

$$2) e) E(w) = \sum_{i=1}^{50} (y_i - (w_0 + w_1 x_i))^2$$

$$g = \begin{bmatrix} \frac{\partial E}{\partial w_0} \\ \frac{\partial E}{\partial w_1} \end{bmatrix}$$

$$\frac{\partial E}{\partial w_0} = -2 \sum_{i=1}^{50} (y_i - (w_0 + w_1 x_i))$$

$$\frac{\partial E}{\partial w_1} = -2 \sum_{i=1}^{50} (y_i - (w_0 + w_1 x_i)) x_i$$

$$g_b = -2 \sum_{i=1}^{50} (y_i - (w_0 + w_1 x_i)) \begin{bmatrix} 1 \\ x_i \end{bmatrix} \text{ where } i=1 \text{ to } 50$$

↳ batch learning

To update weights for every sample, we have to use

$$g_o = -2 (y_i - (w_0 + w_1 x_i)) \begin{bmatrix} 1 \\ x_i \end{bmatrix}$$

↳ online learning