

* Linear Regression with Gradient Descent

① → Initially,

$$m = 0 ; c = 0$$

$$L = \text{Learning Rate} = 0.0001$$

② → Calculating partial derivative of loss function w.r.t m & c

$$D_m = \frac{1}{n} \sum_{i=0}^n 2 (y_i - (mx_i + c)) (-x_i)$$

Partial derivative w.r.t m ,

$$D_m = -\frac{2}{n} \sum_{i=0}^n x_i (y_i - \bar{y}_i)$$

Partial derivative w.r.t c ,

$$D_c = -\frac{2}{n} \sum_{i=0}^n (y_i - \bar{y}_i)$$

③ → Updating current values of m & c

$$m = m - L \times D_m$$

$$c = c - L \times D_c$$

④ → Repeat ~~1~~ ② & ③ until Loss = 0