Exercise : 2

Binary representation. (4) Layers:

old o/p layer → 10

new o/p layer → (4) → 4 bit wise o/p

wtg and bias = ?

for correct o/p → activation func = 0.99

for incorrect o/p → activation func = 0.01

Number	binary Rep
0	0 0 0 0
1	0 0 0 1
2	0 0 1 0
3	0 0 1 1
4	0 1 0 0
5	0 1 0 1
6	0 1 1 0
7	0 1 1 1
8	1 0 0 0
9	1 0 0 1

MSb → d_4, LSb → d_1

d_1 having ones - {1, 3, 5, 7, 9}

d_2 having ones - {2, 3, 6, 7}

d_3 having ones - {4, 5, 6, 7}

d_4 having ones - {8, 9}

∴ we need these to be fired o/p as 1.

z > 0 → 1

z ≤ 0 → 0

(0.99) (1) ≠ (≤ 0.5)

0.99 * 0.5 > 1 ✓

(0.01) (0) = 0 ≤ 0.5

Note: $Z > 0 \Rightarrow 1$, and $Z \leq 0 \Rightarrow 0$

Logical neurons → 0, 99

Unlogical neurons → 0, 01

bias values highly depends on sign

to achive what we needed.

$W = 1$ for ones $W = 0$ for 0's

$b = -0.5$

Case 1:

$$Z = (1)(0.99) - 0.5$$

$$= (0.99) - 0.5$$

$$= 0.49, \quad Z > 0$$

Case 2:

$$Z = (0)(0.01) - 0.5$$

$$= 0 - 0.5$$

$$Z < 0$$

This Works Logical.