What Makes for a Popular Book Review?

Michael Burnam-Fink
Metis Project Luther

Business Case

- Popular book reviews are engaging

goodreads

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Business Case

- Engagement on Goodreads.com impacts book sales on Amazon

amazon

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Tools

Scraping

Selenium

Beautifulsoup

Modelling

SM

StatsModels

scikit learn

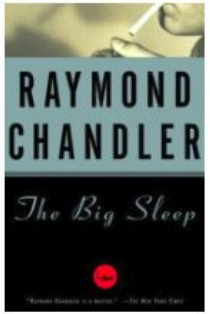
Visualizing

matplotlib

seaborn

Data Source

Michael Burnam-Fink's Reviews > The Big Sleep



The Big Sleep (Philip Marlowe, #1)
by Raymond Chandler

Michael Burnam-Fink's review — May 05, 2012 · edit

★★★★★

bookshelves: mystery, fiction, 2012

7 highlights (Private)

What can you say about "The Big Sleep" that hasn't already been said? This is a classic of hard boiled noir. The language is as glamorous as the dames, as punchy as private-eye Marlowe, and as dark as the souls of the criminals, dissolute rich, and corrupt cops who inhabit the world. If you haven't read it, you're missing out.

1 like

READING PROGRESS

- Started Reading Add a date
- May 5, 2012 – Shelved
- May 5, 2012 – Shelved as: mystery
- May 5, 2012 – Shelved as: fiction
- May 5, 2012 – Shelved as: 2012
- May 5, 2012 – Finished Reading

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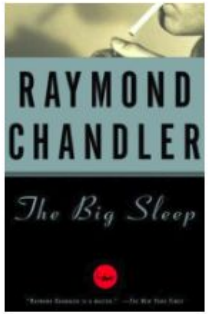
Data Source

- Word Count
- Image Count
- Book info
- Rating

- User Friends
- Average Rating
- Total Times Reviewed

Michael Burnam-Fink's Reviews > The Big Sleep



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1 like

Target

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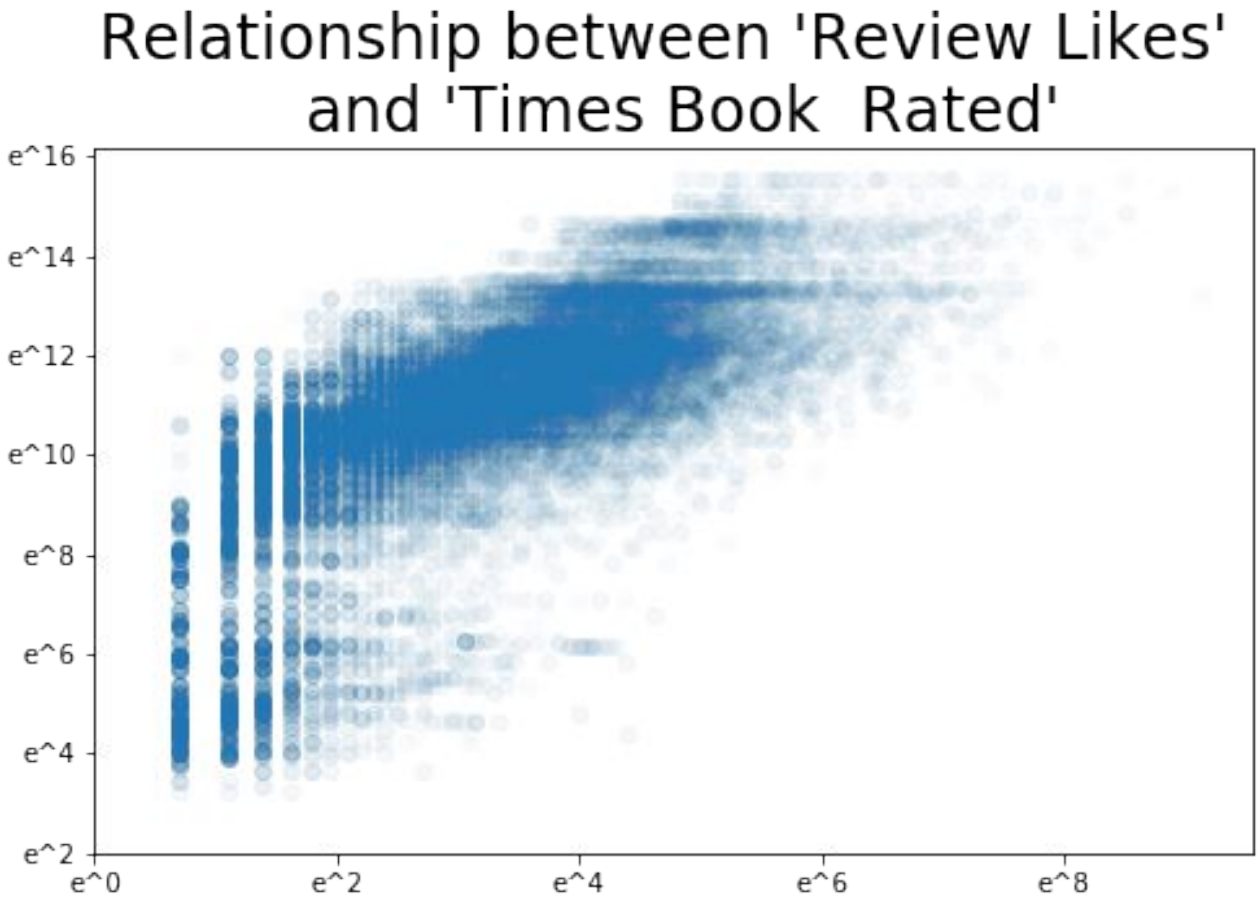
EDA


