

Model and Cost Function

Cost Function - Intuition 1

Hypothesis:

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

Parameters:

$$\theta_0, \theta_1$$

Cost Function:

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

Goal: minimize $J(\theta_0, \theta_1)$
 θ_0, θ_1

Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

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Parameters:

$$\underline{\theta_0, \theta_1}$$



Cost Function:

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

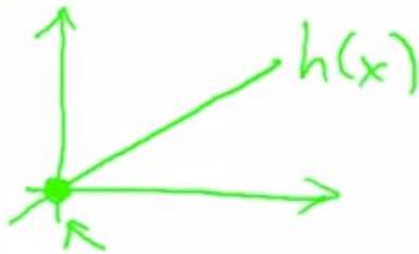
Goal: minimize $J(\theta_0, \theta_1)$
 $\nearrow \theta_0, \theta_1$

Simplified

$$h_{\theta}(x) = \underline{\theta_1 x}$$

$$\theta_0 = 0$$

$$\underline{\theta_1}$$



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

minimize $J(\theta_1)$ $\theta_1, x^{(i)}$

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$$h_{\theta}(x)$$

$$J(\theta_1)$$

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Windows'u Etkinleştir
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Andrew Ng

→ $h_{\theta}(x)$

(for fixed θ_1 , this is a function of x)

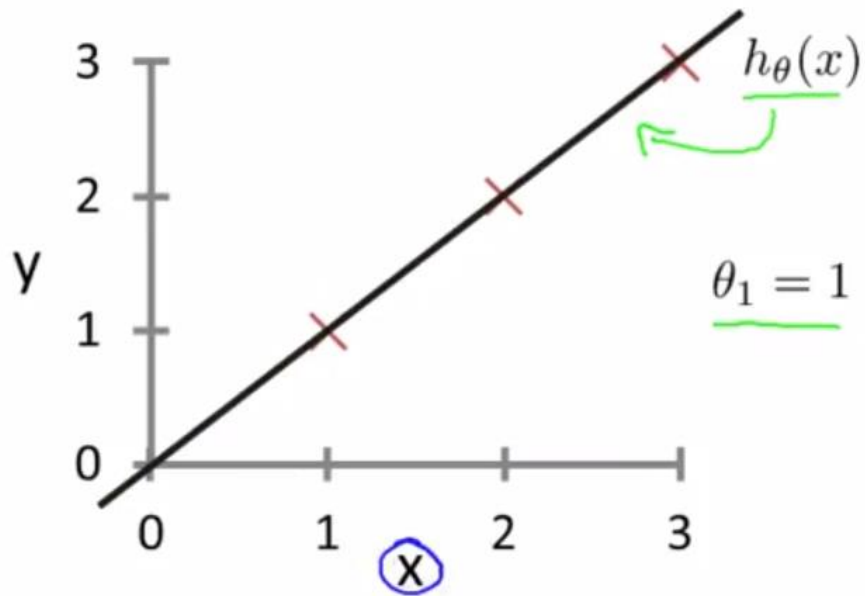
→ $J(\theta_1)$

(function of the parameter θ_1)

Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

→ $h_{\theta}(x)$

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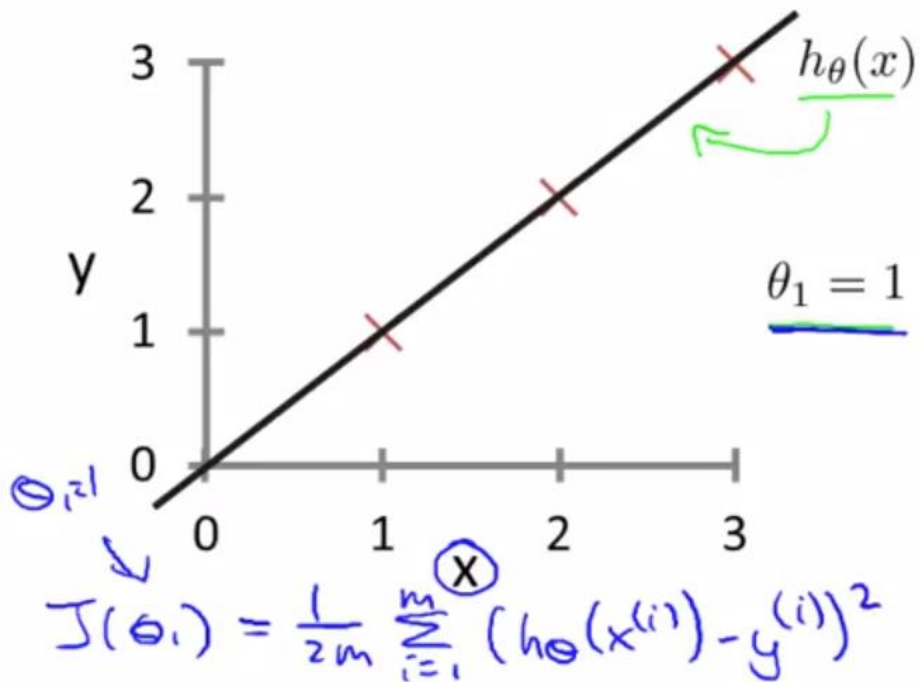


→ $J(\theta_1)$

(function of the parameter θ_1)

→ $h_{\theta}(x)$

(for fixed θ_1 , this is a function of x)



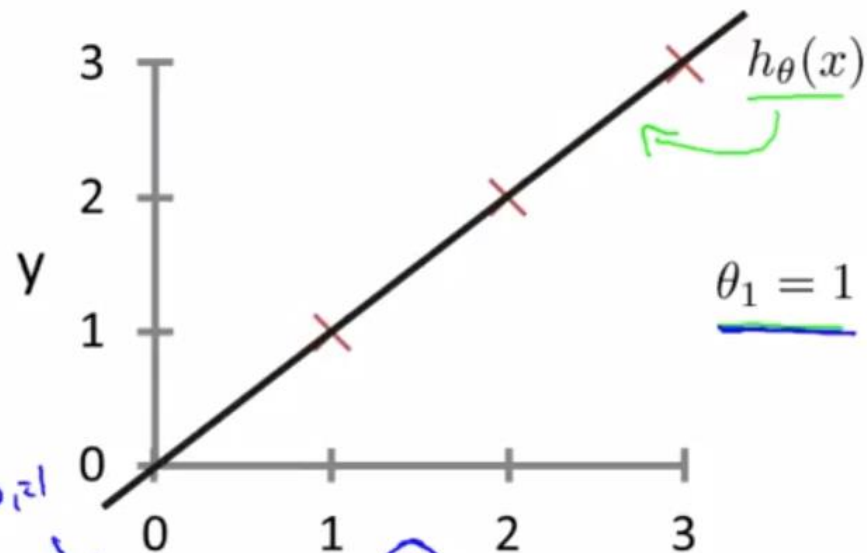
→ $J(\theta_1)$

(function of the parameter θ_1)

Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

→ $h_{\theta}(x)$

(for fixed θ_1 , this is a function of x)



