

## **Artificial Neural Network - III**

**Yes bank case study**

**1 Activation functions**

**2 Bias in neural network**

**3 Loss functions in neural networks**

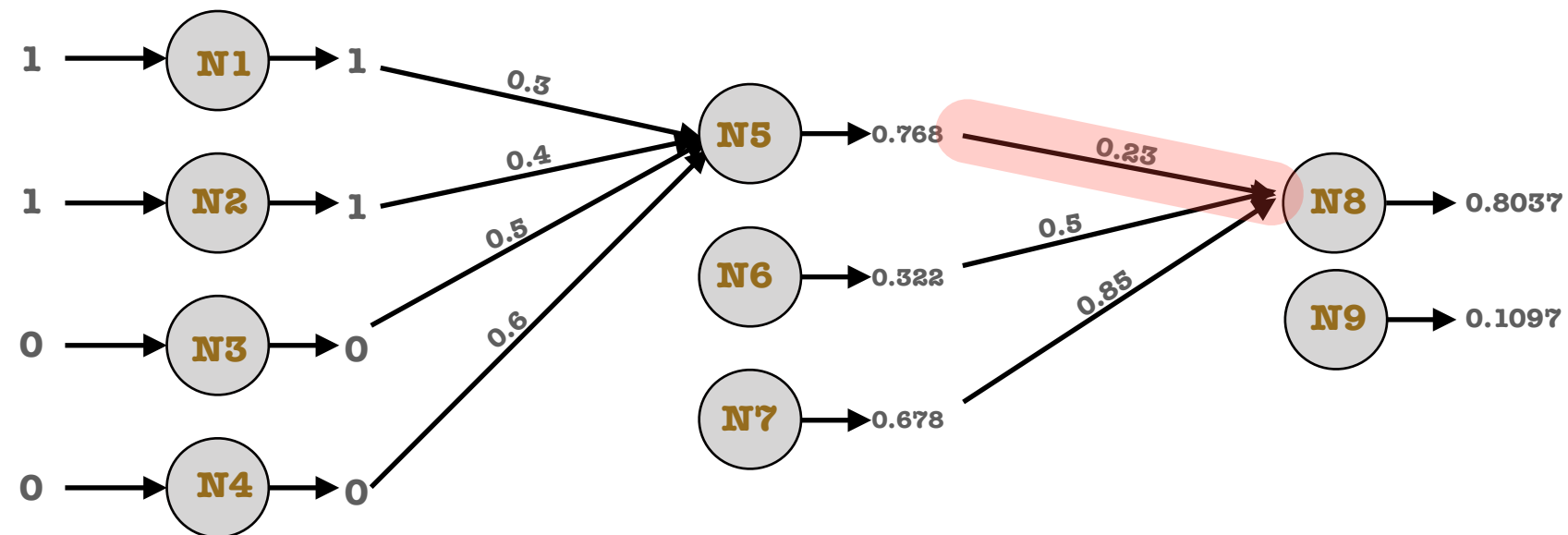
**4 Optimizers in neural network**

**5 Back propagation in neural network**



# Feed Forward and Back propagation

## Artificial Neural Network



Target	LOSS
1	0.03101
0	0.76

$$\begin{aligned} &= \text{sigmoid} [(1 * 0.3) + (1 * 0.4) + (0 * 0.5) + (0 * 0.5) + b] \\ &= \text{sigmoid} [(1 * 0.3) + (1 * 0.4) + (0 * 0.5) + (0 * 0.5) + 0.5] \\ &= 0.768 \end{aligned}$$

$$\begin{aligned} \text{weight\_N5\_to\_N8} &= \text{weight\_N5\_to\_N8} + (\text{learning\_rate} * \text{N8\_loss} * \text{n5\_output}) \\ &= 0.23 + (0.01 * 0.03 * 0.768) \\ &= 0.2302304 \end{aligned}$$



**In 2016 Yes bank observed lot customers were closing there accounts and moving to some other bank service. They had millions of users and they were loosing there customers day by day. It was very difficult to understand the reason behind this.**

**Yes bank decided to give some exiting offers with respect to credit card or loan to those people who are most likely to leave. Hence they hired you to find the people who are most likely to leave the Yes bank and opt for other banking services.**



## **SOLUTION**



Attribute_1	Attribute_2	Attribute_3	Attribute_4	Attribute_5	is_good?	Predicted	Loss
0.1	0.1	0.2	0.2	0.2	1	0	0.9
0.1	0.4	0.3	0.2	0.1	1	1	0.6
0.9	0.8	0.7	0.9	0.9	0	1	0.7
0.1	0.1	0.2	0.2	0.2	1	1	0.7
0.1	0.4	0.3	0.2	0.1	1	1	0.6
0.9	0.8	0.7	0.9	0.9	0	0	0.7
0.1	0.1	0.2	0.2	0.2	1	0	0.9
0.1	0.4	0.3	0.2	0.1	1	1	0.6
0.9	0.8	0.7	0.9	0.9	0	1	0.3
0.1	0.1	0.2	0.2	0.2	1	1	0.9
0.1	0.4	0.3	0.2	0.1	1	1	0.6
0.9	0.8	0.7	0.9	0.9	0	0	0.3

Attribute_1	Attribute_2	Attribute_3	Attribute_4	Attribute_5	is_good?
0.1	0.1	0.2	0.2	0.2	1
0.1	0.4	0.3	0.2	0.1	1
0.9	0.8	0.7	0.9	0.9	0
0.1	0.1	0.2	0.2	0.2	1
0.1	0.4	0.3	0.2	0.1	1
0.9	0.8	0.7	0.9	0.9	0
0.1	0.1	0.2	0.2	0.2	1
0.1	0.4	0.3	0.2	0.1	1
0.9	0.8	0.7	0.9	0.9	0
0.1	0.1	0.2	0.2	0.2	1
0.1	0.4	0.3	0.2	0.1	1
0.9	0.8	0.7	0.9	0.9	0

no\_of\_samples = 12

no\_of\_batches = 4

Find the number of samples in each batch = ?

$$\frac{\text{no\_of\_samples}}{\text{no\_of\_batches}} = \frac{12}{4} = 3$$

Batch\_size = 3

no\_of\_samples = 12

Batch\_size = 3

Total number of batches = ?

$$\frac{\text{no\_of\_samples}}{\text{Batch\_size}} = \frac{12}{3}$$

no\_of\_batches = 4

no\_of\_samples = 12

Batch\_size = 5

Total number of batches = ?

$$\frac{\text{no\_of\_samples}}{\text{Batch\_size}} = \frac{12}{5}$$

no\_of\_batches = 2

no\_of\_batches = 2 + 1 = 3

**Thank you**