**≮**Back to Week 2

i≣Lessons

Prev

Next

## Gradient Descent For Multiple Variables

## **Gradient Descent for Multiple Variables**

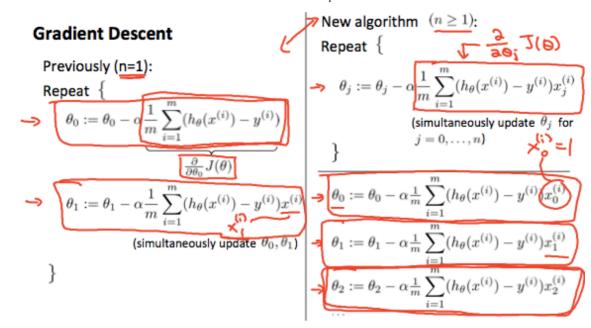
The gradient descent equation itself is generally the same form; we just have to repeat it for our 'n' features:

repeat until convergence: { 
$$\theta_0 := \theta_0 - \alpha \frac{1}{m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) \cdot x_0^{(i)}$$
 
$$\theta_1 := \theta_1 - \alpha \frac{1}{m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) \cdot x_1^{(i)}$$
 
$$\theta_2 := \theta_2 - \alpha \frac{1}{m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)}) \cdot x_2^{(i)}$$
 ... }

In other words:

repeat until convergence: { 
$$\theta_j := \theta_j - \alpha \, \frac{1}{m} \sum_{i=1}^m (h_\theta(x^{(i)}) - y^{(i)}) \cdot x_j^{(i)} \qquad \text{for j} := 0...n}$$
 }

The following image compares gradient descent with one variable to gradient descent with multiple variables:



Mark as completed

