Predict the IMDb score of films

Stat 418 project

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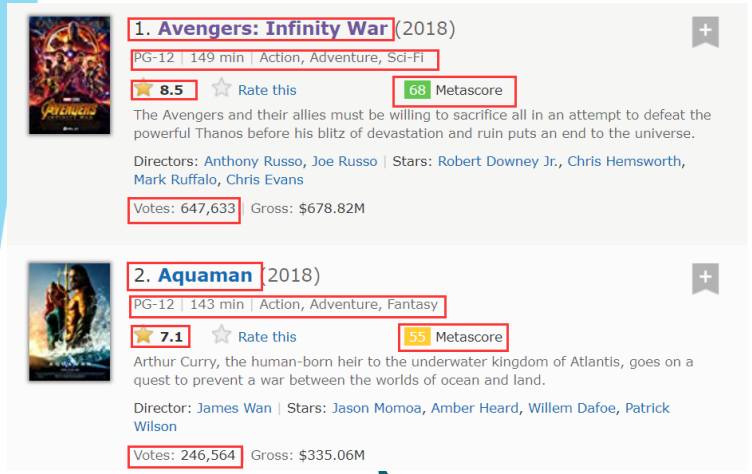
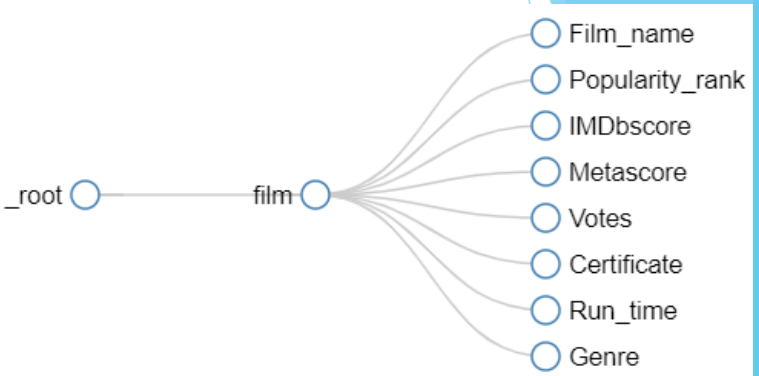
Attaining Data – Web Scraper

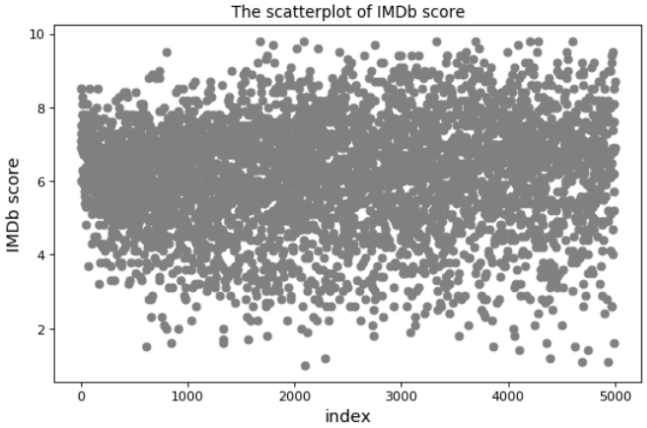


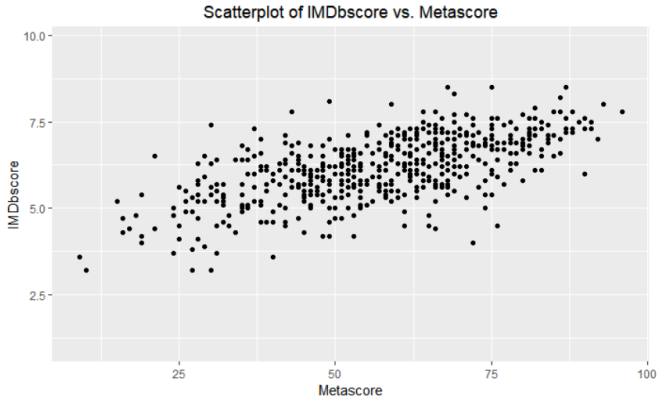


	web-scraper-order	web-scraper-start-url	Film_name	Popularity_rank	IMDbscore	Metascore	Votes	Run_time	Genre
0	1557261010-11301	https://www.imdb.com/search/title?title_type=f...	Avengers: Infinity War	1	8.5	68.0	647469.0	149 min	Action, Adventure, Sci-Fi
1	1557261010-11302	https://www.imdb.com/search/title?title_type=f...	Aquaman	2	7.1	55.0	246474.0	143 min	Action, Adventure, Fantasy
2	1557261010-11303	https://www.imdb.com/search/title?title_type=f...	Arctic	3	6.9	71.0	13690.0	98 min	Adventure, Drama

