

Executive Summary

Problem 1

This problem has been solved by the use of Association Rule Mining. The sale data of the months Aug-Nov has been used. Apriori algorithm has been used to derive association rules of the form Slot -> Food item for each segment. Then for each segment, the top association rules are chosen according to the criteria of support. The top association rules chosen using this criterion for each segment are then used for updating the **newPrices.csv** by altering the new prices. The change in price is kept static for each segment as **min(10% of old price, 10)** which can be the maximum change in price in order to maximize the revenue increase. As the price change is very less, the change in penalty will not differ by a large amount if the price change is taken static at its maximum value.

For each segment, a CSV file is formed on which the Apriori algorithm is applied to obtain frequent itemsets and the association rules. As there are 8 segments for which segment weight is defined, there will be 8 segment CSV files. The CSV file for each segment has 2 attributes - the time slot of item transaction and the food item involved in the transaction. Association rules formed will have the time slot in the antecedent and the food item in the consequent. These association rules indicate the popularity of food item with respect to the time slot and give an indication as to which item must have its price increased in a time slot to maximize the revenue increase without adding much to the penalty.

Once the rules have been framed for each segment, the top 48 rules are chosen from the segments F2,F3,F4 and the top 85 rules are chosen from the remaining segments to obtain the final revenue increase of 5.006% with a penalty of 51198.9.