Contents

ACME Inc Market Basket Analysis
CRISP DM model

1. Business Understanding

ACME Inc. is a retail company that operates a chain of stores selling various products. To enhance customer loyalty and improve marketing strategies, ACME Inc. has implemented a loyalty card program. This program allows them to collect data on customer transactions, including purchases made with the loyalty card.

The objective of this project is to conduct a Market Basket Analysis (MBA) using the customer shopping cart data obtained through the loyalty card program. MBA aims to identify patterns of co-occurring items in customer transactions to understand which products are frequently purchased together. By uncovering these associations, ACME Inc. can optimize product placement, promotional strategies, and cross-selling opportunities to increase revenue and customer satisfaction.

2. Data Understanding

The original dataset contains 18 variables where 4 of them are continuous, and 14 categorical. This initial arrangement needs to be fixed, since some of the categorical variables will be better as flag or binary variables.

3. Data Preparation

Basket summary:

- cardid. Loyalty card identifier for customer purchasing this basket.
- value. Total purchase price of basket.
- pmethod. Method of payment for basket.

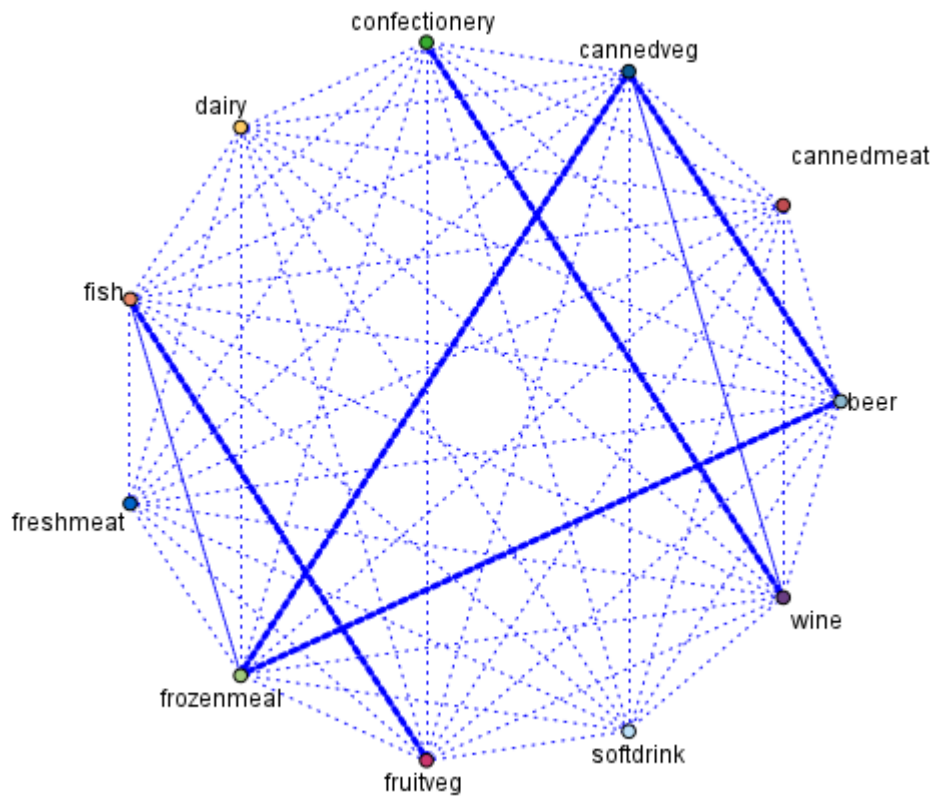**Personal details of cardholder:**

- sex: Female or male
- homeown. Whether or not cardholder is a homeowner.
- Income : Income of every customer
- Age: Age of the customer

Basket contents—flags for presence of product categories:

- fruitveg
- freshmeat
- dairy
- cannedveg

- cannedmeat
- frozenmeal
- beer
- wine
- softdrink
- fish
- confectionery

4. Modeling.

The creation of a web graph allowed us to check visually the connections between products and how strong they are. This provided the basis for the creation of three derived columns that go as follows:

- BoozePizzaCannedVeg: (Group 1) 3 products: Beer, Frozen meal, and canned vegetables.
- WineConfectionary: (Group 2) 2 products: wine and Confectionary
- FruitsVeggiesFish: (Groups 3) 2 products: Fruits & Vegetables and Fish.

Now that we defined this new columns that group distinct products based on the statement that they are usually bought together.

Modeling Approach:

The modeling approach that will be used for this analysis is a decision three that will help us to see what are the main variables that predict the purchase of the items that are commonly purchased together and thus see what kind of clients are buying this products often. By building this client potential profiles is possible to create better marketing strategy and also understand the causes behind that decision making.

Model Building:

The creation of the model consisted basically in creating 3 decision threes in order to see the main drivers of each of the newly created groups of products.

Results:
The modeling showed that for the group 1 the main drivers of purchasing for those products are the facts that the client is a male and has an income of less on equal to 16.950. The income explains 54% of the election for these particular group of products and being a Male explains the other 46%.

