# CS 63015 & CS 73015 Data Mining Techniques

## Homework 3
**Instructor:** Gus Samba
**Due Date:** Please refer to the course website

1. Table 1 shows a transaction database. Please answer the following questions

| TID | Items |
|-----|-------|
| 1 | Bread, Milk, Coke |
| 2 | Bread, Diaper, Beer, Eggs |
| 3 | Milk, Diaper, Beer, Coke |
| 4 | Bread, Milk, Diaper, Beer |
| 5 | Bread, Milk, Diaper, Coke |

**Table 1.** A Transaction Database

a) Please enumerate all association rules involving 3 items {Bread, Milk, Coke}. [10 points]

b) Please compute the support and confidence of each association rule you listed in a). [15 points]

2. Please describe the *anti-monotone property* of the confidence for association rules, and discuss how to use this property to enable the pruning for the apriori algorithm. [15 points]

3. Please choose one reference paper about association rule mining from the lecture slides, and present the motivation, problem definition, and their solutions in this paper. [40 points]

4.
a) Please draw a lattice for association rules related to items {A, B, E}. [10 points]
b) Compute the support and confidence of association rule AB → E in Table 2. [10 points]

| TID | Transactions |
|-----|--------------|
| 100 | {A, B, E} |
| 200 | {B, D} |
| 300 | {A, B, E} |
| 400 | {A, C} |
| 500 | {B, C} |
| 600 | {A, C} |
| 700 | {A, B} |
| 800 | {A, B, C, E} |
| 900 | {A, B, C} |
| 1000 | {A, C, E} |

**Table 2.** Transaction Database for Bonus Question

## Submission

Submit an electronic copy of your homework solution via Canvas