MARKET BASKET ANALYSIS

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EXECUTIVE SUMMARY

- The following presentation is an analysis of transactional data from a grocery store in order to help implement new offers/promotions on their products.
- MBA technique is used to identify items that are sold together and recommends items that can be bought along with the original purchase.
- This analysis helps the business understand the buying patterns of its customers and provide suggestions to help implement new marketing strategies.

EDA & KEY FINDINGS

- The provided dataset contains records of transactions from a grocery store.
- It contains a total of 20641 records, each having information about the product purchased, order ID and the date of purchase.
- "Poultry" is the most frequently purchased product followed by "Soda" while "Hand soap" is the least frequent.
- An order may contain multiple quantities of the same product.
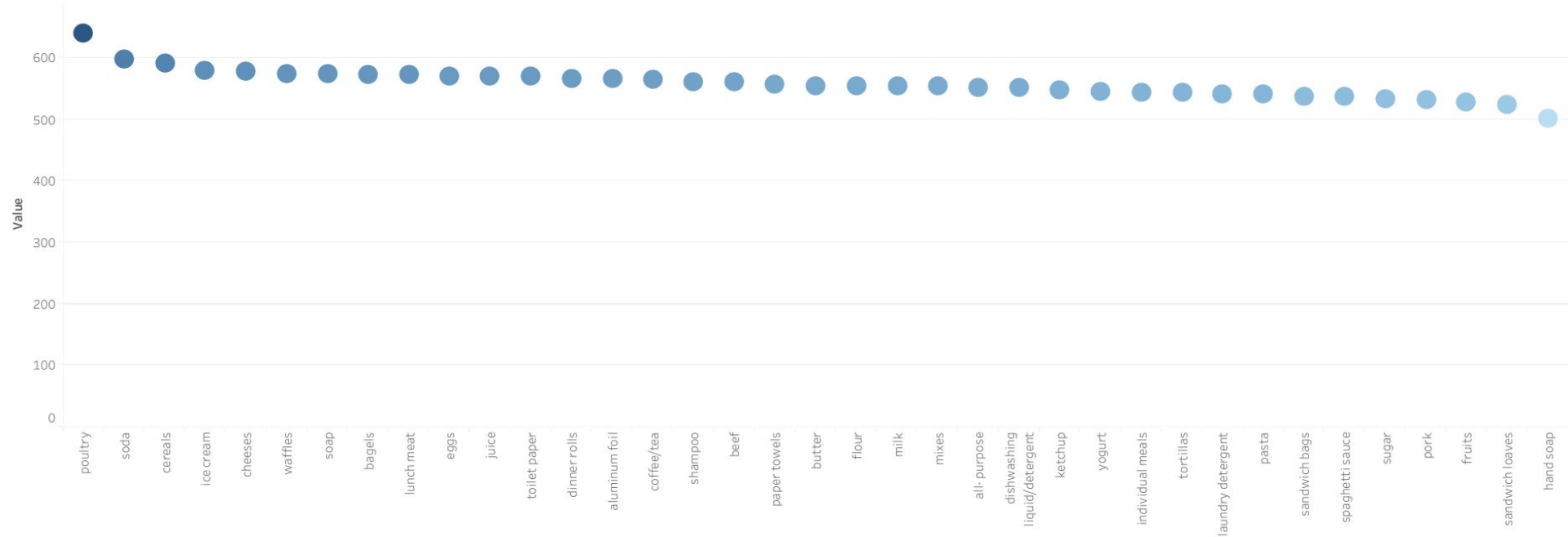
ANALYSIS OF TRENDS ACROSS TIME

- There is a total of 37 different products sold by the store with a total of 1139 orders placed over a period of 20 months ie January - September of 2018 & 2019 and the first two months of 2020.
- The store has its highest number of orders in the year 2018.
- The third quarter of 2019 has the lowest number of orders registered.
- The month of May has the highest number of orders in 2019 and 2018.
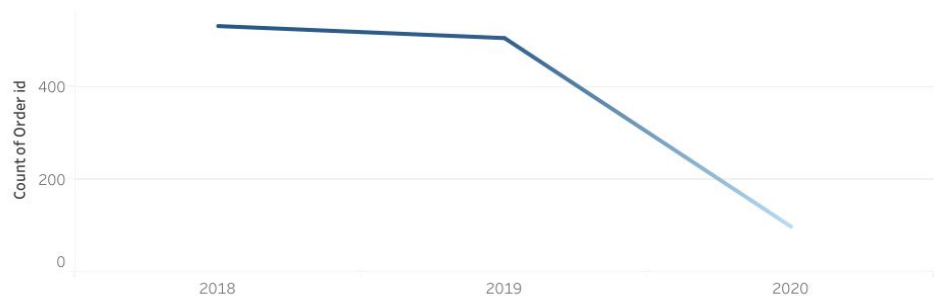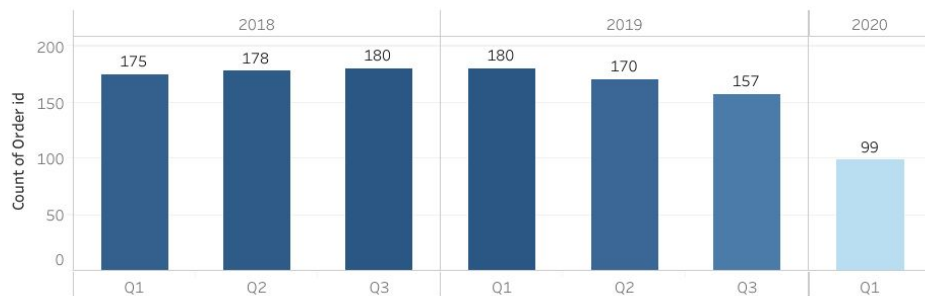
MARKET BASKET ANALYSIS

- A MBA is done to identify the association between products purchased based on the buying patterns of customers in this case.
- The Support metric is used to identify the popularity of a particular product by calculating its frequency.
- The confidence metric is the conditional probability that a customer buys a product A when B is bought.
- The Lift metric is the percentage increase in the probability of a customer buying a product based on the items in their basket.

