

LECTURE 2

LINEAR REGRESSION

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<http://hunkim.github.io/ml>

Acknowledgement

01. Andrew Ng's ML Class

- <https://class.coursera.org/ml-003/lecture>
- [http://www.holehouse.org/mlclass\(note\)](http://www.holehouse.org/mlclass(note))

02. Convolutional Neural Networks for Visual Recognition

- <http://cs231n.github.io>

03. TensorFlow

- <https://www.tensorflow.org>
- <https://github.com/aymericdamien/TensorFlow-Examples>

Predicting Exam Score : Regression

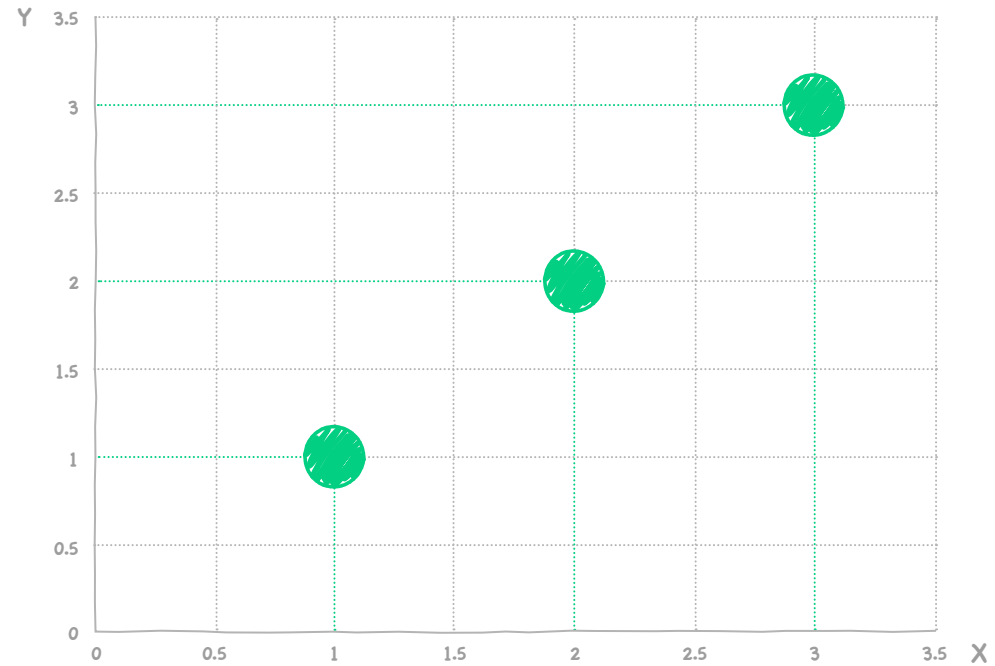
X (hours)	Y (score)
10	90
9	80
3	50
2	30

Regression (Data)

