1. R^k, onde $k = 1, \dots, 4$, é da forma

R^k: Se x_1 é A_1^k e x_2 é A_2^k então y é B^k

Mamdani: $\hat{R} = \bigcup_{k=1}^{4} \hat{R}^k$, onde

$$\mu_{\hat{R}^k}(x,y) = \mu_{A^k}(x) \wedge \mu_{B^k}(y) = \mu_{A_1^k}(x_1) \wedge \mu_{A_2^k}(x_2) \wedge \mu_{B^k}(y)$$

saída fuzzy $\tilde{B} = \tilde{A} \circ \hat{R} = \tilde{A} \circ \bigcup_{k=1}^{4} \hat{R}^k = \bigcup_{k=1}^{4} \tilde{A} \circ \hat{R}^k$

Seja $\tilde{B}^k = \tilde{A} \circ \hat{R}^k$ para $k = 1, \dots, 4$

Temos $\mu_{\tilde{B}^k}(y) = \bigvee_{x \in X} \mu_{\tilde{A}}(x) \wedge \mu_{\hat{R}^k}(x,y)$

$$= \bigvee_{x \in X} \mu_{\tilde{A}}(x) \wedge \mu_{A^k}(x) \wedge \mu_{B^k}(y)$$

$$= \bigvee_{x_1 \in X_1} \bigvee_{x_2 \in X_2} \mu_{\tilde{A}_1}(x_1) \wedge \mu_{\tilde{A}_2}(x_2) \wedge \mu_{A_1^k}(x_1) \wedge \mu_{A_2^k}(x_2) \wedge \mu_{B^k}(y)$$

$$= \left[\bigvee_{x_1 \in X_1} \mu_{\tilde{A}_1 \wedge A_1^k}(x_1) \wedge \bigvee_{x_2 \in X_2} \mu_{\tilde{A}_2 \wedge A_2^k}(x_2) \right] \wedge \mu_{B^k}(y)$$

Daí: $\mu_{\tilde{B}^1}(y) = \left[\bigvee_{x_1 \in X_1} \mu_{\tilde{A}_1 \wedge N}(x_1) \wedge \bigvee_{x_2 \in X_2} \mu_{\tilde{A}_2 \wedge F}(x_2) \right] \wedge \mu_{B^1}(y)$

$$= [0.5 \wedge 0.5] \wedge \mu_{B^1}(y) = 0.5 \wedge \mu_P(y)$$

$$\mu_{\tilde{B}^2}(y) = [0.5 \wedge 0.75] \wedge \mu_{B^2}(y) = 0.5 \wedge \mu_{\cancel{B^2}P}(y)$$

$$\mu_{\tilde{B}^3}(y) = [1 \wedge 0.5] \wedge \mu_{B^3}(y) = 0.5 \wedge \mu_{B^3}(y) = 0.5 \wedge \mu_M(y)$$

$$\mu_{\tilde{B}^4}(y) = [1 \wedge 0.75] \wedge \mu_{B^4}(y) = 0.75 \wedge \mu_{B^4}(y) = 0.75 \wedge \mu_U(y)$$

$\therefore \tilde{B} = (0.5 \wedge P) \vee (0.5 \wedge M) \vee (0.75 \wedge U)$