All Foods
Australian Grocery Store
Revenue recovering

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Problem Overview

All Foods, is a grocery store in Melbourne, Australia that sells a variety of groceries ranging from fresh produce to grains to snacks to dairy and eggs and more. And to cater to the diverse population of Melbourne they have even introduced foods from asian countries such as Sri Lanka!

In the year 2017, the store operated for all hours of the day. However for the year 2018, the store changed strategy and was open only from 7am to 7pm daily. This dropped their revenues by more than $50,000 and profits by more than $40,000!

Our team analyzed the daily total profit of each day in the week and the profit of each item sold in the store. And generated two possible solution to help All Foods on recovering its revenue.

Data Analysis & Visualization

What are the most efficient ways that the store can reduce losses & increase profits?

Our solutions:

Solution 1

Stop selling items that continuously generate negative profit

Solution 2

Shifting operation time one hour back to 8:00 - 20:00

Solution 1

Which items should the store stop selling? Why?

Negative profit items for 2017-2018

- The negative values are in dollar units.
- The values lost in profit increased for Cabbage Wombok (This does not include the buy in price as Cabbage Wombok has a null value)
- There are significant and repeating negative profit items such as cabbage wombok and avocado hass medium.

Solution 1

Our process

1) Consider an alternative question that we can answer in response to “Which items should the store stop selling?.” We decided to make a sub question: “Which items generate negative profit?”
2) Clean and filter dataset using Python and Jupyter Notebook accordingly to only include values that we need to answer the question.
3) Import our edited dataset into Tableau to create our data visualizations and then change colors, title, legend, and labels accordingly. We decided pie charts best identify the general gist of which items are losing profit.

Solution 1

We filtered the dataset to only display negative profit numbers ($ units), item name, and the absolute numbers for 2017 and 2018

total_profit_2017	total_profit_2018	item_name	loss_2017	loss_2018
-0.6	-17.399999999999995	Artichoke 2 For 3	0.6	17.399999999999995
-147.46000000000012	-968.5899999999932	Avocado Hass Medium	147.46000000000012	968.5899999999932
-138.35855000000006	-105.12838000000005	Banana Cavendish	138.35855000000006	105.12838000000005
-5.399999999999999	-34.20000000000006	Brown Onion 1Kg	5.399999999999999	34.20000000000006
-274.17150000000004	-1835.5725000000014	Cabbage Wombok	274.17150000000004	1835.5725000000014
-13.799999999999988	-23.399999999999963	Gold Nugget700g	13.799999999999988	23.399999999999963
-1.52	-2.2800000000000002	Lemon 1kg	1.52	2.2800000000000002
-24.852	-21.255000000000003	Longans	24.852	21.255000000000003
-2.7299999999999924	-2.0200000000000014	Piel de Sapo Melon	2.7299999999999924	2.0200000000000014
-155.39999999999986	-133.00000000000037	Red Radish bunch	155.39999999999986	133.00000000000037
-44.080000000000005	-1.72	Turmeric	44.080000000000005	1.72
-104.81600000000006	-132.93950000000007	bitter melon	104.81600000000006	132.93950000000007
-4.08999999999996	-3.3899999999999757	choy sum 2 for $ 1.99	4.08999999999996	3.3899999999999757

