

The District Company: Predictive Analytics for Sales and Marketing

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Problem Statement

The District
Company:
Predictive
Analytics for
Sales and
Marketing

Megan
Mortensen,
Connor Phu,
Brian Dassow,
Bella Nordahl

Introducing
the Problem

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Data Analysis

Regressions

Acknowledgements

- Interpret data to help the company make important business decisions
- Look at the correlation between events and concession sales
- Create and evaluate surveys to determine what customers want and need

Status Update

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- Comparing weekly events with data
- Big data analysis
- Category sums and means
- Multiple regression

Events

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Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
6:00 PM Modern Monday	5:00 PM- 11:00 PM Board Game Night	6:30 PM Magic: The Gathering - Standard Format	5:00 PM Yu-Gi-Oh! Tournament.	6:00 AM-9:30 AM Friday Night Magic - Booster Draft, just \$10!	5:00 PM Super Smash Bros Wii U @ The District	12:00 PM-4:00 PM Kids Board-Game Teach-&-Play
6:30 PM Star Wars X-Wing Miniatures Game - Meet-up	6:00 PM-11:00 PM EDH/Commander meet up!	6:30 PM Warhammer 40k Casual Play	5:00 PM-11:00 PM Board Game Night	9:30 AM Friday Night Magic - Booster Draft, just \$10!	5:30 PM Force of Will Tournament	4:00 PM-8:00 PM Dungeons and Dragons: Expeditions
6:30 PM Warhammer 40k Casual Play	8:00 PM Game Designer Meet-up	6:30 PM Star Wars X-Wing Miniatures Game - Meet-up	6:00 PM Throwback Thursday		6:00 PM Magic the Gathering Chaos Draft	4:00 PM-8:00 PM Pokemon Trading Card Game League

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<u>pokemon</u>					<u>pokemon</u>	<u>pokemon</u>
				network	Network	network
				Dice +accessories	Dice +accessories	Dice +accessories
			Yu gi oh	Yu gi oh	Yu gi oh	Yu gi oh
Warhammer						
		Dragon ball z		Dragon ball z	Dragon ball z	
			Video gaming		Video gaming	Video gaming
				Event tickets		
				Card games		
				D and d		
					Beverages	Beverages
					Board games	
					Force of will	

Big Data Analysis

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- Given:
 - Item Name
 - Category
 - Amount Sold
 - Gross Sales
 - Profit
 - Tax
- Able to decrease the scope
- Data is organized in Data Frames

Decrease Scope Explanation

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Category	Items Sold	Gross Sales	Net Sales	Tax
3D printing	28	0.35763	0.34555	0.01511
Beverages	492	0.583	0.93607	0.0477
Birthdays	3	0.14	0.14	0.00165
Board Games	456	12.05529	11.52154	0.62344
Bottled Beverages	5272	12.02576	11.21322	0.61394
Candy	1579	1.18444	1.11405	0.0602
Canned Beverages	2739	5.86174	5.48176	0.29971
Card Game	2206	10.73258	9.94015	0.42897
Card Gaming Accessories	1271	7.64518	7.25185	0.38789
Clothing	3	0.054	0.038	0.00099
D&D	89	1.61609	1.37206	0.07547
Dice and accessories	824	1.48916	1.4417	0.07832
Dragon Ball Z	227	1.44857	1.26794	0.06951
Event Tickets	1631	14.247	13.60231	0.00325
Figures And Models	9	0.12191	0.11239	0.00541
Food	847	18.25576	17.11289	0.68088
Force of Will	2801	15.08294	12.85137	0.67745
Glass Bottled Soda	10265	23.162	21.6417	1.18758
MTG Sealed (booster packs, fat packs, etc)	565	5.81935	5.0339	0.27648
Magic The Gathering	8950	76.87371	66.67143	3.28245
Minimates	12	0.03488	0.03488	0.00191
Miscellaneous	107	1.21907	1.07954	0.02937
Netrunner	4	0.08384	0.06985	0.00384
Network	914	5.329	5.2638	0.28849
Novelties	5907	36.8991	29.55752	1.57233
Pokemon	1150	8.83377	7.45969	0.36969
Prize Support	4	0.135	0	0
Star Wars	74	1.56122	1.51311	0.08104
Uncategorized	1138	5.94413	5.49347	0.18382