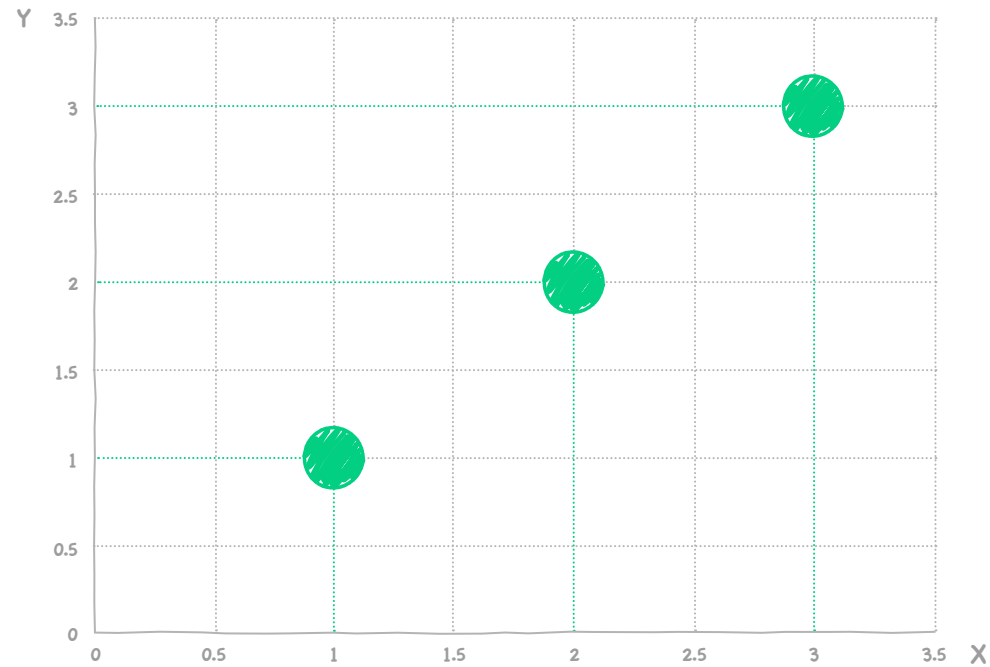
X	Y
1	1
2	2
3	3

Regression (Presentation)

