



$$Z = w_0 + \sum_{i=0}^n w_i x_i$$

Hidden layer 1

$$\begin{aligned} z_1 &= 3 + (3x - 3) + (2x - 1) \\ &= 3 + (-9) + (-2) \\ &= -8 \end{aligned}$$

$$\begin{aligned} z_2 &= 3 + (2x - 2) + (3x - 1) \\ &= 3 + (-4) + (3) = -4 \end{aligned}$$

$$\begin{aligned} z_3 &= 3 + (3x - 4) + (2x - 0) \\ &= 3 - 12 = -9 \end{aligned}$$

$$\begin{aligned} z_4 &= 3 + (3x - 0) + (2x - 3) \\ &= 3 + 0 + (-6) \\ &= -3 \end{aligned}$$

Using Relu function.

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

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

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

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

Hidden layer 2

$$Z_5 = 3 + (0 \times 4) + (0 \times 2) + (0 \times 4) + (0 \times 0) = 3$$

$$Z_6 = 3 + (0 \times -3) + (0 \times -5) + (0 \times 1) + (0 \times -1) = 3$$

$$Z_7 = 3 + (0 \times -1) + (0 \times 3) + (0 \times 2) + (0 \times -3) = 3$$

Using Relu function.

$$Z_5 = 3, Z_6 = 3, Z_7 = 3.$$

$$\begin{aligned} y &= 3 + (3 \times -5) + (3 \times 4) + (3 \times -3) \\ &= -12 + 12 - 9 \\ &= -9 \end{aligned}$$

$$y = \frac{1}{1 + e^{-(-9)}} = \frac{1}{1 + e^9} = 0.0001234$$