Relationship between 'Review Likes' and 'Times Book Rated'
e^16
e^14
e^12
e^10
e^8
e^6
e^4
e^2
e^0
e^2
e^4
e^6
e^8

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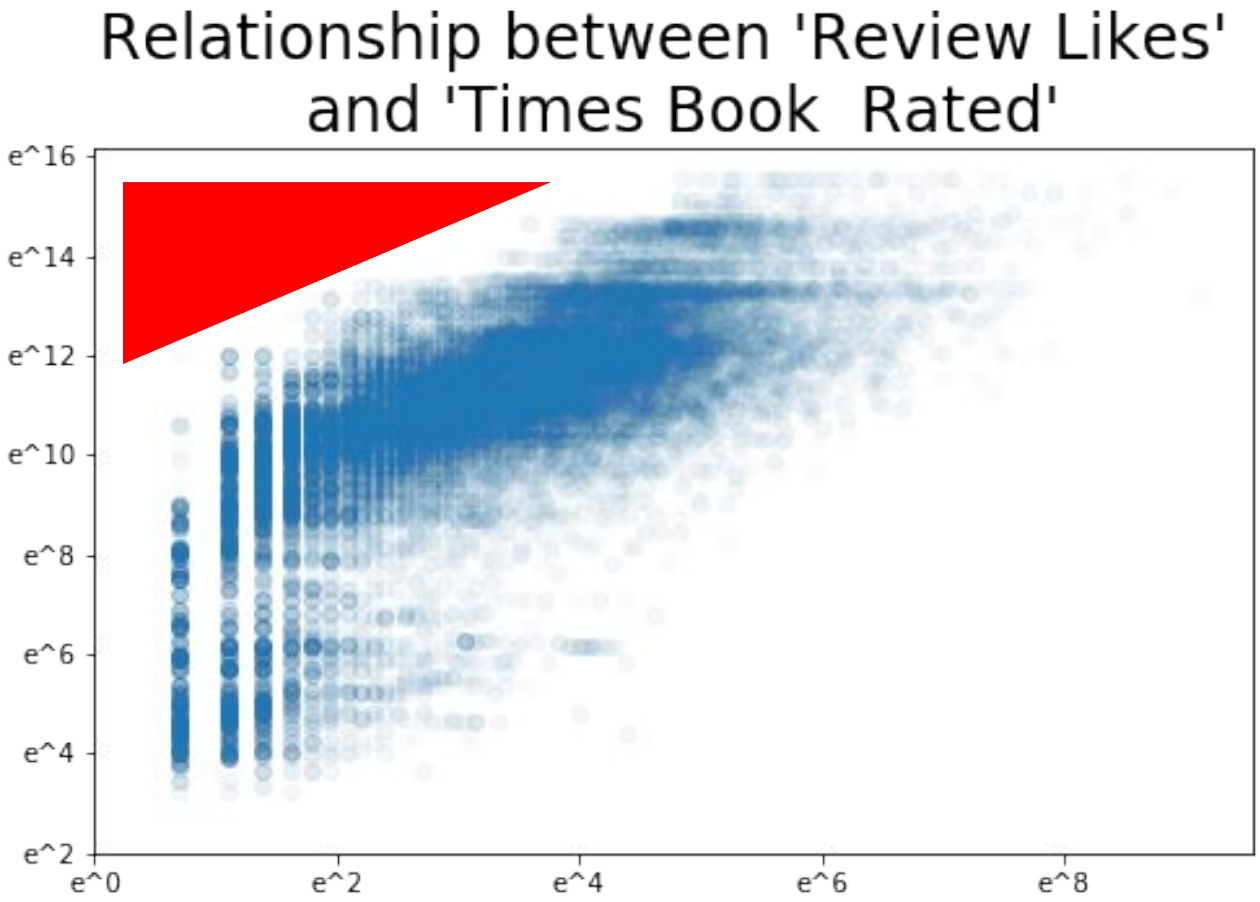
EDA

