

Date: / /
 M T W T F S S

③ $m = 1.05$, $b = 0.66$

$$\hat{y}_1 = 1.05(1) + 0.66 \quad \text{Error}_1 = 2 - 1.71 = 0.29$$

$$\begin{aligned} \hat{y}_2 &= 1.05(2) + 0.66 \quad \text{Error}_2 = 3 - 2.76 = 0.24 \\ &= 2.76 \end{aligned}$$

Gradients:

$$\begin{aligned} \frac{\partial J}{\partial m} &= -2 \left(1 \times 0.29 + 2 \times 0.24 \right) \quad \frac{\partial J}{\partial b} = -2(0.29 + 0.24) \\ &= -1(0.29 + 0.48) \quad = -1(0.53) \\ &= -0.77 \quad = -0.53 \end{aligned}$$

Update $m \& L$:

$$\begin{aligned} m_{\text{new}} &= 1.05 - 0.1(-0.77) \quad b_{\text{new}} = 0.66 - 0.1(-0.53) \\ &= 1.05 + 0.077 \quad = 0.66 + 0.053 \\ &= \underline{\underline{1.127}} \quad = \underline{\underline{0.713}} \end{aligned}$$

\hat{y} - predicted:

$$\begin{aligned} y_1 &= 1.127(1) + 0.713 \\ &= 1.84 \end{aligned}$$

$$\text{Error}_1 = 2 - 1.84 = \underline{\underline{0.16}}$$

$$\begin{aligned} y_2 &= 1.127(2) + 0.713 \\ &= 2.967 \end{aligned}$$

$$\text{Error}_2 = 3 - 2.967 = \underline{\underline{0.033}}$$



$$MSE = \frac{(0.16)^2 + (0.033)^2}{2}$$

$$= 0.0133445$$