Exploratory data analysis

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5000 entries, 0 to 4999
Data columns (total 9 columns):
web-scraper-order      5000 non-null object
web-scraper-start-url  5000 non-null object
Film_name              5000 non-null object
Popularity_rank        5000 non-null int64
IMDbscore              4459 non-null float64
Metascore              563 non-null float64
Votes                  4459 non-null float64
Run_time               4284 non-null object
Genre                  4989 non-null object
dtypes: float64(3), int64(1), object(5)
memory usage: 351.6+ KB
```



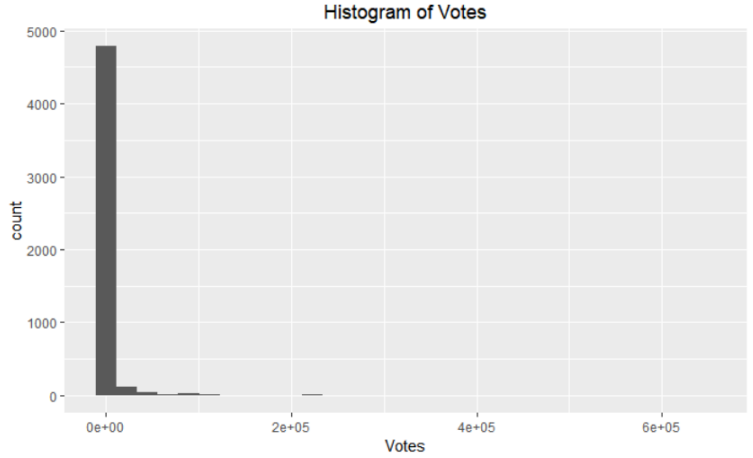


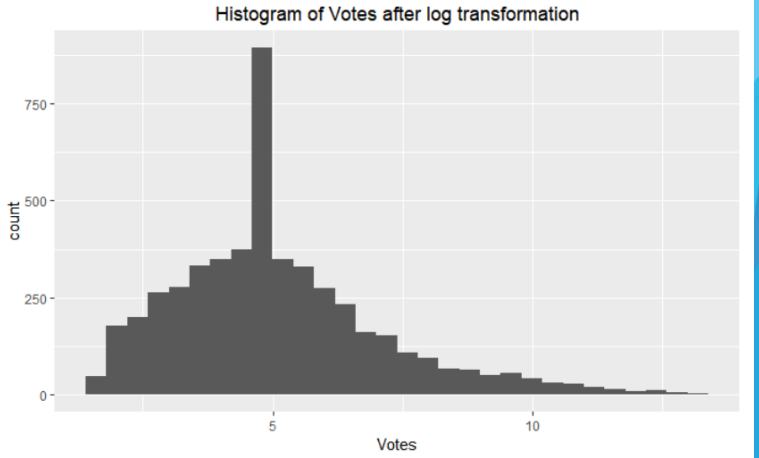
Feature Engineering

Genre
Action, Adventure, Sci-Fi
Action, Adventure, Fantasy
Adventure, Drama
Animation, Action, Adventure
Action, Adventure, Comedy
Action, Adventure, Sci-Fi

```
for (i in 1:length(data[,'Genre'])) {
  a <- as.vector.factor(data[i,'Genre'])
  b <- unlist(strsplit(a,split=","))
  data[i,'Genre'] <- b[1]
}
```

Genre
Action
Action
Adventure
Animation
Action
Action





Model – Linear Regression, XGBoost

Linear Regression

```
Call:
lm(formula = IMDbscore ~ Popularity_rank + Metascore + log(Votes) +
    Run_time + Genre, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-5.8620 -0.6727  0.0934  0.7895  4.0798

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)      3.366e+00  2.230e-01  15.092  < 2e-16 ***
Popularity_rank  3.750e-05  1.662e-05   2.256 0.024116 *
Metascore        2.762e-02  3.212e-03   8.601  < 2e-16 ***
log(Votes)      -5.127e-02  1.248e-02  -4.108 4.06e-05 ***
Run_time         1.067e-02  8.888e-04  12.000  < 2e-16 ***
GenreAdventure   2.290e-01  9.411e-02   2.433 0.014997 *
GenreAnimation   3.995e-01  1.131e-01   3.531 0.000418 ***
GenreBiography   9.251e-01  1.271e-01   7.277 3.94e-13 ***
GenreComedy      1.959e-01  6.008e-02   3.261 0.001116 **
GenreDrama       5.958e-01  5.696e-02  10.459  < 2e-16 ***
GenreHorror     -4.002e-01  7.173e-02  -5.580 2.54e-08 ***
GenreRomance     4.255e-01  1.390e-01   3.061 0.002220 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.303 on 4988 degrees of freedom
Multiple R-squared:  0.1209,    Adjusted R-squared:  0.119
F-statistic: 62.36 on 11 and 4988 DF,  p-value: < 2.2e-16
```

"The RMSE of the model is 1.303423"

XGBoost (nround=10)

```
[1]     train-rmse:4.182815
[2]     train-rmse:3.061179
[3]     train-rmse:2.313911
[4]     train-rmse:1.829632
[5]     train-rmse:1.530007
[6]     train-rmse:1.348144
[7]     train-rmse:1.247435
[8]     train-rmse:1.187237
[9]     train-rmse:1.154672
[10]    train-rmse:1.136153
```

```
               Length Class              Mode
handle              1 xgb.Booster.handle externalptr
raw             32406 -none-             raw
niter               1 -none-             numeric
evaluation_log      2 data.table         list
call               16 -none-             call
params              4 -none-             list
callbacks           2 -none-             list
feature_names       5 -none-             character
nfeatures           1 -none-             numeric
```

Deployment

https://zhouyichen961104.shinyapps.io/stat-418-project/