

Assignment 1.1

$$Z = w_0 + \sum_{i=1}^n w_i X_i$$

$$\text{Relu} = \max(0, z)$$

$$\text{Find } \hat{y} = \text{Sigmoid} = \frac{1}{1 + e^{-z}}$$

1st Layer iteration!

$$\begin{aligned} Z_1 &= w_0 + w_1 x_1 + w_2 x_2 \\ &= 3 + (3x - 3) + (2x - 1) \end{aligned}$$

$$\boxed{Z_1 = -8}$$

$$\begin{aligned} Z_2 &= 3 + (2x - 2) + (3x - 1) \\ &= 3 - 4 - 3 \end{aligned}$$

$$\boxed{Z_2 = -4}$$

$$\begin{aligned} Z_3 &= 3 + (3x - 4) + (2x - 0) \\ &= 3 - 12 \end{aligned}$$

$$\boxed{Z_3 = -9}$$

$$Z_4 = 3 + (3x - 0) + (2x - 3)$$

$$\boxed{Z_4 = -3}$$

App 9 Activation Function :

$$z_1 = \text{Relu}(0, -8) = \max(0, -8) = 0$$

$$z_2 = \text{Relu}(0, -4) = \max(0, -4) = 0$$

$$z_3 = \text{Relu}(0, -9) = \max(0, -9) = 0$$

$$z_4 = \text{Relu}(0, -3) = \max(0, -3) = 0$$

2nd layers iteration

$$z_5 = 3 + (0 \times -4) + (0 \times 2) + (0 \times 4) + (0 \times 0)$$

$$\boxed{z_5 = 3}$$

$$z_6 = 3 + (0 \times -3) + (0 \times -5) + (0 \times 1) + (0 \times -1)$$

$$\boxed{z_6 = 3}$$

$$z_7 = 3 \times (0 \times -1) + (0 \times 3) + (0 \times 2) + (0 \times -3)$$

$$= 3 \times -10 + 0 + 0 + 0$$

$$\boxed{z_7 = -30}$$

$$z_7 = (3 \times 0) + (0) + (0)$$

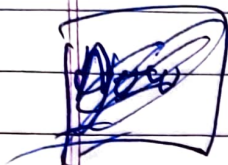
$$\boxed{z_7 = 3}$$

Applying activation Function

$$z_5 = \text{Relu}(0, 3) = \max(0, 3) = 3$$

$$z_6 = \text{Relu}(0, 3) = \max(0, 3) = 3$$

$$z_2 = \text{Relu}(0, 3) = \max(0, 3) = 3$$



$$y = 3 + (3 \times -5) + (3 \times 4) + (3 \times -3)$$

$$= 3 - 15 + 12 - 9$$

$$= -12 + 12 - 9$$

$$\boxed{y = -9}$$

$$y = \frac{1}{1 + e^{-(-9)}}$$

$$= \frac{1}{1 + e^9}$$

$$\boxed{y = 1}$$

$$\boxed{y = \frac{1}{1 + e^{(9)}} = 0.000123}$$