Fuzzy Modelling

Exercise 1

Write a script to draw triangular membership functions, which are described by the following mathematical relationships:

a)

$$\mu_A(x) = \begin{cases} 0 \text{ for } x = 0 \\ 1 \text{ for } x = 3 \\ 0 \text{ for } x = 5 \end{cases} \qquad \mu_B(x) = \begin{cases} 0 \text{ for } x = -1 \\ 1 \text{ for } x = -2 \\ 0 \text{ for } x = -6 \end{cases}$$

R = [-8, 7] DS = 0.2

C1 – green C2 – red

b)

$$\mu_A(x) = \begin{cases} 0 \text{ for } x = 0 \\ 1 \text{ for } x = 4 \\ 0 \text{ for } x = 6 \end{cases} \qquad \mu_B(x) = \begin{cases} 0 \text{ for } x = -1 \\ 1 \text{ for } x = -3 \\ 0 \text{ for } x = -7 \end{cases}$$

R = [-9, 8] DS = 0.2

C1 – blue C2 – yellow

Draw the membership functions $\mu_A(x)$ and $\mu_B(x)$ on one graph in the range of R. Use a DS discretization step and the following colors $\mu_A(x)$ – C1 and $\mu_B(x)$ – C2. Determine the support and core of the fuzzy sets: support (A), support (B), core(A), core(B).