THERE SHOULD BE DATA HERE



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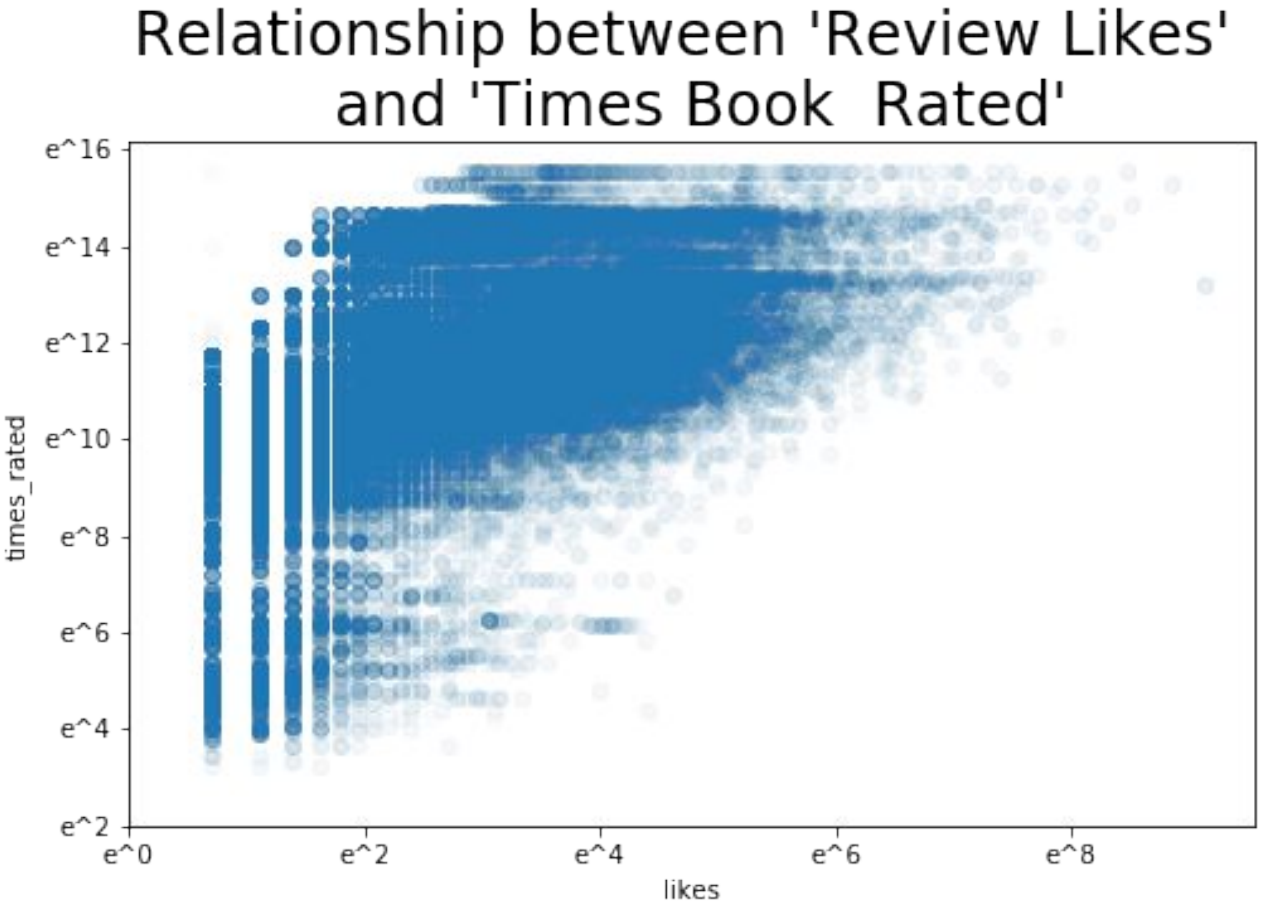
EDA

