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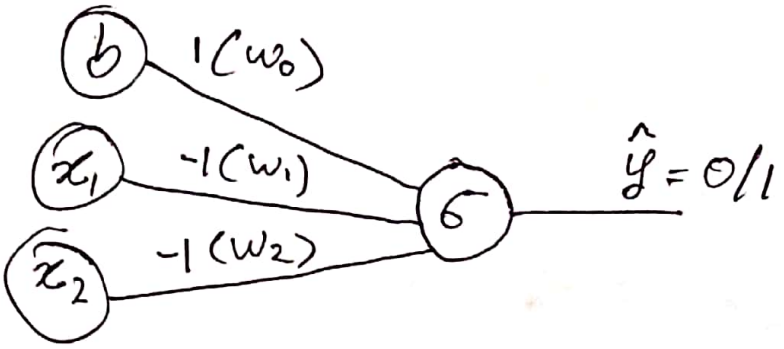
Answer to the Q.No.1

(i)



We know,

$$\hat{y} = \sigma(w_0 b + x_1 w_1 + x_2 w_2)$$

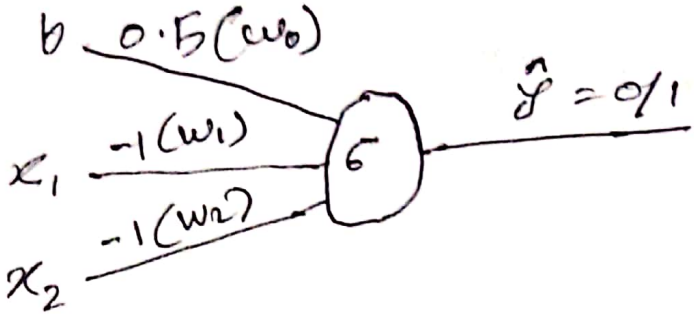
$b = +1$

x_1	x_2	$\hat{y}$
0	0	$\sigma(1\times1 + 0\times-1 + 0\times-1) = 1$
0	1	$\sigma(1\times1 + 0\times-1 + 1\times-1) = \sigma(1-1) = 1$
1	0	$\sigma(1\times1 + 1\times-1 + 0\times-1) = \sigma(1-1) = 1$
1	1	$\sigma(1\times1 + 1\times-1 + 1\times-1) = \sigma(1-2) = \sigma(-1) = 0$

$$\sigma(x) = \begin{cases} 0, & \text{if } x \le 0 \\ 1, & \text{if } x > 0 \end{cases}$$

The truth table given above is same as ~~NOR~~ NAND gate so the output of the first AND simulates ~~NOR~~ NAND gate.

(ii)



~~We know~~

here, $b = +1$

$$\sigma(x) = \begin{cases} 0 ; \text{if } x < 0 \\ 1 ; \text{if } x \geq 0 \end{cases}$$

x_1	x_2	$\hat{y} = \sigma(bw_0 + x_1w_1 + x_2w_2)$
0	0	$\sigma(1\times0.5 + 0\times(-1) + 0\times(-1)) = \sigma(0.5) = 1$
0	1	$\sigma(1\times0.5 + 0\times(-1) + 1(-1)) = \sigma(0.5-1)$ $= \sigma(-0.5) = 0$
1	0	$\sigma(1\times0.5 + 1\times(-1) + 0\times(-1)) = \sigma(0.5-1)$ $= \sigma(0.5) = 0$
1	1	$\sigma(1\times0.5 + 1\times(-1) + 1\times(-1)) = \sigma(0.5-2)$ $= \sigma(-1.5) = 0$

The given table above ~~represents~~ is same as NOR gate so this ANN simulates NOR gate.

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(3)

Answer to the Q.No.2

The main difference between pitts and pencetnon model is in pitts model ~~used~~ uses a threshold value to convert the calculated sum to ~~0~~ 0 or 1. And in perceptnon model an activation function i.e. sigmoid, hyperbolic tangent, ReLU, Leaky ReLU is used to genanate output from the summation. In modern day usage concepts of perceptnon model is used instead of McCulloch & Pitts model.

—— 2 ——