

CONVOLUTION NEURAL NETWORK

Convolution Layer 1:

P=Null, S=1, b=0

Using filter 1 on RGB:

1	0	-9	-26	-21	-20
-5	0	3	4	-1	-3
-5	-3	6	16	10	2
-8	-14	-20	16	-9	-8
-5	-7	-4	-6	-7	-12
16	15	10	-7	-14	-11

Channel 1 (6x6)

Using filter 2 on RGB:

12	-11	0	6	17	9
-2	1	1	1	10	9
-4	-6	-4	2	13	12
-10	2	6	11	6	-7
-8	-7	0	17	7	-6
-7	-6	-7	9	7	-4

Channel 2 (6x6)

Output of Conv. Layer 1 = (6x6x2)

POOL 1:

P=Null, S=2, F=2 Max Pooling

Channel 1

1	4	-1
-3	16	10
16	10	-7

Channel 2

1	6	17
2	11	13
-6	17	7

Convolution Layer 2:

P=same, s=1, b=1

Filter 1 =

1	0	1
0	-4	0
1	0	1

After padding of channel 1:

1	1	4	-1	-1
1	1	4	10	10
-3	-3	16	10	10
16	16	10	-7	-7
16	16	10	-7	-7

After padding of channel 2:

1	1	6	17	17
1	1	6	17	17
2	2	11	13	13
6	6	17	17	7
6	6	13	7	7

Applying filter:

14	-9	33
43	-55	-34
-25	-24	1

Channel 1

16	9	-21
22	-13	-5
8	-40	16

Channel 2

Merging both channels: and adding bias weight=1:

31	1	13
66	-67	-38
-16	-63	18

← output of Conv. layer 2.

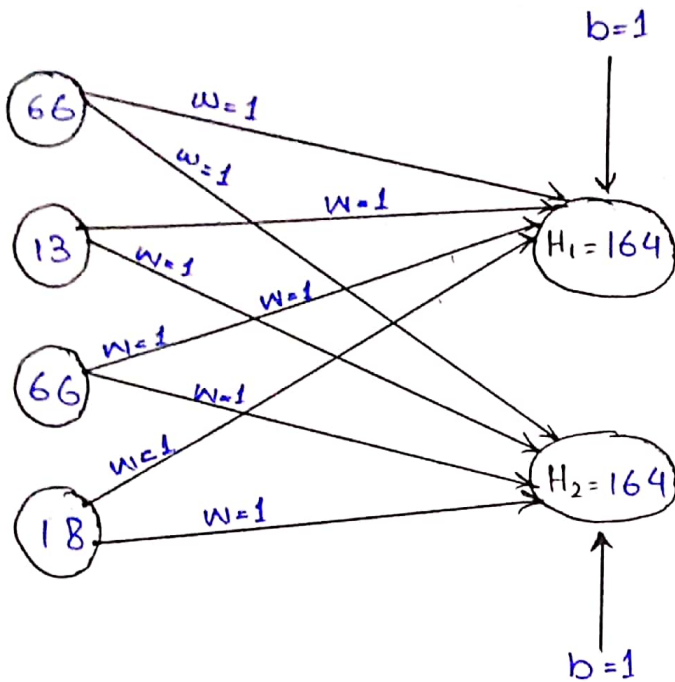
POOL 2:

$P = \text{Null}$, $S = 1$, $F = 2$ Max Pooling

66	13
66	18

FC3:

units = 2, Hidden unit weight = 1, b = 1 Activation func = Sigmoid

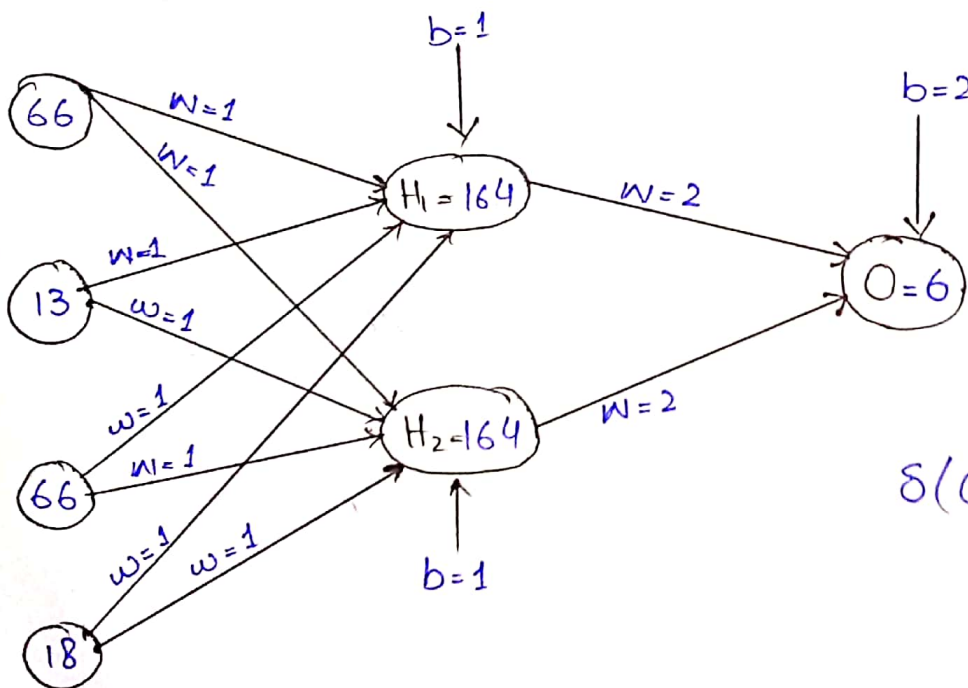


$$\delta(H_1) = \frac{1}{1 + e^{-164}} = 1$$

$$\delta(H_2) = \frac{1}{1 + e^{-164}} = 1$$

Output:

unit = 1, Output unit weight = 2, b = 2, Activation func = Sigmoid



$$\delta(O) = \frac{1}{1 + e^{-6}} = 0.9975273768$$