計算数学特論 レポート課題3　機械知能工学専攻 16344217 津上 祐典

	[P,1]	[P,2]	[P,3]	[Q,1]	[Q,2]	[Q,3]	[R,1]	[R,2]	[R,3]	[S,1]	[S,2]	[S,3]
inf	{4}	{2}	{1,5}	{5}	{3}	{4}	{}	{1}	{3,5}	{}	{}	{1,4}
sup	{3,4}	{2,3}	{1,5}	{1,5}	{2,3}	{1,2,4}	{2}	{1,4}	{2,3,4,5}	{2,3,5}	{3,5}	{1,2,4}

以下に，$minsup, OUTACC, minacc, maxsup, INACC, maxacc$ の計算結果を示す．レポート枚数の都合上，計算途中は省略した．また，すべての Certain rule , Possible rule を求めた．

(1) $\tau_1 : [P,1] => [S,1]$

$$minsup(\tau_1) = 0 \ , \ maxsup(\tau_1) = 0$$

(2) $\tau_2 : [P,1] => [S,2]$

$$minsup(\tau_2) = 0 \ , \ maxsup(\tau_2) = \frac{1}{5}$$
$$INACC = \{3\} \ , \ maxacc(\tau_2) = \frac{1}{2}$$

(3) $\tau_3 : [P,1] => [S,3]$

$$minsup(\tau_3) = \frac{1}{5} \ , \ OUTACC = \{3\} \ , \ minacc(\tau_3) = \frac{1}{2}$$
$$maxsup(\tau_3) = \frac{1}{5} \ , \ INACC = \{\} \ , \ maxacc(\tau_3) = 1$$

(4) $\tau_4 : [P,2] => [S,1]$

$$minsup(\tau_4) = 0 \ , \ maxsup(\tau_4) = \frac{2}{5} \ , \ INACC = \{3\} \ , \ maxacc(\tau_4) = 1$$

(5) $\tau_5 : [P,2] => [S,2]$

$$minsup(\tau_5) = 0 \ , \ maxsup(\tau_5) = \frac{1}{5} \ , \ INACC = \{3\} \ , \ maxacc(\tau_5) = \frac{1}{2}$$

(6) $\tau_6 : [P,2] => [S,3]$

$$minsup(\tau_6) = 0 \ , \ maxsup(\tau_6) = \frac{1}{5} \ , \ INACC = \{\} \ , \ maxacc(\tau_6) = 1$$

(7) $\tau_7 : [P,3] => [S,1]$

$$minsup(\tau_7) = 0 \ , \ maxsup(\tau_7) = \frac{1}{5} \ , \ INACC = \{\} \ , \ maxacc(\tau_7) = \frac{1}{2}$$

(8) $\tau_8 : [P,3] => [S,2]$

$$minsup(\tau_8) = 0 \ , \ maxsup(\tau_8) = \frac{1}{5} \ , \ INACC = \{\} \ , \ maxacc(\tau_8) = \frac{1}{2}$$

(9) $\tau_9 : [P,3] => [S,3]$

$$minsup(\tau_9) = \frac{1}{5} \ , \ OUTACC = \{\} \ , \ minacc(\tau_9) = \frac{1}{2}$$
$$maxsup(\tau_9) = \frac{1}{5} \ , \ INACC = \{\} \ , \ maxacc(\tau_9) = \frac{1}{2}$$

(10) $\tau_{10} : [Q, 1] => [S, 1]$

$$minsup(\tau_{10}) = 0 \ , \ maxsup(\tau_{10}) = \frac{1}{5} \ , \ INACC = \{\} \ , \ maxacc(\tau_{10}) = 1$$

(11) $\tau_{11} : [Q, 1] => [S, 2]$

$$minsup(\tau_{11}) = 0 \ , \ maxsup(\tau_{11}) = \frac{1}{5} \ , \ INACC = \{\} \ , \ maxacc(\tau_{11}) = 1$$

(12) $\tau_{12} : [Q, 1] => [S, 3]$

$$minsup(\tau_{12}) = 0 \ , \ maxsup(\tau_{12}) = \frac{1}{5} \ , \ INACC = \{1\} \ , \ maxacc(\tau_{12}) = \frac{1}{2}$$

(13) $\tau_{13} : [Q, 2] => [S, 1]$

$$minsup(\tau_{13}) = 0 \ , \ maxsup(\tau_{13}) = \frac{2}{5} \ , \ INACC = \{2\} \ , \ maxacc(\tau_{13}) = 1$$

(14) $\tau_{14} : [Q, 2] => [S, 2]$

$$minsup(\tau_{14}) = 0 \ , \ maxsup(\tau_{14}) = \frac{1}{5} \ , \ INACC = \{\} \ , \ maxacc(\tau_{14}) = 1$$