Decrease Scope

Americana cherry cola	Uncategorized	1	0.002	0.00169	0
Angels Mtg From The Vau	Uncategorized	21	0.73479	0.68638	0.03773
Battlelore: Herfard Guard	Uncategorized	1	0.03995	0.03	0.00165
Battlelore: Warband of Sc	Uncategorized	1	0.03995	0.03	0.00165
Bones 77124	Uncategorized	1	0.00249	0.00249	0.00014
Catan Junior	Uncategorized	1	0.03	0.02564	0.00141
Chaos Draft	Uncategorized	1	0.015	0.015	0
Chess Set Purchase	Uncategorized	11	0.055	0	0
Chessex Small d6 Assorte	Uncategorized	12	0.0078	0.0078	0.0003
Citadels	Uncategorized	1	0.02495	0.02495	0
Commander Deck (dustin	Uncategorized	2	0.1	0.05	0
Con Sale	Uncategorized	25	0.47745	0.47745	0.02626
Con Soda	Uncategorized	3	0.009	0.009	0.00048
Crazy Urban Myths	Uncategorized	1	0.00499	0.00499	0.00027
D&D 4th Edition Players H	Uncategorized	1	0.03495	0.03495	0.00192
DBZ Heroes Box	Uncategorized	1	0.07999	0.07999	0.0004
DC Deck builder Crossover	Uncategorized	1	0.01	0.01	0.00055
DC Deck-Building Game -	Uncategorized	1	0.04	0.04	0.0022
DQ Starkiss	Uncategorized	3	0.00567	0.00491	0.00027
Delivery Typ	Uncategorized	3	0.012	0.002	0
DQ Sandwich	Uncategorized	3	0.00567	0.00567	0.0001
Dragon Ball Z Evolution	Uncategorized	15	0.05985	0.04995	0.00275
Elis Cah Makeup	Uncategorized	1	0.01	0.01	0
Elvis Dice Set 7	Uncategorized	1	0.013	0.013	0.00072

Category Sums

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Introducing the Problem

Status Update

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Acknowledgements

	A	B	C	D	E	F	G	H
1	Category	Items Sold	Gross Sales	Items Refunded	Refunds	Discounts	Net Sales	Tax
2	3D printing	28	0.35763	0	0	-0.01208	0.34555	0.01511
3	Beverages	492	0.983	-1	-0.0015	-0.04483	0.93667	0.0477
4	Birthdays	3	0.14	0	0	0	0.14	0.00165
5	Board Games	656	13.05529	-1	-0.00399	-1.52976	11.52154	0.62144
6	Bottled Beverages	5272	12.02576	-1	-0.031	-0.78343	11.21322	0.61194
7	Candy	1579	1.18444	-1	-0.00135	-0.06931	1.11405	0.0602
8	Canned Beverages	2739	5.86174	-5	-0.011	-0.36898	5.48176	0.29971
9	Card Game	2206	10.73258	-4	-0.01297	-0.78371	9.94015	0.42897
10	Card Gaming Accessories	1271	7.64518	-5	-0.05947	-0.33406	7.25165	0.38789
11	Clothing	3	0.054	-2	-0.036	0	0.018	0.00099
12	D&D	89	1.61659	-1	-0.13	-0.11453	1.37206	0.07547
13	Dice and accessories	824	1.48916	0	0	-0.04746	1.4417	0.07832
14	Dragon Ball Z	227	1.46857	0	0	-0.20063	1.26794	0.06951
15	Event Tickets	1631	14.247	-15	-0.32	-0.32463	13.60231	0.00325
16	Figures And Models	9	0.12191	0	0	-0.00972	0.11219	0.00541
17	Food	8417	18.25576	-21	-0.07241	-1.07313	17.11109	0.68098
18	Force of Will	2601	15.08294	-21	-0.21166	-2.0239	12.85157	0.67745
19	Glass Bottled Soda	10265	23.162	-18	-0.041	-1.48335	21.6417	1.18758
20	MTG Sealed (booster packs, fat packs, etc)	565	5.81935	0	0	-0.78545	5.0339	0.27648
21	Magic The Gathering	6950	76.87371	-93	-4.17774	-6.03207	66.67143	3.28245
22	Miniatures	12	0.03488	0	0	0	0.03488	0.00191
23	Miscellaneous	107	1.21907	-3	-0.09883	-0.0812	1.03904	0.02937
24	Netrunner	4	0.08384	0	0	-0.01399	0.06985	0.00384
25	Network	914	5.329	-5	-0.022	-0.0432	5.2638	0.28849
26	Novelties	5907	36.8991	-62	-1.7213	-5.62664	29.55752	1.57233
27	Pokemon	1150	8.83377	-11	-0.16364	-1.21044	7.45969	0.36969
28	Prize Support	4	0.135	-1	-0.1	-0.035	0	0
29	Star Wars	74	1.58122	0	0	-0.06811	1.51311	0.08324
30	Uncategorized	1138	5.94413	-18	-0.19933	-0.31633	5.43347	0.18382
31	Venue Fee	8	0.04	0	0	0	0.04	0
32	Video Gaming	190	0.199	-3	-0.003	-0.01047	0.18553	0
	Category Sums	Category Mean						