75,000 records
200 MB of data



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Code: Multiprocessing

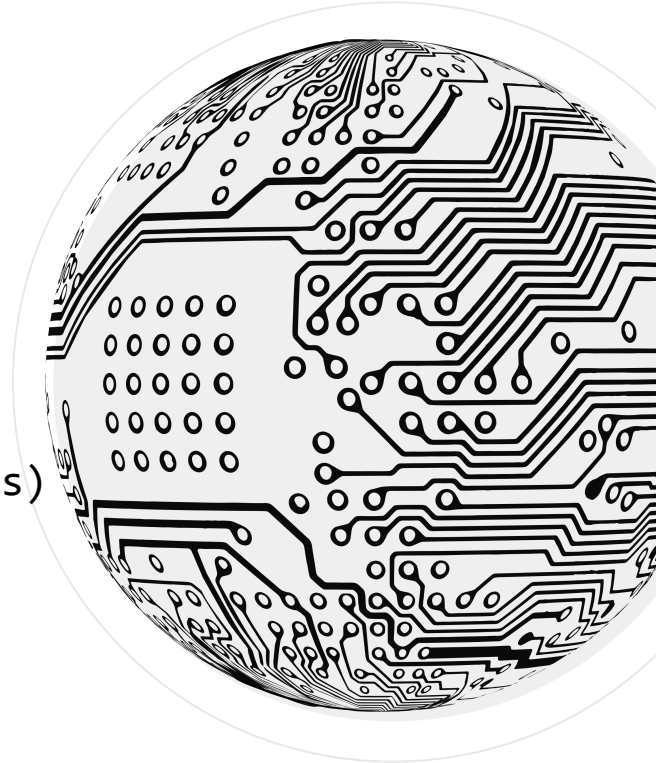
```
import multiprocessing

def reviewscraper(url)
review_urls = [url_1, url_2... url_300]

pool = multiprocessing.Pool()
reviews = pool.map(review_scraper, review_urls)

df = pd.DataFrame.from_records(reviews)

outfile = open(‘title book.pkl’,'wb')
pickle.dump(df,outfile)
```



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First Linear Regression

Dep. Variable:	y	**R-squared:**	0.256
Model:	OLS	**Adj. R-squared:**	0.255
Method:	Least Squares	**F-statistic:**	1226.
Date:	Thu, 11 Oct 2018	**Prob (F-statistic):**	0.00
Time:	14:28:31	**Log-Likelihood:**	-3.1845e+05
No. Observations:	53576	**AIC:**	6.369e+05
Df Residuals:	53560	**BIC:**	6.371e+05
Df Model:	15		
Covariance Type:	nonrobust		

