

Introduction

This poster focusses on two research questions related to Hollywood movies.

Question 1: Does Christmas have a positive effect on the daily movie revenue in the USA?

For instance, people spend more time with family during Christmas, which might result in more theater visits and thus higher movie revenues. This could be a reason for studios to release a movie in the theaters by Christmas, hoping to increase revenues.

$$H_0 : \mu_{\text{daily_revenue_Christmas}} = \mu_{\text{daily_revenue_around_Christmas_December}}$$

$$H_a : \mu_{\text{daily_revenue_Christmas}} > \mu_{\text{daily_revenue_around_Christmas_December}}$$

Question 2: Are Oscar-winning movies more often profitable than non-Oscar-winning movies in the USA?

$$H_0 : p_{\text{profitable_with_Oscar}} = p_{\text{profitable_without_Oscar}}$$

$$H_a : p_{\text{profitable_with_Oscar}} > p_{\text{profitable_without_Oscar}}$$

When Oscar-winning producers and actors indeed contribute to a higher likelihood for a movie to be profitability, a studio might want to choose these people next time as well.

Methods

(1) Since the days of the week that Christmas falls on, and the movies released in a given year, might have an effect on the outcome, a period of 40 years is used. For this question, Christmas is defined as December 24th, 25th and 26th. The density plot, Q-Q plot, and Anderson-Darling test of the log-transformed data, do not provide evidence to reject the normality assumption. Considering the p-value (t-test), we cannot reject the null hypothesis ($\alpha = 0.05$) however.

(2) By combining the movie and Oscar data frames, we can group all Oscar-winning and non-Oscar-winning movies. Next, we calculate the proportion that satisfies 'profit > 0' for both groups. Based on the p-value resulting from the z-test, we reject the null hypothesis ($\alpha = 0.05$).

Fig. 1: Christmas seems to have a positive effect on daily revenue.

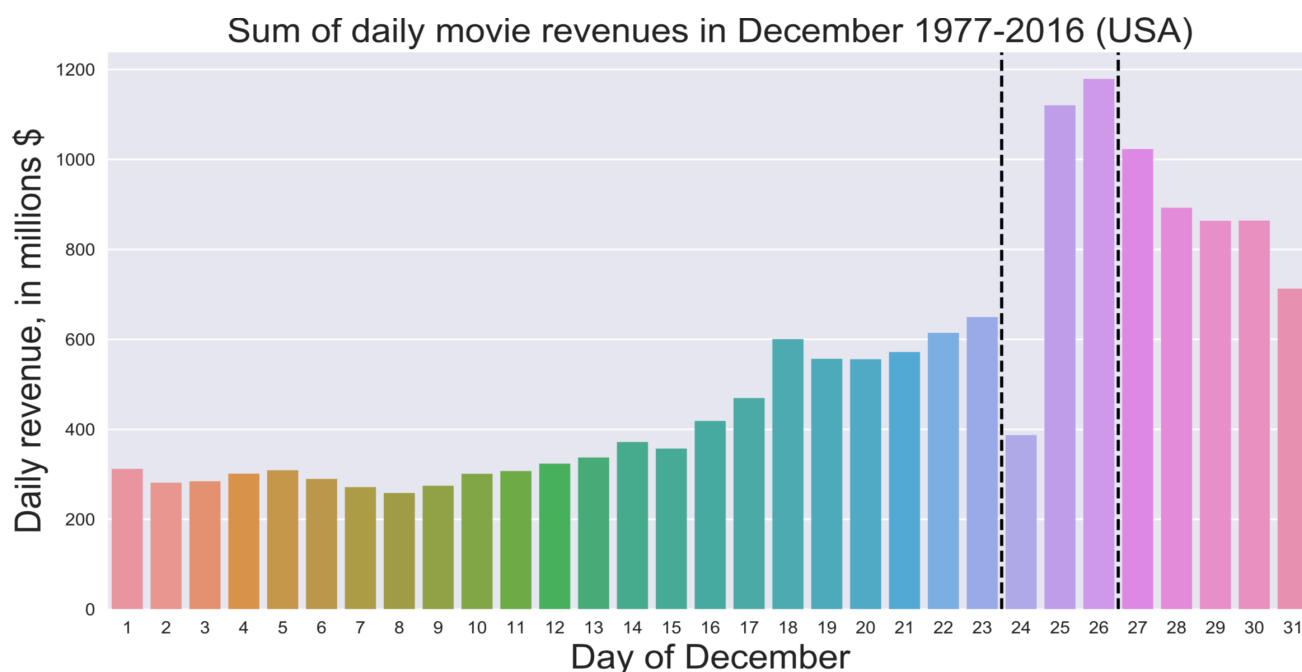
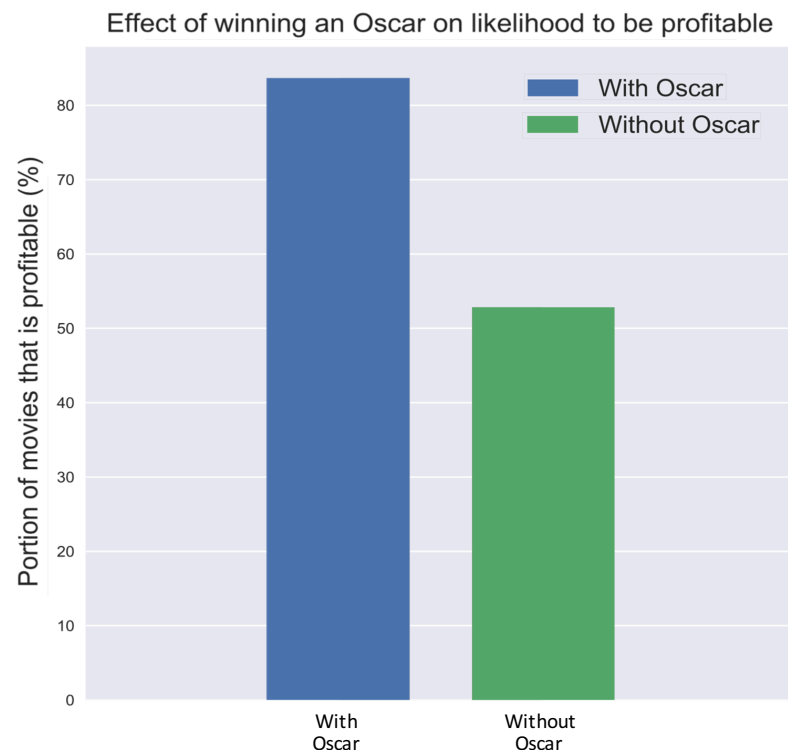


Fig. 2: Oscar-winning movies are more likely to be profitable.



Discussion

(1) Because the 24th of December shows a clear decrease in revenue, the high variance in combination with too little difference with surrounding days, means that we cannot reject the null hypothesis. However, Christmas does appear to have an effect on revenues (Fig. 1), but it cannot be determined whether this effect is strictly caused by Christmas (RQ), or by the holiday in general. Therefore, qualitative research is to be conducted as well. If instead of Christmas, the Christmas holiday is compared to surrounding days, we can perhaps conclude that there indeed is an effect on revenues. Because of inflation, the results could be biased towards more recent years.

(2) The difference in likelihood to be profitable between Oscar-winning and non-Oscar-winning movies is statistically significant. The percentages (Fig. 2) are in line with other research.

Conclusion

(1) Based on the research, we cannot determine whether Christmas has a positive effect on daily revenue. However, the results indicate that the Christmas holiday does have a positive effect.

(2) Oscar-winning movies are more often profitable than non-Oscar-winning movies.