

Data Mining (CS4038)

Quiz No.6

Solution

Roll No: _____

Section: _____

Date:-10-05-2024

Question No.1

(20 marks)

For the following given Transaction Data-set, Apply the Apriori algorithm and identify all frequent k-itemsets. Also Generate Rules using the identified frequent itemsets.

Consider the values as Support=50% and Confidence=75%

Transaction ID	Items Purchased
1	Bread, Cheese, Egg, Juice
2	Bread, Cheese, Juice
3	Bread, Milk, Yogurt
4	Bread, Juice, Milk
5	Cheese, Juice, Milk

Bread = B
Cheese = C
Egg = E
Juice = J
Milk = M
Yogurt = Y

Frequent itemset

supp = 50%

①

B = 4 = $\frac{4}{5} = 80\%$ ~~x3~~
C = 3 = $\frac{3}{5} = 60\%$
E = 1 = $\frac{1}{5} = 20\%$ X
J = 4 = $\frac{4}{5} = 80\%$
M = 3 = $\frac{3}{5} = 60\%$
Y = 1 = $\frac{1}{5} = 20\%$ X

②

BC = $\frac{2}{5} = 40\%$ X ~~x3~~
BJ = $\frac{3}{5} = 60\%$
BM = $\frac{2}{5} = 40\%$ X
CJ = $\frac{3}{5} = 60\%$
CM = $\frac{1}{5} = 20\%$ X
JM = $\frac{2}{5} = 40\%$ X

Rule Generation

Conf $\geq 75\%$

③

BCJ = $\frac{2}{5} = 40\%$ X ~~x4~~

B \rightarrow J = $\frac{3}{4} = 75\%$ ~~x10~~

J \rightarrow B = $\frac{3}{4} = 75\%$

C \rightarrow J = $\frac{3}{3} = 100\%$

J \rightarrow C = $\frac{3}{4} = 75\%$

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Question No.1

(20 marks)

For the following given Transaction Data-set, Apply the Apriori algorithm and identify all frequent k-itemsets. Also Generate Rules using the identified frequent itemsets.

Consider the values as Support=40% and Confidence=60%

Transaction ID	Items Purchased
1	A, B, D, E
2	B, C, D
3	A, B, E
4	B, D
5	A, B, C, E

① Frequent itemset $\text{supp} \geq 40\%$

$A = 3 = 60\%$

$B = 5 = 100\%$

$C = 2 = 40\%$

$D = 3 = 60\%$

$E = 3 = 60\%$

x3

\Rightarrow

② $AB = 3 = 60\%$ $BE = 3 = 60\%$

$AC = 1 = 20\% \times$

$AD = 1 = 20\% \times$

$AE = 3 = 60\%$

$BC = 2 = 40\%$

$BD = 3 = 60\%$

$CD = 1 = 20\% \times$

$CE = 1 = 20\% \times$

$DE = 1 = 20\% \times$

x3

③

$ABE = 3 = 60\%$

$ABD = 1 = 20\% \times$

$BDE = 1 = 20\% \times$

$ABC = 1 = 20\% \times$

$BCD = 1 = 20\% \times$

$BCE = 1 = 20\% \times$

x4

Rule Generation

$\text{conf} \geq 60\%$

$A \rightarrow B = 3/3 = 100\%$

$B \rightarrow A = 3/5 = 60\%$

$A \rightarrow E = 3/3 = 100\%$

$E \rightarrow A = 3/3 = 100\%$

$B \rightarrow C = 2/5 = 40\% \times$

$C \rightarrow B = 2/2 = 100\%$

$B \rightarrow D = 2/5 = 40\% \times$

$D \rightarrow B = 2/2 = 100\%$

x10

$B \rightarrow E = 3/5 = 60\%$

$E \rightarrow B = 3/3 = 100\%$

$$AB \rightarrow E = 3/3 = 100\%$$

$$E \rightarrow AB = 3/3 = 100\%$$

$$A \rightarrow BE = 3/3 = 100\%$$

$$BE \rightarrow A = 3/3 = 100\%$$

$$EA \rightarrow B = 3/3 = 100\%$$

$$B \rightarrow EA = 3/5 = 60\%$$