

Introduction

Market Basket Analysis is one of the key techniques used by large retailers to uncover associations between items. It works by looking for combinations of items that occur together frequently in transactions. To put it another way, it allows retailers to identify relationships between the items that people buy. Association Rules are widely used to analyze retail basket or transaction data, and are intended to identify strong rules discovered in transaction data using measures of interest, based on the concept of strong rules. We implemented the Apriori algorithm to discover associations between different sub-categories of products. The data was grouped by panel ID, week and minute to aggregate from item level purchase data to transaction level data to analyze sub-categories of items that were bought together.

Results

After implementing the apriori algorithm with minimum support of 0.001 and minimum confidence of 0.5, we got multiple association rules with different coverage and lift rates. After detailed analysis, we found out that the majority of them have confidence just above 50% and have a support rate just above 0.001. Filtering parameters To finalize our selective association rules, we gave utmost importance to Confidence and Lift parameters. As we know confidence indicates the frequency of association given the frequency of antecedent combination, we decided to consider a 60% confidence so that the association is guaranteed at least 60% of the times. And to make sure the association is not random, we have given next priority to Lift value [higher the Lift value, we are surer about the association]. By filtering the associations with these conditions of confidence ≥ 0.6 and higher Lift values, we came up with the following top 3 significant association rules. You can observe from the following association rules that all of them have almost the same support value, confidence value ≥ 0.6 and Lift value greater than 3. 1)

{FZ PIZZA,RFG SKIM/LOWFAT MILK,RFG YOGURT,SPAGHETTI/ITALIAN SAUCE} => {READY-TO-EAT CEREAL} Support 0.001182863 Confidence 0.6193548 Coverage 0.001909831 Lift 3.525228 2) {RFG SKIM/LOWFAT MILK,RFG YOGURT,SPAGHETTI/ITALIAN SAUCE,TORTILLA/TOSTADA CHIPS} => {READY-TO-EAT CEREAL} Support 0.001201346 Confidence 0.6018519 Coverage 0.001996082 Lift 3.425604 3) {REGULAR SOFT DRINKS,RFG SKIM/LOWFAT MILK,RFG YOGURT,SPAGHETTI/ITALIAN SAUCE} => {READY-TO-EAT CEREAL} Support 0.001213667 Confidence 0.6099071 Coverage 0.001989921 Lift 3.471453

Recommendations

Our target customers are purchasing ready to eat cereal, so they prefer breakfast which takes lower time to prepare. So we should associate it with products which are similar and will be attractive to our target customers. Based on both coverage and confidence values we should make sure we place

the other products like Milk and Yogurt in close proximity to our Ready to eat cereal. Since people pour milk in the cereal, it will be best to find shelf space for these ready to eat cereals in the shelves that are opposite to refrigerators that have low fat milk and yogurt. To overcome the competition we can provide our target customers some discount to purchase bundled products (milk+ ready to eat cereal) by collaborating with milk product vendors. This will tend to increase the sales of both the products and help in saving costs for promotion since both the companies will spend for advertising. The other products in the association based on coverage and confidence are Pizza, Italian sauce, Tortilla chips and soft drinks. Since all the products in the sub group are classified as food products, we can ensure they share shelf space in close proximity to each other. This will promote the customer to purchase all their food needs when they are shopping around these shelves. Since our ready to eat cereal is considered to be a healthy breakfast option, placing them in close proximity to these products will ensure customers will have a tendency to buy our cereals for breakfast, considering they are a healthier choice of food, when they are purchasing pizza/ soft drinks for dinner. Once again, in order to promote and increase the sales, we can provide the customers with combo/ bundle options to buy ready to eat cereals along with pizza/soft drinks/tortilla chips and provide a discount price for the bundle. Since customers can gain more variety of food options from the bundle for a lesser price, this might prompt them to buy more bundled products. Add in-store display of ads next to the aisles and shelves, providing information about the various promotions, offers, bundles and discounts that are available with the ready to eat cereal products. Stepwise instructions or illustrations showing variations of different recipes for Pizza or different ingredients that go along with the cereal, so that customers are curious to try out new recipes and products and eventually lead to increased sales. Also try marketing using local influencers who will promote our product as healthier breakfast options and place pamphlets and banners in the store with some marketing campaigns