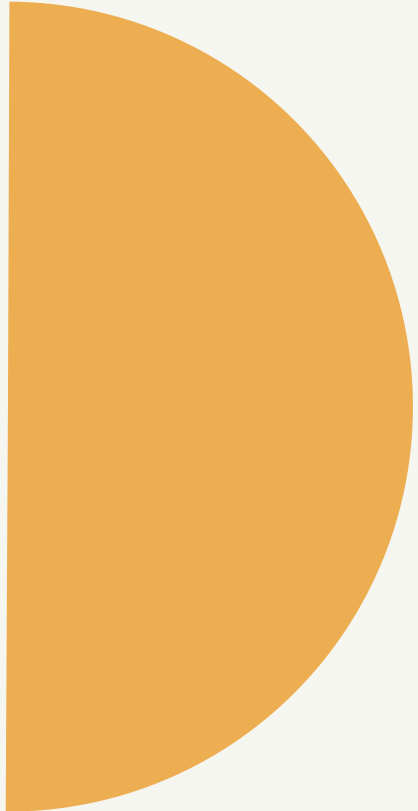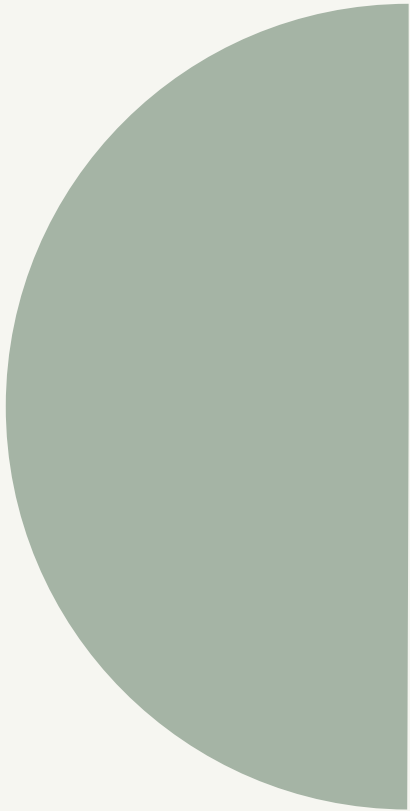# IMDb Dataset

Liam Sloan

Dax Kelson

Hunter Klinglesmith

Milad Tanha

Donald Harrison

"What are the key performance indicators for how well a movie performs in the box office?"

KPI's
(Key Performance Indicators)

Budget - Don

Rating - Liam

Directors/Actors - Hunter

Popularity of Genre - Dax

Budget vs Rating - Milad

Data Cleanup Steps

1 Sourced our Datasets from Kaggle

We used an inflation dataset and IMDb Dataset

2 Limited our analysis to US movies because the budget column was in each movie's national currency.

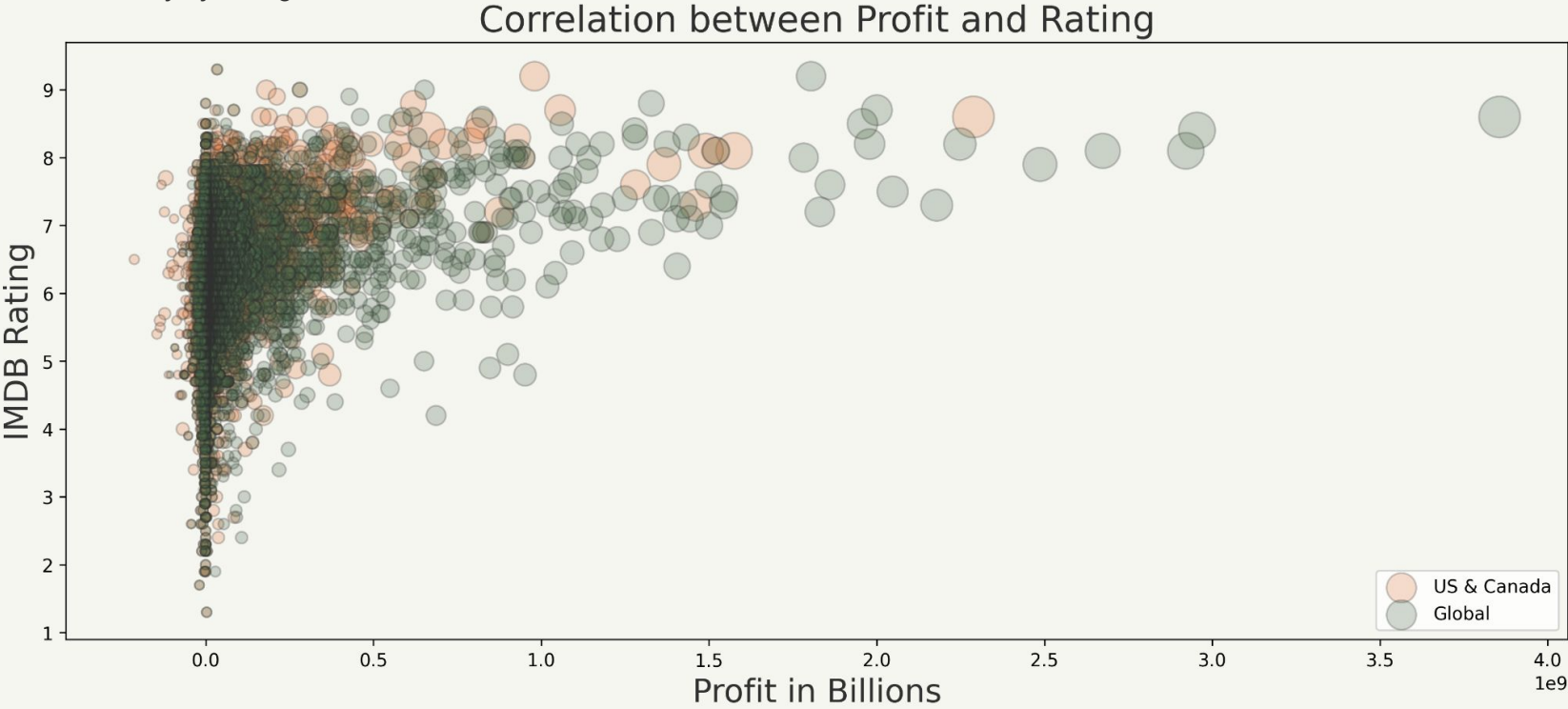**3** Created function for converting dollars between years for inflation

