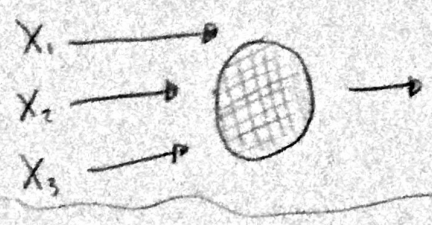
Tarea b



$$X = \begin{bmatrix} X_1 \\ X_2 \\ X_3 \end{bmatrix} = \begin{bmatrix} 4.8 \\ 25.5 \\ -3.3 \end{bmatrix} \qquad W = [W_{11}, W_{12}, W_{13}, W_{1b}]$$

$$= [-1.2, 8, 12.7, 0.33]$$

Evalua Con: Función Sigmoide

Funcion tangente hiperbolica

$$a = \sum_{i=0}^{n} W_{11} * X_1 + W_{12} * X_2 + W_{13} * X_3 + W_{1b} =$$

$$= (-1.2)(4.8) + (8)(25.5) + (12.7)(-3.3) + 0.33 =$$

$$= -5.76 + 204 - 41.91 + 0.33 = 156.66 \quad \therefore a = 156.66$$

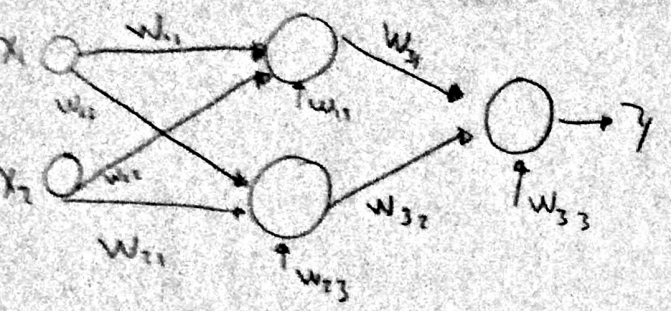
Recordemos...

Función Sigmoide $f(x) = \frac{1}{1 - e^{-x}}$

Función hiperbolica $f(x) = \frac{2}{1 + e^{-2x}} - 1$

Activación Sigmoide $f(a) = \frac{1}{1 - e^{-(156.66)}} = \underline{1}$

Activación tangente hiperbolica $f(a) = \frac{2}{1 + e^{-2(156.66)}} - 1 = 2 - 1 = \underline{1}$



$$X = \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} = \begin{bmatrix} 0.1 \\ 0.5 \end{bmatrix}$$

$$W = \begin{bmatrix} W_{11} & W_{12} & W_{13} \\ W_{21} & W_{22} & W_{23} \\ W_{31} & W_{32} & W_{33} \end{bmatrix} = \begin{bmatrix} -4.8 & 4.6 & -2.6 \\ 5.1 & -5.2 & 3.7 \\ 5.9 & 5.2 & -1.3 \end{bmatrix}$$

Recordar:

Sigmoide:

$$F(x) = \frac{1}{1 - e^{-a}}$$

tangente hiperbolica

$$F(a) = \frac{2}{1 + e^{-2x}} - 1$$

$$S_1 = X_1 \cdot W_{11} + X_2 \cdot W_{22} + W_{13} = a$$

$$a_1 = (0.1)(-4.8) + (0.5)(-5.2) + (-2.6) = -5.68$$

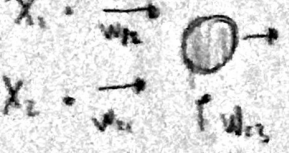
Sigmoide

$$F(a) = \frac{1}{1 - e^{-(-5.68)}} = -0.003425$$

tangente hiperbolica

$$F(a) = \frac{2}{1 + e^{-2(-5.68)}} - 1 = -0.999976$$

$$a_2 = X_1 \cdot W_{12} + X_2 \cdot W_{21} + W_{23}$$



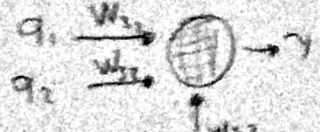
$$a = (0.1)(4.6) + (0.5)(5.1) + 3.2 = 6.21$$

Sigmoide

$$F(a) = \frac{1}{1 - e^{-(6.21)}} = 1.002013$$

tangente hiperbolica

$$F(a) = \frac{2}{1 + e^{-2(6.21)}} - 1 = 1.9999$$



$$Y = a_1 \cdot W_{31} + a_2 \cdot W_{32} + W_{33}$$

Para Sigmoide

$$Y = (-0.003425)(5.9) + (1.002013)(5.2) + (-1.3) = 3.89026$$

$$F(Y) = \frac{1}{1 - e^{-(3.89026)}} = 1.020866$$

Para hiperbolica

$$Y = (0.999976)(5.9) + (1.9999)(5.2) + (-1.3) = 14.9946$$

$$F(Y) = \frac{2}{1 + e^{-2(14.9946)}} = 2$$