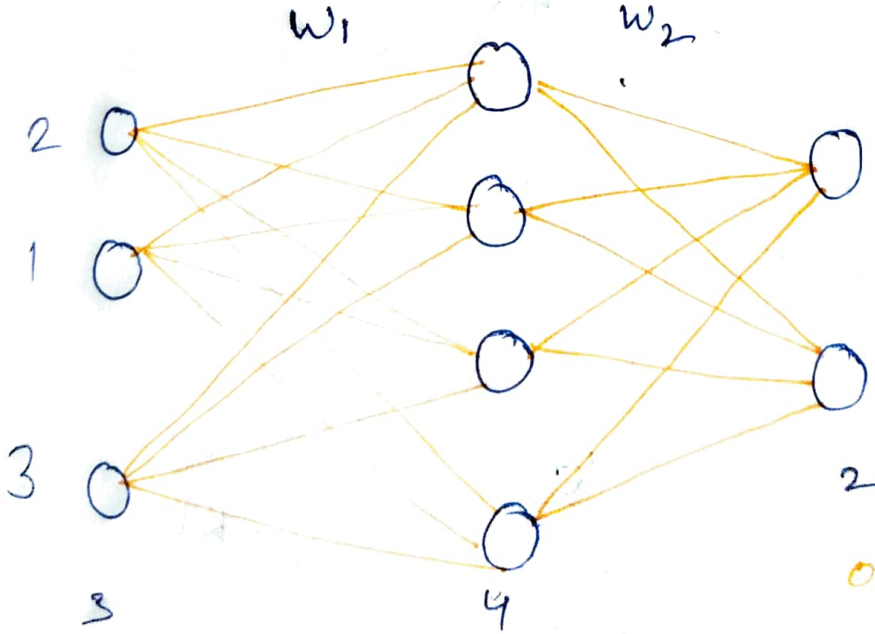
Hidden Layer :→



output layer

4 Neurons

(2x4) weight matrix

+ 2

3

1

~~4x3~~ 4x4

x

2
1
3

(3×1)

ϕ = ReLU

W_1 $\quad$ b

1	-1	1	-5
1	1	0	0
0	1	1	1
1	0	1	-2

(4×3)

-1
3
5
3

$\phi \approx$

0
3
5
3

h

$Wx + b$

$(4\times3)\ (3\times1) + (4\times1)$

(4×1)

$$\begin{bmatrix} 1 & -1 & 1 \\ 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}_{4\times3} \begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix}_{3\times1} + \begin{bmatrix} -5 \\ 0 \\ 1 \\ -2 \end{bmatrix}_{(4\times1)}$$

$$\begin{bmatrix} 2(1) + (-1)(1) + 1(3) - 5 \\ 2(1) + 1(1) + 0(3) + 0 \\ 0(2) + 1(1) + 1(3) + 1 \\ 2(1) + 0(1) + 1(3) - 2 \end{bmatrix} = \begin{bmatrix} -1 \\ 3 \\ 5 \\ 3 \end{bmatrix}$$

$Wx + b$

$(2\times4) + 2$

W_2

1	1	-1	0	0
0	0	1	-1	1

(2×4)

0
3
5
3

4×1

ϕ = ReLU

-2	ϕ	0
3	$\approx$	3

2×1