4 Created "clean_data.py" file.

5 Use "%run clean_data.py" at the top of your notebook to generate clean data

6 Use Pandas read_csv function to bring in generated csv file in your notebook

Correlation between Profit and Rating

US & Canada and Global profits both have a positive correlation between profitability and the rating given. There's no instance where lower rated movies gained any significant profit, while rare instances show high ratings for negative profitability, however largely the higher the rating, the higher the profitability,
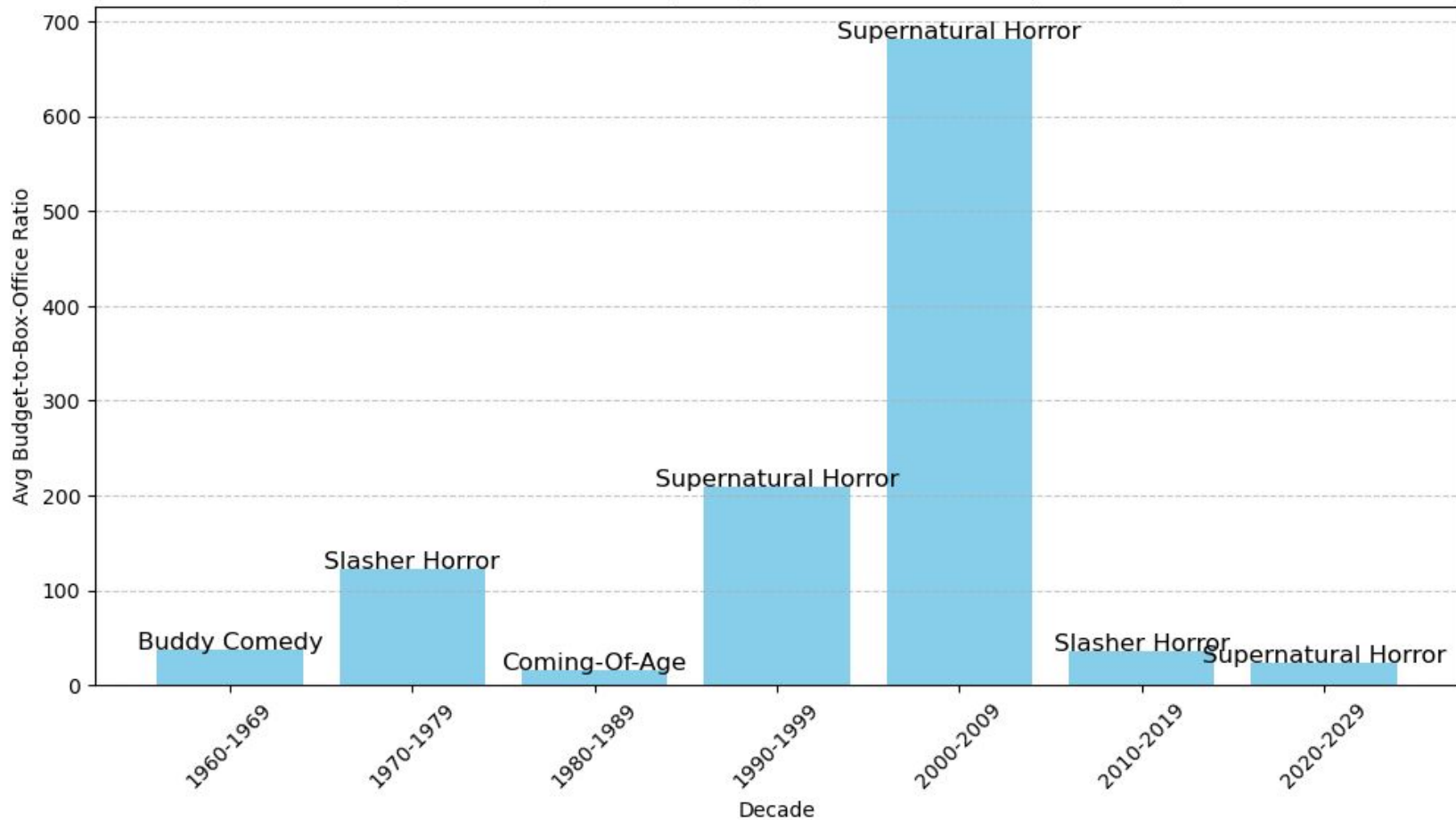
Key Points

Profitability By Rating

- No instance of low ratings and high profits

- Some instances of high ratings with negative profits

- Positive correlation between high ratings and high profits

- Most notable is that all ratings especially between 5 & 8 report profits fewer than 0.5 Billion USD

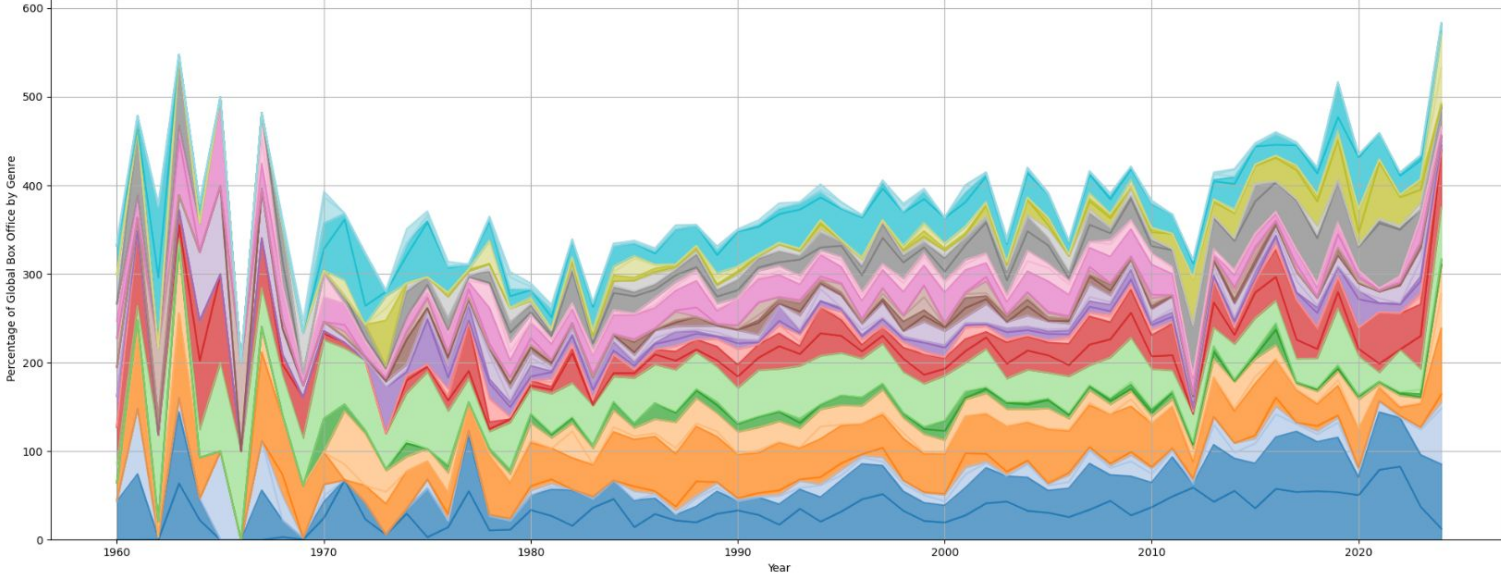**Dax Kelson - Profitability By Genre & Popularity of Genre by Year**

Analysis of the data shows that a core audience exists for many core genres, but that horror movies consistently perform the best for low budget films in terms of box office returns.

