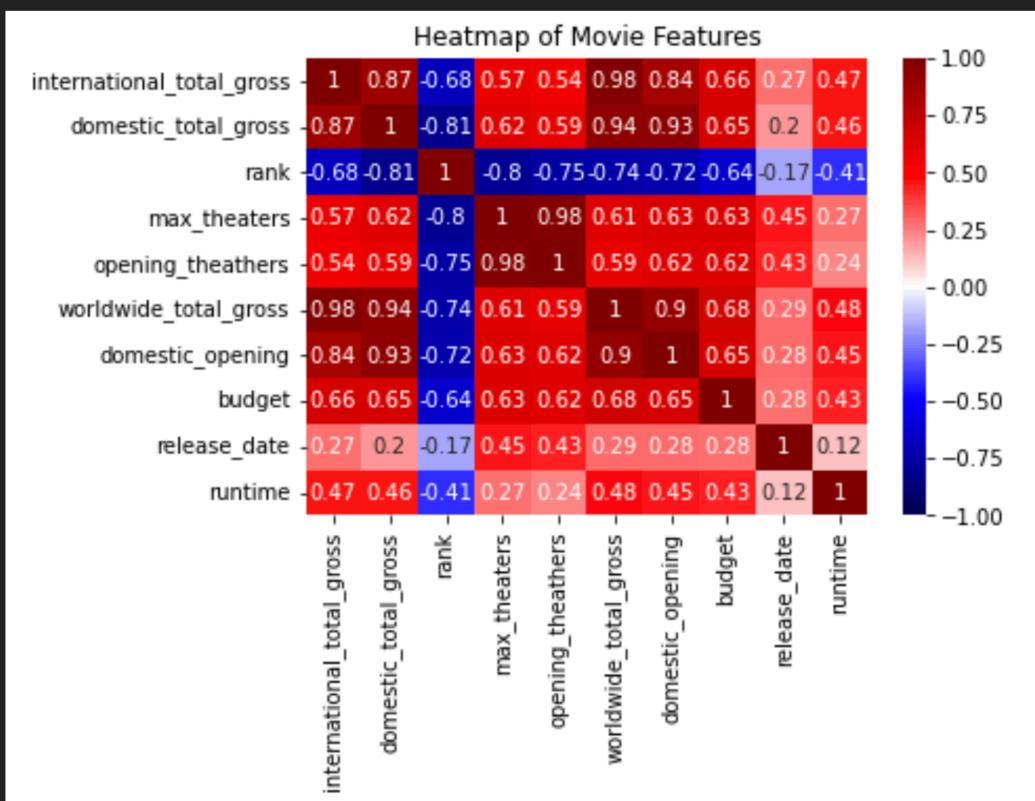
The screenshot shows a search results page on the Box Office Mojo website. The header includes the site logo, a search bar, and social media links. The main content area is titled "Genre Keyword: Adaptation". A table lists the top three adaptation movies based on lifetime gross: "Avengers: Endgame", "Spider-Man: No Way Home", and "Black Panther". Each row includes the rank, title, lifetime gross, number of theaters, opening weekend gross, opening date, and distributor.

| Rank | Title | Lifetime Gross | Max Theaters | Opening | Open Th | Release Date | Distributor |
|------|-------------------------|----------------|--------------|---------------|---------|--------------|-------------------------------------|
| 1 | Avengers: Endgame | \$858,373,000 | 4,662 | \$357,115,007 | 4,662 | Apr 26, 2019 | Walt Disney Studios Motion Pictures |
| 2 | Spider-Man: No Way Home | \$794,343,553 | 4,336 | \$260,138,569 | 4,336 | Dec 17, 2021 | Sony Pictures Entertainment (SPE) |
| 3 | Black Panther | \$700,059,566 | 4,084 | \$202,003,951 | 4,020 | Feb 16, 2018 | Walt Disney Studios Motion Pictures |

RESULTS

- ▶ Known **high** multicollinearity
- ▶ Log transformation:
 - ▶ **domestic total gross**
- ▶ Feature engineering:
 - ▶ **Profit** = domestic gross - budget
 - ▶ **Opening profit** = domestic opening - budget