$\theta_1 = 1$ ↓

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

$$= \frac{1}{2m} \sum_{i=1}^m (\theta_1 x^{(i)} - y^{(i)})^2 = \frac{1}{2m} (0^2 + 0^2 + 0^2) = 0$$

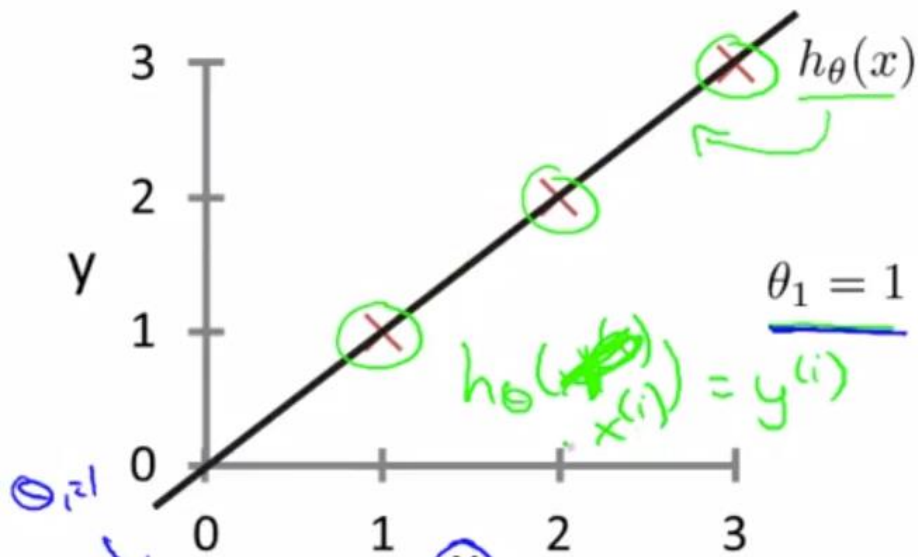
→ $J(\theta_1)$

(function of the parameter θ_1)

Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

→ $h_{\theta}(x)$

(for fixed θ_1 , this is a function of x)



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

$= \frac{1}{2m} \sum_{i=1}^m (\theta_1 x^{(i)} - y^{(i)})^2 = \frac{1}{2m} (0^2 + 0^2 + 0^2) = 0^2$

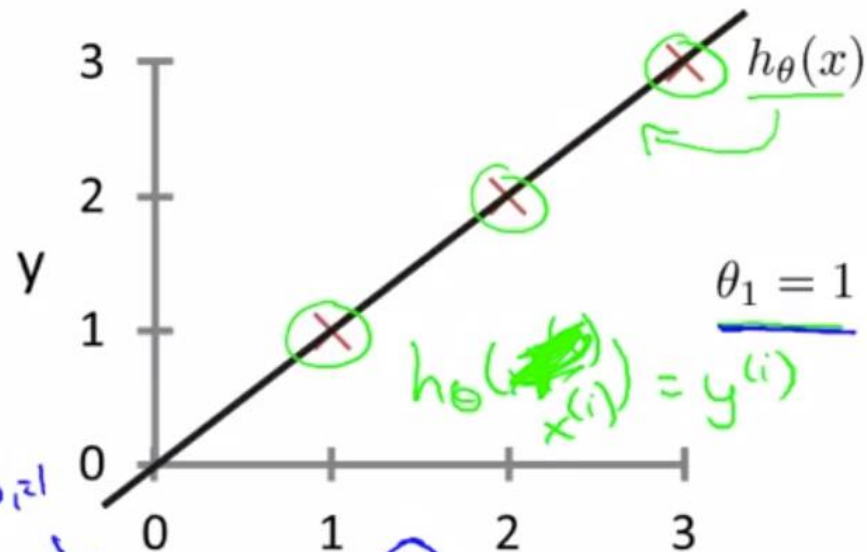
→ $J(\theta_1)$

(function of the parameter θ_1)

Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

→ $h_{\theta}(x)$

(for fixed θ_1 , this is a function of x)

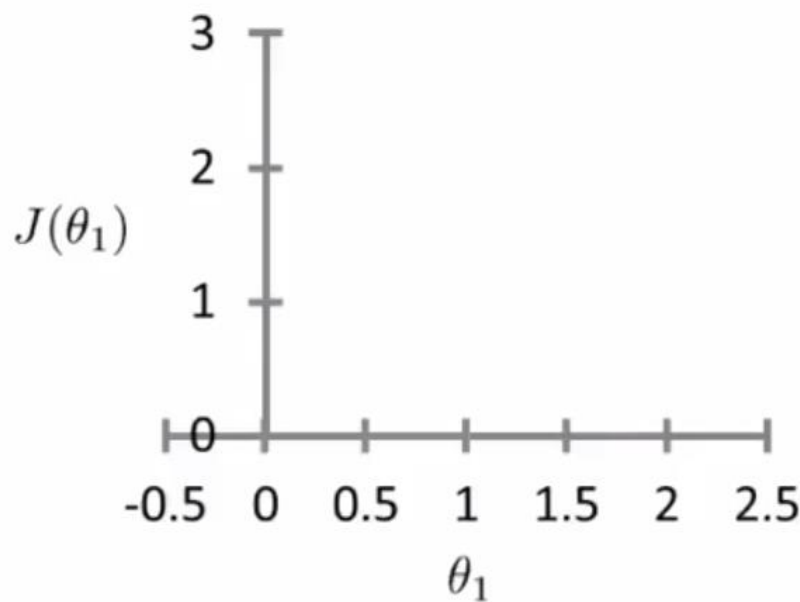


$J(\theta_1)$ = $\frac{1}{2m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)})^2$

$= \frac{1}{2m} \sum_{i=1}^m (\theta_1 x^{(i)} - y^{(i)})^2 = \frac{1}{2m} (0^2 + 0^2 + 0^2) = 0$

→ $J(\theta_1)$

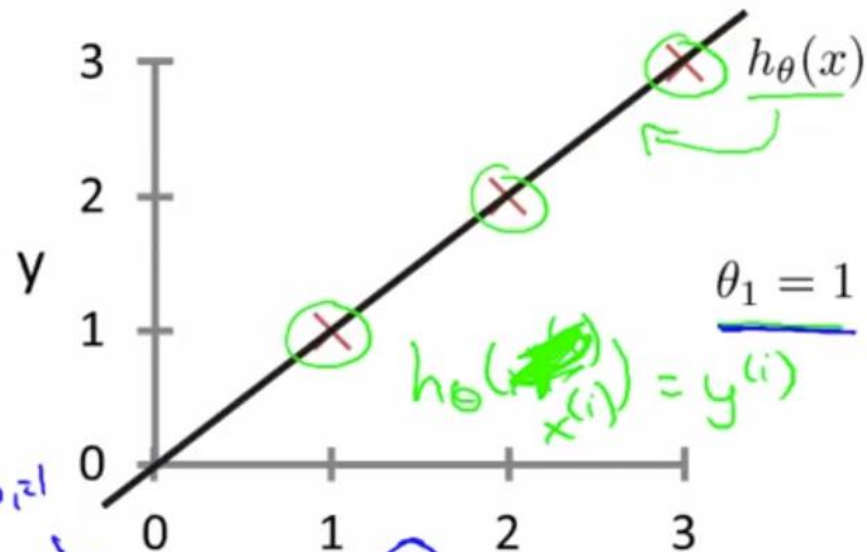
(function of the parameter θ_1)