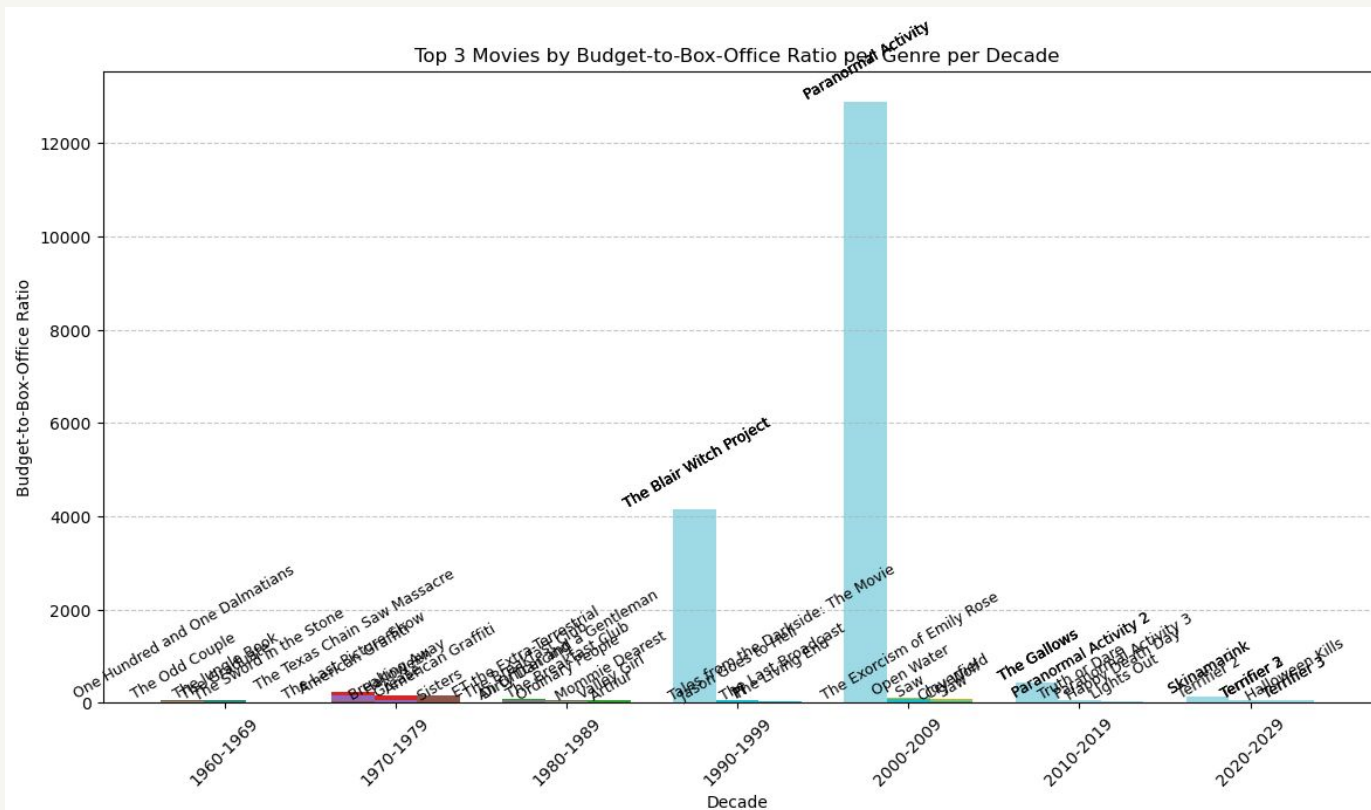Top 3 Performing Genres by Budget-to-Box-Office Ratio (Per Decade)
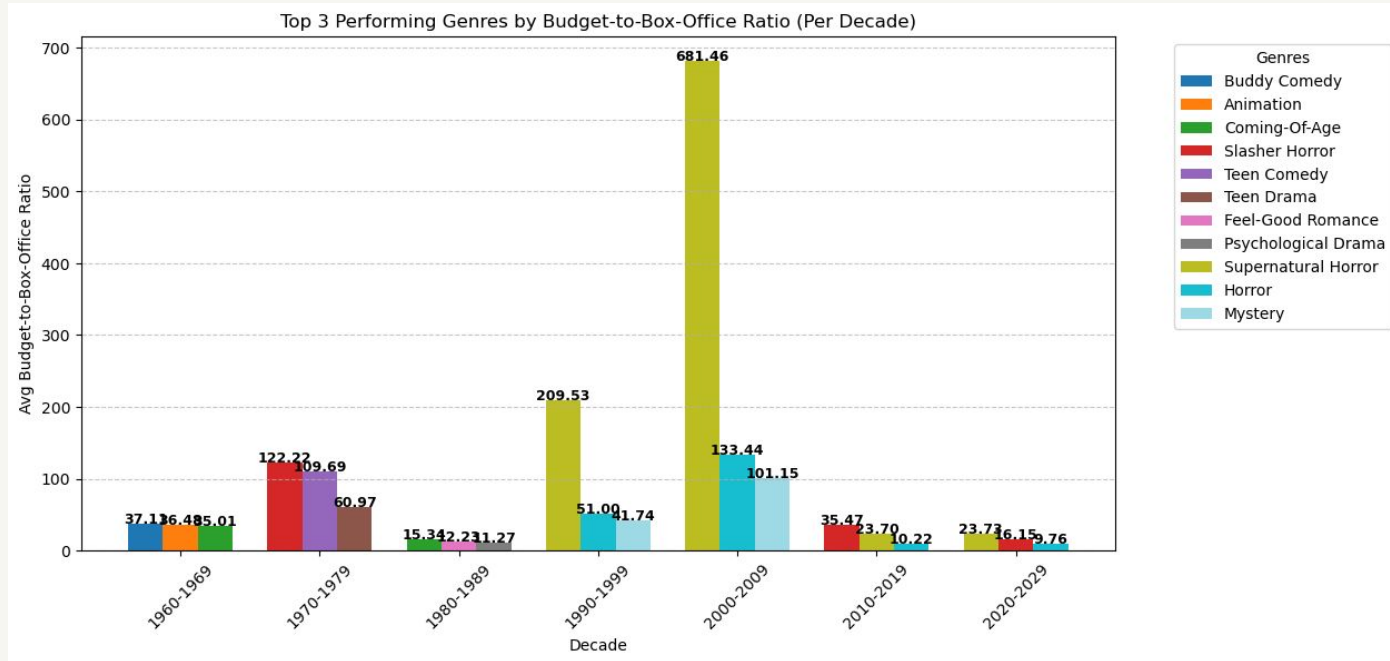
Top Performing Genres by Budget-to-Box-Office Ratio (Per Decade)

Genre Contribution to Global Box Office Over Time

The movies that did it:

Top 3 Movies by Budget-to-Box-Office Ratio per Genre per Decade

Key Points

Profitability By Genre & Popularity of Genre by Year

- There are several "bread and butter" genres that perform well regardless of decade and have a consistent audience

- Horror movies can be created that have mass appeal with very low budgets, resulting in high profitability

- Family Animated movies have become an increasingly large portion of the box office

- Superhero movies have suffered as share of total box office since the Pandemic

Hunter Klinglesmith -

Do directors and/or actors influence movie success?

