

Exercises from conversions of representations of discrete fuzzy sets.

Exercise 1.1 *Personal preferences of (all 4) candidates participating in elections are:*

$$\begin{aligned}\mu_C(A.B.) &= 0.4, \\ \mu_C(C.D.) &= 0.7, \\ \mu_C(E.F.) &= 0.8, \\ \mu_C(G.H.) &= 0.4.\end{aligned}$$

Find the horizontal representation of this fuzzy set.

Exercise 1.2 (“satisfaction with the grades”; old scale) *Fuzzy set A is given by its collection of cuts:*

$$\mathcal{R}_A(\alpha) = \begin{cases} \{1, 2, 3, 4\}, & \alpha = 0, \\ \{1, 2, 3\}, & \alpha \in (0, 0.2], \\ \{1, 2\}, & \alpha \in (0.2, 0.7], \\ \{1\}, & \alpha \in (0.7, 1]. \end{cases}$$

Find its vertical representation.

Exercise 1.3 (“satisfaction with the grades”; new scale) *Fuzzy set B is given by its collection of cuts:*

$$\mathcal{R}_B(\alpha) = \begin{cases} \{A, B, C, D, E, F\}, & \alpha = 0, \\ \{A, B, C, D, E\}, & \alpha \in (0, 0.1], \\ \{A, B, C\}, & \alpha \in (0.1, 0.2], \\ \{A, B, C, D\}, & \alpha \in (0.2, 0.5], \\ \{A, B\}, & \alpha \in (0.5, 0.7), \\ \{A\}, & \alpha \in [0.7, 1]. \end{cases}$$

Find its vertical representation.