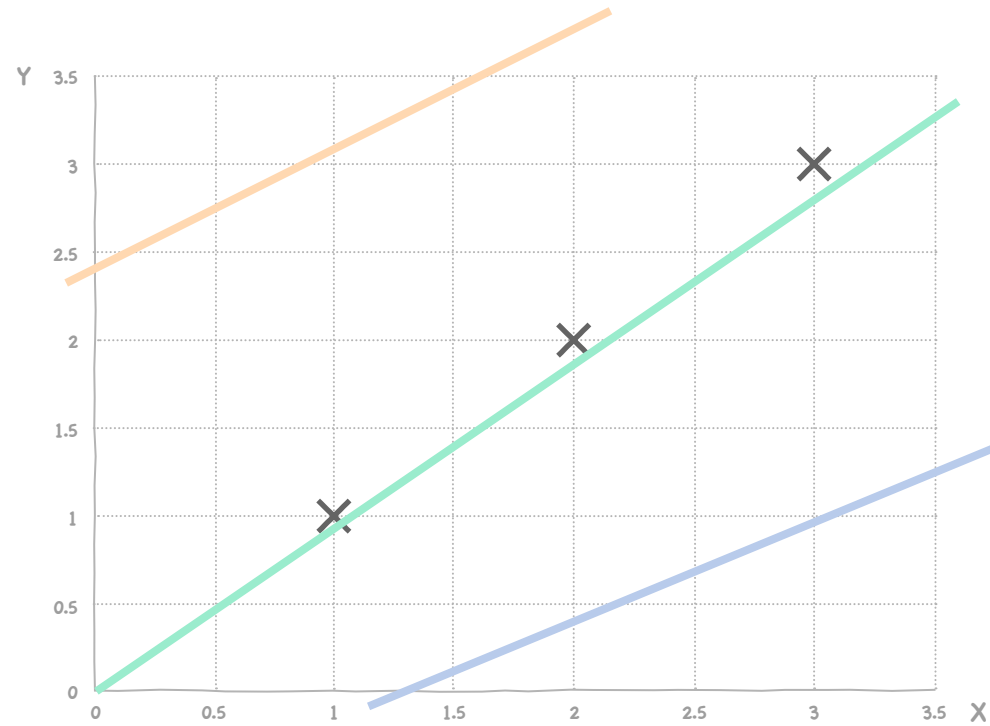
X	Y
1	1
2	2
3	3



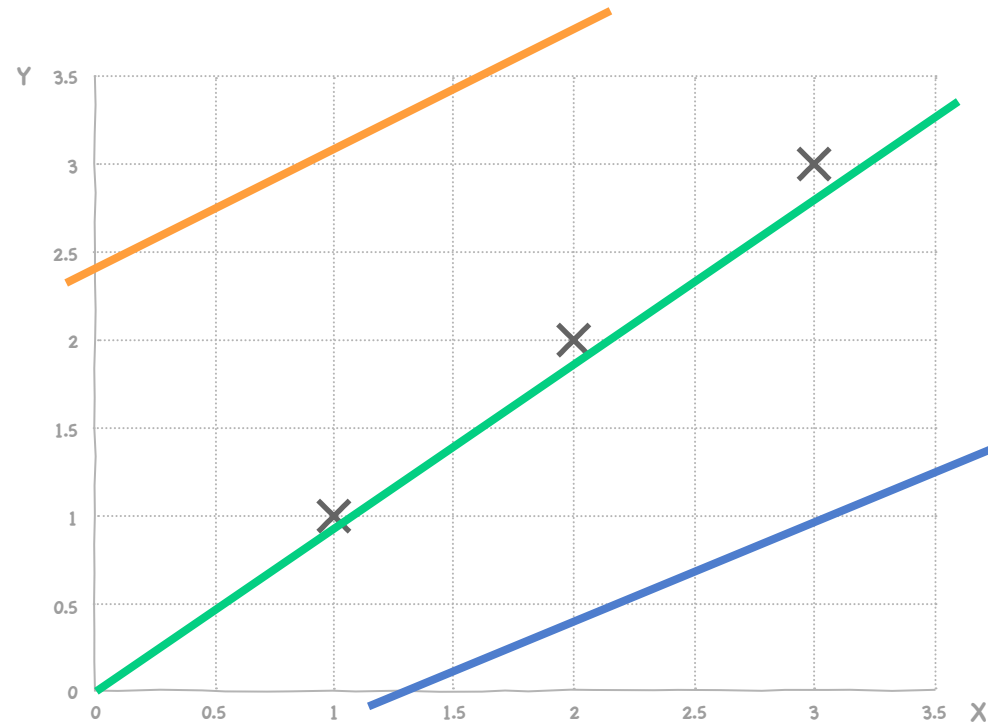
Hypothesis (Linear)



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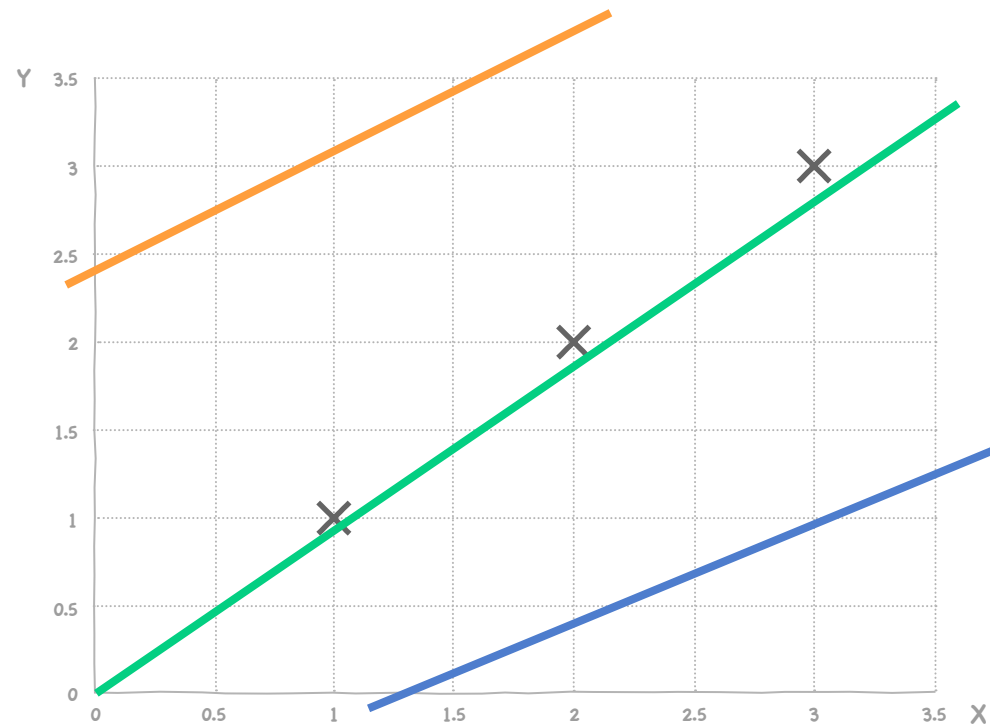


