Assessment

9/11

Compare mult rules and patterns

Maximal itemset: itemset is maximal all supersets are not frequent

$$sup(X) \geq minsup \quad \text{and} \quad \forall\, Y \supset X \quad sup(Y) < min\ sup$$

Closed itemsets & min generators

itemset X is closed if all supersets have less support

$$\forall\, Y \supset X \quad sup(X) > sup(Y)$$

itemset X is minimal generator
if all subsets have strictly higher support

$$\forall\, Y \subset X, \quad sup(X) < sup(Y)$$

How to use:

X not minimal generator $\Rightarrow$
$\exists\ Y \subset X$ & $W \subset Y$
$\ni\ sup(X) = sup(Y \cup (X - Y)) = sup(W \cup (X - Y))$

E.g. $X = \{abcde\}$
$Y = \{cde\}$
$W = \{cd\}$

X is not a minimal generator
$sup(abcde) = sup(\{cde\} \cup \{ab\}) = sup(\{cd\} \cup \{ab\}) = sup(cdab)$

Prop Let X be a minimal generator
$\Rightarrow \forall\ Y \subset X$ Y is also a minimal generator

Compare rules

Given 2 rules $R: X \to Y$
$R': W \to Y$
w/ $W \subset X$

R is more specific than R'
R' is more general than R

R is redundant if $\exists$ a more general rule R' w/ same support

Improvement of rule $X \to Y$

$$imp(X \to Y) = conf(X \to Y) - \max_{W \subset X} \{conf(W \to Y)\}$$

A rule is productive if $imp(R) > 0$

$\Rightarrow \forall$ more general R' $conf(R) > conf(R')$

.... unproductive if $imp(R) \leq 0$

$\Rightarrow \exists$ more general R' w/ $conf(R) \leq conf(R')$
$\Rightarrow R$ is redundant