### What makes a Board Game "Good"?

Predicting eventual ranking on BoardGameGeek

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#### The Board Game Industry

"Over \$12 billion by 2023" - Industry Forecast



"In 2019, fans pledged more than \$176 million [on Kickstarter] toward tabletop games — up 6.8% over the previous year"

-Guardian Article, 5 July 2020

## How can a Board Game Publisher/Designer expect their new Board Game to perform?

BoardGameGeek is a collection of thousands of Board Games

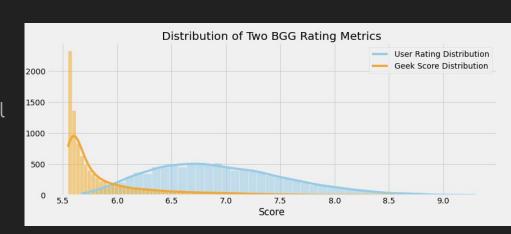
So much data, but ranking is not commensurate with user reviews

#### Objectives:

Scrape 10,000 games from BGG

Build a Supervised Learning Model

to predict game ranking



#### Methodology

Collection

Requests/BeautifulSoup

makeagif.com

Selenium (dynamically coded database)

#### Modelling

SKLearn and StatsModels for Linear Regression Imputation with MICE for NaN values that couldn't be scraped

Data	columns (total 108 c	columns):		51 maxplayers_des	9906 non-null	float64	
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2	desc	10019 non-null		56 numcomments_des	9906 non-null	float64	
3	geek	10019 non-null		57 numfans_des	9906 non-null	float64	
4	rating	10019 non-null		58 numgeeklists_des	9906 non-null	float64	
5	num_voters	10019 non-null		59 numowned_des	9906 non-null	float64	
6	price	10019 non-null		60 numplays_des	9906 non-null	float64	
7	average	10019 non-null		61 numplays_month_des	9906 non-null	float64	
8	avgweight	10019 non-null		62 numtrading_des	9906 non-null	float64	
9	baverage	10019 non-null		63 numwanting_des	9906 non-null	float64	
10	maxplayers	10019 non-null		64 numwantparts_des	9906 non-null	float64	
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18	numhasparts	10019 non-null			9906 non-null	float64	
19	numowned	10019 non-null		74 party_des 75 abstract_des	9906 non-null	float64	
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32	usersrated	10019 non-null		88 numfans_pub	10008 non-null		
33	views	10019 non-null		89 numgeeklists pub	10008 non-null		
34	walmart price	260 non-null	object	90 numowned pub	10008 non-null		
35	yearpublished	10018 non-null		91 numplays_pub	10008 non-null		
36	genres	10010 non-null	object	92 numplays_month_pub	10008 non-null		
37	designer	9906 non-null	object	93 numtrading_pub	10008 non-null		
38	publish	10008 non-null		94 numwanting_pub	10008 non-null	float64	
39	strategy_war	10000 non-null		95 numwantparts_pub	10008 non-null	float64	
40	strategy_war	10019 non-null		96 numweights_pub	10008 non-null		
41	family	10019 non-null		97 numwish_pub	10008 non-null		
	thematic			98 price_mkt_pub	8604 non-null	float64	
42		10019 non-null		99 views_pub	10008 non-null		
43	war	10019 non-null		100 strategy_war_pub	10008 non-null		
44	party	10019 non-null		<pre>101 strategy_pub</pre>	10008 non-null		
45	abstract	10019 non-null		102 family_pub	10008 non-null		
46	rank_des	9906 non-null	float64	103 thematic_pub	10008 non-null		
47	geek_des	9906 non-null	float64	104 war_pub	10008 non-null		
48	rating_des	9906 non-null	float64	105 party_pub	10008 non-null		
49	num_voters_des	9906 non-null	float64	106 abstract_pub	10008 non-null		
50	baverage_des	9906 non-null	float64	107 numpub	10008 non-null	float64	

