ÖRNEK

x	y
0	1
1	2
2	3

$$h_\theta(x) = \theta_0 + \theta_1 x$$

$$\theta_0 = 0 \ , \ \theta_1 = 0$$

x	$h_\theta(x)$	y	hata
0	0	1	-1
1	0	2	-2
2	0	3	-3

$$J(\theta) = \frac{1}{2m} \sum_{i=1}^{m} (h_\theta x_i - y_i)^2$$

$$J\theta = \frac{1}{2 \cdot 3} \sum_{i=1}^{3} (h_\theta x_i - y_i)^2 = \frac{1}{6}\left((-1)^2 + (-2)^2 + (-3)^2\right) = \frac{14}{6}$$

$$\theta_j = \theta_j - \alpha \frac{\partial J(\theta)}{\partial \theta_j}$$

$$\frac{\partial J(\theta)}{\partial \theta_0} = \frac{1}{m} \sum_{i=1}^{m} (\theta_0 + \theta_1 x_i - y_i) \cdot 1 = \frac{1}{3}\left[(-1) + (-2) + (-3)\right] = -2$$

$$\frac{\partial J\theta}{\partial \theta_1} = \frac{1}{m} \sum_{i=1}^{m} (\theta_0 + \theta_1 x_i - y_i) \cdot x_i = \frac{1}{3}\left[(-1) \cdot 0 + (-2) \cdot 1 + (-3) \cdot 2\right] = \frac{-8}{3} = -2.6$$

$$\theta_0 = 0 - 0.1(-2) = 0.2$$

$$\theta_1 = 0 - 0.1(-2.6) = 0.26$$

$x=0 \quad h_\theta(x) = 0.2 + 0.26 \cdot 0 = 0.2$

$x=1 \quad = 0.2 + 0.26 \cdot 1 = 0.46$

$x=2 \quad = 0.2 + 0.26 \cdot 2 = 0.72$

x	$h_\theta(x)$	y	Hata
0	0.2	1	-0.8
1	0.46	2	-1,54
2	0,72	3	-2,28

$$\frac{\partial J\theta}{\partial \theta_0} = -1,54$$

$$\frac{\partial J\theta}{\partial \theta_1} = -2,033$$

$$\theta_0 = 0,2 - (0,1)(-1,54) = 0,354$$

$$\theta_1 = 0,26 - (0.1) - 2,033 = 0,4633$$

x	$h_\theta(x)$	y	Hata
0		1	-0,646
1		2	-1,1827
2		3	-1,8734

$x=0 \Rightarrow h_\theta(x) = 0,354 + 0 = 0,354$

$x=1$ $\quad 0,354 + 0,4633 = 0,8173$

$x=2$ $\quad 0,354 + 0,9266 = 1,1266$