

A. Support for $\{e\}$

$\{0001, 0024, 0012, 0021, 0015, 0022, 0038, 0033\}$ (8 transactions)

$$\text{Support } \{e\} = 8/10 = 0.8$$

* Support for $\{b, d\}$

$\{0012, 0022\}$ (transactions = 2)

$$\text{Support } \{b, d\} = 2/10 = 0.2$$

* Support for $\{b, d, e\}$

$\{0012, 0022\}$ (2 transactions)

$$\text{Support } \{b, d, e\} = 2/10 = 0.2$$

B. Confidence for $\{b, d\} \rightarrow \{e\}$

$$\text{Support } \{b, d, e\} = 0.2$$

$$\text{Support } \{b, d\} = 0.2$$

$$\text{Confidence} = \frac{\text{Support } \{b, d, e\}}{\text{Support } \{b, d\}}$$

$$= \frac{0.2}{0.2}$$

$$\boxed{\text{Confidence} = 1.0}$$

* confidence for $\{e\} \rightarrow \{b, d\}$

$$\text{Support } \{b, d, e\} = 0.2$$

$$\text{Support } \{e\} = 0.8$$

$$\text{Confidence} = \frac{\text{Support } \{b, d, e\}}{\text{Support } \{e\}}$$

$$= \frac{0.2}{0.8}$$

$$= 0.25$$

C. Symmetric measures are not synonymous with confidence for instance in this example the confidence of rule $\{e\} \rightarrow \{b, d\}$ is 0.25 while the confidence of the rule $\{b, d\} \rightarrow \{e\}$ is 1.0. This discrepancy occurs because the support for the antecedent (the left side of the rule) can differ depending on the direction of the association. When we switch the antecedent and consequent, we'd see that the confidence values do not remain symmetrical therefore, changing it affects the resulting confidence value.