

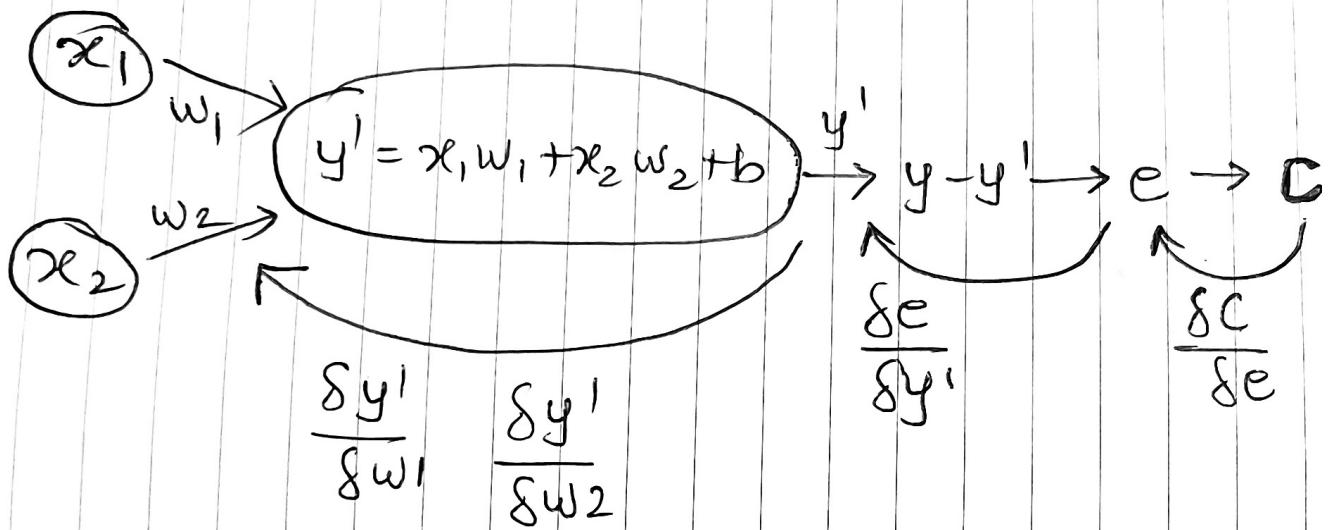
x_1	x_2	y
10	100	5
20	200	10
30	300	15

Diagram illustrating the forward pass of a linear regression model:

- Inputs: $x_1 = 10$, $x_2 = 100$
- Weights: $w_1 = 1$, $w_2 = 1$
- Bias: $b = 1$
- Model: $y' = x_1 w_1 + x_2 w_2 + b$
- Output: $y' = 10 \cdot 1 + 100 \cdot 1 + 1 = 111$
- Error: $e = y - y' = 106 - 111 = -5$
- MSE: $\frac{e_1^2 + e_2^2 + e_3^2}{3} = MSE$

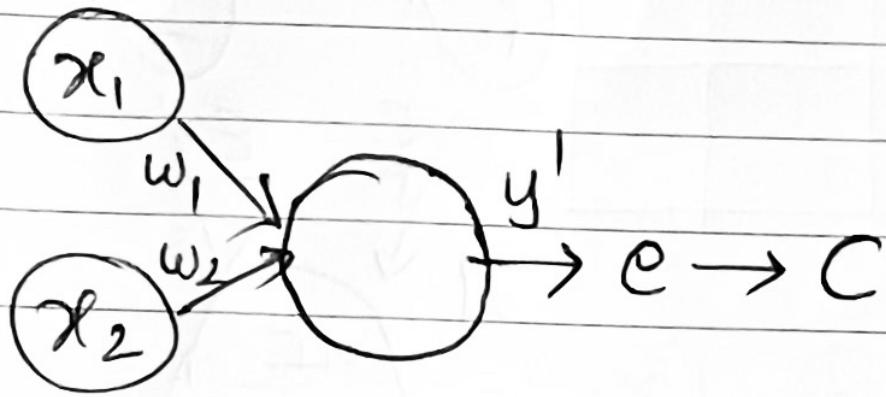
$$w_1' = w_1 - LR * Pd(w_1)$$

$$w_2' = w_2 - LR * Pd(w_2)$$



$$\frac{\delta C}{\delta w_1} = \frac{\delta C}{\delta e} * \frac{\delta e}{\delta y'} * \frac{\delta y'}{\delta w_1}$$

VGP



$$w_1 = w_1 - LR * Pd(w_1)$$

$$\frac{\delta C}{\delta w_1} = \frac{\delta C}{\delta e} * \frac{\delta e}{\delta y'} * \frac{\delta y'}{\delta w_1}$$

Gradient

→ 0.005

$$\begin{aligned} w_1 &= w_1 - (0.01) * 0.005 \\ &= w_1 - 0.00005 \end{aligned}$$

won't change much

Date: _____

EGP

$$\frac{\delta C}{\delta w_1} = 100 * 200 * 300$$

$$= 6000000$$

$$w_1 = w_1 - (0.01) * 6000000$$

$$= w_1 - 60000$$

huge change.