For the group 2 we can observe that the main drivers for the purchase of wine and confectionery are that the consumer be a female and has earnings over 16.950. Being a female has a weight on the decision to choose these products of 76% and having an income higher than average explains 25% of the election for wine and confectionary.
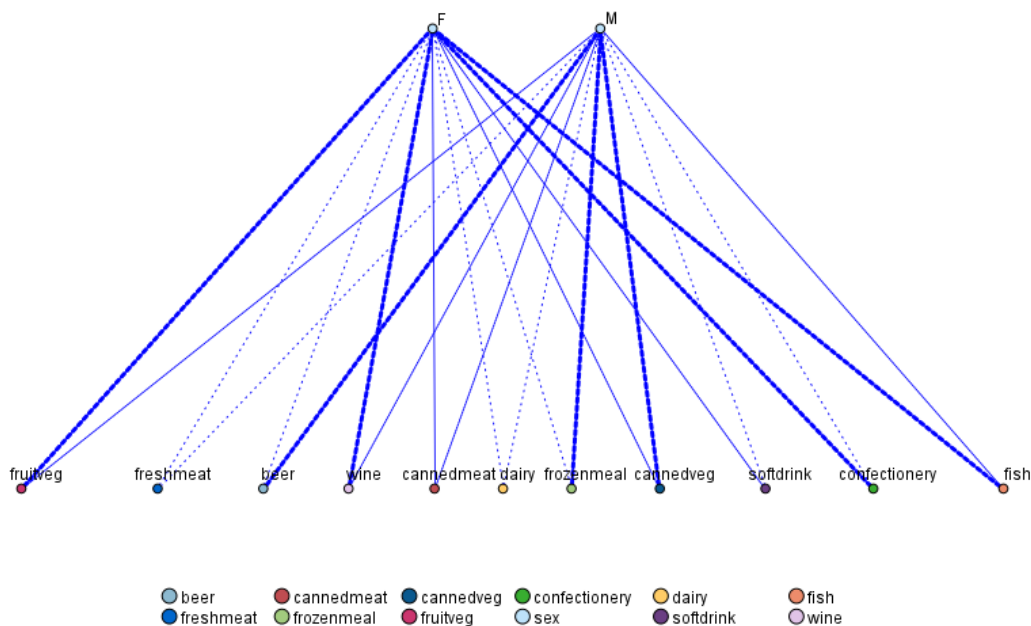
Finally, for the group 3, the main purchase drivers were not owning a home explains 30% of the decision of a person that buys fruits, vegetables and fish, but what really explains the decision of buying these products is being older than 24 years, since that explains 70% of the decision of buying for the products on this group.

5. Evaluation

The model provides an accurate description of the variables that drive the purchasing patterns of groups of products that are frequently bought together. By contrasting the results of the model with reality we can provide possible explanations of why the drivers found for each group of products makes sense or not. For group 1 we decided to call it the "lonely man meal" derived from the popular believe that a single male will only have beer, frozen food and some canned vegetables as food source. Makes sense that the drivers for this group were: being a male (46%) and having an income lower that 16.950 (54%) because usually lower income males will eat have this type of diet.

For group 2 the drivers make sense, but they lack a bit of predictability, since being a female and having an income greater than 16.950 might be related with the purchasing of wine and confectionary we still need to dig deeper in order to have a proper marketing target for these couple of products.

For group 3 the logical explanation can be that a person that is has more than 24 years and is not a home owner will have more time and energy to buy this food, and also since the age accounts for 70% of the pattern for these products we could also say that young people at that age usually goes to the gym or practice some sport that requires better nutrition and a healthier diet.

6. Recommendations:

With this first approach to the type of clients that usually buy determined products we can establish marketing strategies focused on providing each specific group incentives to buy those products that usually buy together.

We will focus on creating marketing campaigns that include aspects such as color theory, branding, discounts, and special offers for those clients subscribed to the loyalty program, understanding that depending on the patterns of each client we will be able to offer specific discounts and offers and thus creating a dynamic marketing campaign that stays updated with the new data from the clients.

This kind of studies can also help us identify how to catch new subscribers to the loyalty program. By analyzing the purchasing patterns of customers who frequently buy from us but are not yet part of the loyalty program, we can identify key factors and behaviors that may incentivize them to join.

For example, we can examine the demographics, purchasing frequency, and preferences of these potential customers to tailor targeted marketing campaigns specifically designed to encourage them to enroll in the loyalty program. This could include offering exclusive benefits, personalized incentives, or special promotions that resonate with their preferences and purchasing habits.

Next Steps:

1. Implementation Planning: Develop a detailed plan for implementing the recommended marketing strategies and initiatives. Assign responsibilities, set timelines, and allocate resources accordingly to ensure successful execution.
2. Pilot Testing: Conduct pilot tests of the proposed marketing campaigns and initiatives to gauge their effectiveness and identify areas for improvement. Collect feedback from customers and stakeholders to refine the strategies before full-scale implementation.
3. Integration with Loyalty Program: Integrate the insights from the Market Basket Analysis into the existing loyalty program framework. Customize program offerings and benefits based on customer segments identified in the analysis to enhance program effectiveness and encourage enrollment.
4. Monitoring and Evaluation: Establish metrics and KPIs to monitor the performance of the implemented marketing strategies. Continuously track key indicators such as customer engagement, loyalty program enrollment, and revenue growth to assess the impact of the initiatives and make data-driven adjustments as needed.
5. Feedback Mechanisms: Implement feedback mechanisms to gather insights from customers regarding their experiences with the tailored marketing campaigns and the loyalty program. Use this feedback to iterate and improve the strategies over time, ensuring alignment with customer preferences and market dynamics.

Conclusion:

The analysis using decision trees has revealed important insights into how our customers shop, showing us which products they tend to buy together. Understanding these patterns allows us to create smarter marketing strategies tailored to different types of customers.

We've confirmed some of our assumptions and discovered new details about what influences customers' choices, like gender and income. Armed with this knowledge, we can design marketing campaigns that better meet our customers' needs and preferences.

Moving forward, we'll use these insights to make our marketing efforts more targeted and effective, offering personalized incentives to our loyal program members. We'll also work on attracting new subscribers by understanding what motivates them to join.

In short, this analysis helps us make smarter decisions based on customer behavior, paving the way for growth and success in the future.

7. Appendix A.