Histogram of the gross worldwide box office earnings. There are very few movies in the upper quartile.


```
Gross Worldwide
count  8.133000e+03
mean   1.207480e+08
std    2.524236e+08
min    1.334347e+02
25%    4.692508e+06
50%    3.170849e+07
75%    1.168282e+08
max    4.265545e+09
```
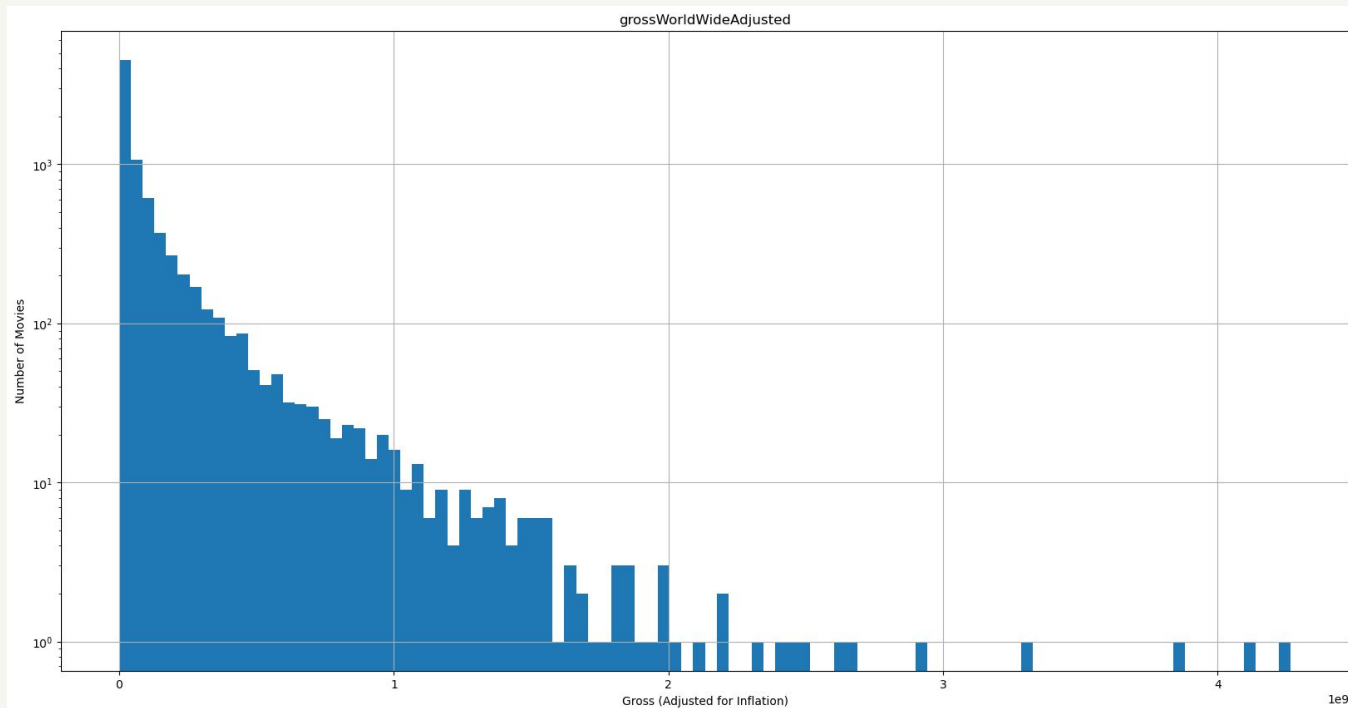
Do directors and/or actors influence movie success?

Top 10 Directors rated by average gross worldwide earnings of their movies

```
Gross Worldwide
count 8.133000e+03
mean  1.207480e+08
std   2.524236e+08
min   1.334347e+02
25%   4.692508e+06
50%   3.170849e+07
75%   1.168282e+08
max   4.265545e+09
```

directors	Average grossWorldWideAdjusted
Peter Jackson	8.495588e+08
Steven Spielberg	7.785966e+08
Michael Bay	6.827934e+08
Christopher Nolan	6.590538e+08
Gore Verbinski	5.710376e+08
Chris Columbus	5.611471e+08
Bryan Singer	5.114061e+08
Roland Emmerich	4.993858e+08
Robert Zemeckis	4.917768e+08
James Wan	4.721665e+08

Do directors and/or actors influence movie success?

This graph shows the gross worldwide box office earnings (adjusted for inflation) for the 10 directors with the highest average.
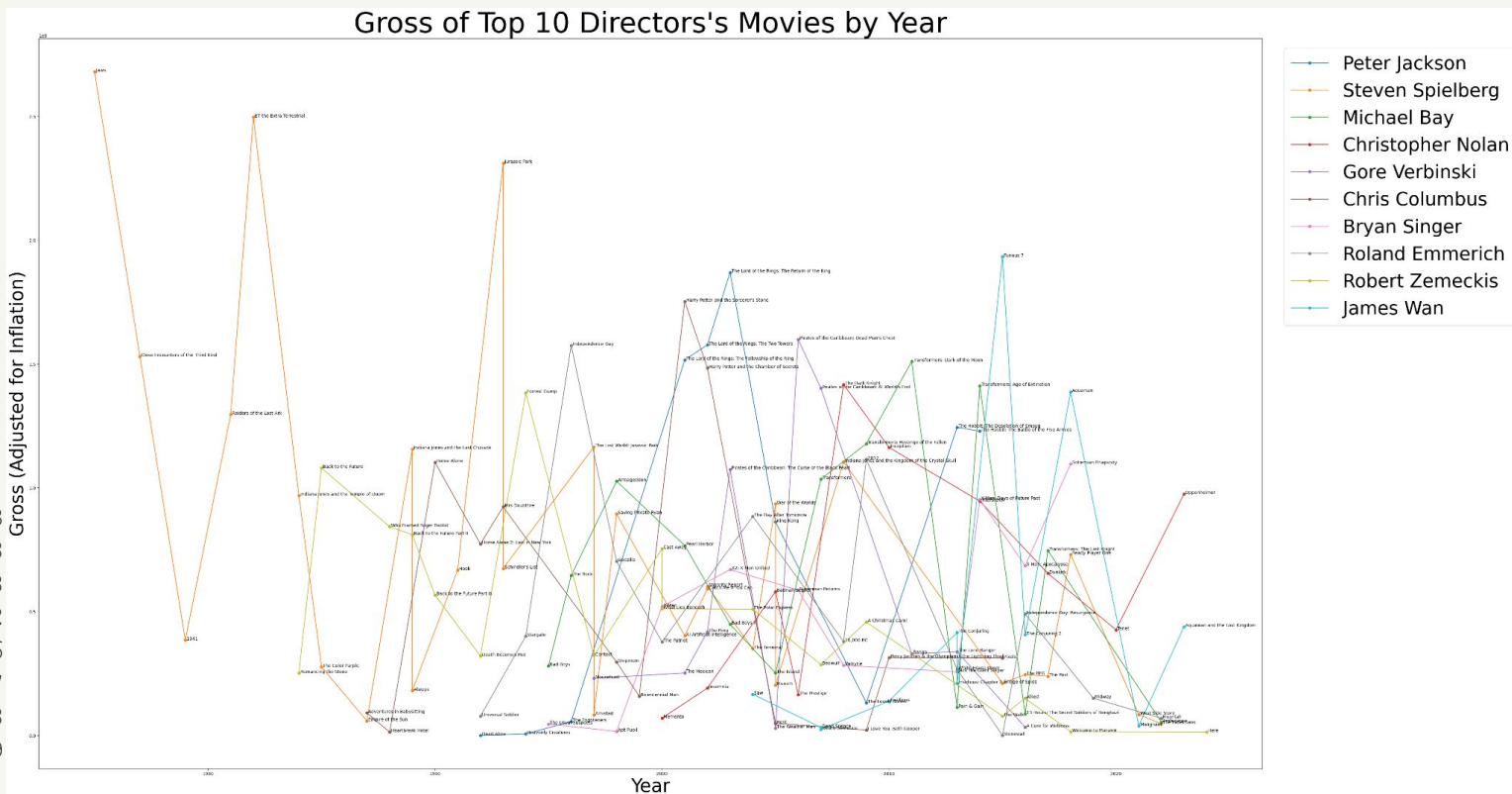
```
Gross Worldwide
count  8.133000e+03
mean   1.207480e+08
std    2.524236e+08
min    1.334347e+02
25%    4.692508e+06
50%    3.170849e+07
75%    1.168282e+08
max    4.265545e+09
```


