

Exercise 1: Single Neuron + ReLU

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2
1
3

} input matrix (x)

w_{11}	w_{12}	w_{13}	b
1	-1	1	-5

weights (w) bias (b)

1
-1

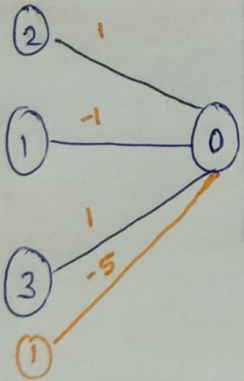
ϕ ReLU

0

$$w \cdot x + b$$

1x3 3x1 +6

Let's consider the one node with 3 different inputs from previous layer



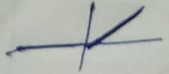
$$\Rightarrow \begin{aligned} 2 \times 1 &= 2 \\ 1 \times -1 &= -1 \\ + \quad 3 \times 1 &= 3 \end{aligned}$$

$$\begin{aligned} &4 \text{ (sum of weighted input)} \\ + &-5 \text{ (bias)} \end{aligned}$$

-1 → now I will put this through relu.

Each input is weighted with weights and then corrected by called bias (-5)

⇒ ReLU → makes -ve $\Rightarrow 0$, and +ve remains unaffected



$$\text{ReLU}(-1) = 0$$