T.E. COMP6 - DEC 19

consider the transaction database given below

TID	Items
10	1, 3, 4
20	2, 3, 5
30	1, 2, 3, 5
40	2, 5
50	1, 3, 5

Use Apriori Algorithm with min-support count = 2 and min-confidence = 60% to find all frequent itemsets & association rules.

Step 1: Generate 1-Itemset with corresponding support.

Itemset	Support
{1}	3
{2}	3
{3}	4
{4}	1
{5}	4

MinSup = 2

→ will not be included in candidate set as minsup criteria not met.

Itemset	Support
{1}	3
{2}	3
{3}	4
{5}	4

Step 2: Pruning & generating candidate Itemsets

Step 3 : Generating 2-Itemset with corresponding Support.

Item	Support
{1,2}	1 — X
{1,3}	3
{1,5}	2
{2,3}	2
{2,5}	3
{3,5}	3

Step 4 : Pruning & generating candidate set

Item	support
{1,3}	3
{1,5}	2
{2,3}	2
{2,5}	3
{3,5}	3

step 5 : Generating 3-Itemset with Corresponding support.

Item	Support
{1,3,5}	2
{1,3,2}	1 — X
{2,3,5}	2

Step 6 : Pruning to generate candidate set.

Item	support
{1,3,5}	2
{2,3,5}	2

step7 : Generating 4-Itemset.

Item	support
{1,3,5,2}	1

This item set does not satisfy minsup criteria hance will not be considered.

Generating Frequent Itemsets from step 6

$\{1,3,5\}$ & $\{2,3,5\}$

Generating Association rules from these Itemsets

		support	confidence
1	$\{1,3\} \rightarrow 5$	2	$S(\{1,3\} \cup \{5\}) / S(\{1,3\}) = 2/3 = 66\%$
2	$\{1,5\} \rightarrow 3$	2	$2/2 = 100\%$
3	$\{3,5\} \rightarrow 1$	2	$2/3 = 66\%$
4	$\{1\} \rightarrow \{3,5\}$	2	$2/3 = 66\%$
5	$\{3\} \rightarrow \{1,5\}$	2	$2/4 = 50\%$ ✗
6	$\{5\} \rightarrow \{1,3\}$	2	$2/4 = 50\%$ ✗
7	$\{2\} \rightarrow \{3,5\}$	2	$2/3 = 66\%$
8	$\{3\} \rightarrow \{2,5\}$	2	$2/4 = 50\%$ ✗
9	$\{5\} \rightarrow \{2,3\}$	2	$2/4 = 50\%$ ✗
10	$\{2,3\} \rightarrow \{5\}$	2	$2/2 = 100\%$
11	$\{3,5\} \rightarrow \{2\}$	2	$2/3 = 66\%$
12	$\{2,5\} \rightarrow \{3\}$	2	$2/3 = 66\%$

Rule 5, 6, 8, 9 does not satisfy minimum confidence criteria (60%), hence cannot be considered as strong association rules

So following are the strong association rules.

	Rule	Confidence
1	1,3 → 5	66 %
2	1,5 → 3	100 %
3	3,5 → 1	66 %
4	1 → 3,5	66 %
5	2 → 3,5	66 %
6	2,3 → 5	100 %
7	3,5 → 2	66 %
8	2,5 → 3	66 %