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Course - B.Sc. Computer Science.

AS-1 (a) Support

1. {o} → appears in 8 transaction → 8/10 = 0.8
2. {b, d, e} → appears in 2 transections → 2/10 = 0.2
3. {a, b, c, e} → appears in 1 transaction → 1/10 = 0.1
4. {a, b, c, d, e} → appears in 0 transaction → 0/10 = 0.

(b) Association Rules from {b, d, e}.

Possible rules & confidence.

1. b, d → e : 2/2 = 1.0
2. b, e → d : 2/3 ≈ 0.667
3. d, e → b : 2/4 = 0.5
4. b → d, e : 2/4 = 0.5
5. d → b, e : 2/4 = 0.5.
6. e → b, d : 2/8 = 0.25.

AS-2 (a) Frequent 1-itemsets (L1).

Minimum Support = 40% → must appears in ≥4 transections.

Count of each item:

(i) Oregano: T1, T3, T5, T7, T8, T9 → 6/10 = 0.6
(ii) Chocolate: T1, T3, T4, T5, T6, T8, T10 → 7/10 = 0.7
(iii) milk: T1, T2, T9 → 3/10 = 0.3
(iv) Chuse: T1, T2, T3, T4, T5 → 5/10 = 0.5.
(v) fries: T1, T2, T4, T5, T7, T8, T10 → 7/10 = 0.7
(vi) ketchup: T2, T3, T6, T7, T9 → 5/10 = 0.5.

L1: {oregano: 0.6}, {chocolate: 0.7}, {cheese: 0.5},
{fries: 0.7}, {ketchup: 0.5}.

(b) Candidate 2-itemsets (L_2) and their Support

- {oregano, chocolate} : 0.4
- {oregano, fries} : 0.4.
- {chocolate, cheese} : 0.4.
- {chocolate, fries} : 0.5.
- {cheese, fries} : 0.4.

(c) Association rules from L_2.

Confidence formula:

$$\text{Confidence}(A \rightarrow B) = \frac{\text{Support}(A \cup B)}{\text{Support}(A)}.$$

1. oregano → chocolate : 0.4/0.6 = 0.667
   chocolate → oregano : 0.4/0.7 ≈ 0.571
2. oregano → fries : 0.4/0.6 = 0.667
   fries → oregano : 0.4/0.7 ≈ 0.571.
3. chocolate → cheese : 0.4/0.7 ≈ 0.571
   cheese → chocolate : 0.4/0.5 = 0.8.
4. chocolate → fries : 0.5/0.7 ≈ 0.714
   fries → chocolate : 0.5/0.7 ≈ 0.714.
5. cheese → fries : 0.4/0.5 = 0.8
   fries → cheese : 0.4/0.7 ≈ 0.571.