1 Regression

Introduction

Linear regression is the

Cost

$$J(\theta) = 1/2m\sum_{i=1}^{m}(h_{(\theta)}^{(i)} - y^{(i)})^2 \tag{1}$$

Gradient

$$\frac{\partial J(\theta)}{\partial \theta_j} = 1/m\sum_{i=1}^{m}(h_{(\theta)}^{(i)} - y^{(i)}).X_j^{(i)} \tag{2}$$

Gradients

$$\theta_0 := \theta_0 - \alpha.(1/m.\sum_{i=1}^{m}(h_{(\theta)}^{(i)} - y^{(i)}).X_0^{(i)}) \tag{3}$$

$$\theta_1 := \theta_1 - \alpha.(1/m.\sum_{i=1}^{m}(h_{(\theta)}^{(i)} - y^{(i)}).X_1^{(i)}) \tag{4}$$

$$\theta_2 := \theta_2 - \alpha.(1/m.\sum_{i=1}^{m}(h_{(\theta)}^{(i)} - y^{(i)}).X_2^{(i)}) \tag{5}$$

$$\theta_j := \theta_j - \alpha.(1/m.\sum_{i=1}^{m}(h_{(\theta)}^{(i)} - y^{(i)}).X_0^{(i)}) \tag{6}$$

Gradient Descent

Repeat

$$\theta_j := \theta_j - \alpha^* \frac{\partial J(\theta)}{\partial \theta_j} \tag{7}$$

Stochastic Gradient Descent

Repeat

$$\theta_j := \theta_j - \alpha^* \frac{\partial J(\theta)}{\partial \theta_j}(X^{(i)}, y^{(i)}) \tag{8}$$

Minibatch Gradient Descent

Repeat

$$\theta_j := \theta_j - \alpha^* \frac{\partial J(\theta)}{\partial \theta_j}(X_b^{(i)}, y_b^{(i)}) \tag{9}$$