Predicting Movie Domestic Total Gross

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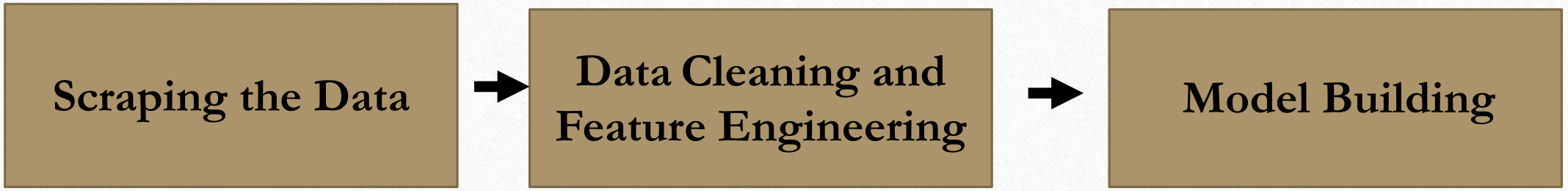
Outline

- Introduction
- Methodology Design
- Conclusion and Future work

Introduction

- The film industry is a significant player in the global economy.
- The business question is whether we could use a regression model to identify domestic total gross movies .
- The major goal is to predict a domestic total gross value by using a linear regression model.

Predicting Movie Domestic Total Gross Workflow



Scraping the Data

- Box Office Mojo
- BeautifulSoup

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Box Office
Daily
Weekend
Weekly
Monthly
Quarterly
Seasonal
Yearly
All Time
International

Indices
Studios
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Theater Counts

2018 DOMESTIC GROSSES

Total Grosses of all Movies Released in 2018

#1–100 - #101–200 - #201–300 - #301–400 - #401–500 - #501–600 - #601–700 - #701–800 - #801–879

< Previous Year Data as of: Today or (Month / Day / 2018) Go Next Year >

Rank	Movie Title (click to view)	Studio Filter	Total Gross / Theaters	Opening / Theaters	Open	Close
1	**Black Panther**	V	**$700,059,566** 4,084	$202,003,951 4,020	2/16	8/9
2	**Avengers**					
3	**Incredibl**					
4	**Jurassic V Kingdom**					
5	**Aquaman**					
6	**Deadpool**					
7	**Dr. Seuss (2018)**					
8	**Mission: Fallout**					
9	**Ant-Man**					
10	**Bohemia**					
11	**A Star is**					
12	**Solo: A S**					
13	**Venom (2**					

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Dr. Seuss' The Grinch (2018)

Domestic Total Gross: **$270,620,950**

Distributor: **Universal**	Release Date: **November 9, 2018**
Genre: **Animation**	Runtime: **1 hrs. 30 min.**
MPAA Rating: **PG**	Production Budget: **$75 million**