Hypothesis (Linear)

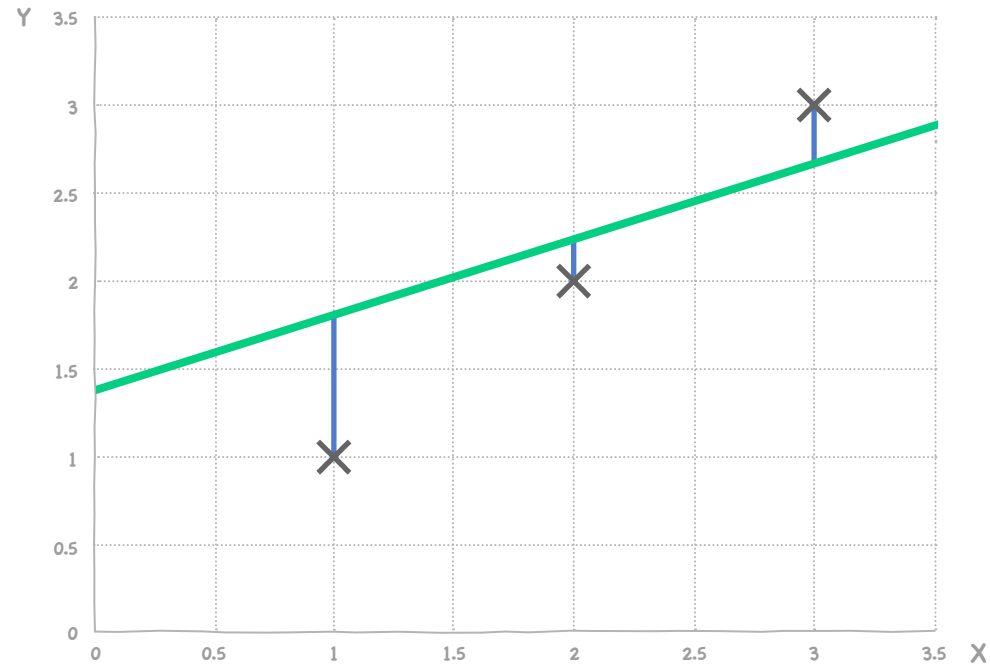


$$\underline{H(x) = Wx + b}$$

Which Hypothesis Is Better?



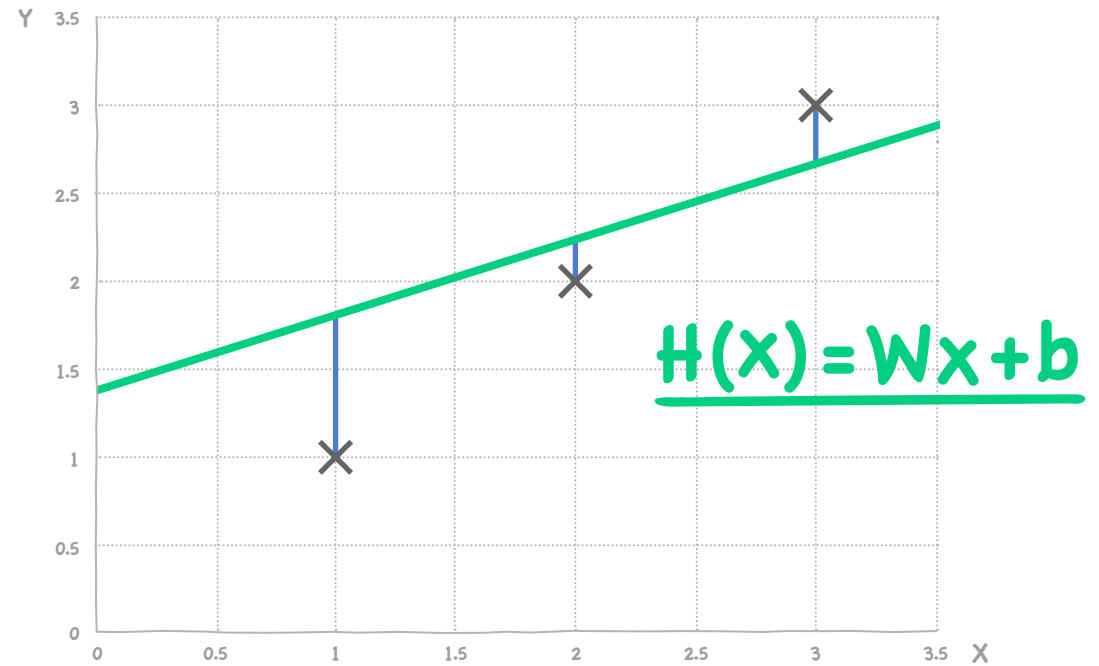
Which Hypothesis Is Better?



