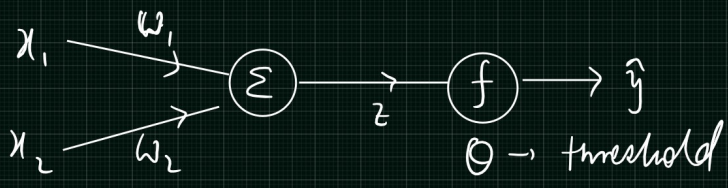
More about

PERCEPTRON



$$z = w_1 x_1 + w_2 x_2 \quad -(1)$$

$$\hat{y} = f(z) = \begin{cases} 1 & z \geq \theta \\ 0 & z < \theta \end{cases}$$

$$= \begin{cases} 1 & w_1 x_1 + w_2 x_2 \geq \theta \\ 0 & w_1 x_1 + w_2 x_2 < \theta \end{cases}$$

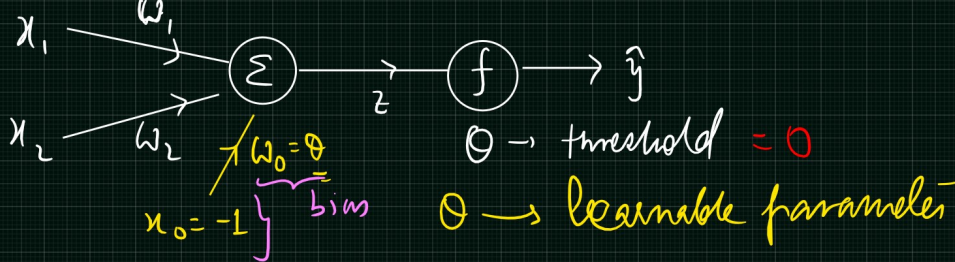
$$= \begin{cases} 1 & w_1 x_1 + w_2 x_2 - \theta \geq 0 \\ 0 & w_1 x_1 + w_2 x_2 - \theta < 0 \end{cases}$$

$$\boxed{w_1 x_1 + w_2 x_2 - \theta}$$

Let $w_0 = \theta$, $x_0 = -1$

$$w_0 x_0 = -\theta \quad -(2)$$

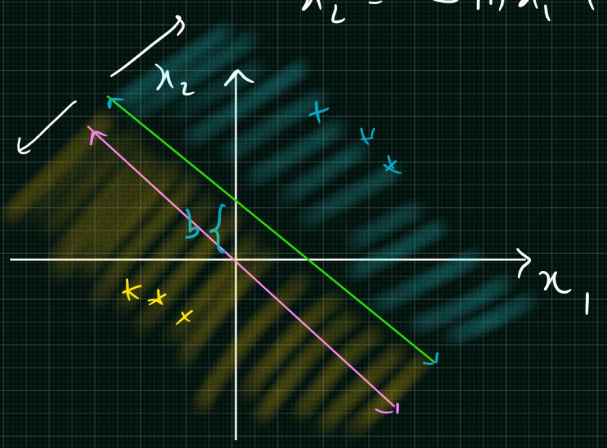
$$w_1 x_1 + w_2 x_2 + w_0 x_0$$



$w_1 x_1 + w_2 x_2 - \theta = 0$ assumption

$$x_2 = -\frac{w_1}{w_2} x_1 + \underbrace{\frac{\theta}{w_2}}$$

$$x_2 = -m x_1 + b$$



m → rotation factor
b → translation factor

if $\theta = 0 \rightarrow b \rightarrow 0$ $x_2 = -m x_1$