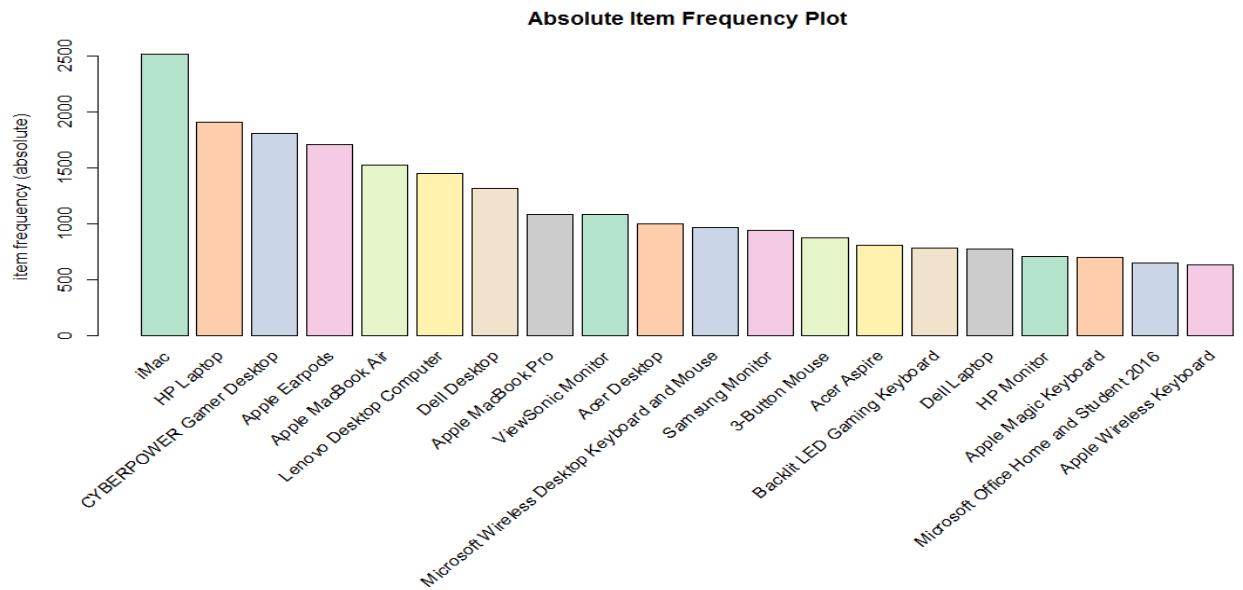
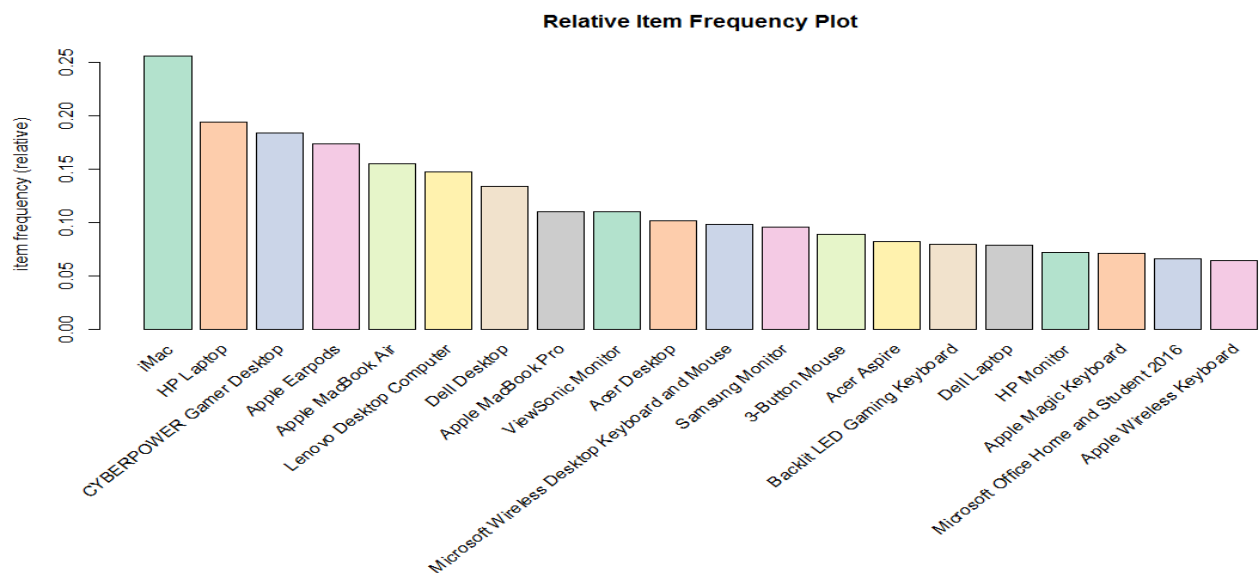