Gross of Top 10 Directors's Movies by Year

Legend:
- Peter Jackson
- Steven Spielberg
- Michael Bay
- Christopher Nolan
- Gore Verbinski
- Chris Columbus
- Bryan Singer
- Roland Emmerich
- Robert Zemeckis
- James Wan

Hunter Klinglesmith -

Do directors and/or actors influence movie success?

This graph show the top 15 directors ranked by the gross worldwide box office earnings as a multiple of the budget (gross worldwide box office / budget)

Example: on average Kevin Smith movies earn 15 times their budget

```
Budget to Box Office Ratio Stats
count     27.000000
mean       4.110927
std        3.350699
min        0.755606
25%        2.410446
50%        3.365553
75%        4.184099
max       15.120232
```


Top 15 Directors by Profitability Ratio

Do directors and/or actors influence movie success?

Top 10 Actors rated by average gross worldwide earnings of their movies

```
Gross Worldwide
count  8.133000e+03
mean   1.207480e+08
std    2.524236e+08
min    1.334347e+02
25%    4.692508e+06
50%    3.170849e+07
75%    1.168282e+08
max    4.265545e+09
```
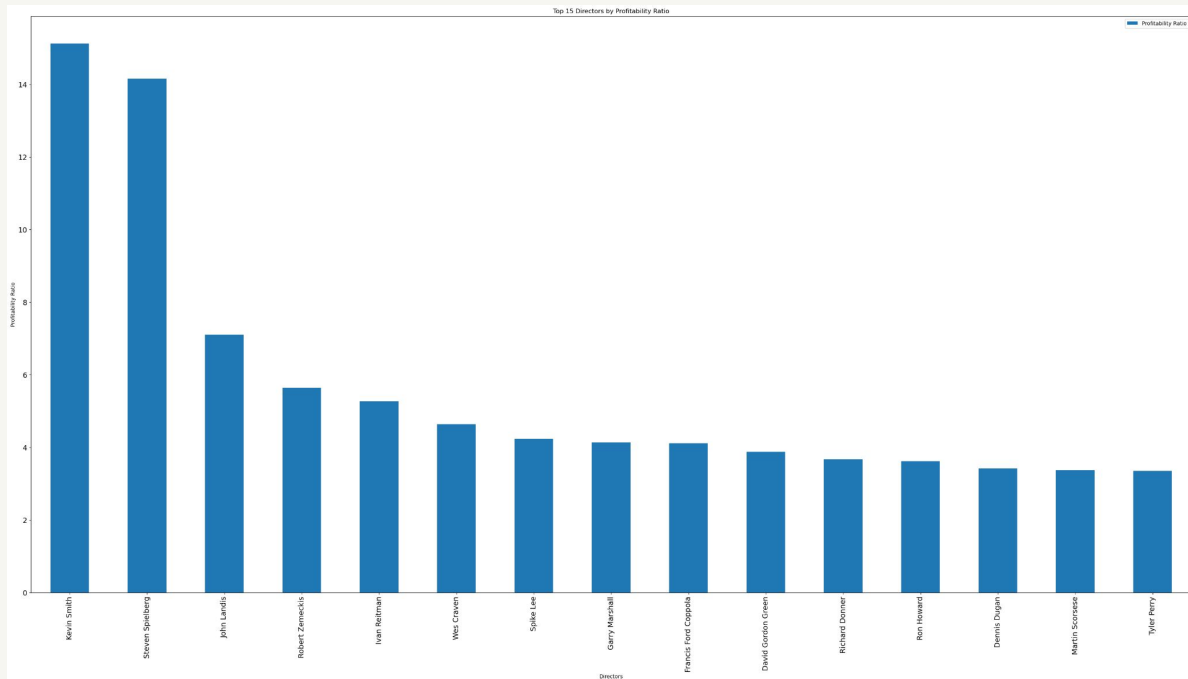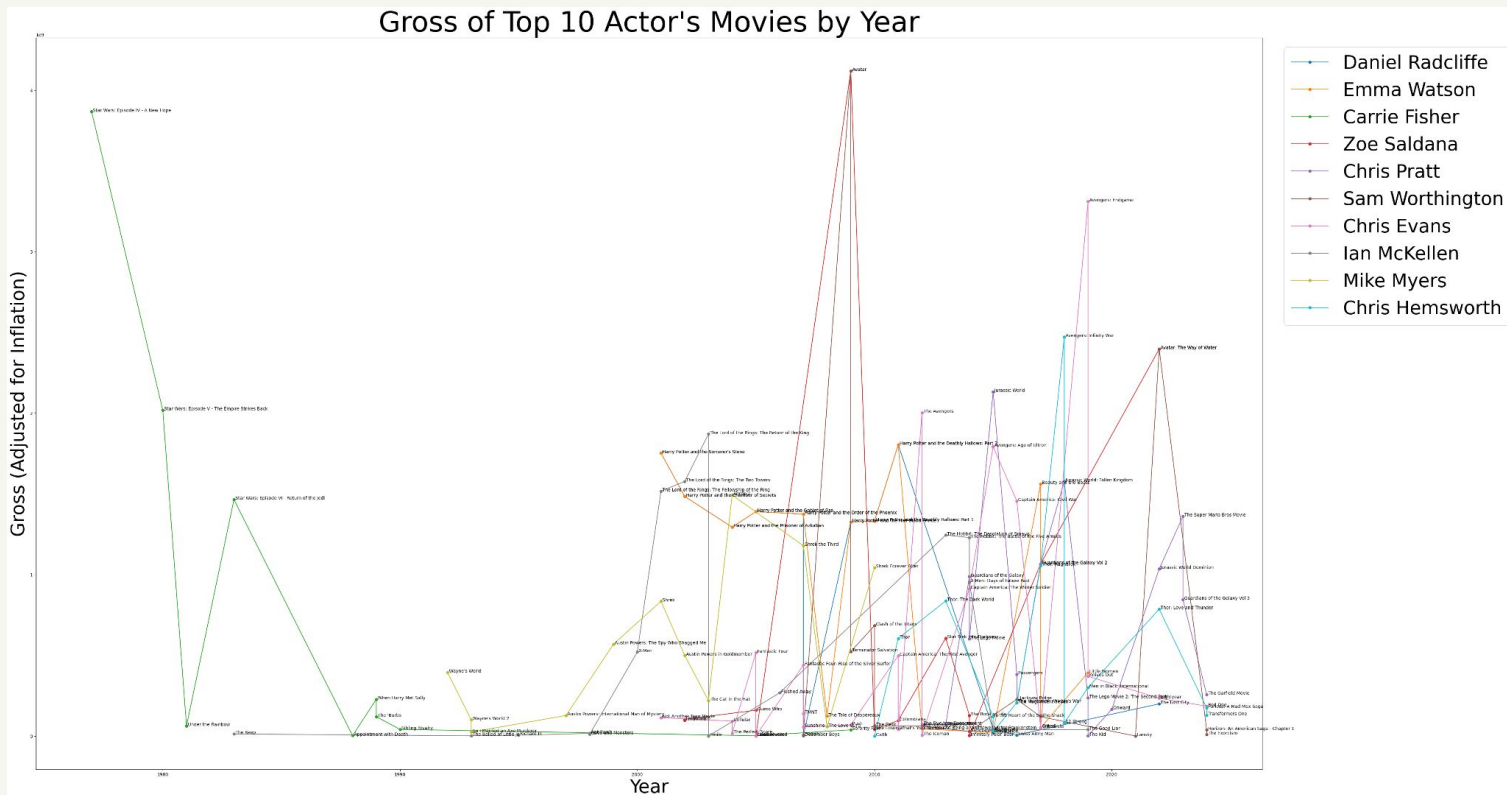
stars	Average grossWorldWideAdjusted
Daniel Radcliffe	1.000731e+09
Emma Watson	9.965052e+08
Carrie Fisher	7.844499e+08
Zoe Saldana	7.347337e+08
Chris Pratt	6.871220e+08
Sam Worthington	6.369472e+08
Chris Evans	5.859637e+08
Ian McKellen	5.814986e+08
Mike Myers	5.451653e+08
Chris Hemsworth	5.223894e+08