R^2 : 0.256

MSE: 5,883

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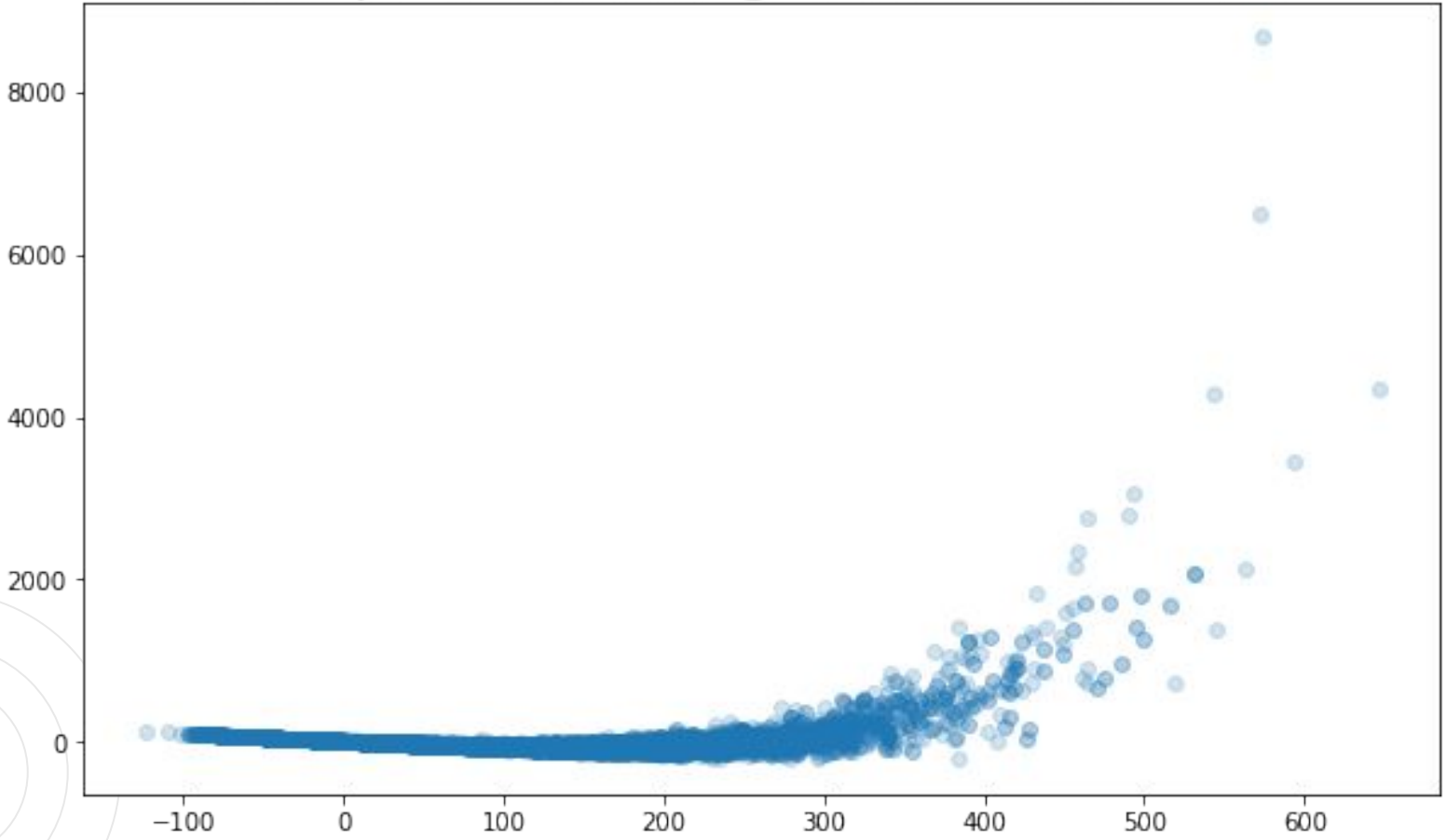
Simple Linear Regression Residuals