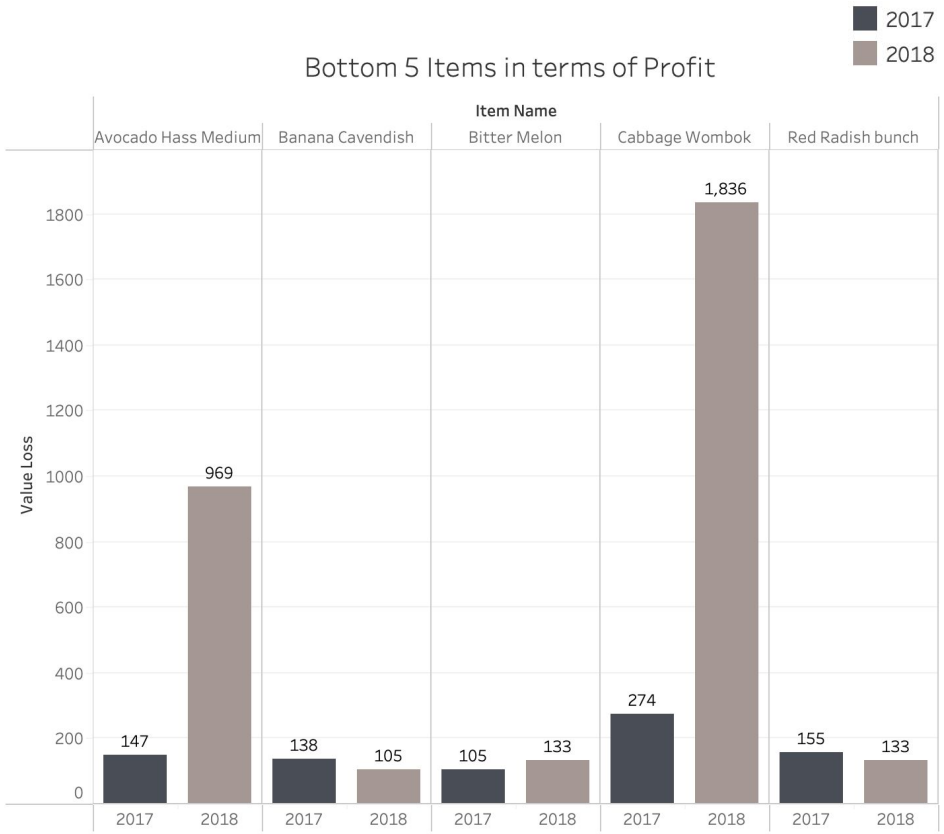
Solution 1

Conclusion

Stop selling items that continuously generate negative profit, like Avocado Hass Medium and Cabbage Wombok

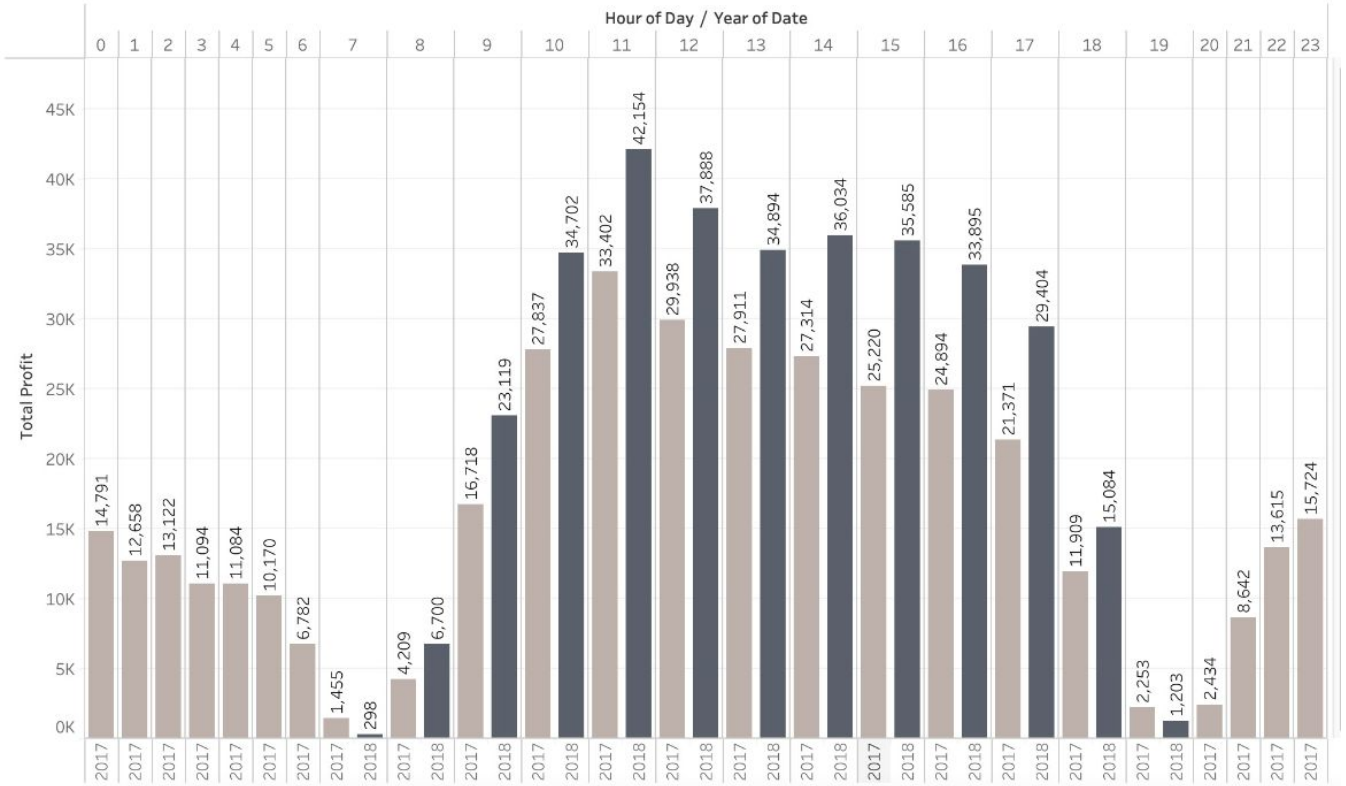
- We filtered the data to find the lowest profit amongst all items.
- Then, we turned the negative numbers (units is in $) into absolute numbers when plotting.