Hunter Klinglesmith -

Do directors and/or actors influence movie success?

This graph shows the gross worldwide box office earnings (adjusted for inflation) for the 10 actors with the highest average.

```
Gross Worldwide
count  8.133000e+03
mean   1.207480e+08
std    2.524236e+08
min    1.334347e+02
25%    4.692508e+06
50%    3.170849e+07
75%    1.168282e+08
max    4.265545e+09
```


Gross of Top 10 Actor's Movies by Year

Legend:
- Daniel Radcliffe
- Emma Watson
- Carrie Fisher
- Zoe Saldana
- Chris Pratt
- Sam Worthington
- Chris Evans
- Ian McKellen
- Mike Myers
- Chris Hemsworth

Hunter Klinglesmith -

Do directors and/or actors influence movie success?

This graph show the top 15 actors ranked by the gross worldwide box office earnings as a multiple of the budget (gross worldwide box office / budget)


```
Budget to Box Office Ratio Stats
count     229.000000
mean        2.994275
std         1.931699
min         0.543355
25%         1.905783
50%         2.625489
75%         3.619073
max        20.481746
```
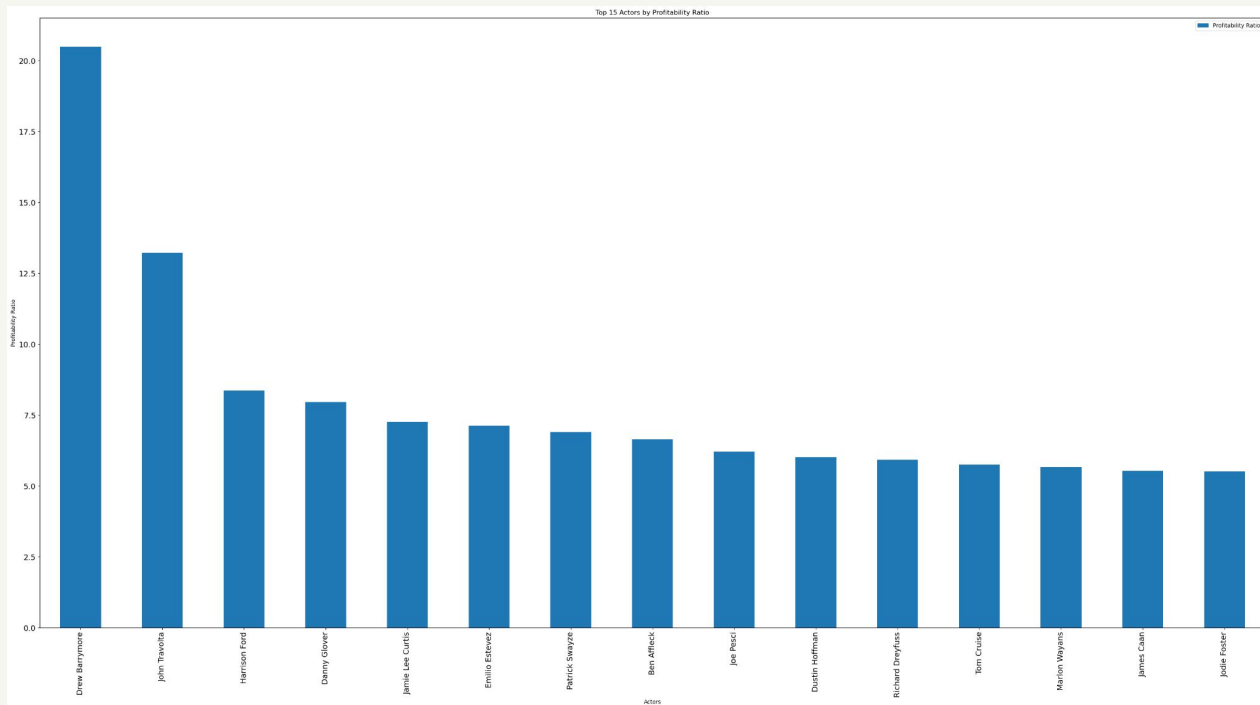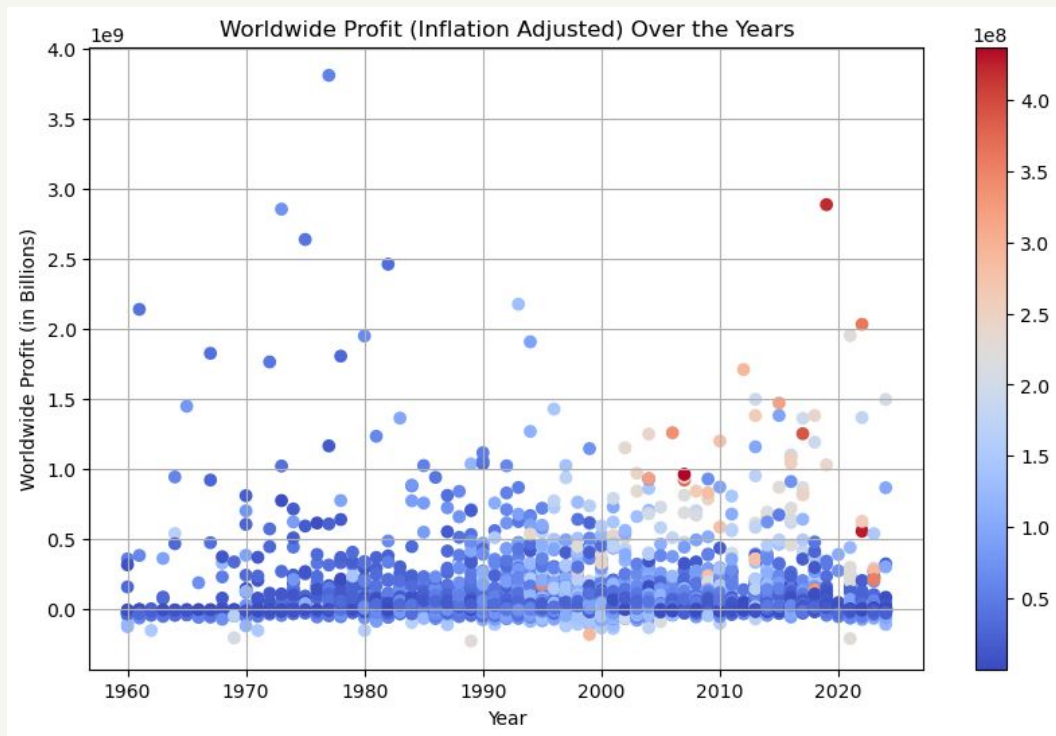
Key Points