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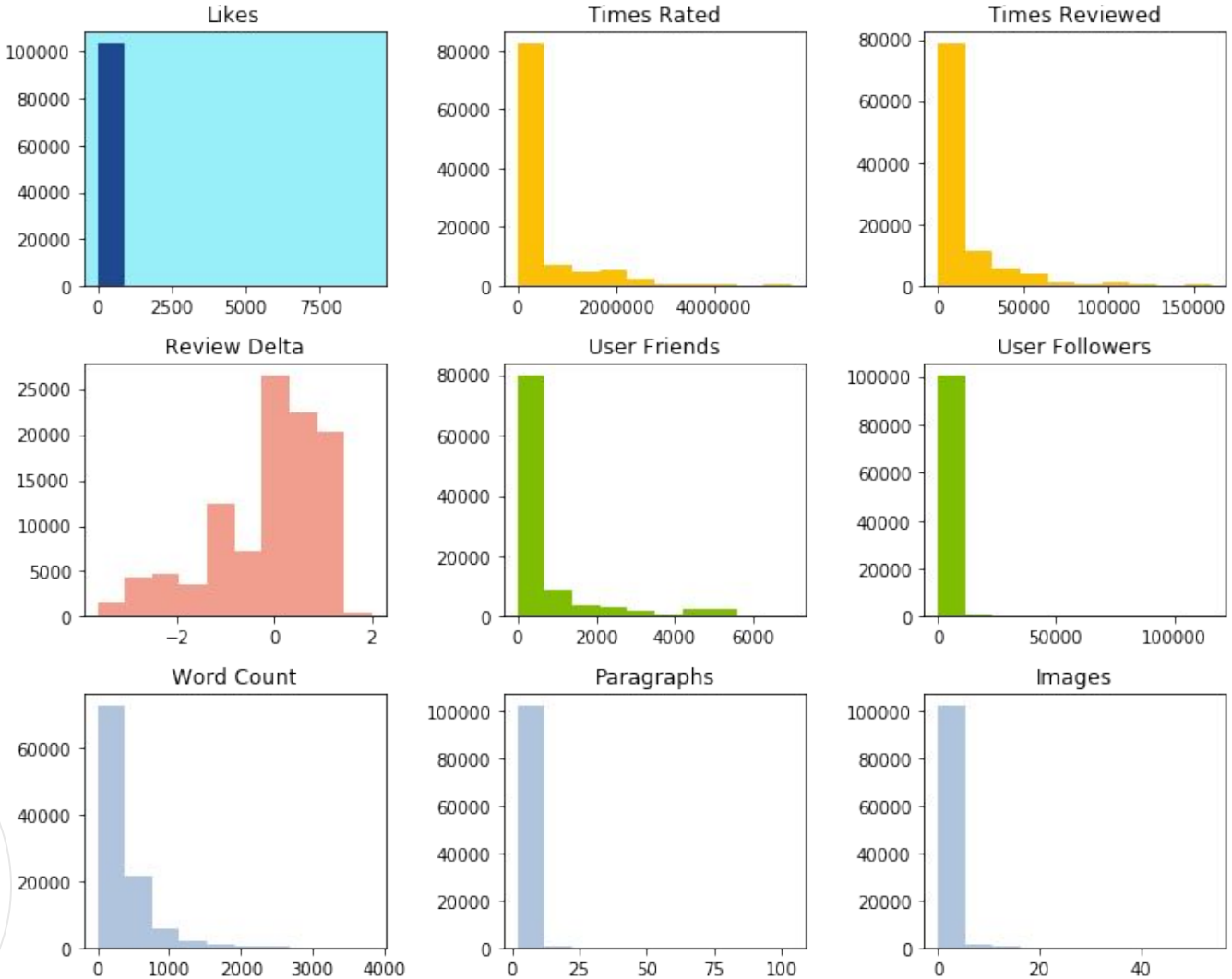
Likes
Times Rated
Times Reviewed
Review Delta
User Friends
User Followers
Word Count
Paragraphs
Images

