

Calculate the Support, Confidence, Lift and Conviction for {Cold, Diarrhoea->Fever} from the following dataset.

PID	Symptoms
1	Fever, Throat pain, Cold
2	Fever, Headache
3	Cold, Dizziness, Fever
4	Pneumonia, Cold, Dizziness
5	Diarrhoea, Pneumonia

Solution:

PID	Cold	Diarrhoea	Pneumonia	Dizziness	Fever	Headache	Throat Pain
1	1	0	0	0	1	0	1
2	0	0	0	0	1	1	0
3	1	0	0	1	1	0	0
4	1	1	1	0	0	0	0
5	0	1	1	0	0	0	0

Itemset	Support Count	Support
Cold*	3	3/5=60%
Diarrhoea	1	1/5=20%
Dizziness*	2	2/5=40%
Fever*	3	3/5=60%
Headache	1	1/5=20%
Throat Pain	1	1/5=20%
Pneumonia*	2	2/5=40%

Reject Throat Pain, Diarrhoea, Headache, Throat Pain because they have the least support.

Itemset	Support Count	Support
Cold, Dizziness*	2	2/5=40%
Cold, Fever*	2	2/5=40%
Cold, Pneumonia	1	1/5=20%
Fever, Dizziness	1	1/5=20%
Fever, Pneumonia	0	0/5=0%
Dizziness, Pneumonia	1	1/5=20%

First two itemset are selected because they have the maximum support.

Itemset	Support Count	Support
Cold, Dizziness, Fever	1	1/5=20%

$$\text{Support}(\{\text{Cold, Dizziness} \rightarrow \text{Fever}\}) = 0.20 = 20\%$$

$$\text{Confidence} = \frac{\text{Support}(\{\text{Cold, Dizziness} \rightarrow \text{Fever}\})}{\text{Support}(\{\text{Cold, Dizziness}\})} = 1/5 * 2/5 = 0.50 = 50\%$$

$$\text{Lift} = \frac{\text{Support}(\{\text{Cold, Dizziness} \rightarrow \text{Fever}\})}{\text{Support}(\{\text{Cold, Dizziness}\}) * \text{Support}(\text{Fever})} = 1/5 / (2/5 * 3/5) = 1.2$$

$$\text{Conviction} = \frac{1 - \text{Support}(\text{Fever})}{1 - \text{Confidence}(\{\text{Cold, Dizziness} \rightarrow \text{Fever}\})} = (1 - 0.60) / (1 - 0.50) = 0.80$$