Summary | Daily | Weekend | Weekly | Foreign | Similar Movies

Total Lifetime Grosses
Domestic: $270,620,950 52.9%

The Players
Directors: Yarrow Cheney

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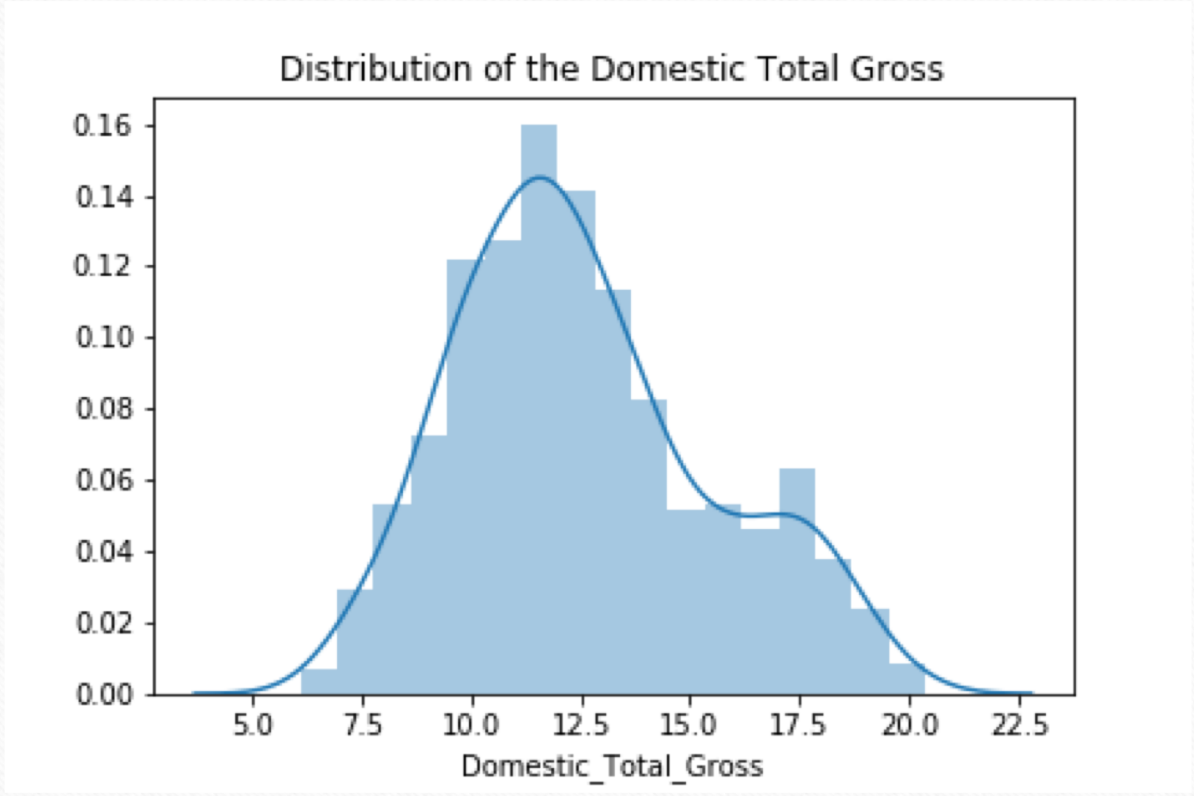
Movie Dataset

- All top Movies Released in 2018
- 879 movies and 8 features
- Title, Domestic_Total_Gross, Distributor, Release_Date,Runtime Production_Budget, MPAA_Rating, and Genre