Windows'u etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

→ $h_{\theta}(x)$

(for fixed θ_1 , this is a function of x)

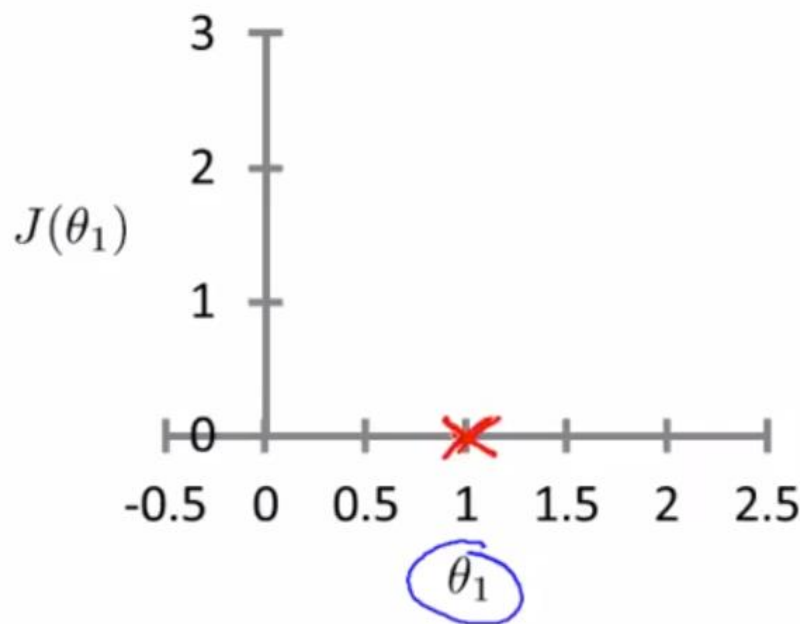


$J(\theta_1)$ = $\frac{1}{2m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)})^2$

= $\frac{1}{2m} \sum_{i=1}^m (\theta_1 x^{(i)} - y^{(i)})^2 = \frac{1}{2m} (0^2 + 0^2 + 0^2) = 0$

→ $J(\theta_1)$

(function of the parameter θ_1)

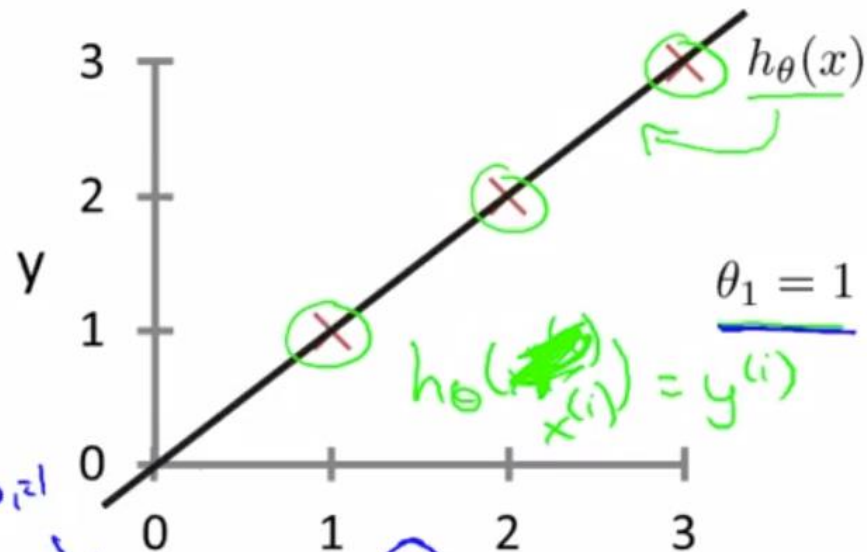


Windows'u etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$J(1) = 0$

→ $h_{\theta}(x)$

(for fixed θ_1 , this is a function of x)

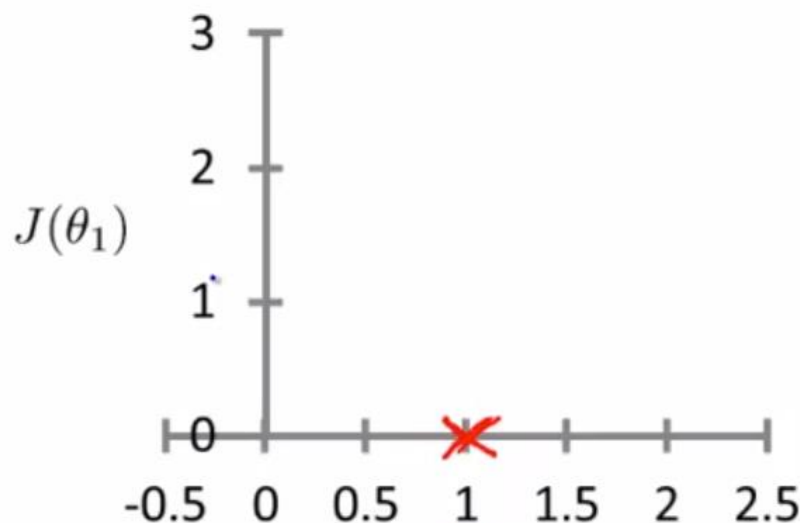


$J(\theta_1)$ = $\frac{1}{2m} \sum_{i=1}^m (h_{\theta}(x^{(i)}) - y^{(i)})^2$

= $\frac{1}{2m} \sum_{i=1}^m (\theta_1 x^{(i)} - y^{(i)})^2 = \frac{1}{2m} (0^2 + 0^2 + 0^2) = 0$

→ $J(\theta_1)$

(function of the parameter θ_1)



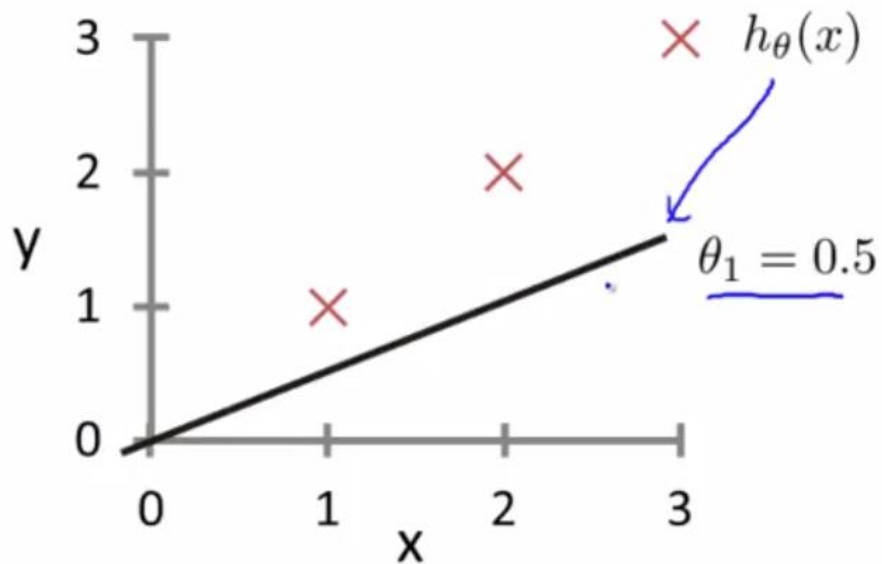
$\theta_1 = 0.5?$ θ_1

Windows'u etkinleştirin
Windows'u etkinleştirmek için Ayarlar'a gidin.

