**Assignment 4: Association Rules Mining** Dr. Kamesam

**ISGB 7967 –Data Mining for Business**

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**PART A**

**Problem Statement**

Given data on customers’ shopping records, is it possible to build an association rule (Apriori) model which generate some interesting rules(unexpected and actionable strong rules)? Based on these rules, what management strategies in terms of the Alcohol can we make?

**Analysis**

Using IBM SPSS, an “Apriori” Association Rule model is constructed against the customer shopping data. The minimum antecedent support is set as 10% and the minimum rule confidence is 75%. There are 26 rules. Then we can create a rule set for Alcohol field and get 3 rules which consequence is buying Alcohol.

The 3 rules are:if a customer bought Milk and Frozen foods, then he/she would buy Alcohol;if a customer bought Frozen foods, Bakery goods and Ready made, then he/she would buy Alcohol;if a customer bought Frozen foods, Snacks and Ready made,then he/she would buy Alcohol. For example, the first rule(if Milk and Frozen foods then Alcohol) shows that Milk, Frozen foods were purchased on 10.814% of the shopping records;among these 10.814% customers, 77.6% also bought Alcohol. The lift of the first rule is 1.97, not near 1.0.It is an interesting rule.

By analyzing the rule set information,we can conclude that the most of customers who match the Alcohol rules have NO CHILDERN and WORKING=YES.

**Conclusion&Strategies**

1***.***we can **send coupons of Alcohol** to these customer who **with NO CHILRDREN and WORKING=YES** through emails or texts.They would be attracted and come to the supermarket to buy goods.

2.Three rules **contains Frozen foods in the antecedent**.Let Frozen foods be a **loss leader** product to introduce more customers and improve sales of Alcohol.

3.**Put Alcohol away from all the products show up in the antecedents**(Milk, Frozen foods, Bakery foods, Ready made and Snacks).Therefore, it wold take customer more time to find Alcohol.Maybe they would buy other goods on the way to the Alcohol.

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| 120039837504830974  **Model Summary** | 180568662606847317  **Rule set**  **Rules set of Alcohol** |
| 189981468152428458  **Minimum settings** | 105280861587845143  **Model stream** |

**Part B**

**Problem Statement**

Given data which containing information on more than 2000 persons attending SPSS courses, is it possible to build a model which can generate rules(unexpected and actionable strong rules). Based on these rules, what recommendations or promotion plan can we make to improve more consumers taking courses?

**Analysis**

Using IBM SPSS, an “Apriori” Association Rule model is constructed against the customer attending courses data. The minimum antecedent support is set as 1% and the minimum rule confidence is 50%. There are 9 rules.

For example, the first rule, if a customer attended Market Segmentation and Introduction to CHAID, then he/she would attend Building Predictive Models.This rule shows that 1.217% customers attended Market Segmentation and Introduction to CHAID; among these customers, 65.385% also attended Building Predictive Models. The lift of this rule is about 10, far away from 1.0.It is an interesting rule.

**These rules make sense**.For example, customers who took introduction to CHAID first, then he/she took the building predictive models.**Rules** have introduction courses in antecedent the courses may serve as the prerequisite for other courses.

**Rules** have introduction courses in the consequent also can be well explained. By taking one course, a customer might be activated to take other courses in order to expand his or her understanding of SPSS field.So the customer would take a introduction course then.

**Conclusion&Strategies**

1.**If a customer have already took one course in the antecedents,We should offer him or her a discount on the courses which in the consequences.**They are building prediction models,introduction to CHAID and introduction to statistics.

2.**Make an appropriate curriculum.**Courses in antecedents and courses in consequences should be considered in different schedule.Thus, customers can choose the courses they want to take without conflict.

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| 616147742479838040  **Minimum settings** | 816399039472507252  **Model summary** |
| 748351687931225027  **Model stream** | |