Market Basket Analysis Report

Market Basket Analysis helps to find the association between different items or objects. It can tell what items are frequently bought together. The Apriori algorithm mines frequently bought itemsets and relevant rules that form a relation between the items. The three factors that will be used in this analysis are: Support which is the frequency at which an item is being bought, Confidence which is the probability that items in a basket are bought together often and Lift which is the correlation between items. According to the data provided by Electronidex, it consisted of different baskets of products bought by customers over the past month. A total of 9835 transactions of 125 items were provided for analysis. The data shows frequently bought items and using the Apriori algorithm we get the following plot:



The above graph plots the numeric frequencies of item independently. Below is the relative item frequency plot which plots how many times these items have appeared compared to others.



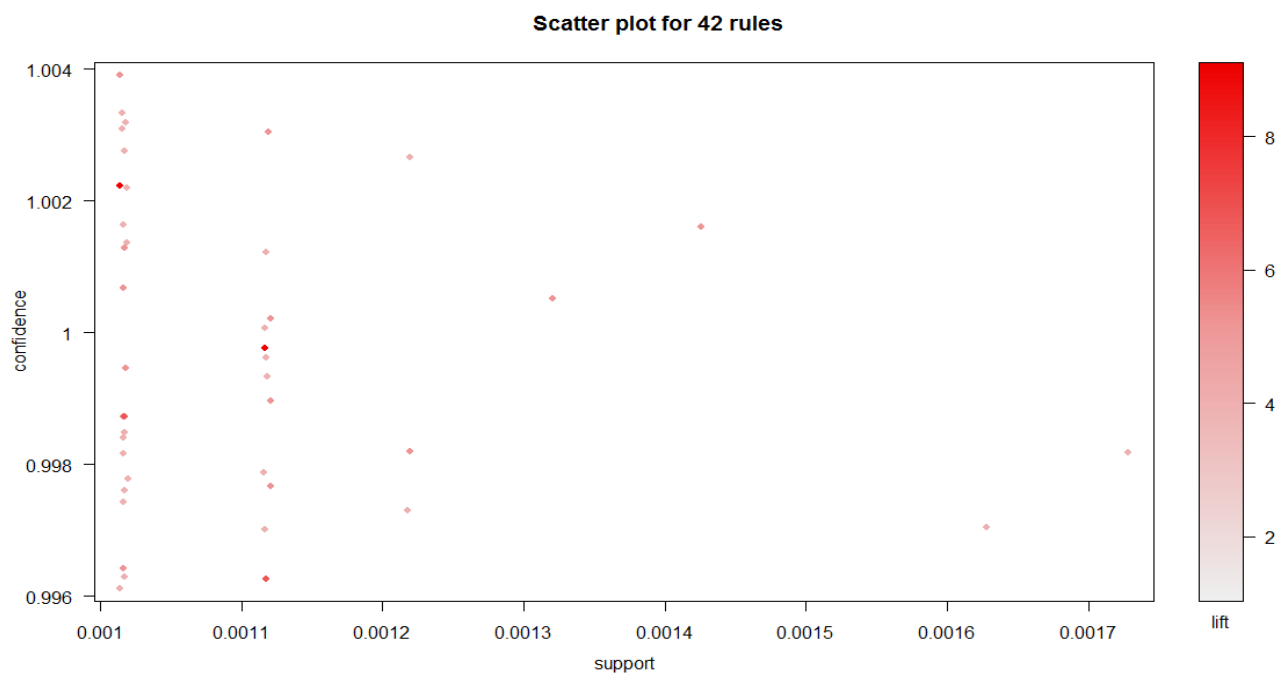
Here is a brief summary of the data that is taken into consideration with APRIORI algorithm:

- Parameter Specification: Support = 0.01 and confidence= 0.8 values with 10 items as max of items in a rule
- Total Number of Rules: Set of 635 rules
- Distribution of rule length: A length of 4 items has the most rules: 4330 and length of 2 items have the lowest number of rules: 9
- The 3 most frequently bought items with their count:
iMac – 2519, HP Laptop-1909, CYBERPOWER Gamer Desktop-1809

According to the below table if we take a look at iMac alone:

LHS		RHS	Count
{iMac}	=>	{HP Laptop}	743
{iMac}	=>	{Lenovo Desktop Computer}	578
{iMac}	=>	{CYBERPOWER Gamer Desktop}	558
{iMac}	=>	{Dell Desktop}	537

Where the LHS is the (if) part and RHS defines the (then) part. The probability of customers buying iMac with a HP Laptop is around 7% of the whole transaction. The analysis will help Blackwell decide on which products go well if cross-selling was done.



