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Assignment 6 - Assignment Rule Mining

1)

TID	milk	bread
1	1	1
2	0	1
3	1	0
4	1	1
5	0	1
6	1	1
7	1	1

Find supp, conf, and lift
for rule $\{milk\} \to \{bread\}$

$Supp(M \to B) = 4/7 = 0.57 \approx 57\%$

$Conf(M \to B) = Supp(M \to B)/Supp(M) \Rightarrow supp(M) = 5/7 = 0.71 \approx 71\%$

$Conf(M \to B) = 0.57/0.71 = 0.80 \approx 80\%$

$Lift(M \to B) = \dfrac{Supp(M \to B)}{Supp(M) \times Supp(B)} \Rightarrow Supp(B) = 6/7 = 0.86 \approx 86\%$

$= \dfrac{0.57}{0.71 \times 0.86} = 0.43 \approx 93\%$

$Lift(M \to B)$ is less than 1 so the rule $M \to B$ is not interesting despite high confidence level

Min supp = 60% = 3   min_conf = 80%

2.

TID	items-bought
T100	{M,O,N,K,E,Y}
T200	{D,O,N,K,E,Y}
T300	{M,A,K,E}
T400	{M,U,C,K,Y}
T500	{C,O,O,K,I,E}

first scan

C_1

Itemset	Sup
M	3
O	3
N	2
K	5
E	4
Y	3
D	1
A	1
U	1
C	2
I	1

L_1

Itemset	Sup
M	3
O	3
K	5
E	4
Y	3

C_2

Itemset
{M,O}
{M,K}
{M,E}
{M,Y}
{O,K}
{O,E}
{O,Y}
{K,E}
{K,Y}
{E,Y}

2nd scan

C_2

Itemset	Sup
{M,O}	1
{M,K}	3
{M,E}	2
{M,Y}	2
{O,K}	3
{O,E}	3
{O,Y}	2
{K,E}	4
{K,Y}	3
{E,Y}	2

L_2

Itemset	Sup
{M,K}	3
{O,K}	3
{O,E}	3
{K,E}	4
{K,Y}	3

C_3

Itemset
{M,K,O}
{M,K,E}
{M,K,Y}
{O,K,E}
{O,K,Y}
{K,E,Y}

3rd scan

C_3

Itemset	Sup
{M,K,O}	1
{M,K,E}	2
{M,K,Y}	2
{O,K,E}	3
{O,K,Y}	2
{K,E,Y}	2

L_3

Itemset	Sup
{O,K,E}	3

L1: M O K E Y
L2: {M,K} {O,K} {O,E} {K,E} {K,Y}
L3: {O,K,E}

Generate rules:

I: {O,K,E}
{O,K} {O,E} {K,E}

{O,K} → E, Conf = 3/3 = 100%
{O,E} → K, conf = 3/3 = 100%
{K,E} → O, conf = 3/4 = 75%

1st and 2nd rules are interesting

{O,K} → E
{O,E} → K