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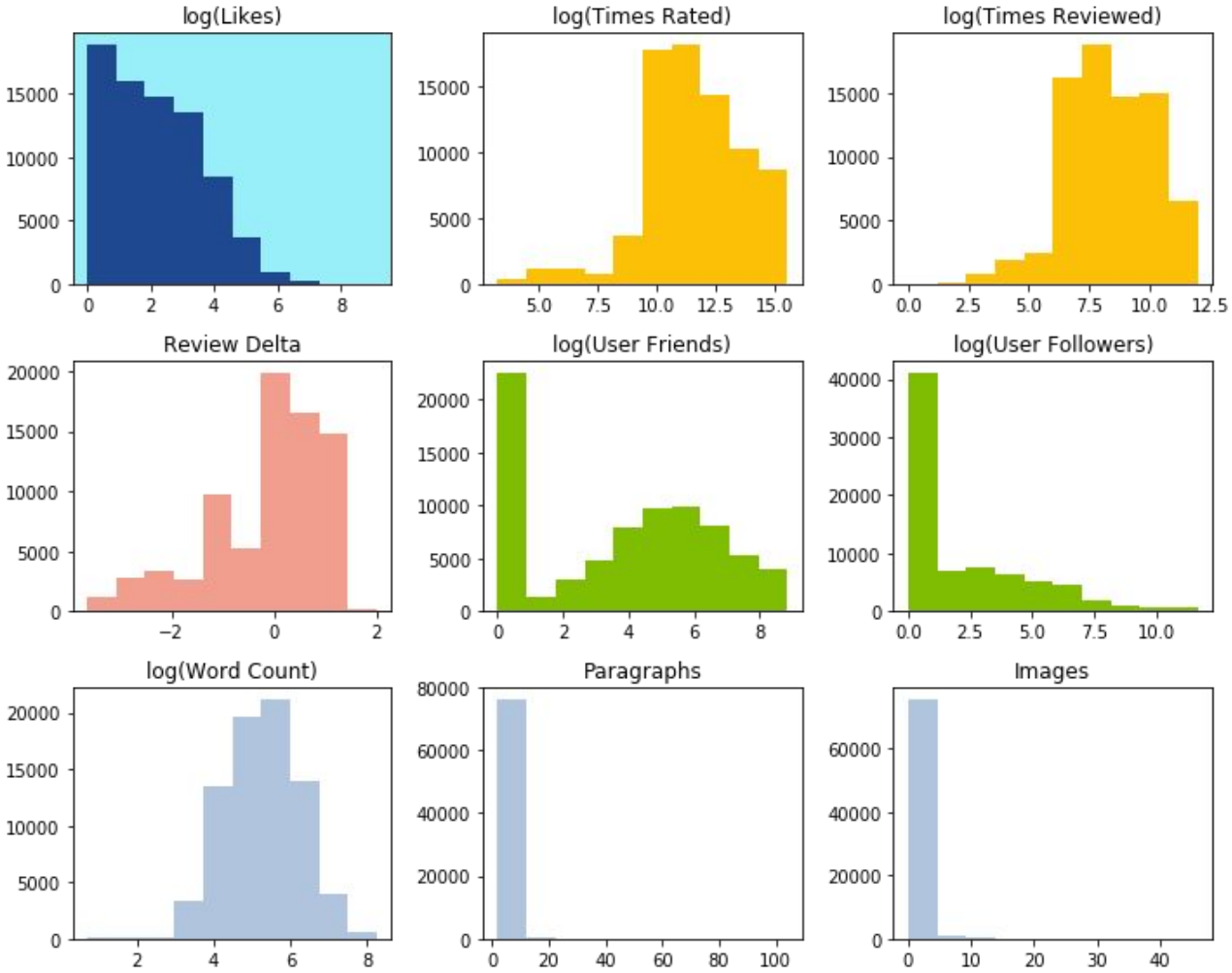
Social networks
grow by
preferential attachment
and demonstrate
exponential distributions


log(Likes)
log(Times Rated)
log(Times Reviewed)
Review Delta
log(User Friends)
log(User Followers)
log(Word Count)
Paragraphs
Images