Do directors and/or actors influence movie success?

- Movies from the top directors and actors by average gross worldwide:
  - Are far above the upper quartile cutoff

  - Many have a very high grossing movie that raises their average

- Top directors and actors by average gross worldwide
  - Trend over time
    - Spielberg movies' gross worldwide success has decreased over time
- Directors and actors with highest average gross worldwide earnings don't always have the highest budget to box office ratio

Donald Harrison -

Is there a range of budgets that ensured a movie was successful in the box office?

The color of the circles indicates the budget spent on a movie.
We can see that recently, the positive profit movies have also gotten higher budgets

Worldwide Profit (Inflation Adjusted) Over the Years

Donald Harrison -

Is there a range of budgets that ensured a movie was successful in the box office?

If movie reception was random, we could consider the y axis as percent chance of earning over the median profit amount: $1,767,096.92
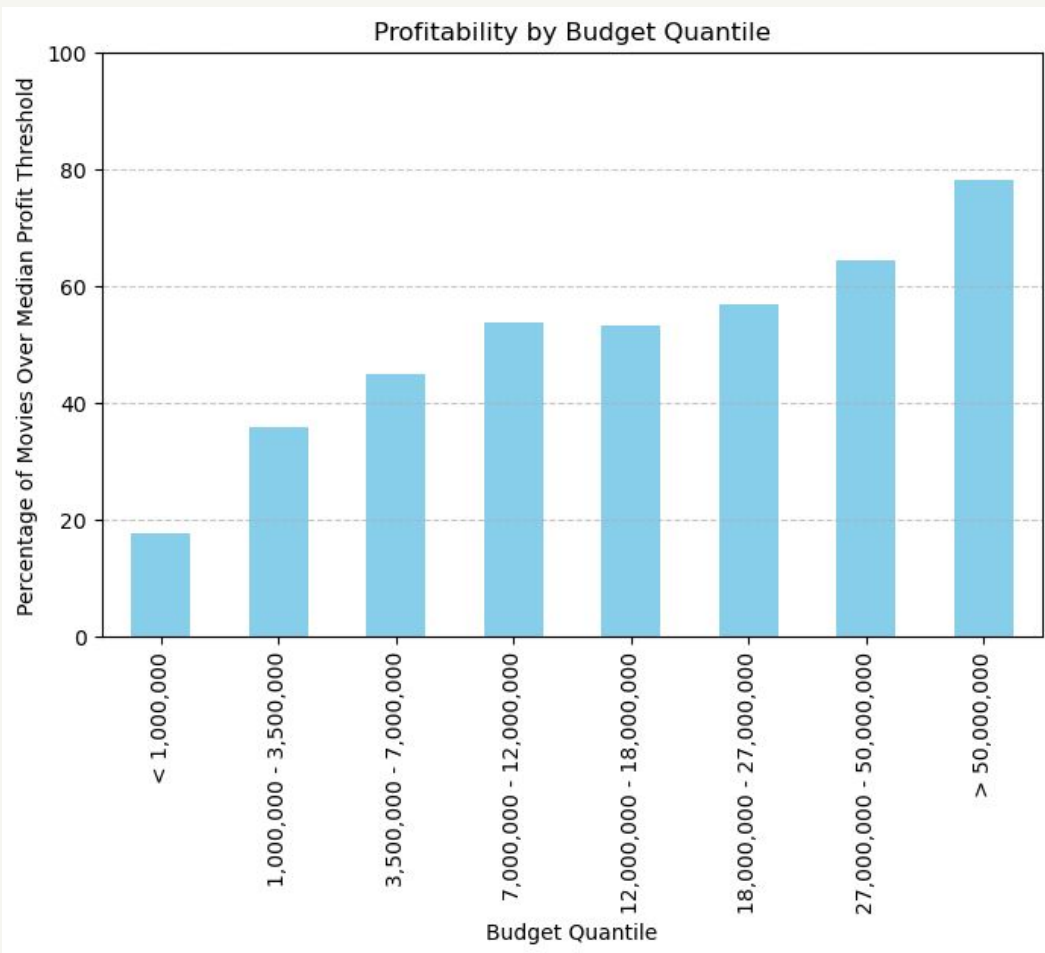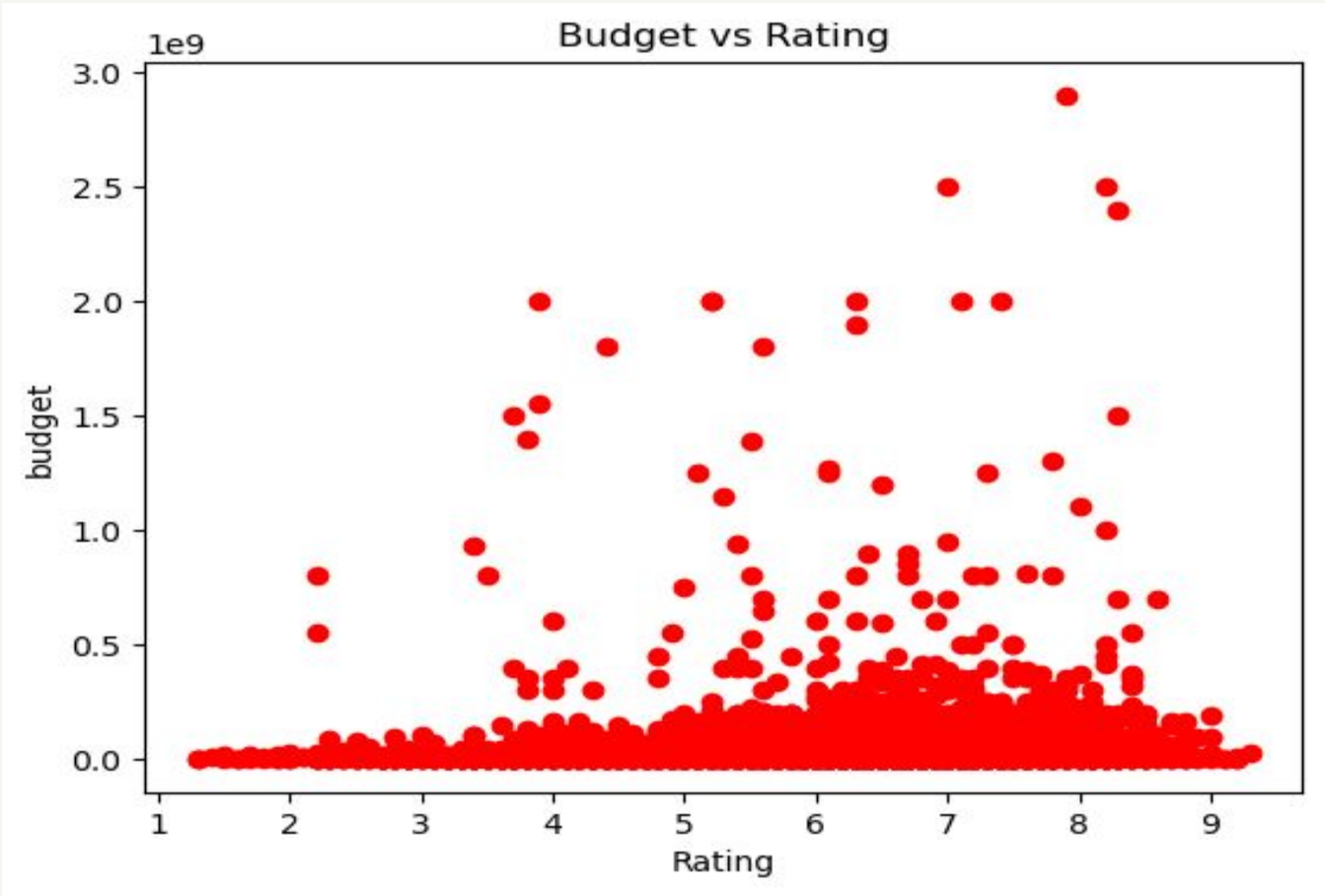
Key Points

