

Perzeptron

1b

$$w = \begin{bmatrix} -1 \\ 1 \\ 1 \end{bmatrix}$$

$$0 = w_0 + x_1 w_1 + x_2 w_2$$

$$x_1 = \frac{w_0}{w_1}$$

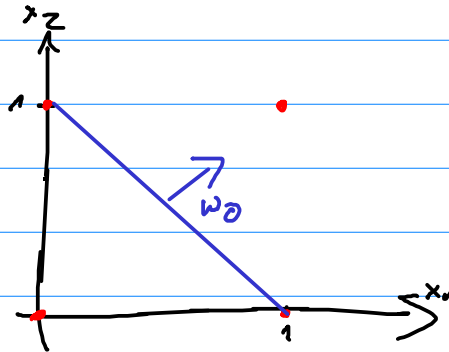
$$w_1 x_1 + w_2 x_2 + w_0 = 0$$

$$x_1 = -x_2 \frac{w_2}{w_1} - \frac{w_0}{w_1}$$

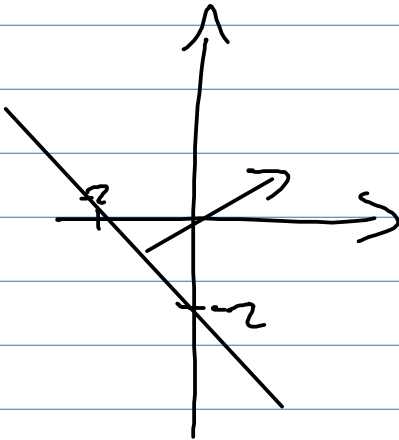
$$x_1 = -x_2 \frac{0,5}{0,5} - \frac{-0,5}{0,5}$$

$$x_1 = -x_2 + 1$$

$$x_2 = -x_1 + 1$$



2a



b

b) Welche der folgenden Perzeptrons haben die selbe Trennebene? Welche weisen exakt die gleiche Klassifikation auf?

- $(w_0, w_1, w_2)^T = (1, 0.5, 0.5)^T$ ✓ ✓
- $(w_0, w_1, w_2)^T = (200, 100, 100)^T$ ✓ ✓
- $(w_0, w_1, w_2)^T = (\sqrt{2}, \sqrt{1}, \sqrt{1})^T$ ✗ ✗
- $(w_0, w_1, w_2)^T = (-2, -1, -1)^T$ ✓ ✓

74

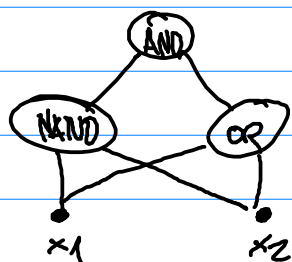
$$y = g(\langle w, x \rangle) ; g(q) = q ; y = \langle w, x \rangle$$

$$y_j = \langle w_j, y_i \rangle$$

$$y_j = \langle w_j, \langle w_i, x \rangle \rangle$$

$$(w_j \cdot w_i) \cdot x$$

8

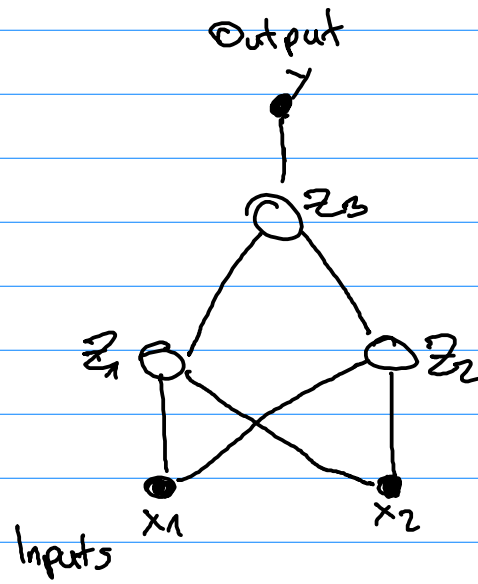


$$w_{NAND} = \begin{bmatrix} 1,5 \\ -1 \\ -1 \end{bmatrix}$$

$$w_{OR} = \begin{bmatrix} -0,5 \\ 1 \\ 1 \end{bmatrix}$$

$$w_{AND} = \begin{bmatrix} -1,5 \\ 1 \\ 1 \end{bmatrix}$$

6



$$w_{z1} = \begin{bmatrix} -2 \\ 1 \\ 0 \end{bmatrix}$$

$$w_{z2} = \begin{bmatrix} -3 \\ 0 \\ 1 \end{bmatrix}$$

$$w_{y1} = \begin{bmatrix} -5 \\ 1 \\ 1 \end{bmatrix}$$