



Mo	Tu	We	Th	Fr	Sa	Su
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Memo No. _____

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ITERATION 4

Before update:

$$\bullet m_3 = 1.34$$

$$\bullet m_4 = 1.916$$

Predictions:

$$\begin{aligned} \hat{y}_1 &= 1.34(1) + 1.916 \\ \hat{y}_1 &= 3.256 \end{aligned}$$

$$\begin{aligned} \hat{y}_2 &= 1.34(3) + 1.916 \\ \hat{y}_2 &= 5.936 \end{aligned}$$

Errors :

$$e_1 = 3 - 3.256$$

$$e_1 = -0.256$$

$$e_2 = 6 - 5.936$$

$$e_2 = 0.064$$



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Compute gradients:

$$\frac{\partial J}{\partial m} = -\frac{2}{2} (1 - 0.256) + 3(0.064)$$
$$= 0.064$$

$$\frac{\partial J}{\partial b} = -\frac{2}{2} (-0.256 + 0.064)$$
$$= 0.192$$

UPDATE PARAMETERS

$$m_4 = 1.34 - 0.1(0.064) = 1.3336$$

$$b_4 = 1.916 - 0.1(0.192) = 1.8968$$



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AFTER UPDATE

New predictions:

$$\hat{y}_1 = 1.3336(1) + 1.8968$$

$$\hat{y}_1 = 3.2304$$

$$\hat{y}_2 = 1.3336(3) + 1.8968$$

$$\hat{y}_2 = 5.8976$$

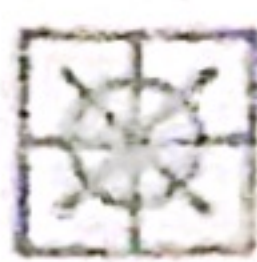
New errors:

$$e_1 = 3 - 3.2304$$

$$e_1 = -0.2304$$

$$e_2 = 6 - 5.8976$$

$$e_2 = 0.1024$$



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New MSE:

$$MSE_4 = \frac{(-0.2304)^2 + (0.1024)^2}{2} = \frac{(0.0531) + (0.0105)}{2}$$

$$MSE_4 = 0.03178$$