(15) $\tau_{15} : [Q, 2] => [S, 3]$

$$minsup(\tau_{15}) = 0 \ , \ maxsup(\tau_{15}) = \frac{1}{5} \ , \ INACC = \{2\} \ , \ maxacc(\tau_{15}) = \frac{1}{2}$$

(16) $\tau_{16} : [Q, 3] => [S, 1]$

$$minsup(\tau_{16}) = 0 \ , \ maxsup(\tau_{16}) = \frac{1}{5} \ , \ INACC = \{2\} \ , \ maxacc(\tau_{16}) = \frac{1}{2}$$

(17) $\tau_{17} : [Q, 3] => [S, 2]$

$$minsup(\tau_{17}) = 0 \ , \ maxsup(\tau_{17}) = 0$$

(18) $\tau_{18} : [Q, 3] => [S, 3]$

$$minsup(\tau_{18}) = \frac{1}{5} \ , \ OUTACC = \{2\} \ , \ minacc(\tau_{18}) = \frac{1}{2}$$
$$maxsup(\tau_{18}) = \frac{3}{5} \ , \ INACC = \{1, 2\} \ , \ maxacc(\tau_{18}) = 1$$

(19) $\tau_{19} : [R, 1] => [S, 1]$

$$minsup(\tau_{19}) = 0 \ , \ maxsup(\tau_{19}) = \frac{1}{5} \ , \ INACC = \{2\} \ , \ maxacc(\tau_{19}) = 1$$

(20) $\tau_{20} : [R, 1] => [S, 2]$

$$minsup(\tau_{20}) = 0 \ , \ maxsup(\tau_{20}) = 0$$

(21) $\tau_{21} : [R, 1] => [S, 3]$

$$minsup(\tau_{21}) = 0 \ , \ maxsup(\tau_{21}) = \frac{1}{5} \ , \ INACC = \{2\} \ , \ maxacc(\tau_{21}) = 1$$

(22) $\tau_{22} : [R,2] => [S,1]$

$$minsup(\tau_{22}) = 0\ ,\ maxsup(\tau_{22}) = 0$$

(23) $\tau_{23} : [R,2] => [S,2]$

$$minsup(\tau_{23}) = 0\ ,\ maxsup(\tau_{23}) = 0$$

(24) $\tau_{24} : [R,2] => [S,3]$

$$minsup(\tau_{24}) = \frac{1}{5}\ ,\ OUTACC = \{\}\ ,\ maxsup(\tau_{24}) = 1$$

(25) $\tau_{25} : [R,3] => [S,1]$

$$minsup(\tau_{25}) = 0\ ,\ maxsup(\tau_{25}) = \frac{3}{5}\ ,\ INACC = \{2\}\ ,\ maxacc(\tau_{25}) = 1$$

(26) $\tau_{26} : [R,3] => [S,2]$

$$minsup(\tau_{26}) = 0\ ,\ maxsup(\tau_{26}) = \frac{2}{5}\ ,\ INACC = \{\}\ ,\ maxacc(\tau_{26}) = 1$$

(27) $\tau_{27} : [R,3] => [S,3]$

$$minsup(\tau_{27}) = 0\ ,\ maxsup(\tau_{27}) = \frac{2}{5}\ ,\ INACC = \{2,4\}\ ,\ maxacc(\tau_{27}) = \frac{1}{2}$$

以上までで minsup は OK で minacc は NO なのは

$$[P,1] => [S,3]\ ,\ [P,3] => [S,3]\ ,\ [Q,3] => [S,3]$$

の 3 パターンである．これらの条件部に条件を追加する．

(28) $\tau_{28} : [P,1] \wedge [Q,3] => [S,3]$

$inf([P,1] \wedge [Q,3]) = \{4\}$, $sup([P,1] \wedge [Q,3]) = \{4\}$ より

$$minsup(\tau_{28}) = \frac{1}{5}\ ,\ OUTACC = \{\}\ ,\ minacc(\tau_{28}) = 1$$

となる．

以上より，$support \geq 0.2$, $accuracy \geq 0.8$ を満たす Possible rule は，

$[P,1] => [S,3]$, $[P,2] => [S,1]$, $[P,2] => [S,3]$, $[Q,1] => [S,1]$, $[Q,1] => [S,2]$

$[Q,2] => [S,1]$, $[Q,2] => [S,2]$, $[Q,3] => [S,3]$, $[R,1] => [S,1]$, $[R,1] => [S,3]$

$[R,2] => [S,3]$, $[R,3] => [S,1]$, $[R,3] => [S,2]$

であり，Certain rule は，

$$[R,2] => [S,3]\ ,\ [P,1] \wedge [Q,3] => [S,3]$$

である．