$J(\theta_1) = 0$

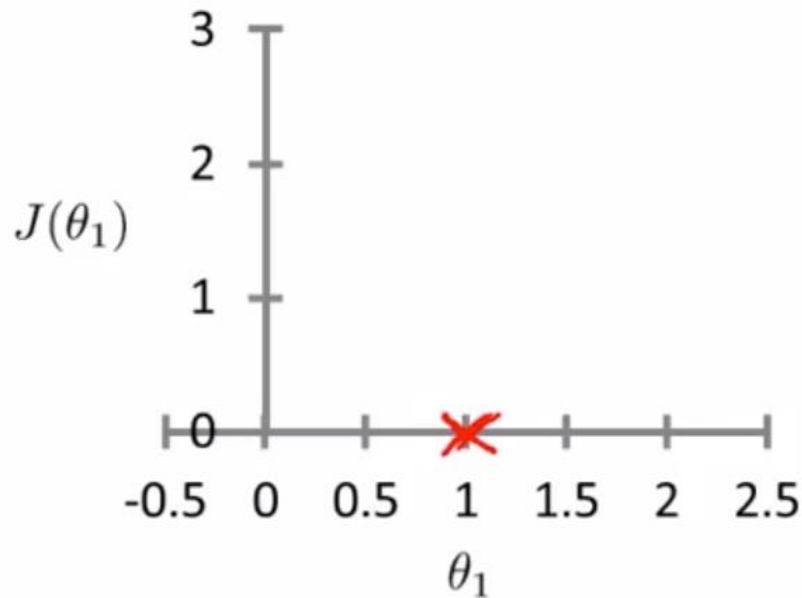
$$h_{\theta}(x)$$

(for fixed θ_1 , this is a function of x)



$$J(\theta_1)$$

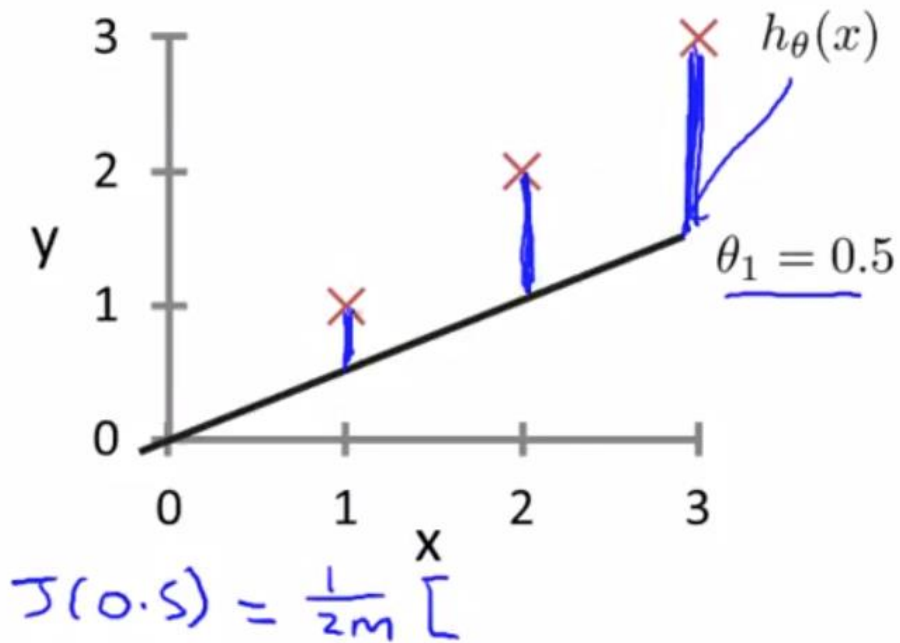
(function of the parameter θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

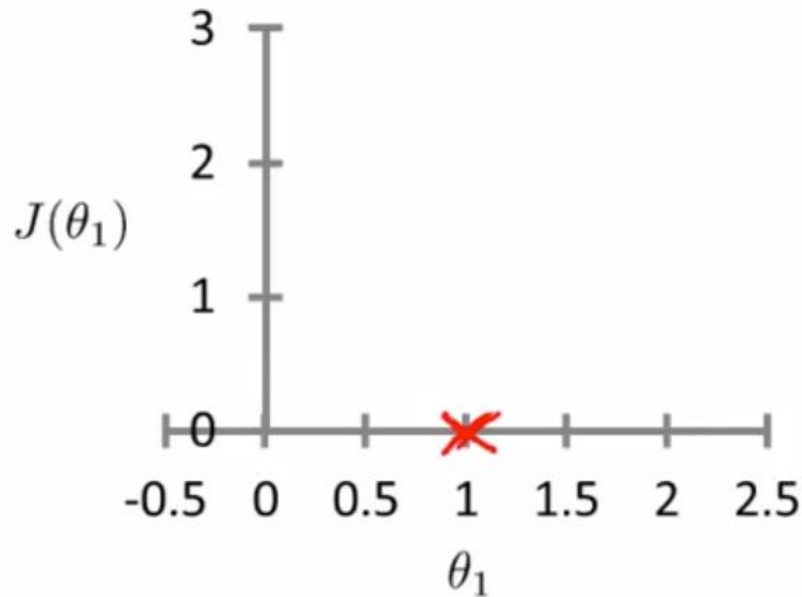
$$h_{\theta}(x)$$

(for fixed θ_1 , this is a function of x)



$$J(\theta_1)$$

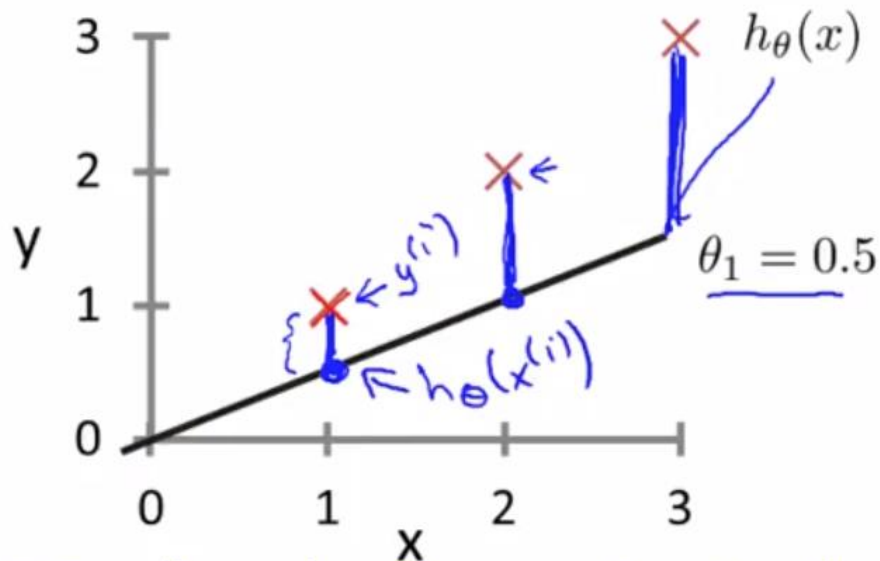
(function of the parameter θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$h_{\theta}(x)$$

