Q(4) Repeat until $J(\theta)$ stops improving:

$$\theta_j \leftarrow \theta_j - \alpha \frac{1}{2} \sum_{i=1}^{m} (X^{(i)}$$

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

where $J(\theta) = \frac{1}{2} \sum_{i=1}^{m} \frac{1}{2} (X^{(i)}\theta - Y^{(i)})^2$

$$\frac{\partial J}{\partial \theta_j} = \sum_{i=1}^{m} (X^{(i)}\theta_j - Y^{(i)}) X_j^{(i)}$$

$\rightarrow j^{th}$ feature of i^{th} training example.

$$\Rightarrow \theta_j \leftarrow \theta_j - \alpha \sum_{i=1}^{m} (X^{(i)}\theta - Y^{(i)}) X_j^{(i)}, \; j = 1, 2, \ldots, n$$

Pseudo code

Repeat
{ For $j = 1, 2, \ldots, n$

$$\theta_j \leftarrow \theta_j - \alpha \sum_{i=1}^{m} (X^{(i)}\theta - Y^{(i)}) X_j^{(i)}$$

}

until $J(\theta)$ stops improving.