Karanveer Sandhu
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## Asg 3: Q3

Let Cereal = Ce, Cheese = Ch, Juice = J, Shampoo = S,
Eggs = E

The itemsets are

Daniel: $\{Ce, Ch, J\}$,
Julie: $\{Ce, Ch\}$,
Mark: $\{Ce, E, J, S\}$,
Paulin: $\{Ce, Ch\}$,
Ricardo: $\{Ce, Ch\}$,
Sophia: $\{Ce, Ch, S\}$

Our minimum support value is 0.15
Since $1/6 = 0.1\overline{6} > 0.15$, itemsets only need one instance
for it to be considered a frequent itemset.

L-1 Frequent items:

Ce, Ch, J, S, E.

| | |
|---|---|
| Ce | 6 |
| Ch | 5 |
| J | 2 |
| S | 2 |
| E | 1 |

L-2 Frequent items:

$\underline{\{Ce, Ch\}}$ : $\{Ce\} \rightarrow \{Ch\}$ $Conf = \dfrac{sup\{Ce, Ch\}}{sup\{Ce\}} = \dfrac{5/6}{6/6} = \dfrac{5}{6}$

5 instances

$\searrow$ Interest $= |Conf - sup\{Ch\}| = |\dfrac{5}{6} - \dfrac{5}{6}| = 0$

①

$\{Ch\} \Rightarrow \{Ce\}$ $Conf = \dfrac{sup\{Ch, Ce\}}{sup\{Ch\}} = \dfrac{5/6}{5/6} = 1.00$

$Interest = |Conf - sup\{Ce\}| = \dfrac{6}{6} - \dfrac{6}{6} = 0$

$\dfrac{\{Ce, J\}}{2}$ : $\{Ce\} \Rightarrow \{J\}$ $Conf = \dfrac{sup\{Ce, J\}}{sup\{Ce\}} = \dfrac{2/6}{6/6} = \dfrac{2}{6} = 0.33$

$Int = |Conf - sup\{J\}| = |\dfrac{2}{6} - \dfrac{2}{6}| = 0$

$\{J\} \Rightarrow \{Ce\}$ $Conf = \dfrac{sup\{Ce, J\}}{sup\{J\}} = \dfrac{2/6}{2/6} = 1.00$

$Int = |Conf - sup\{Ce\}| = |1 - 1| = 0$

$\dfrac{\{Ch, J\}}{1}$ : $\{Ch\} \Rightarrow \{J\}$ $Conf = \dfrac{sup\{Ch, J\}}{sup\{Ch\}} = \dfrac{1/6}{5/6} = 1/5 = 0.20$

$Int = |Conf - sup\{J\}| = |\dfrac{1}{5} - \dfrac{2}{6}| = |\dfrac{1}{5} - \dfrac{1}{3}| = \dfrac{2}{15} = 0.13$

$\{J\} \Rightarrow \{Ch\}$ $Conf = \dfrac{sup\{Ch, J\}}{sup\{J\}} = \dfrac{1/6}{2/6} = \dfrac{1}{2} = 0.50$

$Int = |Conf - sup\{Ch\}| = |\dfrac{1}{2} - \dfrac{5}{6}| = \dfrac{2}{6} = 0.33$

$\dfrac{\{Ce, E\}}{1}$ : $\{Ce\} \Rightarrow \{E\}$ $Conf = \dfrac{sup\{Ce, E\}}{sup\{Ce\}} = \dfrac{1/6}{6/6} = 1/6 = 0.17$

$Int = |Conf - sup\{E\}| = |\dfrac{1}{6} - \dfrac{1}{6}| = 0$

$\{E\} \Rightarrow \{Ce\}$ $Conf = \dfrac{sup\{Ce, E\}}{sup\{E\}} = \dfrac{1/6}{1/6} = 1.00$

