

4th iteration

$$m = 1.34$$

$$b = 1.916$$

$$y = mx + b$$

point A(1,3)

point B(3,6)

$$y_i = 1.34(1) + 1.916$$

$$= 3.25$$

$$\hat{y}_i = 1.34(3) + 1.916$$

$$= 5.93$$

$$\frac{dJ}{dm} = \frac{-2}{n} \sum (y_i - \hat{y}_i) x_i$$

$$= \frac{-2}{2} \left[(3 - 3.25) + (6 - 5.93)(3) \right]$$

$$= \frac{-2}{2} \left[(-0.25) + (0.07) \right]$$

$$= 0.04$$

$$\frac{dJ}{db} = \frac{-2}{n} \left[(3 - 3.25) + (6 - 5.93) \right]$$

$$= \frac{-2}{2} \left[(-0.25) + (0.07) \right]$$

$$= -0.18$$

$$m_{\text{new}} = m_{\text{old}} - \alpha \frac{dJ}{dm}$$

$$= 1.34 - 0.1 (0.04)$$

$$= 1.34 - 0.004$$

$$= \underline{\underline{1.33}}$$

$$b_{\text{new}} = 1.916 - 0.1 (-0.18)$$

$$= 1.916 + 0.018$$

$$= 1.934$$

New equation

$$y = 1.33x + 1.934$$