(for fixed θ_1 , this is a function of x)

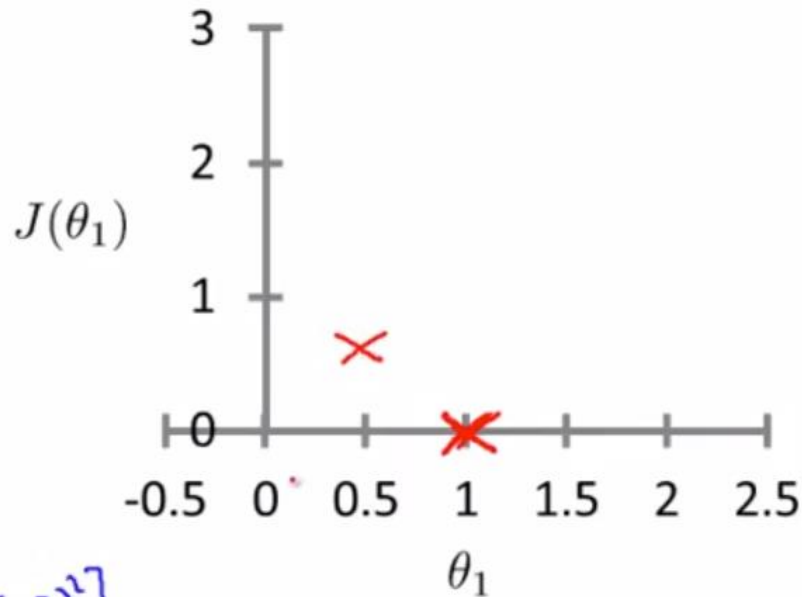


$$J(0.5) = \frac{1}{2m} [(0.5-1)^2 + (1-2)^2 + (1.5-3)^2]$$

$$= \frac{1}{2 \times 3} (3.5) = \frac{3.5}{6} \approx \underline{0.58}$$

$$J(\theta_1)$$

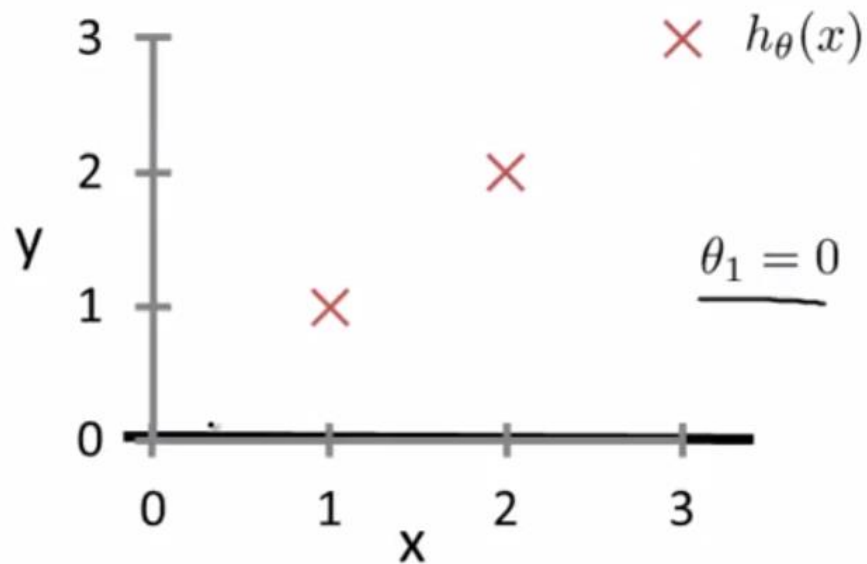
(function of the parameter θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

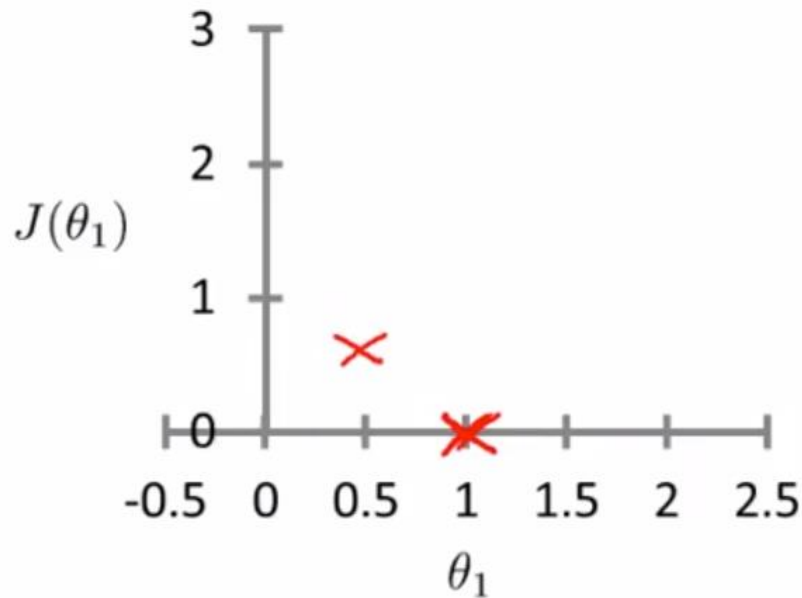
$$h_{\theta}(x)$$

(for fixed θ_1 , this is a function of x)



$$J(\theta_1)$$

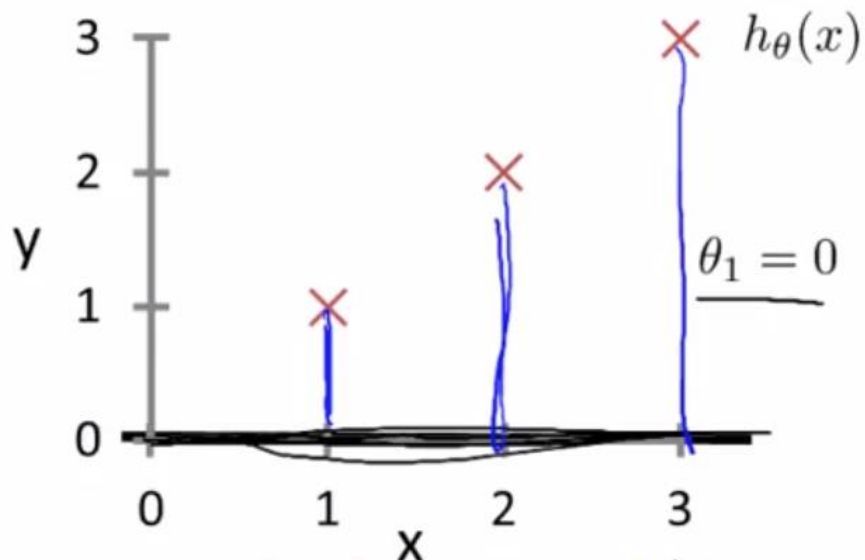
(function of the parameter θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$h_{\theta}(x)$$

