1.2) Batch Gradient Descent

errors:

$$e_1 = \hat{y}_1 - y_1 = 0 - 2 = -2$$

$$e_2 = \hat{y}_2 - y_2 = 0 - 3 = -3$$

$$\Rightarrow \frac{\partial L}{\partial w_1} = \frac{2}{N} \sum e_i x_{1i}$$

$$\frac{\partial L}{\partial w_2} = \frac{2}{N} \sum e_i x_{2i}$$

$$\frac{\partial L}{\partial b} = \frac{2}{N} \sum e_i$$

for $N = 2$

$$\frac{\partial L}{\partial w_1} = \frac{2}{2}\left[(-2)(1) + (-3)(2)\right] = -8$$

$$\frac{\partial L}{\partial w_2} = \frac{2}{2}\left[(-2)(2) + (-3)(1)\right] = -5$$

$$\frac{\partial L}{\partial b} = \frac{2}{2}(-2-3) = -5$$

$$\boxed{\frac{\partial L}{\partial w_1} = -8} \qquad \boxed{\frac{\partial L}{\partial w_2} = -5}$$

to

$$\boxed{\frac{\partial L}{\partial b} = -5}$$