$Int = |Conf - sup\{Ce\}| = |1 - 1| = 0$

$\dfrac{\{Ce, S\}}{2}$ : $\{Ce\} \Rightarrow \{S\}$ $Conf = \dfrac{sup\{Ce, S\}}{sup\{Ce\}} = \dfrac{2/6}{6/6} = 2/6 = 0.33$

$Int = |Conf - sup\{S\}| = |\dfrac{2}{6} - \dfrac{2}{6}| = 0$

$\{S\} \Rightarrow \{Ce\}$ $Conf = \dfrac{sup\{Ce, S\}}{sup\{S\}} = \dfrac{2/6}{2/6} = 1.00$

$Int = |Conf - sup\{Ce\}| = |1 - 1| = 0$

②

$\underline{\{E, J\}}_1:$

$\{E\} \rightarrow \{J\}$ $Conf = \dfrac{sup\{E,J\}}{sup\{E\}} = \dfrac{1/6}{1/6} = 1.00$

$Int = |Conf - sup\{J\}| = |1 - \frac{2}{6}| = \frac{4}{6} = 0.67$

$\{J\} \rightarrow \{E\}$ $Conf = \dfrac{sup\{E,J\}}{sup\{J\}} = \dfrac{1/6}{2/6} = \dfrac{1}{2} = 0.50$

$Int = |Conf - sup\{E\}| = |\frac{1}{2} - \frac{1}{6}| = \frac{2}{6} = 0.33$

$\underline{\{E, S\}}_1:$

$\{E\} \rightarrow \{S\}$ $Conf = \dfrac{sup\{E,S\}}{sup\{E\}} = \dfrac{1/6}{1/6} = 1.00$

$Int = |Conf - sup\{S\}| = |1 - \frac{2}{6}| = \frac{4}{6} = 0.67$

$\{S\} \rightarrow \{E\}$ $Conf = \dfrac{sup\{E,S\}}{sup\{S\}} = \dfrac{1/6}{2/6} = \dfrac{1}{2} = 0.50$

$Int = |Conf - sup\{E\}| = |\frac{1}{2} - \frac{1}{6}| = \frac{2}{6} = 0.33$

$\underline{\{J, S\}}_1:$

$\{J\} \rightarrow \{S\}$ $Conf = \dfrac{sup\{J,S\}}{sup\{J\}} = \dfrac{1/6}{2/6} = \dfrac{1}{2} = 0.50$

$Int = |Conf - sup\{S\}| = |\frac{1}{2} - \frac{2}{6}| = \frac{1}{6} = 0.17$

$\{S\} \rightarrow \{J\}$ $Conf = \dfrac{sup\{J,S\}}{sup\{S\}} = \dfrac{1/6}{2/6} = \dfrac{1}{2} = 0.50$

$Int = |Conf - sup\{J\}| = |\frac{1}{2} - \frac{2}{6}| = \frac{1}{6} = 0.17$

$\underline{\{Ch, S\}}_1:$

$\{Ch\} \rightarrow \{S\}$ $Conf = \dfrac{sup\{Ch,S\}}{sup\{Ch\}} = \dfrac{1/6}{5/6} = \dfrac{1}{5} = 0.20$

$Int = |Conf - sup\{S\}| = |\frac{1}{5} - \frac{1}{3}| = \frac{2}{15} = 0.13$

$\{S\} \rightarrow \{Ch\}$ $Conf = \dfrac{sup\{S,Ch\}}{sup\{S\}} = \dfrac{1/6}{2/6} = \dfrac{1}{2} = 0.50$

$Int = |Conf - sup\{Ch\}| = |\frac{1}{2} - \frac{5}{6}| = \frac{2}{6}$
$= 0.33$

L-3 Frequent Itemsets:

$\{Ce, Ch, J\}$, $\{Ce, E, J\}$, $\{Ce, E, S\}$, $\{Ce, J, S\}$, $\{E, J, S\}$, $\{Ce, Ch, S\}$: all with one instance

L-4 Frequent Itemsets:

$\{Ce, E, J, S\}$ : 1

There are no L-5 Frequent Itemsets