Environment Setup Instructions

Multivariate Linear Regression

- **Video:** Multiple Features 8 min
- **Reading:** Multiple Features 3 min
- **Video:** Gradient Descent for Multiple Variables 5 min
- **Reading:** Gradient Descent For Multiple Variables 2 min
- **Video:** Gradient Descent in Practice I - Feature Scaling 8 min
- **Reading:** Gradient Descent in Practice I - Feature Scaling 3 min
- **Video:** Gradient Descent in Practice II - Learning Rate 8 min
- **Reading:** Gradient Descent in Practice II - Learning Rate 4 min
- **Video:** Features and Polynomial Regression 7 min
- **Reading:** Features and Polynomial Regression 3 min

Computing Parameters Analytically

Submitting Programming Assignments

Review

Octave/Matlab Tutorial

Review

Features and Polynomial Regression

We can improve our features and the form of our hypothesis function in a couple different ways.

We can **combine** multiple features into one. For example, we can combine x_1 and x_2 into a new feature x_3 by taking $x_1 \cdot x_2$.

Polynomial Regression

Our hypothesis function need not be linear (a straight line) if that does not fit the data well.

We can **change the behavior or curve** of our hypothesis function by making it a quadratic, cubic or square root function (or any other form).

For example, if our hypothesis function is $h_\theta(x) = \theta_0 + \theta_1 x_1$ then we can create additional features based on x_1, to get the quadratic function $h_\theta(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_1^2$ or the cubic function $h_\theta(x) = \theta_0 + \theta_1 x_1 + \theta_2 x_1^2 + \theta_3 x_1^3$

In the cubic version, we have created new features x_2 and x_3 where $x_2 = x_1^2$ and $x_3 = x_1^3$.

To make it a square root function, we could do: $h_\theta(x) = \theta_0 + \theta_1 x_1 + \theta_2 \sqrt{x_1}$

One important thing to keep in mind is, if you choose your features this way then feature scaling becomes very important.

eg. if x_1 has range 1 - 1000 then range of x_1^2 becomes 1 - 1000000 and that of x_1^3 becomes 1 - 1000000000

✓ Complete

Go to next item