#### Methodology: Features

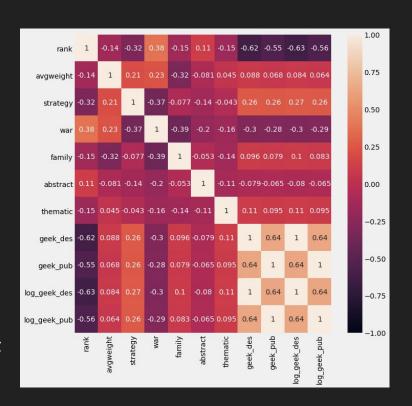
Average Weight, aka Complexity

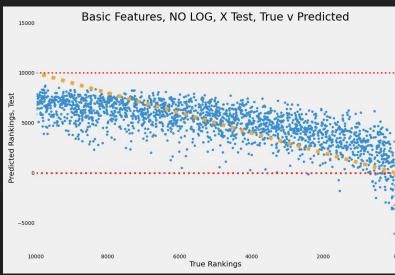
Genres (dummy encoded)

The Geek Score of each Designer and Publisher

Importantly: Log transforms of those scores and rank

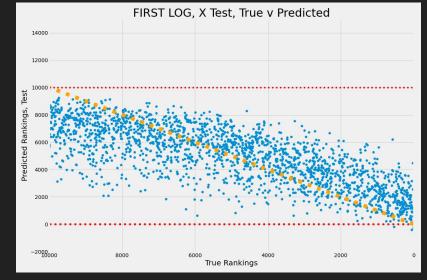
Avoid 'leakage' and assume only basic information about game







R2: 0.56 >



This model curves toward the

Tends to produce negative predicted rankings for "good" games

higher true rankings

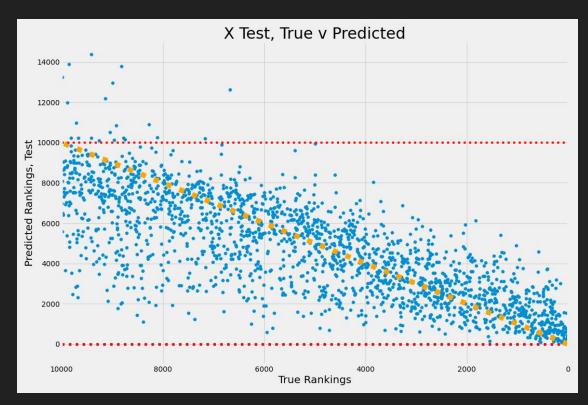
Upon applying log transforms to Designer and Publisher Geek scores, the model improves slightly

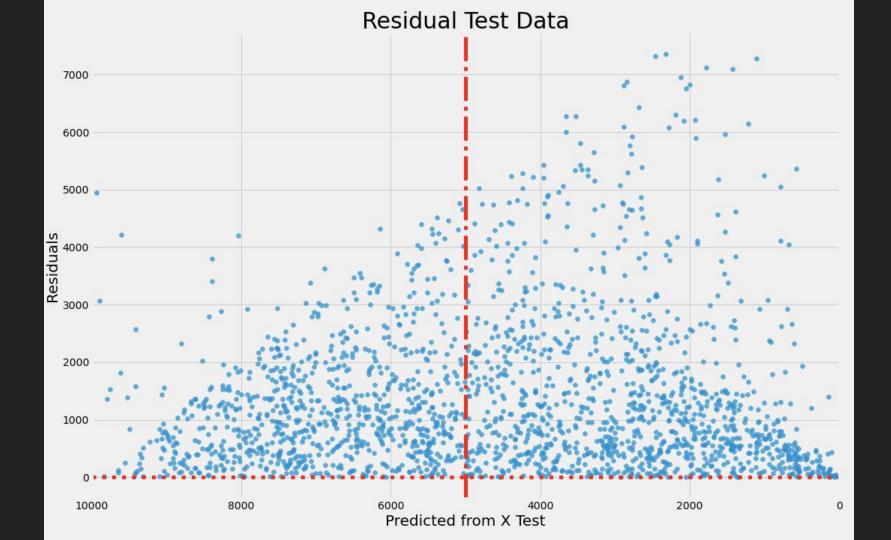
#### Results: Polyfit/Log Transforms

Final R2 Train: 0.60

Final R2 Test: 0.64

R2 Ratio: 0.943





#### What can you do to improve your rank?

Top 1/3! Produce complex games that involve strategy and thematic elements (think fantasy, sci-fi) that are accessible for the whole family

Hire a decent designer:

The mean average designer: 5.871 Geek

Hire 5.971: see your game's rank rise 500+ places!

Avoid abstract concepts (don't reinvent Chess!)

Avoid war games

#### Future Considerations

Of course, there's more to "good" than rank.

Industry playtest data

Better price data

Problem of 'collector items'

# Inank YOU

