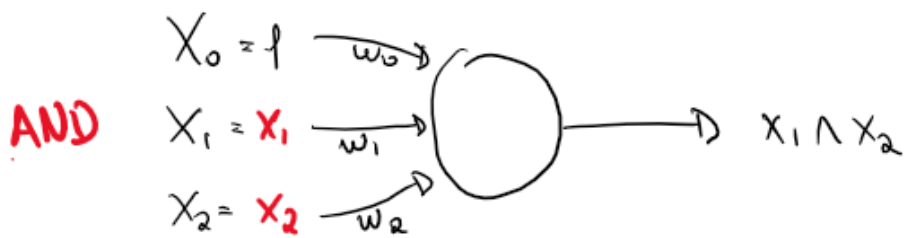


# Coche de Queiroz, João Filipe

## Intelligence artificielle TP 8

### 8.1 fonctions logiques



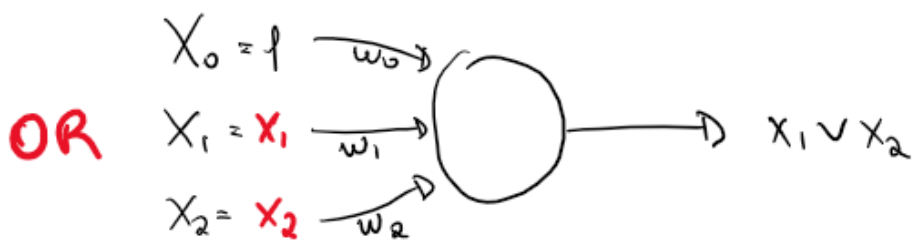
Sut : trouver  $w_0, w_1, w_2$  tq

$$\sum_{i=0}^2 X_i w_i \geq 0 \iff X_1 = 1 \wedge X_2 = 1$$

$$\Rightarrow w_0 = -1,5, w_1 = 1, w_2 = 1$$

exemple:  $X_1 = 1, X_2 = 0$

$$\begin{aligned} &\rightarrow X_0 \cdot w_0 + X_1 \cdot w_1 + X_2 \cdot w_2 \\ &= 1 \cdot -1,5 + 1 \cdot 1 + 0 \cdot 1 \\ &= -0,5 \rightarrow -0,5 < 0 \rightarrow \text{Faux} \quad \checkmark \end{aligned}$$



But : trouver  $w_0, w_1, w_2$  tq

$$\sum_{i=0}^2 X_i w_i \geq 0 \Leftrightarrow X_1 = 1 \vee X_2 = 1$$

$$\Rightarrow w_0 = -0,5, w_1 = 1, w_2 = 1$$

exemple:  $X_1 = 0, X_2 = 0$

$$\begin{aligned} &\rightarrow X_0 \cdot w_0 + X_1 \cdot w_1 + X_2 \cdot w_2 \\ &= 1 \cdot -0,5 + 0 \cdot 1 + 0 \cdot 1 \\ &= -0,5 \rightarrow -0,5 < 0 \rightarrow \text{Faux} \quad \checkmark \end{aligned}$$

## §.2 entraînement de réseau

On initialise  $w_0 = w_1 = w_2 = 1$

etape ①

$$e = \begin{array}{ccc} x_1 & x_2 & y \\ 1 & 1 & 1 \end{array}$$

$$in = w_1 \cdot x_1 + w_2 \cdot x_2 + w_0 = 3$$

$$Err = y - g(in) = 0$$

$$w_0 = w_0 + \alpha \cdot Err \cdot x_0 = w_0 = 1$$

$$w_1 = w_1 + \alpha \cdot Err \cdot x_1 = w_1 = 1$$

$$w_2 = w_2 + \alpha \cdot Err \cdot x_2 = w_2 = 1$$

etape ②

$$e = \begin{array}{ccc} x_1 & x_2 & y \\ 1 & 0 & 1 \end{array}$$

$$in = w_1 \cdot x_1 + w_2 \cdot x_2 + w_0 = 2$$

$$Err = y - g(in) = 0$$

$$w_0 = w_0 + \alpha \cdot Err \cdot x_0 = w_0 = 1$$

$$w_1 = w_1 + \alpha \cdot Err \cdot x_1 = w_1 = 1$$

$$w_2 = w_2 + \alpha \cdot Err \cdot x_2 = w_2 = 1$$

etape ③

$$e = \begin{array}{ccc} x_1 & x_2 & y \\ 0 & 1 & 1 \end{array}$$

$$iu = w_1 \cdot x_1 + w_2 \cdot x_2 + w_0 = 2$$

$$Err = y - g(iu) = 0$$

$$w_0 = w_0 + \alpha \cdot Err \cdot X_0 = w_0 = 1$$

$$w_1 = w_1 + \alpha \cdot Err \cdot X_1 = w_1 = 1$$

$$w_2 = w_2 + \alpha \cdot Err \cdot X_2 = w_2 = 1$$

etape ④

$$e = \begin{array}{ccc} x_1 & x_2 & y \\ 0 & 0 & 0 \end{array}$$

$$iu = w_1 \cdot x_1 + w_2 \cdot x_2 + w_0 = 1$$

$$Err = y - g(iu) = -1$$

$$w_0 = w_0 + \alpha \cdot Err \cdot X_0 = w_0 = 1$$

$$w_1 = w_1 + \alpha \cdot Err \cdot X_1 = w_1 = 1$$

$$w_2 = w_2 + \alpha \cdot Err \cdot X_2 = w_2 = 1$$

$$w_{fin} = w_{debut}$$

→ on commence avec les mauvaises valeurs pour  $w$ .