

## session - 13

Round 1 :

① for the 1<sup>st</sup> instance ( $x_1 = 0, x_2 = 0$ )

$$\text{sum unit } \xi = x_1 * w_1 + x_2 * w_2 = 0 * 0.9 + 0 * 0.9 = 0$$

Activation unit = 0 (not updated, as the output is correct)

2) For the 2<sup>nd</sup> instance ( $x_1 = 0, x_2 = 1$ )

$$\text{sum unit } \xi = x_1 * w_1 + x_2 * w_2 = 0 * 0.9 + 1 * 0.9 = 0.9$$

$$\text{Error } (\epsilon) = \text{actual} - \text{prediction} = 1 - 0.9$$

update weights :

$$w_1 = w_1 + a * \epsilon = 0.9 + 0.5 * 1 = 1.4$$

$$w_2 = w_2 + b * \epsilon = 0.9 + 0.5 * 1 = 1.4$$

3) for the 3<sup>rd</sup> instance ( $x_1 = 1, x_2 = 0$ )

$$\text{sum unit } \xi = x_1 * w_1 + x_2 * w_2 = 1 * 1.4 + 0 * 1.4$$

Activation unit = (not updated, as the output correct.)

1) For the 1st instance ( $x_1=1, x_2=1$ )

$$\text{Sum unit } \xi = x_1 * w_1 + x_2 * w_2 = 1 * 1 + 1 * 1 = 2$$

Activation unit = 1 (not updated as the output is correct)

### Round 2

1) For the 1st instance ( $x_1=0, x_2=0$ )

$$\text{Sum unit } \xi = x_1 * w_1 + x_2 * w_2 = 0 * 1 + 0 * 1 = 0$$

Activation unit = (not updated)

2) For the 2nd instance ( $x_1=0, x_2=0$ )

$$\text{Sum unit } \xi = x_1 * w_1 + x_2 * w_2 = 1 * 1 + 1 * 1 = 2$$

Activation unit = (not updated as the output correct)

3) For the 3rd instance ( $x_1=1, x_2=0$ )

$$\text{Sum unit } \xi = x_1 * w_1 + x_2 * w_2 = 1 * 1 + 0 * 1 = 1$$

Activation unit = 1

4) For the 4th instance ( $x_1=1, x_2=1$ )

$$\text{Sum unit } \xi = x_1 * w_1 + x_2 * w_2 = 1 * 1 + 1 * 1 = 2$$

Activation unit = 1