Cost Function

How fit the line to our (training) data

$$H(x) - y$$

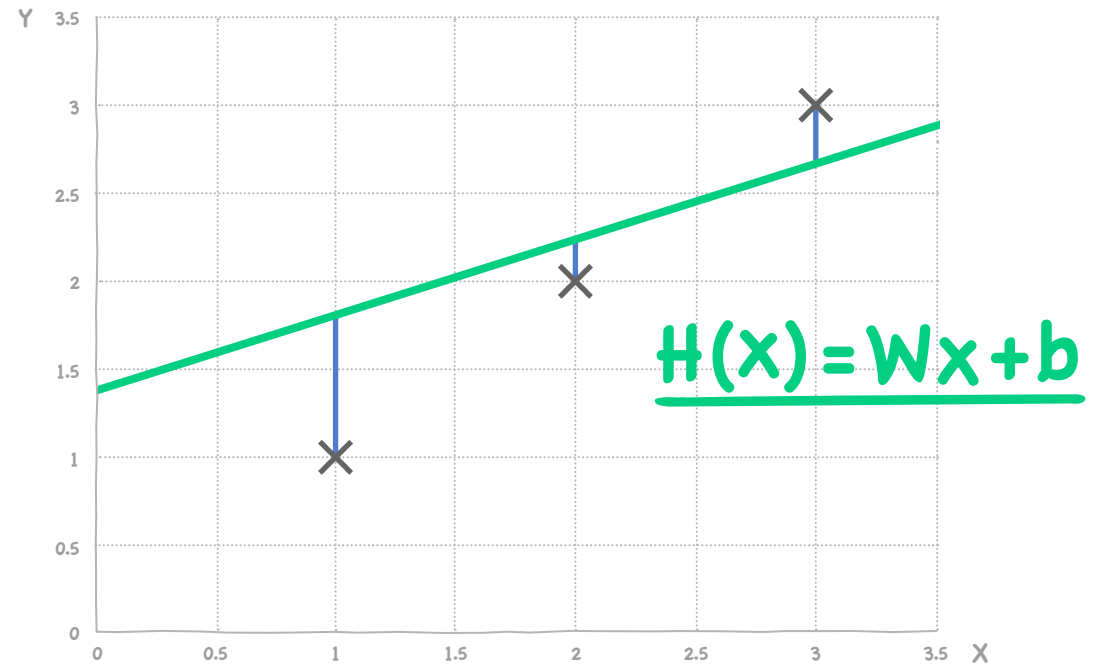


Cost Function

How fit the line to our (training) data

$$\frac{(H(x^{(1)}) - y^{(1)})^2 + (H(x^{(2)}) - y^{(2)})^2 + (H(x^{(3)}) - y^{(3)})^2}{3}$$

$$\text{cost} = \frac{1}{m} \sum_{i=1}^m (H(x^{(i)}) - y^{(i)})^2$$



Cost Function

$$\text{cost}(W) = \frac{1}{m} \sum_{i=1}^m (\text{H}(x^{(i)}) - y^{(i)})^2$$

$$\text{H}(x) = Wx + b$$

$$\text{cost}(W, b) = \frac{1}{m} \sum_{i=1}^m (\text{H}(x^{(i)}) - y^{(i)})^2$$

Goal : Minimize Cost

Minimize Cost(W, b)
 W, b



NEXT LECTURE

HOW TO MINIMIZE COST