May 3rd, 2016

Machine Learning – Introduction

Supervised Learning

* Already know answer and data will match answer
* Data set aka Training set
* Training set –> Machine learning –> Hypothesis
* Predictions of the future (The weather, farm crops, etc …)

Linear Regression Model Cost Function:

* + Minimize **θ**1, **θ**2 in J(**θ**1, **θ**2) = (1/2m) summation (i = 1 to m) of (h(xi) – yi)2

Unsupervised Learning

* Don’t know answer and data will categorize itself
* Classification of data into groups (such as cancer tumours)

May 6th, 2016-05-06

Gradient Descent Algorithm (Batch)

* Batch: Each step of gradient descent uses all the training examples
* Imagine you’re on a hill and you need to find quickest way down to bottom (local min)
* Go 360 degrees around every time and find which baby step takes you down the fastest

Formula:

* + **Θj := Θj – α(partial derivative wrt to Θj to** J(**θ**0, **θ**1)
  + **:= is assignment operator, α is learning rate**
* Need to have simultaneous update (method below):
  + Temp0 for **θ**0
  + Temp1 for **θ**1
  + **Θ**0 := temp0
  + **θ**1 := temp1
* **Θ0 := Θ0 – (**α/m)**(**summation (i = 1 to m) of (h(xi) – yi))
* **Θ1 := Θ1 – (**α/m)**(**summation (i = 1 to m) of (h(xi) – yi))(xi)