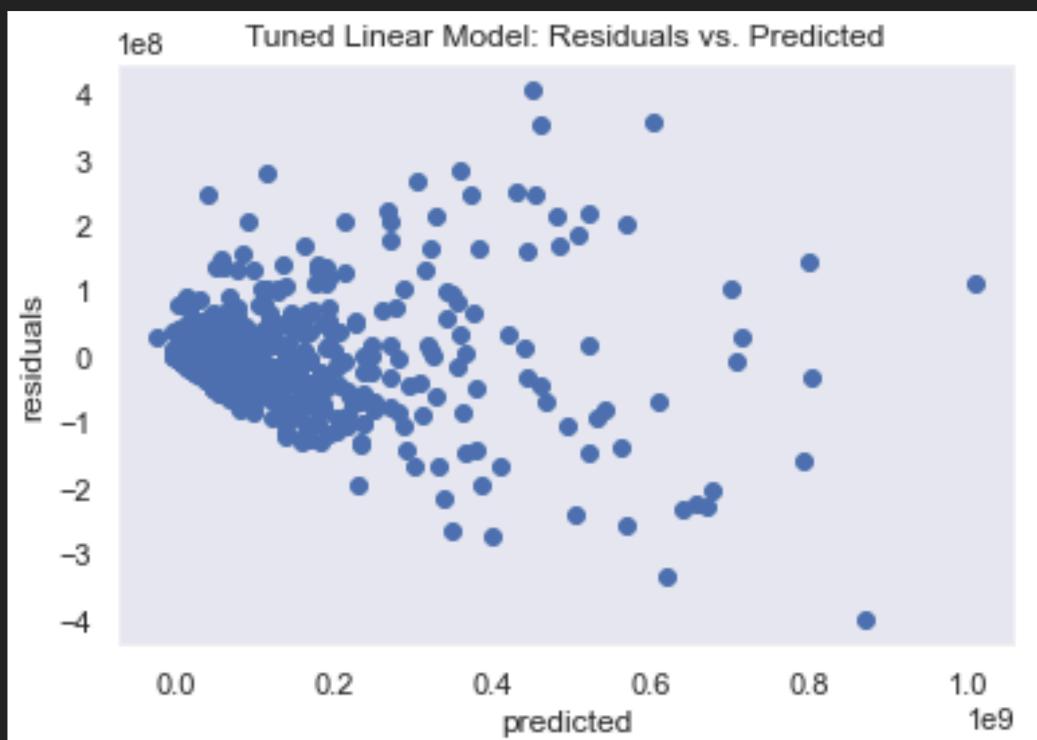
Figure 1.



RESULTS

- ▶ Evaluating with R^2 :
 - ▶ Ridge regression model
 - ▶ Train ~ test
 - ▶ **good fit** 
- ▶ Double checking with MAE:
 - ▶ Linear model better but off by \$45.5 million
 - ▶ Tuning lowered error... by to \$2.8 million 

Figure 2.



CONCLUSIONS

- ▶ This model will not predict international movie gross.
- ▶ Recommend building model based on movie gross data from intended markets.
- ▶ Recommend exploring subset of movies with high international gross and looking for trends or characteristics that contribute to box office sales.



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FUTURE WORK

- ▶ Further EDA to look for patterns among high international grossing movies.
- ▶ Scrape country specific gross data to build model.
- ▶ Explore relationship between bestselling books and their movie counterpart international gross.



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BOXOFFICEMOJO.COM DATA

APPENDIX

- Blog post, code, and slides are available at github.com/slp22/regression-project

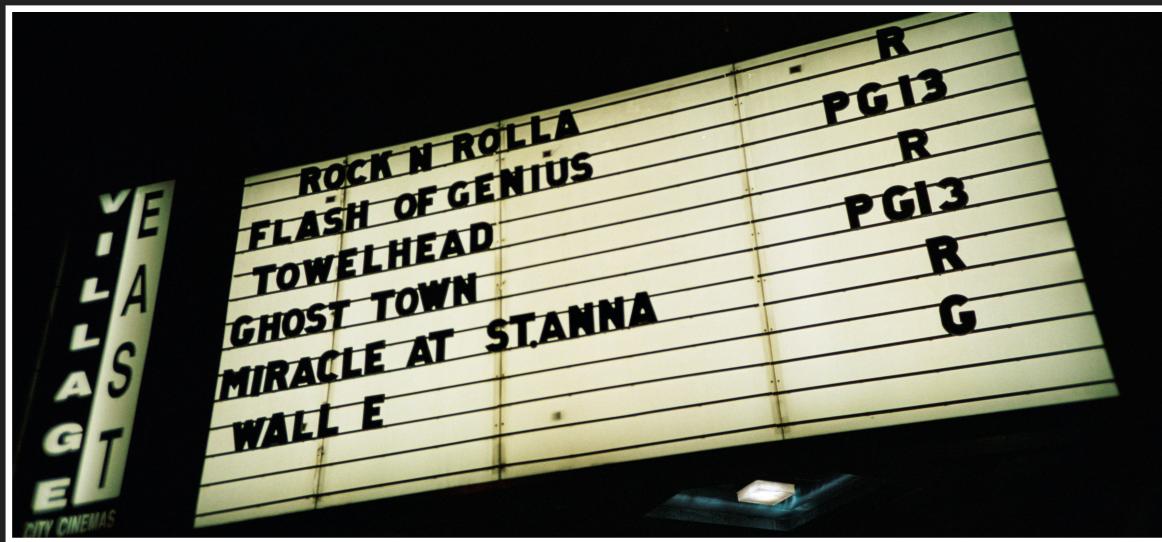


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