Calculate the Support, Confidence, Lift and Conviction for {Milk, Bread->Butter}

Transaction Id	Milk	Bread	Butter	Beer
1	1	1	0	0
2	0	0	0	1
3	1	1	1	0
4	0	1	0	0
5	0	1	1	0
6	1	0	0	0
7	0	1	1	1
8	1	1	1	1
9	0	1	0	1
10	1	1	0	0
11	1	0	0	0
12	0	0	0	1
13	1	1	1	0
14	1	0	1	0
15	1	1	1	1

Solution:

Itemset	Support Count	Support
Milk*	9	9/15=0.6=60%
Bread*	10	10/15=0.67=67%
Butter*	7	7/15=0/46=46%
Beer	6	6/15=0.4=40%

Beer gets rejected because it has the least support out of all the items.

Itemset	Support Count	Support
Milk, Bread*	6	6/15=0.4=40%
Milk, Butter	4	4/15=0.26=26%
Bread, Butter*	6	6/15=0.4=40%

Milk, Butter gets rejected because it has the least support out of all the items.

Itemset	Support Count	Support
Milk, Bread, Butter	4	4/15=0.26=26%

Support ({Milk, Bread->Butter}) = 0.26 = 26%

Confidence=$\frac{\textbf{Support }(\{\textbf{Milk,Bread}\textbf{->Butter}\})}{\boldsymbol{Support}(\{\boldsymbol{Milk,Bread}\})}$= 4/15*15/6=0.67=67%

Lift=$\frac{\textbf{Support }(\{\textbf{Milk,Bread}\textbf{->Butter}\})}{\boldsymbol{Support}(\{\boldsymbol{Milk,Bread}\})*\boldsymbol{Support}(\boldsymbol{Butter})}$=4/15/(7/15*6/15)=1.4

Conviction=$\frac{\mathbf{1}-\boldsymbol{Support}(\boldsymbol{Butter})}{\mathbf{1}-\boldsymbol{Confidence}(\{\boldsymbol{Milk,Bread}\rightarrow\boldsymbol{Butter}\})}$=(1-0.46)/(1-0.65)=1.54