(for fixed θ_1 , this is a function of x)

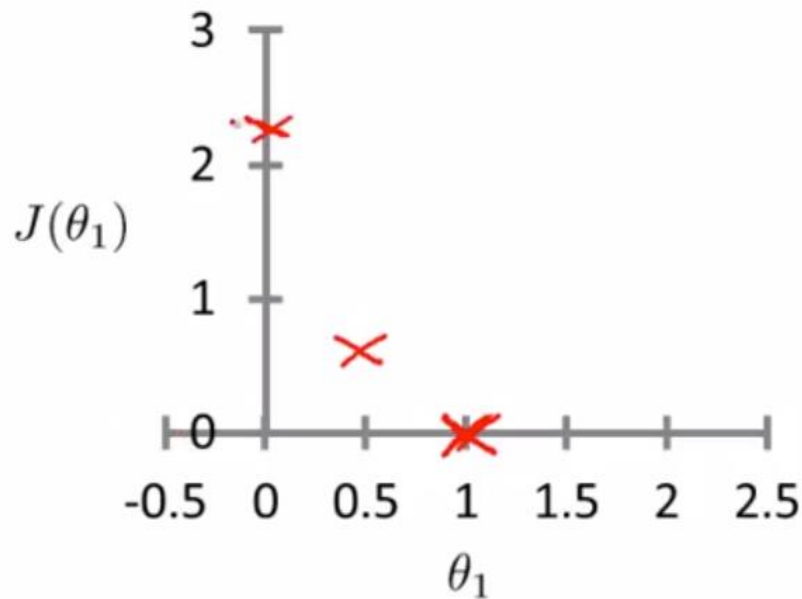


$$J(0) = \frac{1}{2m} (1^2 + 2^2 + 3^2)$$

$$= \frac{1}{6} \cdot 14 \approx 2.3$$

$$J(\theta_1)$$

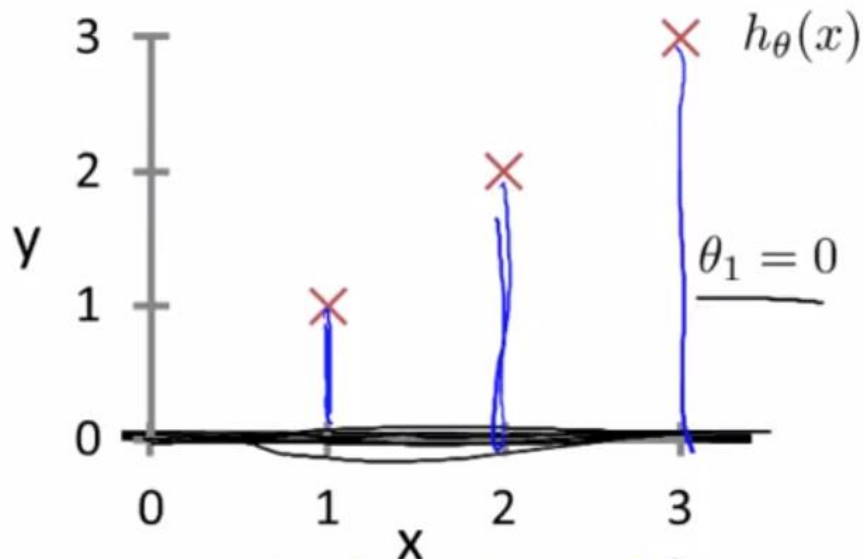
(function of the parameter θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$h_{\theta}(x)$$

(for fixed θ_1 , this is a function of x)



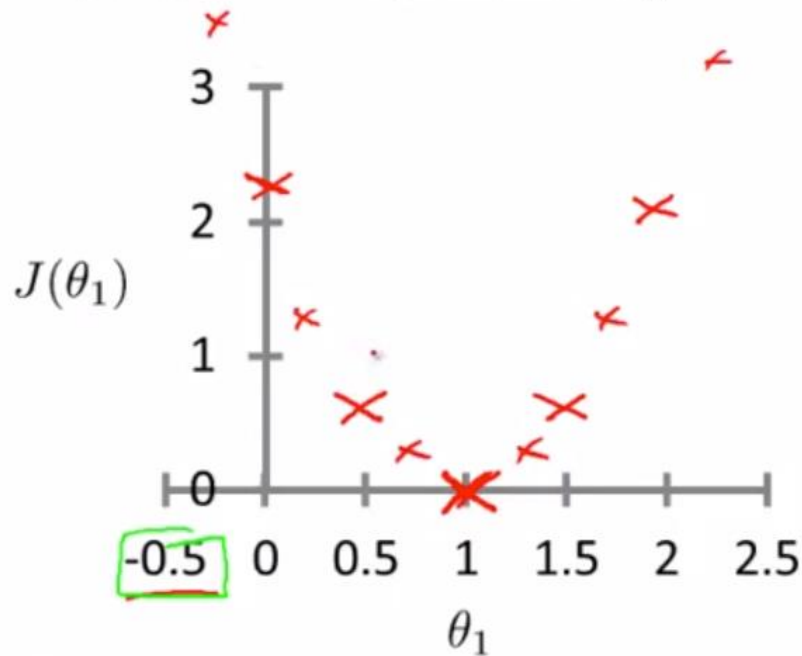
$$J(0) = \frac{1}{2m} (1^2 + 2^2 + 3^2) \\ = \frac{1}{6} \cdot 14 \approx 2.3$$

$$h(x) = -0.5x$$



$$J(\theta_1)$$

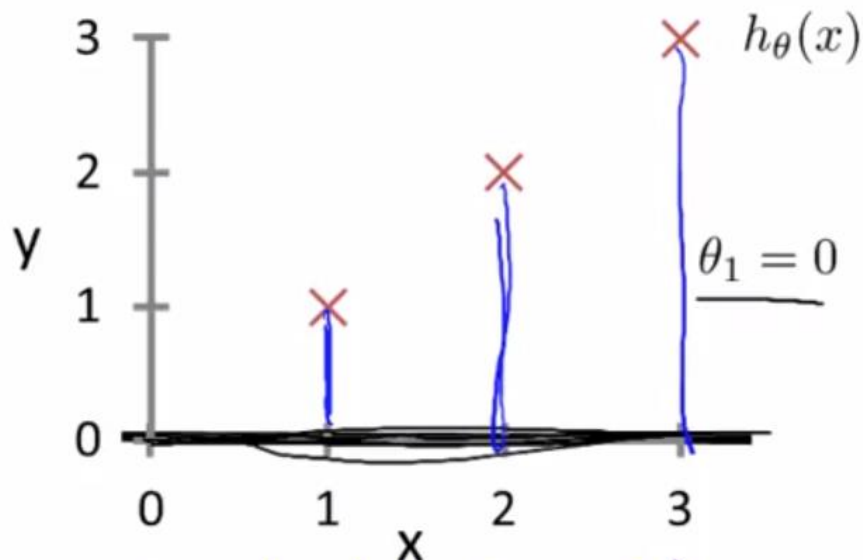
(function of the parameter θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$h_{\theta}(x)$$

