

UNIVERSITI SAINS MALAYSIA

Tutorial # 2

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CMT423 – DSS & BI

- 1) Discuss the main idea and benefits of **market-basket analysis**. Give an example to support your explanation (use any other example than the “diaper-beer” situation).
- 2) (a) Consider the market basket transactions shown in Table 1. Assume that *minsup* > 0.

Table 1: Market Basket Transactions for Question 2(a)

Transaction ID	Items bought
1	{ Milk, Rootbeer, Diapers }
2	{ Bread, Butter, Milk }
3	{ Milk, Diapers, Cookies }
4	{ Bread, Butter, Cookies }
5	{ Rootbeer, Cookies, Diapers }
6	{ Milk, Diapers, Bread, Butter }
7	{ Bread, Butter, Diapers }
8	{ Rootbeer, Diapers }
9	{ Milk, Diapers, Bread, Butter }
10	{ Rootbeer, Cookies }

- (i) What is the maximum number of association rules that can be extracted from this data (including rules that have zero support)?
 - (ii) What is the maximum size of frequent itemsets that can be extracted?
 - (iii) What is the maximum number of size-3 itemsets that can be derived from this data set. (An expression to calculate this number is also a valid answer to this sub-question.)
 - (iv) Find an itemset (of size 2 or larger) that has the largest support.
 - (v) Find a pair of items, a and b, such that the rules $\{a\} \longrightarrow \{b\}$ and $\{b\} \longrightarrow \{a\}$ have the same confidence. Any such pair will do.
- (b) Considering Table 1:
- (i) List all frequent itemsets together with their support.
 - (ii) For all frequent itemsets of **maximal size**, list all corresponding association rules satisfying the requirements on minimum support and minimum confidence together with their confidence.