Is there a range of budgets that ensured a movie was successful in the box office?

- Movies are pretty unprofitable across the board of the US movies with budget data. Movies only become profitable at about the .453 quantile which is about half. 2159 / 4756
- We see that once you hit the $3.5M threshold, your movie will have about a 50% "chance" in the box office.
- After that, it hits a soft cap until $27M or higher, where it starts to increase your chances.

Milad Tanha - IMDB Rating vs Budget

The graph shows the amount of each movie budget compared to its IMDB site rating.
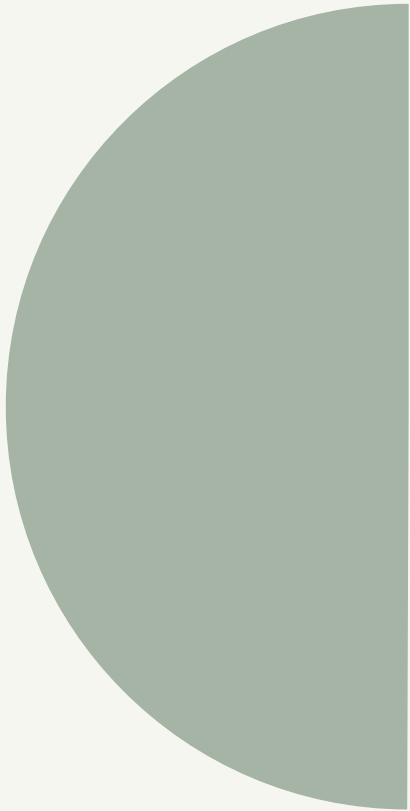
Key Points

IMDB Rating vs Budget

- There is one movie with about $300 million and the rating of 7 out of 10.

- Most movies has a budget less than $50 million.

- Some movies with a budget less than $10 million has the highest ranking.

- We can make this conclusion that not necessarily higher money spent on a movie results to a better ranking.

Project Summary

We were able to determine:

1. When given a higher budget, a movie has a better chance to break even and better
2. Directors and Actors heavily influence a movie's success
3. Genre popularity heavily influences a movie's success.
4. A movie's profitability coincides with its ratings, but really only needs to be at least a 5/10
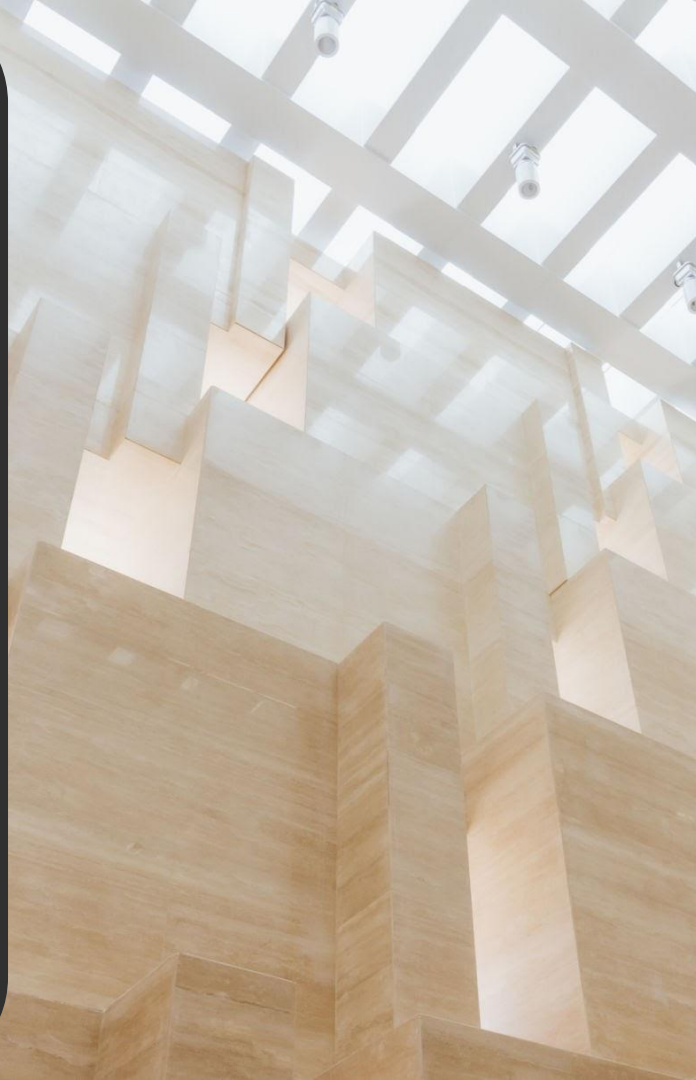
"$50M, a mediocre movie, and some stardom. Basically, Adam Sandler is the patron saint of movies"

Retrospective

Issues

- There is valuable data that is lost from cleaning
- Had to drop many rows because of incomplete budget data or currency that wasn't converted to US currency. Went from 33k rows to 4k
- Movie success involves other influences that were not in the data
- There are other measures of success than profit and ratings

Future

- If profit coincides with ratings, do cult classics just get unlucky in the box office?
- Identify trending genres using a line plot to see when movie genres start trending and peak in popularity.
- Try additional statistical methods to check for correlation
- Improve data cleaning and/or look for other sources of IMDb data

Thank You