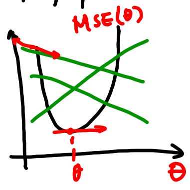
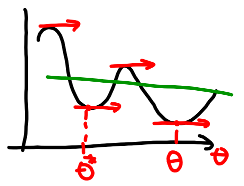
	x	$\hat{y}$
	h	N
x_1	5	45
x_2	3	2
⋮	⋮	⋮

$\hat{y} = \theta_0 \cancel{x_0} + \theta_1 x_1$

$\hat{y} = h_\theta(x) = [\theta][x]$
$= x^T \theta$

$X = \begin{bmatrix} x_0 \\ x_1 \end{bmatrix}$ $\theta = \begin{bmatrix} \theta_0 \\ \theta_1 \end{bmatrix}$

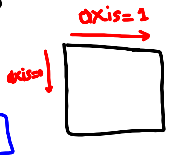




$X = [[49, \ldots,]]$

x.shape (1, 5)

y.shape (1, 5)



[0, 1, 2]

(3,)

✓ $x = [[49], [69], [\ ]]$

x.shape (5, 1)

Lr.fit (x, y)

$MSE(\theta) = \frac{1}{m} \sum_{m=1}^{m} (\theta^T x - y)^2$

$\nabla MSE(\theta) = \begin{bmatrix} \frac{\partial MSE(\theta)}{\partial \theta_0} \\ \frac{\partial MSE(\theta)}{\partial \theta_1} \end{bmatrix} = \frac{1}{m} \cdot 2 (\theta^T x - y) x$

$\hat{y} = \theta_0 + \theta_1 x_1$

$[\theta] = \begin{bmatrix} \theta_0 \\ \theta_1 \end{bmatrix}$

$[\hat{y}] = [x][\theta]$

$x = \begin{bmatrix} 49 \\ 69 \\ 89 \\ 99 \\ 109 \end{bmatrix}$ $y = \begin{bmatrix} 124 \\ 95 \\ 71 \\ 45 \\ 18 \end{bmatrix}$

$[\hat{y}] = [x][\theta^T]$

$MSE(\theta) = \frac{1}{m} \sum_{m=1}^{5} (x\theta^T - y)^2$

$\nabla MSE(\theta) = \begin{bmatrix} \frac{\partial MSE}{\partial \theta_0} \\ \frac{\partial MSE}{\partial \theta_1} \end{bmatrix} = \frac{1}{m} \sum_{m=1}^{5} (\theta_0 + \theta_1 x - y)^2$

$= \frac{2}{m} (\theta_0 \cancel{x_0} + \theta_1 x_1 - y) \cdot (x_0)$

$= \frac{2}{5}$

$\begin{bmatrix} 0 \\ 0 \end{bmatrix}$

$\hat{\theta} = \theta - \nabla MSE(\theta) \cdot \alpha$ $\frac{2}{m} (\theta_0 x_0 + \theta_1 x_1 - y) \cdot (x_1)$