(for fixed θ_1 , this is a function of x)



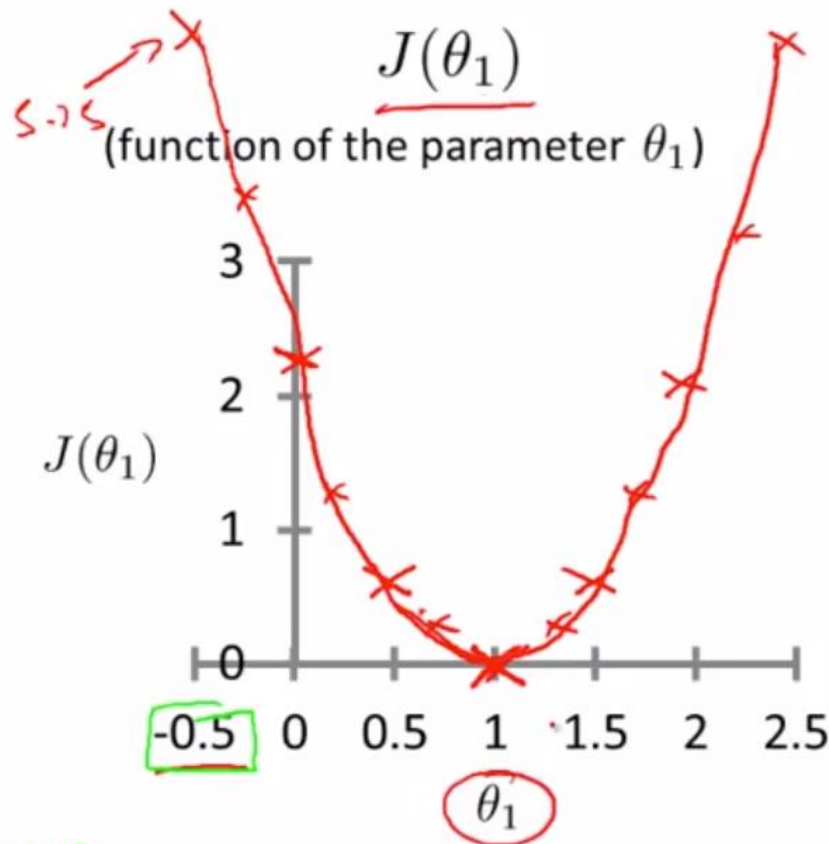
$$J(0) = \frac{1}{2m} (1^2 + 2^2 + 3^2) \\ = \frac{1}{6} \cdot 14 \approx 2.3$$

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$$J(\theta_1)$$

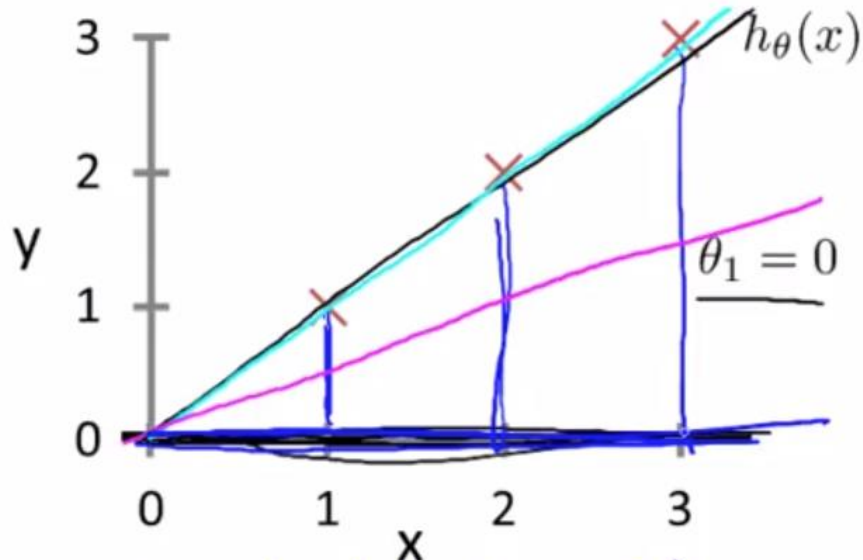
(function of the parameter θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$h_{\theta}(x)$$

(for fixed θ_1 , this is a function of x)



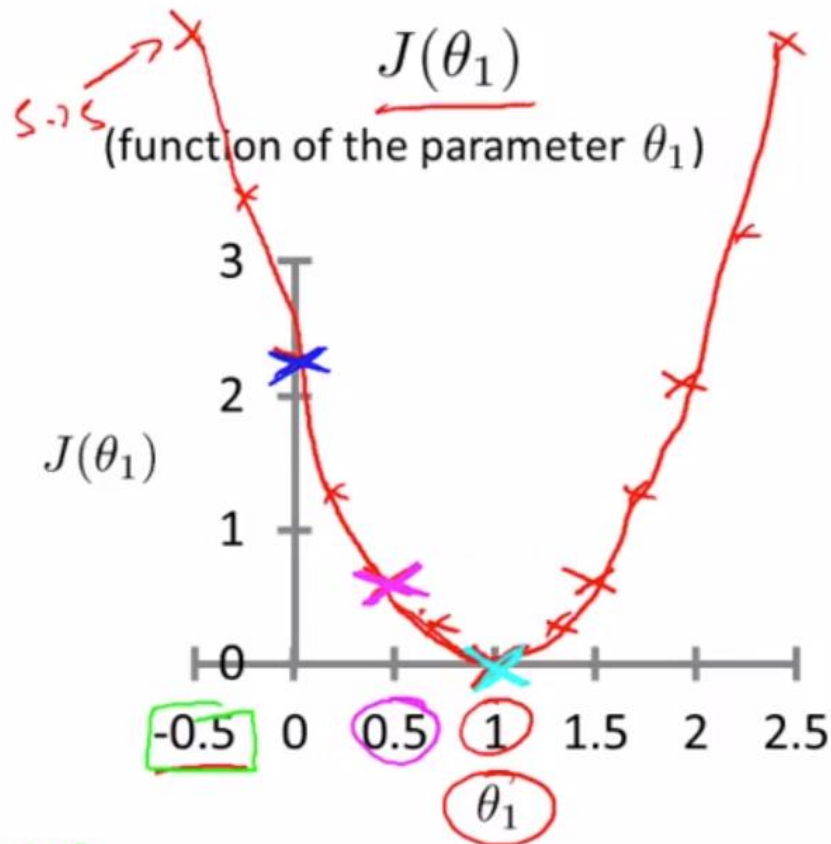
$$J(0) = \frac{1}{2m} (1^2 + 2^2 + 3^2) = \frac{1}{6} \cdot 14 \approx 2.3$$

