The Impact of Film's Properties on IMDB Ratings: A logistic Regression Approach

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1 Introduction

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The entertainment industry happens to be a competitive market and the film industry is an important aspect of it. The stakeholders in the film industry are interested in properties or features that make their films successful. One key aspect of a film's success is its rating on platforms such as IMDB, which can influence audience perception and drive revenue.

The aim of this project is to investigate the relationship between the properties of films and their IMDB ratings. Specifically, we want to use a logistic regression model to know which properties of a film influence whether a film is rated by IMDB as greater than 7 or not, using variables such as year of release, length, budget, number of votes, and genre.

Section 2 speaks to the exploratory data analysis of IMDP ratings and explores the relationship between the rating and the properties of the films. Section 3 contains the results from the logistic regression model. While Section 4 gives the final remark to the research.

2 Exploratory Data Analysis

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NA

The data contains 2847 observations and 7 variables. The variables year, length, budget, votes, and rating are numerical variables, and genre is a categorical variable. Table 1 shows the first 6 rows of the table. It is also worth of note that the length of some of the films is not recorded.

film_id length budget votes genre rating year 5993 1943 65 15.542 Action 7.6 37190 1961 87 12.3 6 Drama 6.0 43646 1987 79 16.4161 Action 7.5 28476 1976 NA12.2 5 Documentary 8.0 23975 1982 12.597 Action 3.5 88

Table 1: Highlight of the IMDB data

From the summary statistics in table 2, we can see that the year of release of the films is between 1898 to 2005 and the year with the highest release of films rated is 2002. The minimum budget for film in the data

7.0

146

Drama

4.4

set is 2.5 million while the maximum is 22.3 million. It is also clear that Action films is the highest genre in terms of frequency.

Table 2: Summary statistics of the numerical variables

year	length	budget	votes	rating
Min. :1898 1st Qu.:1957 Median :1982 Mean :1976 3rd Qu.:1997	Min.: 1.00 1st Qu.: 73.00 Median: 90.00 Mean: 82.22 3rd Qu.:101.00	Min.: 2.50 1st Qu.: 9.90 Median:11.90 Mean:11.85 3rd Qu.:13.70	Min.: 5 1st Qu.: 11 Median: 29 Mean: 657 3rd Qu.: 114	Min. :0.800 1st Qu.:3.700 Median :4.600 Mean :5.342 3rd Qu.:7.700
Max. :2005 NA	Max. :480.00 NA's :131	Max. :22.30 NA	Max. :149494 NA	Max. :9.200 NA

From the scatterplot in figure 1, we can see that there is a negative correlation between the length of the film and its rating. This implies that films with longer length tend to be rated low. There is a positive correlation between the budget of film production and its rating, however, the correlation is weak.

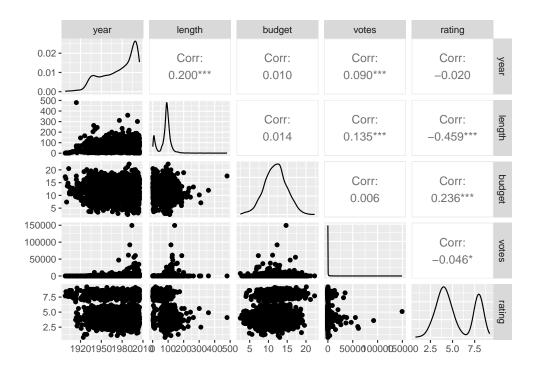


Figure 1: Scatterplot matrix of the numerical variables.

From figure 2, we can see that some genres tend to have higher ratings than others. For example, comedy tends to have higher ratings than romance films. While the majority of the short films are rated higher than 7.

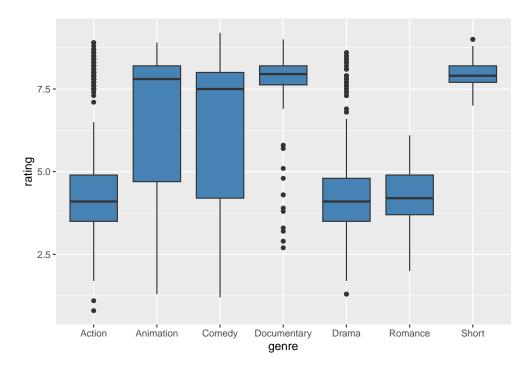


Figure 2: Boxplot of rating by genre.

From figure 3, the binary Boxplot of year by rating shows that the middle 50% of the ratings are between 1953 and 1999 for the ratings greater than 7 while it is between 1959 and 1996 for the ratings that are 7 and below. It is also evident that there is more variability in the length of ratings that are greater than 7 compared to the ratings that are 7 and below as depicted by the Binary Boxplot of length by rating. We can also see that the budget for ratings greater 7 seems to be higher that ratings of 7 and below.

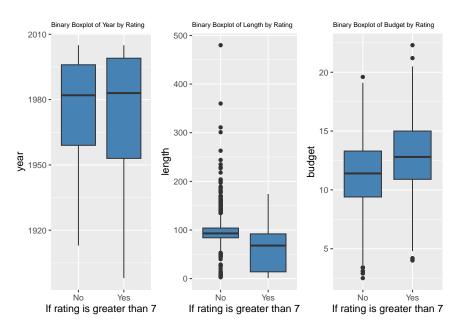


Figure 3: Binary Boxplot for years, Lenght and Budget.

From figure 4, we can see that almost all short films are rated above 7 and there is no romance film that has a rating greater than 7. It is also very evident that comedy has the highest number of rating that is greater than 7.

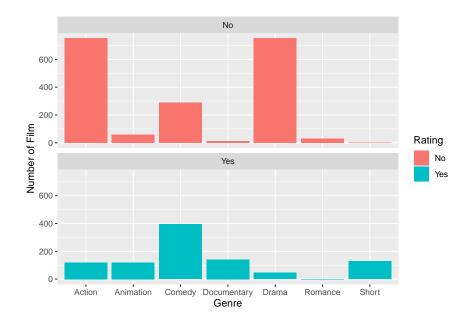


Figure 4: Genres of IMDB Rated Films and their rating status.

3 Formal Data Analysis

4 Conclusion