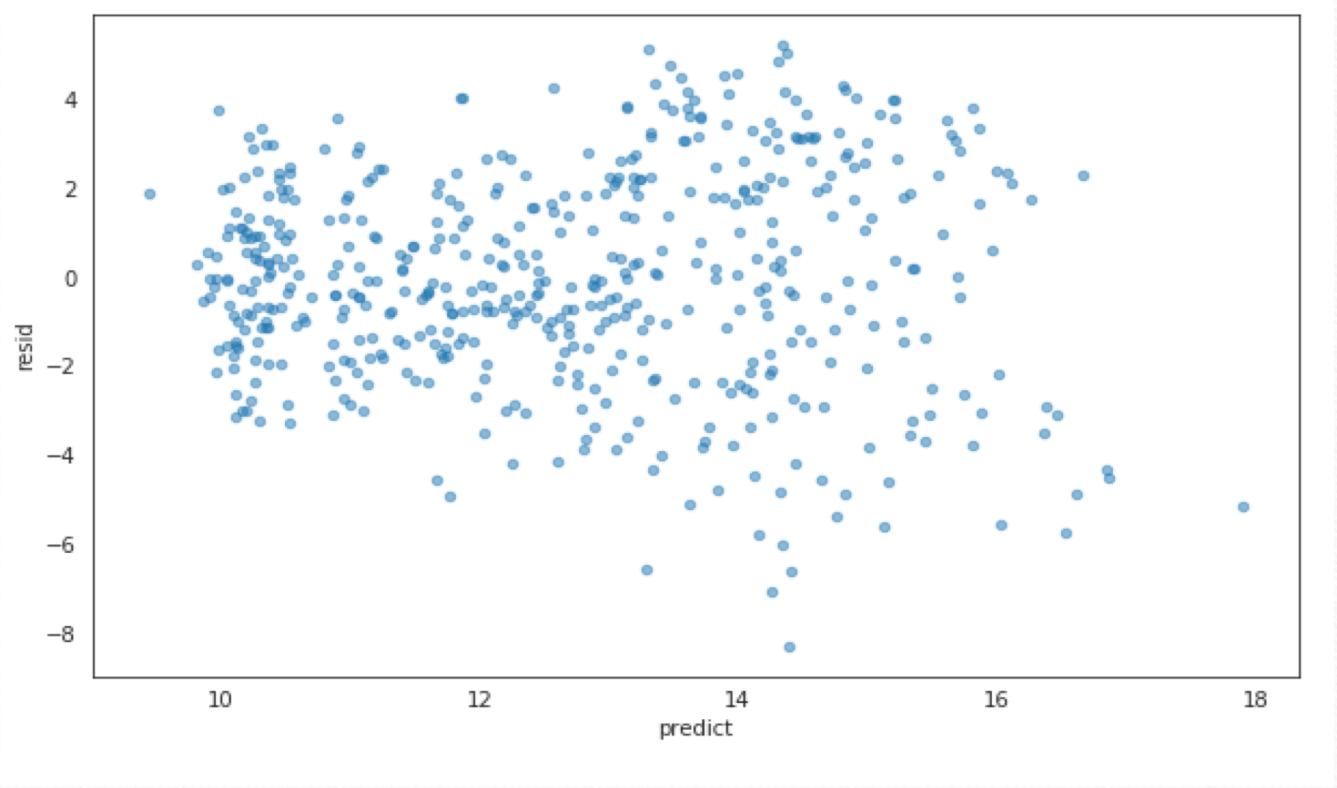
Data Cleaning and Feature Engineering

- Turning the Release Date strings into datetime objects
- Turning the runtime string from "1 hr. 52 min." to minutes float format
- Getting the Month , Day of Year and Day form Release Date
- Dealing with categorical data such as Genre and MAPP Rating
- Drop the Null values
- Shuffling Data

Model Building



Residual plot



Model Selection Process

- Stage 1 :

BaseLine model: Validation R^2= 0.119

- Stage 2:

ElasticNet model: Validation R^2=0.281

- Final Model : Test r^2= 0.298

Conclusion and Future Work

- Using a linear regression model, a month feature influence prediction of the domestic total gross.
- The results of the model shown that there was no significant relationship between a genre and domestic total gross.
- For future work, other features will be selected and improve model r^2.

Thank You

Appendix

- P-Values for Variables in a Regression Model
- Regression Coefficients
- Correlation Matrix

P-Values for Variables in a Regression Model

Covariance Type:		nonrobust				
	coef	**std err**	**t**	**P>|t|**	**[0.025**	**0.975]**
const	16.1525	5.006	3.227	0.001	6.318	25.987
Runtime	0.0125	0.004	3.049	0.002	0.004	0.021
MPAA_Rating	-0.9863	0.073	-13.591	0.000	-1.129	-0.844
Day	0.0372	0.159	0.23	0.815	-0.275	0.349
day_of_year	-0.0236	0.159	-0.14	0.882	-0.335	0.288
Month	0.7491	4.826	0.15	0.877	-8.733	10.231
Komedy_True	-0.9823	0.433	-2.267	0.024	-1.834	-0.131
Othors_True	-0.5187	0.503	-1.032	0.303	-1.506	0.469
Anoimation_True	-2.1299	0.627	-3.395	0.001	-3.362	-0.897
DoKumentary_True	-2.2678	0.566	-4.007	0.000	-3.380	-1.156
Dorama_True	-1.6523	0.443	-3.728	0.000	-2.523	-0.782

Omnibus:	6.328	**Durbin-Watson:**	2.077
Prob(Omnibus):	0.042	**Jarque-Bera (JB):**	6.439
Skew:	-0.257	**Prob(JB):**	0.0400
Kurtosis:	2.820	**Cond. No.**	1.55e+04

Df Residuals:	513	**BIC:**	2430.
Df Model:	6		
Covariance Type:	nonrobust		

	coef	**std err**	**t**	**P>|t|**	**[0.025**	**0.975]**
const	16.7923	0.589	28.525	0.000	15.636	17.949
Runtime	0.0132	0.004	3.247	0.001	0.005	0.021
MPAA_Rating	-0.9915	0.072	-13.709	0.000	-1.134	-0.849
Komedy_True	-0.6542	0.291	-2.251	0.025	-1.225	-0.083
Anoimation_True	-1.6305	0.436	-3.740	0.000	-2.487	-0.774
DoKumentary_True	-1.7847	0.340	-5.255	0.000	-2.452	-1.118
Dorama_True	-1.2415	0.248	-5.007	0.000	-1.729	-0.754

Omnibus:	6.313	**Durbin-Watson:**	2.055
Prob(Omnibus):	0.043	**Jarque-Bera (JB):**	6.408
Skew:	-0.255	**Prob(JB):**	0.0406
Kurtosis:	2.810	**Cond. No.**	695.

Regression Coefficients

```
Runtime : 0.01
MPAA_Rating : -0.99
Day : 0.04
day_of_year : -0.02
Month : 0.75
Komedy_True : -0.98
Othors_True : -0.52
Anoimation_True : -2.13
DoKumentary_True : -2.27
Dorama_True : -1.65
```

Correlation Matrix