MARKET BASKET ANALYSIS

- The Support and Confidence metrics are used as thresholds to control the number of rules to be created.
- The goal is to achieve a high Lift score to identify the most popular combinations and recommendations for the same.
- We perform the MBA using KNIME Analytics Tool.

KNIME WORKFLOW
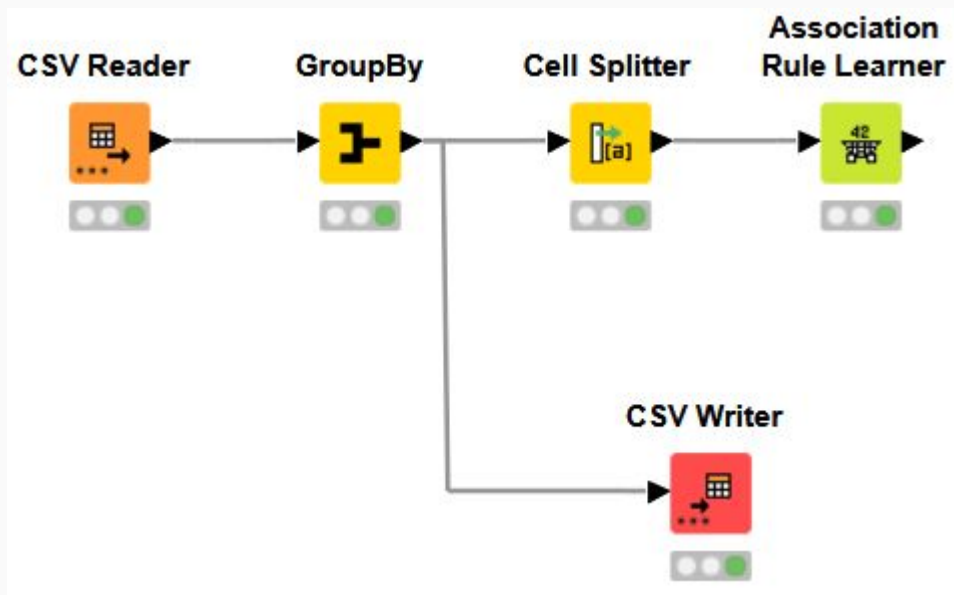
SETTING THRESHOLDS

- To get the ideal amount of rules, we can set the values for the support and confidence metrics in the Association Rule Learner node.
- In order to get the desired combinations for the grocery store problem, we set the minimum support as 0.04 and minimum confidence as 0.5 ie at least 50%.
- We obtain the results and sort it based on the highest Lift scores.

IDENTIFIED ASSOCIATIONS

Support	Confidence	Lift	Consequent	Products
0.04038630378	0.696969697	1.922151295	paper towels	[all- purpose, individual meals, toilet paper]
0.04038630378	0.6764705882	1.821513002	pasta	[hand soap, soda, aluminum foil]
0.04038630378	0.6764705882	1.821513002	ketchup	[butter, aluminum foil, soap]
0.0412642669	0.6714285714	1.807936508	ketchup	[pork, sandwich bags, soap]
0.04565408253	0.65	1.792615012	paper towels	[ice cream, pasta, lunch meat]
0.05531167691	0.6494845361	1.79119343	paper towels	[eggs, ice cream, pasta]
0.04389815628	0.6756756757	1.781468969	soap	[sandwich loaves, all- purpose, ketchup]
0.04389815628	0.6172839506	1.748971193	flour	[yogurt, pasta, coffee/tea]
0.04214223003	0.6486486486	1.746597661	pasta	[dinner rolls, hand soap, individual meals]
0.04653204565	0.6543209877	1.745366756	beef	[poultry, fruits, sugar]

IDENTIFIED ASSOCIATIONS

- The rules listed have the highest lift scores from the Association Rule Learner.
- The rule with the highest lift score can be interpreted as Customers who buy "All-purpose, Individual Meals and Toilet Paper" tend to buy "Paper Towels".
- There is a 70% chance that a customer would buy "Paper Towels" if they have purchased the above mentioned products.

RECOMMENDED OFFERS

- Dinner Rolls have the highest support value and hence the most popular product in the store.
- It is recommended that the store has some kind of a discount on this particular product especially when purchased along with "Poultry"..
- "Paper towels" are often recommended when a group of items are bought and has a high confidence level.
- An offer such as "Buy two get one free" would be ideal for this product.

RECOMMENDED OFFERS

- A discounted price on poultry would be profitable as it is the more frequently bought by the customers.
- Since there is an increase in orders placed in the month of May, a limited time offer on products such as "Poultry", "Soda" and "Ice Cream".
- A loyalty program can be implemented providing special rates for members only.

Tableau Link:

https://public.tableau.com/views/MBA_1_16429180976710/MostFrequencentlyPurchasedProduct?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

https://public.tableau.com/views/Grouped_data_Analysis_MBA/Dashboard1?:language=en-US&publish=yes&:display_count=n&:origin=viz_share_link

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