Category Mean

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1	Category	Items Sold	Gross Sales	Items Refunded	Refunds	Discounts	Net Sales	Tax
2	3D printing	28	0.35763	0	0	-0.01208	0.34555	0.01511
3	Beverages	12.6153846	0.02520513	-0.025641026	-3.8E-05	-0.001149	0.0240172	0.0012231
4	Birthdays	3	0.14	0	0	0	0.14	0.00165
5	Board Games	2.73333333	0.05439704	-0.004166667	-1.7E-05	-0.006374	0.0480064	0.0025893
6	Bottled Beverages	14.9772727	0.03416409	-0.03125	-8.8E-05	-0.002226	0.0318557	0.0017385
7	Candy	26.3166667	0.01974067	-0.016666667	-2.3E-05	-0.001155	0.0185675	0.0010033
8	Canned Beverages	34.6708861	0.07419924	-0.063291139	-0.00014	-0.004671	0.0693894	0.0037938
9	Card Game	31.9710145	0.15554464	-0.057971014	-0.00019	-0.011358	0.1440601	0.006217
10	Card Gaming Accessories	4.29391892	0.02582831	-0.016891892	-0.0002	-0.001129	0.0244988	0.0013104
11	Clothing	3	0.054	-2	-0.036	0	0.018	0.00099
12	D&D	4.68421053	0.08508368	-0.052631579	-0.00684	-0.006028	0.0722137	0.0039721
13	Dice and accessories	25.75	0.04653625	0	0	-0.001483	0.0450531	0.0024475
14	Dragon Ball Z	20.6363636	0.13350636	0	0	-0.018239	0.1152673	0.0063191
15	Event Tickets	49.4242424	0.43172727	-0.575757576	-0.0087	-0.009839	0.4121912	9.848E-05
16	Figures And Models	1.5	0.02031833	0	0	-0.00162	0.0186983	0.0009017
17	Food	40.6618357	0.08819208	-0.101449278	-0.00035	-0.005184	0.0826623	0.0032898
18	Force of Will	76.5	0.44361588	-0.617647059	-0.00623	-0.059526	0.3779874	0.019925
19	Glass Bottled Soda	46.2387387	0.10433333	-0.081081081	-0.00018	-0.006682	0.0974851	0.0053495
20	MTG Sealed (booster packs, fat packs, etc)	282.5	2.909675	0	0	-0.392725	2.51695	0.13824
21	Magic The Gathering	76.3736264	0.84476604	-1.021978022	-0.04591	-0.066286	0.7326531	0.0360709
22	Miniatures	1	0.00290667	0	0	0	0.0029067	0.0001592
23	Miscellaneous	10.7	0.121907	-0.3	-0.00988	-0.00812	0.103904	0.002937
24	Netrunner	1	0.02096	0	0	-0.003498	0.0174625	0.00096
25	Network	228.5	1.33225	-1.25	-0.0055	-0.0108	1.31595	0.0721225
26	Novelties	13.2443946	0.08273341	-0.139013453	-0.00386	-0.012616	0.0662725	0.0035254
27	Pokemon	20.5357143	0.15774589	-0.196428571	-0.00292	-0.021613	0.1332088	0.0066016
28	Prize Support	1.33333333	0.045	-0.333333333	-0.03333	-0.011667	0	0
29	Star Wars	2.05555556	0.04392278	0	0	-0.001892	0.0420308	0.0023122
30	Uncategorized	13.8780488	0.07248939	-0.219512195	-0.00243	-0.003858	0.0662618	0.0022417
31	Venue Fee	8	0.04	0	0	0	0.04	0
32	Video Gaming	95	0.0995	-1.5	-0.0015	-0.005235	0.092765	0
	Category Sums		Category Mean					

Comparisons Between Sums and Means

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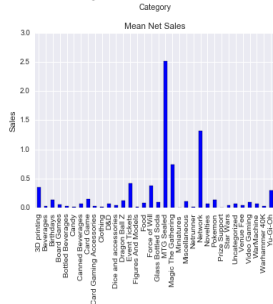
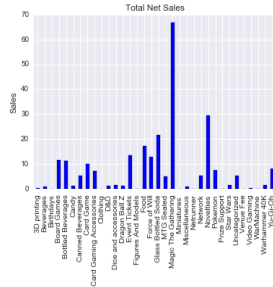
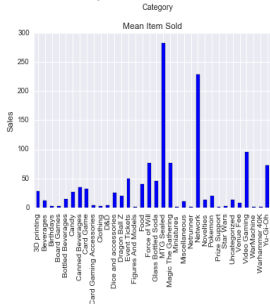
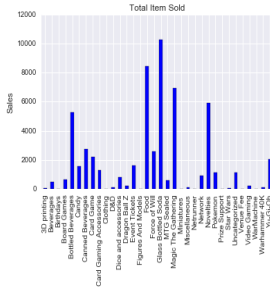
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Correlations with Food and Different Beverages