Graph shows scatter plot of the rules, lower the support higher the confidence and lift. The high lift shows the correlation between the items being sold.

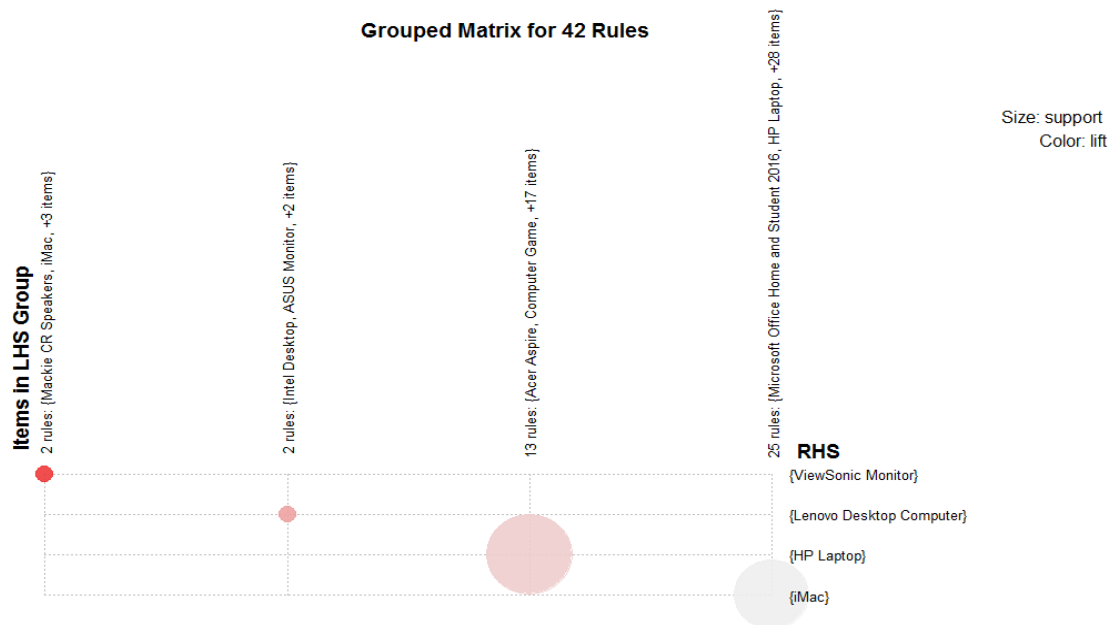
Conclusion

Summary

Analyzing the data of Electronidex, the frequency of sales as well as the frequency of customers buying 4 items or more are high. The most bought item is the iMac and along with that probability of buying other accessories such as HP Laptop, ViewSonic Monitor are pretty high. HP Laptop is the second most sold item among others. The probability of buying HP Laptop with other accessories are as follows:

LHS		RHS	Count
{HP Laptop}	=>	{ViewSonic Monitor}	472
{HP Laptop}	=>	{Lenovo Desktop Computer}	454
{HP Laptop}	=>	{Dell Desktop}	442
{HP Laptop}	=>	{CYBERPOWER Gamer Desktop}	419

If we group a matrix with 42 rules, we get the following plot:



From the above plot we can see that iMac is a common item in most of the carts/baskets. This also tells us that along with an iMac what else were included during the purchase. We see that most of them bought accessories along with an iMac or HP Laptop which makes it more probable for cross-selling. Let's take into account the top 20 products that were most frequently bought at Electronidex and sell it with a product of Blackwell at a discount, this will help improve sales at the same time increase profitability. As per our earlier analysis we found that Accessories are the most sold items at Blackwell as well as Game consoles. For example if we cross sell CYBERPOWER game console of Electronidex with gaming accessories of Blackwell they will complement each other in sales and thus increase profit of Blackwell.

Recommendations

Acquiring Electronidex will be good choice for Blackwell. Considering the frequency at which items are bought at Electronidex, the same strategy of sales and marketing can be implemented in Blackwell to increase profitability. It will also help broaden our clientele with the existing market of the new company.

The part that has to be taken care is cross selling of products. It has to be grouped with products that will be useful for the customer in one way or the other. This will make the clients feel that the products can solve multiple issues at a time. It will also help Blackwell to be a single stop for all electronics related solutions. A strong clientele will help increase leads which will work as an indirect advertisement for Blackwell.

The items that are least frequent in the transactions that were provided by Electronidex can be avoided when considering online sales as it may affect the profit of Blackwell in a drastic way. Also risk of being redundant has to be taken care as both companies have a wide range of electronic items. The sales should be designed in such a way that the current business of Blackwell is not disturbed. Especially as Blackwell is getting ready to introduce new products into the market, the cross selling has to be done in a way they complement the new ones.