# Report – C3T2

Objectives

Association Rule mining or Market Basket analysis is the use of machine learning algorithms to find rules (pairs, trios, etc.) of items which could indicate the likelihood of another “suggested” item. Our aim is to find rules that carry practical significance in terms of decision making. Finding rules that are insightful.

For this I used the libraries arules and arulesViz on R. They load the basket data and make all the computing and rulemaking relatively easy.

Results & Rules

Here are some of the first few rules:

Text

Description automatically generated

Graphical user interface

Description automatically generated

Where:

Count = #baskets that satisfy the rule

Support = fraction of baskets that satisfy rule or fraction of baskets that have all items referenced in rule

Confidence = (posterior) probability that cart has item on RHS given it has all items on LHS of rule

coverage = fraction baskets that have all items in the LHS of rule.

lift = how many times more likely that item in RHS appears in a cart when it contains all items in LHS

RHS = right hand side LHS = left hand side

A good way to visualize this is with arulesViz library, below are two examples of visualizations, the bottom one is a screenshot of an html interactive visualization.

Diagram

Description automatically generated

Diagram

Description automatically generated

Conclusions

The iMac tends to be in to top rules more often, which could indicate that they purchase iMacs so often that they have little regard over other purchasing other products along with it.

I believe there is potential that Blackwell could exploit to increase their sales by acquiring Electronidex. Since there where many meaningful rules created by the algorithm with some significant confidence levels, there is a chance that selling products which fit the same category will drive the company forward.

However, it is worth noting that this is only a month’s worth of data, the longer the period of time collected, the better the algorithm will get. It could be used to even predict seasonality purchases, or even the frequent purchases by a certain demographic. This then can be translated into a much better store or website layout, targeted marketing strategies, discount and limited time offer deals to attract people, etc.