**Homework #1  
Problem #2  
Timothy Tsai  
332003717**

*I certify that I have personally done the coding, generated the figures and written the report without aid from anybody else, and that I have not plagiarized, self-plagiarized, or used AI-generated text. I certify that I have acknowledged any sources I used to complete this assignment*. TT

# Part 1: Better movies more money…?

The goal of this analysis is to determine the impact of movie critics on box office gross, specifically whether higher critical acclaim leads to increased gross revenue. While it seems intuitive that movies that have great ratings would be also backed by high grossing profits, the initial correlation shown in problem 1 shows almost zero correlation. To investigate, various analyses were conducted including a histogram comparing the Metascore verses the average gross revenue for that score. Additionally, a violin plot was created to compare the distribution of gross revenue between “medium” and “high” rated movies. Finally, a scatter plot is used to compare the correlation between the critic Metascores and viewer ratings to explore the differences between these two factors. These findings imply that critics’ scores do not accurately predict box office success, suggesting more complex factors influence movie revenue.

The time series presented in **Figure 1** shows the average gross revenue made from every bucket of Metascores and highlights a general normal distribution peaking from 65-69. This is surprising because it suggests that movies that averaged an “okay” score tend to achieve the highest average gross revenue, contrary to the expectations that higher-rated films would perform stronger. This suggests that different factors such as marketing, actor popularity, or even genre preference may have a more significant influence on the gross outcomes than reviews alone. This complexity underscores the difficulty in predicting a film’s commercial success and raises important questions about if the role of movie critics plays a significant role at all.

A graph of different colored bars

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Figure . Shows a histogram with Metascore buckets of size 5 ranging from 0 – 99 on the x-axis, and the average gross revenue for each score on the y-axis. The data seems slightly left skewed peaking around 65-69.

# Part 2: Average vs. Highly Rated Movies – A Violin Plot Comparison

The graph in **Figure 2** presents a violin plot comparing the distribution of gross revenue for movies scores as either “Medium” (Metascores from 0-79) or “High” (Metascores from 80-100). The actual result showed that movies with medium score had a wider range of gross revenues compared to those in the high category. Specifically, movies with medium Metascores had a broader interquartile range (IQR), including higher-grossing outliers. Meanwhile, high-rated films tended to have a more compressed IQR, with lower overall revenue. Interpreting these findings suggests that higher-rated movies perform consistently worse than their medium-rated movie counterparts. This hints at the general disconnect between that critics find appealing and that broader audiences do. Critical reviews might not be a definitive factor that determines box office success, rather high critical reviews might even have the opposite effect and may predict if a movie will flop at the box office.

A screenshot of a graph

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Figure . Violin plot comparing the distribution of gross revenue for movies with medium Metascores (0-79) and high Metascores (80-100). The blue violin represents the "Medium" category, while the orange violin represents the "High" category. The width of the violin indicates the density of the data points, with the dotted lines showing the median gross revenue. The plot highlights that medium-rated movies have a wider spread in revenue, including higher-grossing outliers, while high-rated movies tend to have more concentrated, lower gross earnings.

# Part 3: Viewers vs Critics

Moving tangentially to the point of how critic’s ratings do not explain a movie’s gross revenue, a point can be made about how critics and viewers do not always enjoy the same movie. In **Figure 3** a scatter plot shows the correlation between what critics rated a movie verse what the general movie rating by viewers were. In there the regression line and the correlation of .30 shows that while generally, critics and views may agree that a movie is “good”, but do not generally agree which movies are “great”. These findings indicate that there are likely other reasons like movie genre or actor likability that more heavily influence general viewers enjoyment of the movie. That being said, as demonstrated in the earlier EDA, movie ratings exhibit only a slight positive correlation with gross revenue, indicating that additional factors beyond a movie's rating influence its financial performance.

A graph with a red line

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Figure . This scatter plot illustrates the relationship between Metascore ratings provided by critics and viewer ratings on a scale of 7.50 to 9.25. Each dot represents a movie, with the Metascore on the x-axis and the viewer rating on the y-axis. The trend line in red indicates a modest positive correlation of 0.30, suggesting a slight tendency for movies with higher critical scores to receive higher viewer ratings.

# Resources used to achieve this goal

While researching whether a critics rating would affect movie market success, I used an article by Follows (2021) to better understand the relationships between scores and movie profitability. It revealed how a movie’s genre can heavily influence the movie’s gross profit, even if the ratings between movies were similar. This background helped me to refine my research questions and show why there was a slightly negative correlation between critical reviews and movie grosses.

# References

Follows, S. (2021, August 2). *Do good reviews lead to a higher chance of financial success?*. American Film Market. <https://americanfilmmarket.com/do-good-reviews-matter/>