



$$z = w_0 + \sum_{i=1}^n w_i x_i$$

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

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

* Hidden layer 1.

~~$$z_1 = 3 + (3 \times 3) + (2 \times -1) + (3 \times -1) + (3 \times 4) + (3 \times 0)$$~~

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

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

$$Z_3 = 3 + (3 \times -4) + (2 \times 0)$$

$$= 3 - 12$$

$$= -9$$

$$E = (E, 0) \text{ norm} = 2.5$$

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$$Z_4 = 3 + (3 \times 0) + (2 \times -3)$$

$$= 3 - 6$$

$$= -3$$

$$(E - XE) + (P \times E) + (2 - XE) + E = \hat{P}$$

$$\star \text{ Hidden layer 2. } P = 5 + 21 - E = \hat{P}$$

$$P =$$

acc

Applying the relu activation function.

$$Z_1 = \max(0, -8) = 0$$

$$Z_2 = \max(0, -4) = 0$$

$$Z_3 = \max(0, -9) = 0$$

$$Z_4 = \max(0, -3) = 0$$

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

\star Hidden layer 2.

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

$$= 3$$

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

$$= 3$$

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

$$= 3$$

Applying the ReLU activation function.

$$z_5 = \max(0, 3) = 3$$

$$z_6 = \max(0, 3) = 3$$

$$z_7 = \max(0, 3) = 3 \cdot 0 \times 5 + 8 = 8$$

$$\begin{aligned}\hat{y} &= 3 + (3 \times -5) + (3 \times 4) + (3 \times -3) \\ &= 3 - 15 + 12 - 9 \\ &= -9\end{aligned}$$

Applying the sigmoid function.

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

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

$$= 1.2339 \times 10^{-4}$$

$$(0 \times 0) + (1 \times 0) + (2 \times 0) + (3 \times 0) + 8 = 8$$

$$(1 \times 0) + (1 \times 0) + (2 \times 0) + (3 \times 0) + 8 = 8$$

$$(2 \times 0) + (2 \times 0) + (3 \times 0) + (1 \times 0) + 8 = 8$$