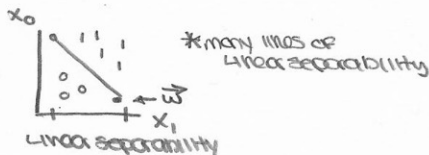


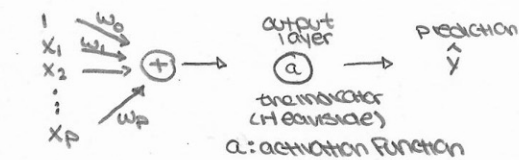
$$y = \{0, 1\}$$

$$\mathcal{H} = \{ \mathbb{I} \vec{w} \cdot \vec{x} \geq 0 : \vec{w} \in \mathbb{R}^{p+1} \}$$

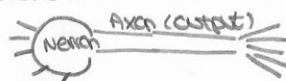
line of linear discrimination



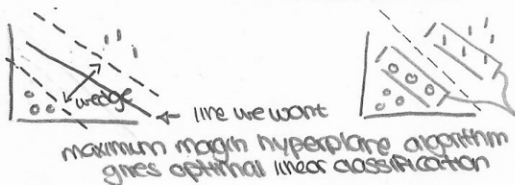
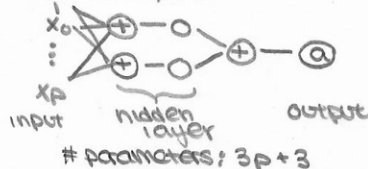
If linearly separable
the perceptron algorithm
is guaranteed to converge



"looks like a neuron"



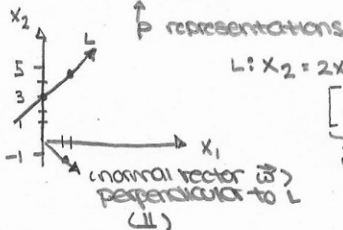
Hidden Layer:



Support Vectors

$$\vec{w} = \begin{bmatrix} w_1 \\ \vdots \\ w_p \end{bmatrix}, w_0 = b$$

$$\mathcal{H} = \{ \mathbb{I} \vec{w} \cdot \vec{x} + b \geq 0 : \vec{w} \in \mathbb{R}^p, b \in \mathbb{R} \}$$



$$L: x_2 = 2x_1 + 3 \Rightarrow 2x_1 - x_2 + 3 = 0$$

$$\begin{bmatrix} 2 \\ -1 \end{bmatrix} \cdot \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} - (-3) = 0$$