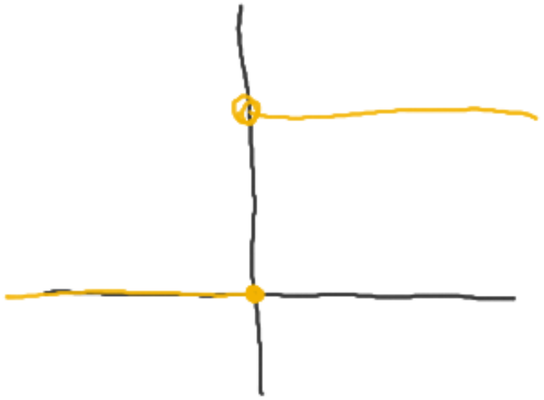
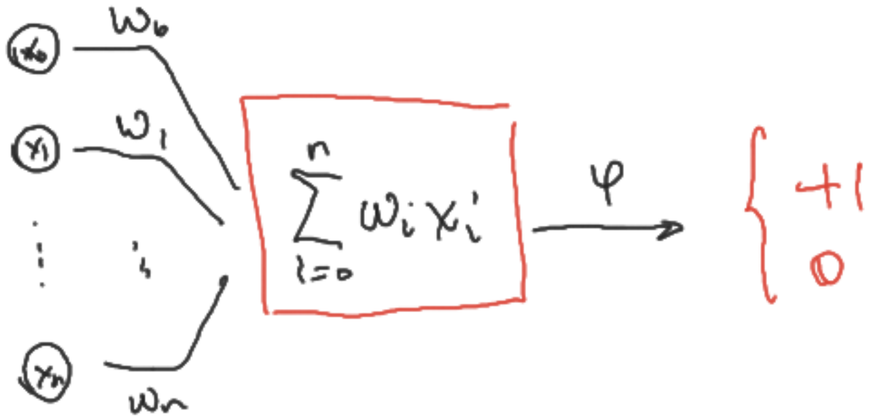
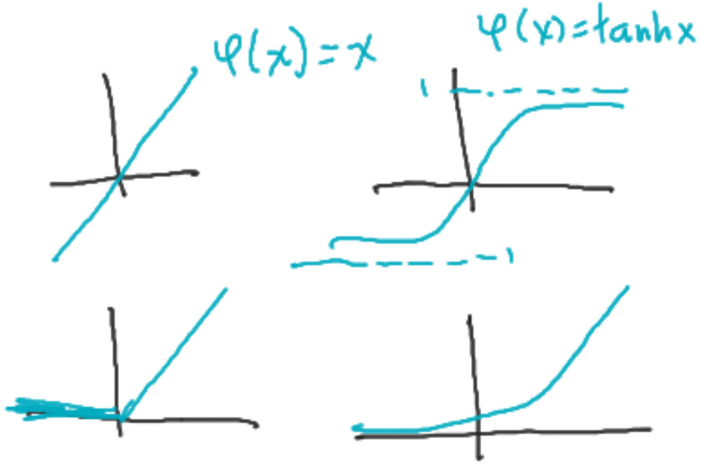
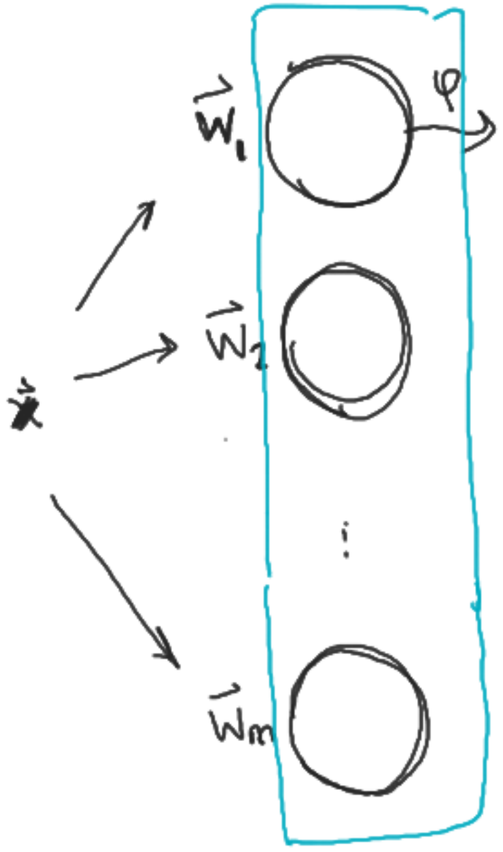


$$\varphi(x) = \begin{cases} 1; & x > 0 \\ 0; & x \le 0 \end{cases}$$







$$w_1 = \begin{pmatrix} w_{11} \\ w_{12} \\ \vdots \\ w_{1n} \end{pmatrix} \qquad \varphi(w_1 \cdot x + b_1)$$

$$w_2 = \begin{pmatrix} w_{21} \\ w_{22} \\ \vdots \\ w_{2n} \end{pmatrix} \qquad \varphi(\vec{w}_2 \cdot x + b_2)$$

$$\vdots \qquad\qquad \vdots$$

$$w_m = \begin{pmatrix} w_{m1} \\ w_{m2} \\ \vdots \\ w_{mn} \end{pmatrix} \qquad \varphi(\vec{w}_m \cdot x + b_m)$$

$$W = \begin{bmatrix} w_{11} & w_{12} & \cdots & w_{1n} \\ w_{21} & w_{22} & \cdots & w_{2n} \\ & & \cdots & \\ w_{m1} & w_{m2} & \cdots & w_{mn} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix} + \begin{bmatrix} b_1 \\ b_2 \\ \vdots \\ b_m \end{bmatrix} = \begin{bmatrix} w_1 \cdot x + b_1 \\ w_2 \cdot x + b_2 \\ \vdots \\ w_m \cdot x + b_m \end{bmatrix}$$

x $\quad$ b

$m \times n \quad n \times 1 \quad m \times 1 \quad m \times 1$

$$W\vec{x} + \vec{b}$$

La salida de toda la capa es

no lineal φ lineal $\left(W\vec{x} + \vec{b} \right) = \begin{bmatrix} \varphi(w_1 x + b_1) \\ \varphi(w_2 x + b_2) \\ \vdots \\ \varphi(w_m x + b_m) \end{bmatrix}_{m \times 1}$