

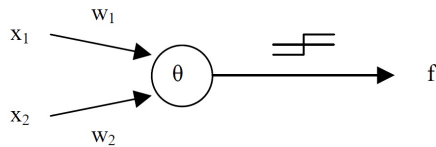
Exercise 1: Reactive Agents and TLU

A. (Exercises 2.3) Indicate which of the following Boolean functions of 3 input variables can be realized by a single threshold element with weighted connections to the input.

1. x_1
2. $x_1x_2x_3$
3. $x_1 + x_2$
4. $(x_1x_2x_3) + (\bar{x}_1\bar{x}_2\bar{x}_3)$
5. 1

B. Learning of a single TLU:

- TLU:



- Relation function:

$$f = 1 \quad \text{if } (w_1x_1 + w_2x_2 - \theta \geq 0)$$

$$= 0 \quad \text{otherwise}$$

- Training set:

	x_1	x_2	d
e_1	5	1	0
e_2	2	1	0
e_3	1	1	1
e_4	3	3	1
e_5	4	2	0
e_6	2	3	1

- Task: learn w_1 , w_2 and θ