Linear regression with one variable

Cost function

melhor linha recta para os nossos dados

Machine Learning

Training Set

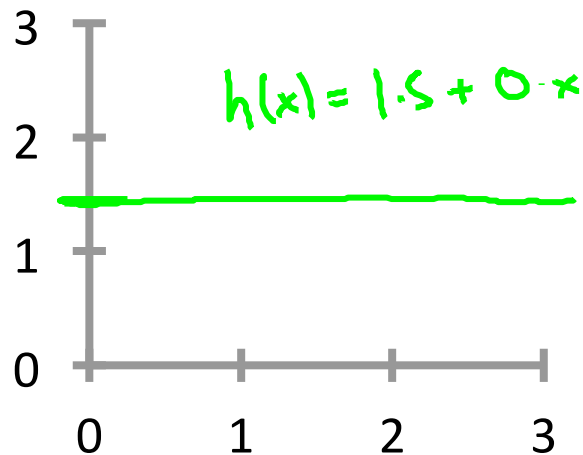| Size in feet^2 (x)	Price (\$) in 1000's (y)
2104	460
1416	232
1534	315
852	178
...	...

$m = 47$

Hypothesis: $h_\theta(x) = \theta_0 + \theta_1 x$

θ_i's: Parameters

How to choose θ_i's ?

$$h_\theta(x) = \theta_0 + \theta_1 x$$

$h(x) = 1.5 + 0 \cdot x$

$h(x) = 0.5x$
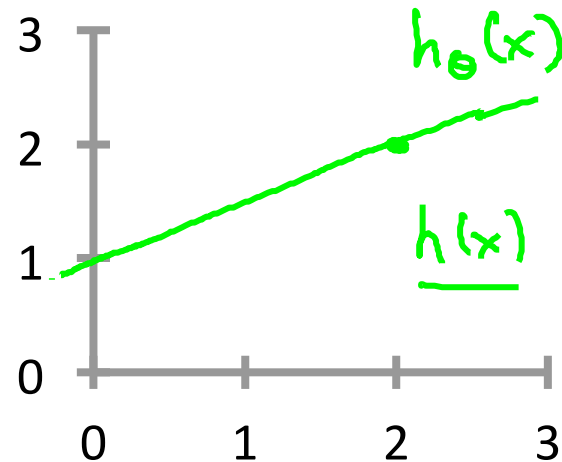
$h_\theta(x)$
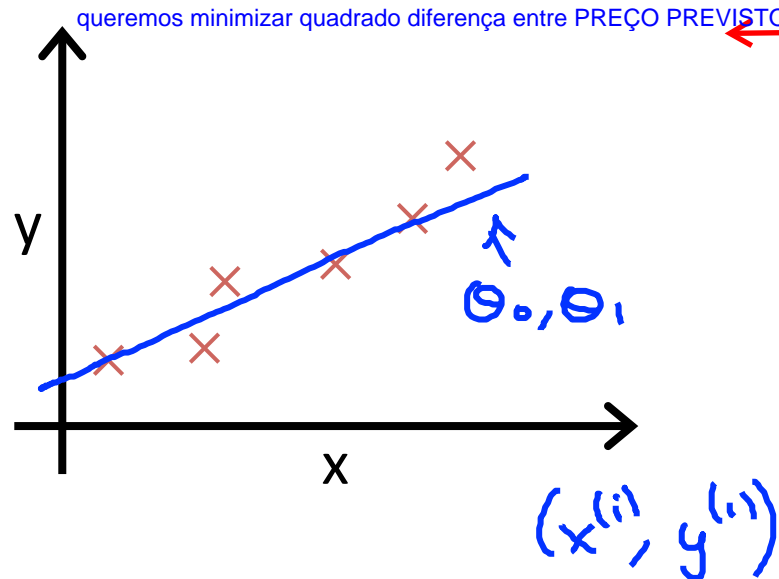
$h(x)$

$\rightarrow \theta_0 = 1.5$
$\rightarrow \theta_1 = 0$

substituir dados formula

$\rightarrow \theta_0 = 0$
$\rightarrow \theta_1 = 0.5$

$\rightarrow \theta_0 = 1$
$\rightarrow \theta_1 = 0.5$

Andrew Ng

queremos minimizar quadrado diferença entre PREÇO PREVISTO CASA e REAL VALOR
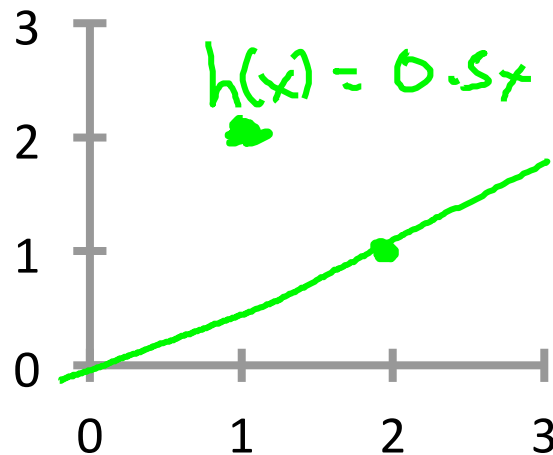
#training examples

$$\text{minimize}_{\theta_0, \theta_1} \frac{1}{2m} \sum_{i=1}^{m} \left(h_\theta(x^{(i)}) - y^{(i)} \right)^2$$

$$h_\theta(x^{(i)}) = \theta_0 + \theta_1 x^{(i)}$$

$(x^{(i)}, y^{(i)})$

$$J(\theta_0, \theta_1) = \frac{1}{2m} \sum_{i=1}^{m} \left(h_\theta(x^{(i)}) - y^{(i)} \right)^2$$

Idea: Choose θ_0, θ_1 so that $h_\theta(x)$ is close to y for our training examples (x, y)

x, y

minimize $_{\theta_0, \theta_1}$ $J(\theta_0, \theta_1)$

Cost function

Squared error function

Andrew Ng