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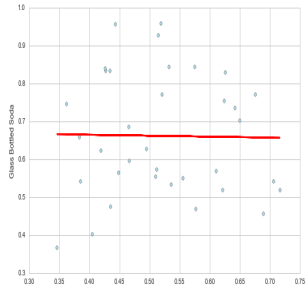
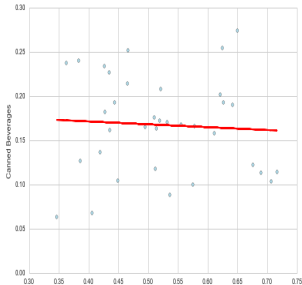
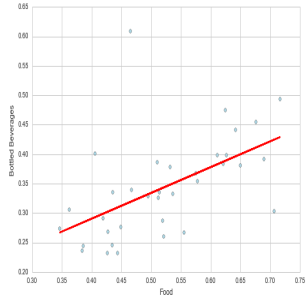
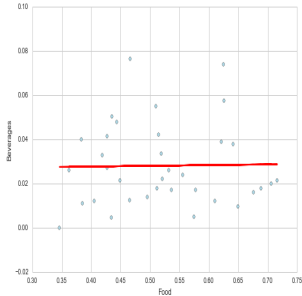
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Multiple Regression Weights

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* decreasing
 > 1
 < 0.1
 $0.1 - 0.5$
 $0.51 - 0.99$

$y \rightarrow$	mtg combined	D+D	novelties	event tickets	board games
beverages	-0.064	0.017	0.024	-0.014	-0.024
bottled beverages	0.014	-0.230	0.085	-0.012	0.034
food	0.031	-0.230	0.037	0.094	0.092
glass	0.023	0.201	0.188	0.023	0.084
canned	-0.006	0.023	0.023	0.084	-0.024
candy	0.003	0.070	-0.025	0.004	-0.017

Linear Regression Weights

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X	Mtg	Mtg	Mtg	Mtg	Mtg	Mtg	
Y	beverages	bottled	food	glass	canned	candy	← people who play Mtg aren't buying lots of concessions
Weight	-0.002	0.014	0.029	0.028	-0.021	0.004	

X	D+D	D+D	D+D	D+D	D+D	D+D	
Y	beverages	bottled	food	glass	canned	candy	← people who play D+D aren't buying lots of concessions
Weight	0.001	-0.026	-0.275	0.820	0.021	0.027	

X	Novelties	Novelties	Novelties	Novelties	Novelties	Novelties	
Y	beverages	bottled	food	glass	canned	candy	← people who buy Novelties aren't buying lots of concessions
Weight	0.011	-0.103	0.072	0.319	0.018	-0.017	

X	event tickets	event tickets	event tickets	event tickets	event tickets	event tickets	
Y	beverages	bottled	food	glass	canned	candy	← people who buy event tickets aren't buying lots of concessions
Weight	0.006	-0.126	-0.197	0.241	0.048	0.004	

X	board games	board games	board games	board games	board games	board games	
Y	beverages	bottled	food	glass	canned	candy	← people who play board games aren't buying lots of concessions
Weight	-0.016	0.006	0.005	0.296	-0.016	0.029	

■ > 1
■ < 0.1
■ 0.1 - 0.5
■ 0.51 - 0.99
■ if decreasing

by weeks after D+D						
Y	beverages	beverages	beverages	beverages	beverages	beverages
X	Mtg	D+D	Novelties	event tickets	board games	board games
Weight	-0.002	0.001	-0.11	0.006	-0.016	-0.016

Y	bottled	bottled	bottled	bottled	bottled
X	Mtg	D+D	Novelties	event tickets	board games
Weight	0.014	-0.036	-0.103	-0.125	0.006

Y	food	food	food	food	food
X	Mtg	D+D	Novelties	event tickets	board games
Weight	0.029	-0.275	0.072	-0.297	-0.005

Y	glass	glass	glass	glass	glass
X	Mtg	D+D	Novelties	event tickets	board games
Weight	0.028	-0.820	0.319	0.241	0.096

Y	canned	canned	canned	canned	canned
X	Mtg	D+D	Novelties	event tickets	board games
Weight	-0.001	0.021	0.018	-0.048	-0.016

Y	candy	candy	candy	candy	candy
X	Mtg	D+D	Novelties	event tickets	board games
Weight	0.004	0.027	-0.017	-0.004	-0.029

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- Project Consultant: Dustin Jepperson
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