**A dataset has five transaction.Let min-support=60% and min-confidence=80%**

|  |  |
| --- | --- |
| TID | Item\_bought |
| T100 | {M,O,N,K,E,Y} |
| T200 | {D,O,N,K,E,Y} |
| 300 | {M,A,K,E} |
| T400 | {M,U,C,K,Y} |
| T500 | {C,O,O,K,I,E} |

1.Find all frequent itemset using Apriori algorithm

2.List all the strong association rules matching the following metarule,where **x** is a variable reprensenting customers and itemi denotes variables representing items(e.g.”A”,”B”)**Ѵ x €** transaction,A buys(x,item2)→buys(x,items)

Step1:

Frequent 1-itemset Frequency support

M----------> 3----------> 3/5=60%

O----------> 4----------> 4/5=80%

**N----------> 2----------> 2/5=40% X**

K----------> 5----------> 5/5=100%

E----------> 4----------> 4/5=80%

Y----------> 3----------> 3/5=60%

**D----------> 1----------> 1/5=20% X**

**A----------> 1----------> 1/5=20% X**

**U----------> 1----------> 1/5=20% X**

**C----------> 1----------> 1/5=20% X**

**I----------> 1----------> 1/5=20% X**

Remove if support<min-support

Step2:

Frequent 2-itemset Frequency support

{M,O}----------> 1----------> 1/5=20% X

{M,K}----------> 3----------> 3/5=60%

{M,E}----------> 2----------> 2/5=40% X

{M,Y}----------> 2----------> 2/5=40% X

{O,K}----------> 3----------> 3/5=60%

{O,E}----------> 3----------> 3/5=60%

{O,Y}----------> 2----------> 2/5=40% X

{K,E}----------> 4----------> 4/5=80%

{K,E}----------> 3----------> 3/5=60%

{E,Y}----------> 2----------> 2/5=40% X

Step3:

Frequent 3-itemset Frequency support

{M,O,K}----------> 1----------> 1/5=20% X

{M,O,E}----------> 1----------> 1/5=20% X

{M,K,E}----------> 2----------> 2/5=40% X

{M,K,Y}----------> 2----------> 2/5=40% X

**{O,K,E}----------> 3----------> 3/5=60%**

{O,K,Y}----------> 2----------> 2/5=40% X

{K,E,Y}----------> 2----------> 2/5=40% X

So the answer of question **a** is {O,K,E} that is 60%

**Answer to the question number 2**

From number a we get

{O,K,E}

{O,K}------>{E} conf=supp{O,K,E})/supp{O,K}=3/3=100%

{O,E}------>{K} conf=supp{O,K,E})/supp{O,E}=3/3=100%

{K,E}------>{O} conf=supp{O,K,E})/supp{K,E}=3/4=75% X

{O}------>{K,E} conf=supp{O,K,E})/supp{O}=3/4=75% X

{K}------>{O,E} conf=supp{O,K,E})/supp{K}=3/5=60% X

{E}------>{O,K} conf=supp{O,K,E})/supp{E}=3/4=75% X