

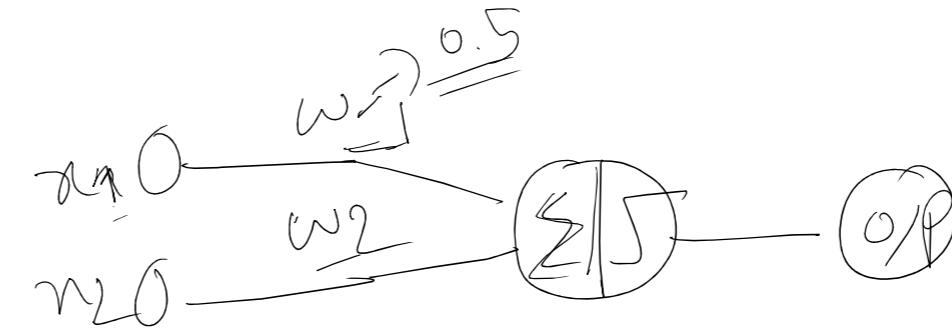
Weight updaton formula:

$$w_{\text{new}} = w_{\text{old}} + \eta(y - \hat{y})x_i$$

error

gradient descent

Special case, $w_{\text{new}} = w_{\text{old}} - \eta \frac{\partial L}{\partial w}$



η - learning rate
 $0-1$
 y = Actual / Target
 \hat{y} = Prediction
 x_i = input

Case 1: $y = 1$ $\hat{y} = 0$ error = 1

$$w_{\text{new}} = w_{\text{old}} + \eta(y - \hat{y})x_i$$

error

$$\Rightarrow \underline{w_{\text{new}}} = \underline{w_{\text{old}}} + \eta \underline{x_i}$$

error

Case: 02: $y = 0$ $\hat{y} = 1$, $\text{error} = -1$

$$w_{\text{new}} = w_{\text{old}} + \eta \underbrace{(y - \hat{y})}_{\text{error}} \underline{x_i}$$

$$w_{\text{new}} = w_{\text{old}} - \eta \underline{x_i}$$

Case: 03: $y = 0$ $\hat{y} = 0$, $\text{error} = 0$

$y = 1$, $\hat{y} = 1$

0

$$w_{\text{new}} = w_{\text{old}} + \eta(y - \hat{y}) \times x_i$$

error

$$w_{\text{new}} = w_{\text{old}}$$