In conclusion, the store should opt to stop selling negative profit items as they are continuously **losing** money in 2017 and 2018. Instead, alternative methods can be to invest in adding stock to items that generate more profit.



Solution 2

Total profit of each hour in a day (2017 & 2018)



We first grouped total profit by every hour in a day and noticed that the lowest profit is at 7 am and 19pm. And we then calculated the 24 differents operation time in 12 hours. (next page)

Solution 2

Data Process

12:00-24:00	13:00-01:00	14:00-02:00	15:00-03:00	16:00-04:00	17:00-05:00	18:00-6:00	19:00:00	20:00-8:00	21:00-9:00	22:00-10:00	23:00-11:00
29938	27911	27314	25220	24894	21371	11909	2253	2424	8642	13615	15724
27911	27314	25220	24894	21371	11909	2253	2424	8642	13615	15724	12658
27314	25220	24894	21371	11909	2253	2424	8642	13615	15724	12658	13122
25220	24894	21371	11909	2253	2424	8642	13615	15724	12658	13122	11094
24894	21371	11909	2253	2424	8642	13615	15724	12658	13122	11094	11084
21371	11909	2253	2424	8642	13615	15724	12658	13122	11094	11084	10170
11909	2253	2424	8642	13615	15724	12658	13122	11094	11084	10170	6782
2253	2424	8642	13615	15724	12658	13122	11094	11084	10170	6782	1455
2424	8642	13615	15724	12658	13122	11094	11084	10170	6782	1455	4209
8642	13615	15724	12658	13122	11094	11084	10170	6782	1455	4209	16718
13615	15724	12658	13122	11094	11084	10170	6782	1455	4209	16718	27837
15724	12658	13122	11094	11084	10170	6782	1455	4209	16718	27837	33402
195491	181277	166024	151832	137706	123896	112695	107568	106770	108555	116631	130853

0:00 - 12:00	1:00 - 13:00	2:00 - 14:00	3:00-15:00	4:00-16:00	5:00-17:00	6:00-18:00	7:00-19:00	8:00-20:00	9:00-21:00	10:00-22:00	11:00-23:00	12:00-
14791	12658	13122	11094	11084	10170	6782	1455	4209	16718	27837	33402	299
12658	13122	11094	11084	10170	6782	1455	4209	16718	27837	33402	29938	279
13122	11094	11084	10170	6782	1455	4209	16718	27837	33402	29938	27911	273
11094	11084	10170	6782	1455	4209	16718	27837	33402	29938	27911	27314	252
11084	10170	6782	1455	4209	16718	27837	33402	29938	27911	27314	25220	248
10170	6782	1455	4209	16718	27837	33402	29938	27911	27314	25220	24894	213
6782	1455	4209	16718	27837	33402	29938	27911	27314	25220	24894	21371	119
1455	4209	16718	27837	33402	29938	27911	27314	25220	24894	21371	11909	225
4209	16718	27837	33402	29938	27911	27314	25220	24894	21371	11909	2253	242
16718	27837	33402	29938	27911	27314	25220	24894	21371	11909	2253	2424	864
27837	33402	29938	27911	27314	25220	24894	21371	11909	2253	2424	8642	136
33402	29938	27911	27314	25220	24894	21371	11909	2253	2424	8642	13615	157
129920	148531	165811	180600	196820	210956	225680	240269	250723	248767	234473	215278	195

By looking the Excel, from 8:00 to 20:00 in 2017 has the highest profit which is 250,723, and the total profit in 2017 from 7:00 to 19:00 is 240,269.

The difference is

10,454

Solution 2

Conclusion

The grocery store could shift operation time from 8:00-20:00.

Whole process of analysis:

1. Grouping time (24 hours)
2. Calculate total profit in 12 hours
3. Find the maximum profit in 12 hours

Machine learning Model

Predict the total amount of selling price in the next 3 months

Predict the total amount of sales in the next 3 months for the selling price:

the store as a whole

YYYY.MM	LR_total_selling_price	nn_total_selling_price	LMST_total_selling_price
2019.01	43873.157137	43304.15625	43304.453125
2019.02	43915.287536	43304.15625	49826.804688
2019.03	43957.417935	43304.15625	51395.523438

Machine learning model:

- Linear Regression model R^2 score: -7.112917722788609

Deep Learning Model:

- Neural Network Model loss: 13998915
- Long Short Term Memory Model loss: 14000476.0

After used three different types to predict the total amount of sales in next three months, we combined the three types together and found the mean for total selling price , then

the total selling price on Jan 2019 is approximate to 43,350

On Feb 2019 is approximate to 46150

On Mar 2019 is approximate to 47150

Thank you!