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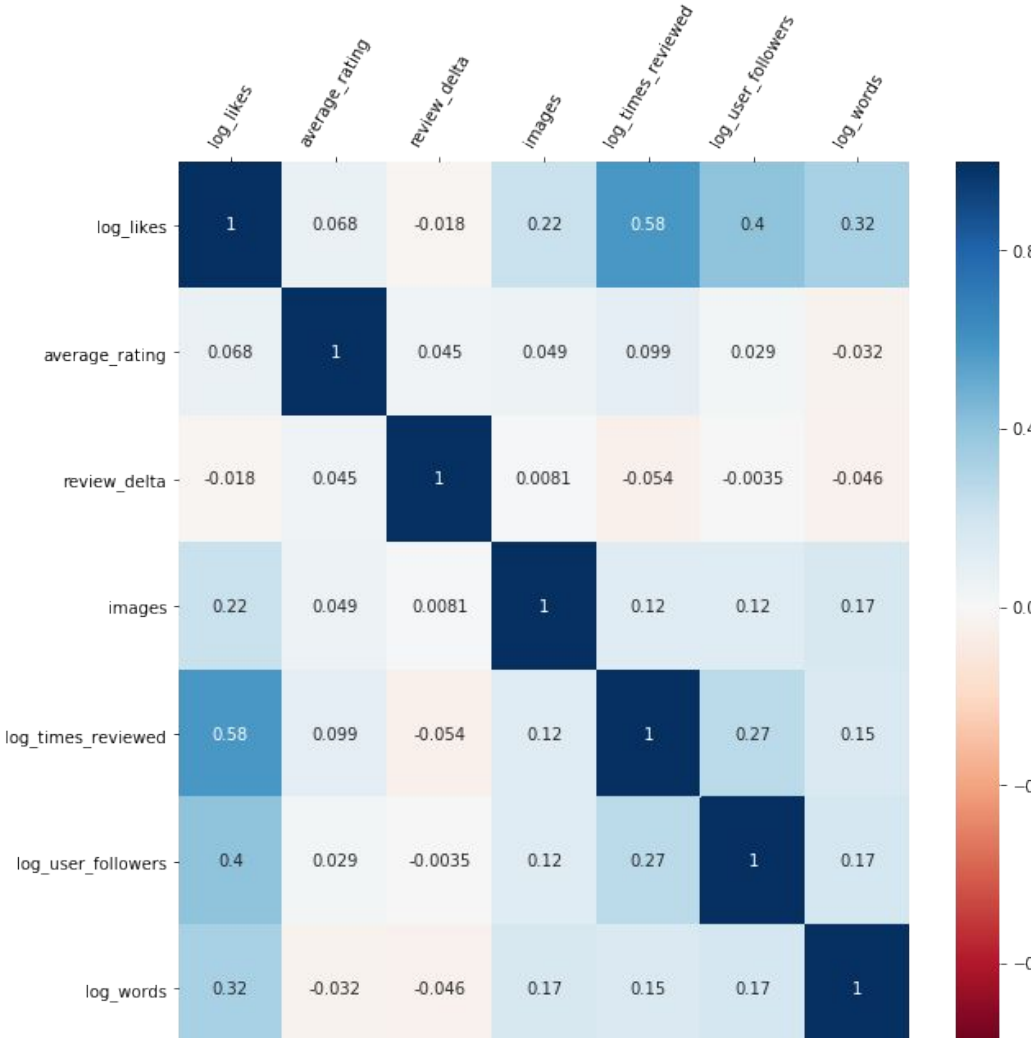
log_likes
average_rating
review_delta
images
log_times_reviewed
log_user_followers
log_words
log_likes 1 0.068 -0.018 0.22 0.58 0.4 0.32
average_rating 0.068 1 0.045 0.049 0.099 0.029 -0.032
review_delta -0.018 0.045 1 0.0081 -0.054 -0.0035 -0.046
images 0.22 0.049 0.0081 1 0.12 0.12 0.17
log_times_reviewed 0.58 0.099 -0.054 0.12 1 0.27 0.15
log_user_followers 0.4 0.029 -0.0035 0.12 0.27 1 0.17
log_words 0.32 -0.032 -0.046 0.17 0.15 0.17 1

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Final LR

Dep. Variable:	log_likes	**R-squared:**	0.461
Model:	OLS	**Adj. R-squared:**	0.461
Method:	Least Squares	**F-statistic:**	7642.
Date:	Thu, 11 Oct 2018	**Prob (F-statistic):**	0.00
Time:	14:29:55	**Log-Likelihood:**	-80973.
No. Observations:	53576	**AIC:**	1.620e+05
Df Residuals:	53569	**BIC:**	1.620e+05
Df Model:	6		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	-3.6139	0.094	-38.551	0.000	-3.798	-3.430
average_rating	0.1185	0.022	5.427	0.000	0.076	0.161
review_delta	0.0416	0.004	9.747	0.000	0.033	0.050
images	0.1254	0.004	29.784	0.000	0.117	0.134
log_words	0.3031	0.005	59.478	0.000	0.293	0.313
log_times_reviewed	0.4092	0.003	145.136	0.000	0.404	0.415
log_user_followers	0.1319	0.002	70.752	0.000	0.128	0.136

Omnibus:	3352.761	**Durbin-Watson:**	2.005
Prob(Omnibus):	0.000	**Jarque-Bera (JB):**	4020.050
Skew:	0.649	**Prob(JB):**	0.00
Kurtosis:	3.340	**Cond. No.**	224.

R^2: 0.467

MSE: 34

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Model Improvement

- KFolds
  - Robust across test/train splits
- Lasso & Ridge
  - Decrease in performance
- Polynomial Features
  - Unstable improvements
- Polynomial + ElasticNetCV
  - Instability + Worse Performance

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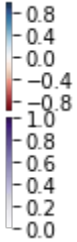
Analysis: What Increase Likes?

	avg. rating	review delta	image	log(words)	log(times_reviewed)	log(user_followers)
Corr:	0.087	0.014	0.21	0.31	0.58	0.41
Coef:	0.11	0.047	0.13	0.31	0.41	0.13



- Read popular books
- Write longer reviews
- Use more images
- Get more friends

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Next Steps

Natural language processing

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