

Example

Dataset is :

TID	Items
T1	Milk, bread, beer
T2	bread, sugar Sugar
T3	bread, butter
T4	Milk, bread, sugar
T5	Milk, butter
T6	bread, butter
T7	Milk, butter
T8	Milk, bread, butter, beer
T9	Milk, bread, butter

Minimum support = 2

minimum confidence = 60%

Step 1 : Support-count of each item
in dataset (Table 1)

Itemset	Support-count
Milk	6
bread	7
butter	6
Sugar	2
beer	2

Now, compare the Table 2 support-count with minimum support. If support-count < minimum support remove that item set.

There are no item set whose support-count is less than the minimum support.

Step 2: Generate Table 2 using $k=2$ Table 1.

If items are not frequent remove that item set.

Table 2:

itemset	Support-count
Milk, bread	4
Milk, butter	4
Milk, sugar	1
Milk, beer	2
bread, butter	4
bread, sugar	2
bread, beer	2
butter, sugar	0
butter, beer	1
sugar, beer	0

Remove the item set whose support-count is less than minimum support.

Table 3:

Itemset	Support count
Milk, bread	4
Milk, butter	2
Milk, beer	4
bread, butter	2
bread, sugar	2
bread, beer	2
bread	

Table 4:

Step 3: Generate Table 4 using
Table 3. (joining Table)

itemset by using Table 3 are

- {Milk, bread, butter} 2
- {Milk, bread, beer} 2
- {Milk, butter, beer} 1
- {bread, butter, sugar}
- {bread, sugar, beer}
- {bread, butter, beer}

if itemset is not frequent
remove the itemset.

Itemset	Support count
Milk, bread, butter	2
Milk, bread, beer	2
Milk, butter, beer	1
bread, butter, sugar	0
bread, sugar, beer	0
bread, butter, beer	1

Remove itemset whose support count is less than minimum support

Remaining Itemset

Table:

Itemset	Support-count
Milk, bread, butter	2
Milk, bread, beer	2

~~Remaining~~

Step 4: Generate Table 7 using Table 6 (joining condition)

Here itemset formed by joining is {Milk, bread, butter, beer} whose subset containing {Milk bread beer} which is not frequent.

So no itemset in Table 7

$$\text{confidence } (A \rightarrow B) = \frac{\text{Support}(A \cup B)}{\text{Support-count}(A)}$$

Itemset {milk, bread, beer} from
Table 6

Rules:

1) [milk \wedge bread] \rightarrow [beer]

$$\text{confidence} = \frac{\text{Sup}(\text{milk} \wedge \text{bread} \wedge \text{beer})}{\text{Sup}(\text{milk} \wedge \text{bread})}$$

$$= \frac{2}{4}$$

= 50%

2) [milk \wedge beer] \rightarrow [bread]

$$\text{confidence} = \frac{2}{2}$$

= 100%

3) [bread \wedge beer] \rightarrow [milk]

$$\text{confidence} = \frac{2}{2}$$

=

= 100%.

4) $[Milk] \Rightarrow [bread \wedge beer]$

$$\text{confidence} = \frac{2}{6} = \frac{1}{3} = 33.33\% \approx 33\%$$

5) $[bread] \Rightarrow [Milk \wedge beer]$

$$\text{confidence} = \frac{2}{7} = 28.57\% \approx 28\%$$

6) $[beer] \Rightarrow [Milk \wedge bread]$

$$\text{confidence} = \frac{2}{2} = 100\%$$

As minimum confidence is 60%,
then 2, 3 & 6 are strong
association Rule

Support (A) = $\frac{\text{No. of transaction in which A appears}}{\text{Total no of transaction.}}$

$$\text{Support (Milk)} = \frac{6}{9} = \frac{2}{3} = \underline{\underline{66.66\%}}$$

$$\text{Support (bread)} = \frac{7}{9} = \frac{77.77\%}{\underline{\underline{}}}$$

$$\text{Support (Sugar)} = \frac{3}{9} = \frac{33.33\%}{\underline{\underline{}}}$$

$$\begin{aligned} \text{Support (if person buys milk \& bread)} \\ = \frac{4}{9} \\ = 44.44\% \end{aligned}$$

$$\begin{aligned} \text{Support (if person buys milk, bread \& butter)} \\ = \frac{2}{9} \\ = 22.22\% \end{aligned}$$

$$\begin{aligned} \text{Support (if person buys milk, beer \& sugar)} \\ = \frac{0}{9} \\ = 0\% \end{aligned}$$