$$h(x) = -0.5x$$



$$J(\theta_1)$$

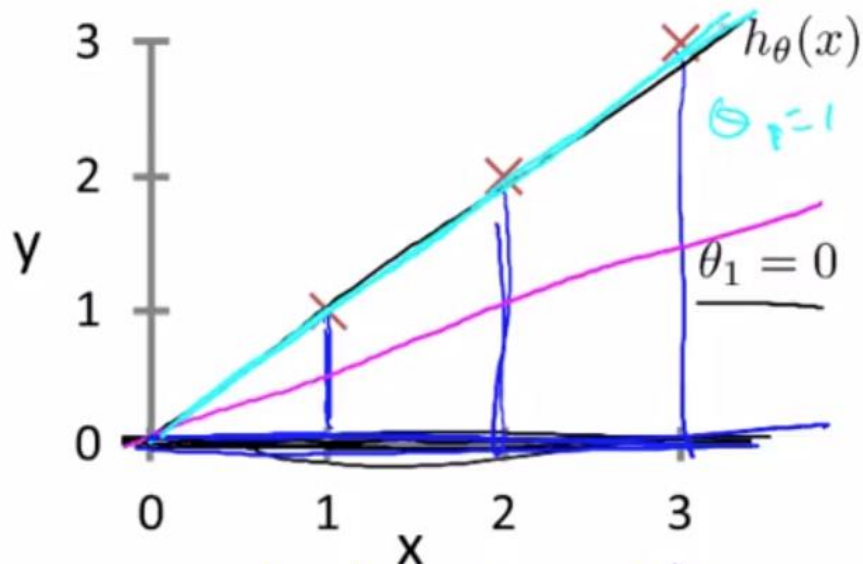
(function of the parameter θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$h_{\theta}(x)$$

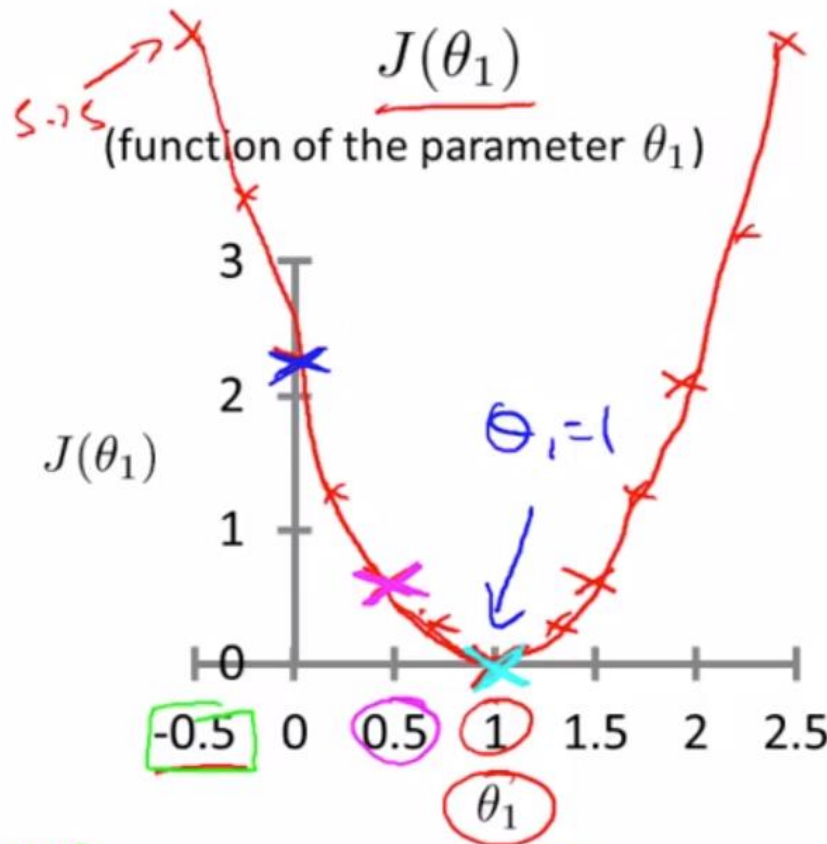
(for fixed θ_1 , this is a function of x)



$$J(0) = \frac{1}{2m} (1^2 + 2^2 + 3^2) = \frac{1}{6} \cdot 14 \approx 2.3$$

$$h(x) = -0.5x$$

$h(x) \theta_1$



minimize $J(\theta_1)$

(Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.)

Cost Function - Intuition 2

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

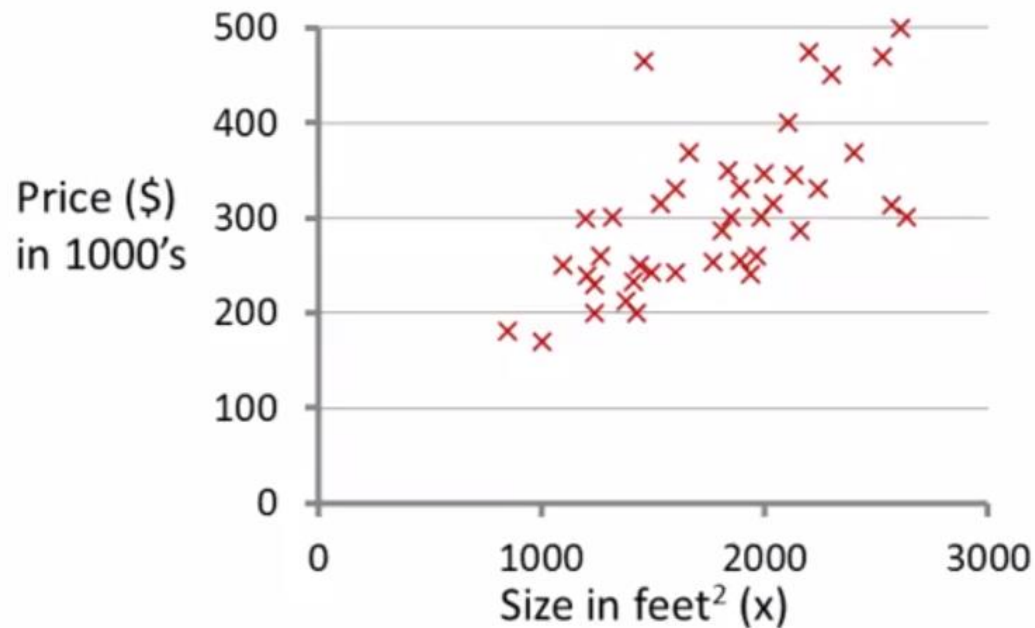
Parameters: θ_0, θ_1

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

Goal: minimize $J(\theta_0, \theta_1)$
 θ_0, θ_1

$$h_{\theta}(x)$$

(for fixed θ_0, θ_1 , this is a function of x)



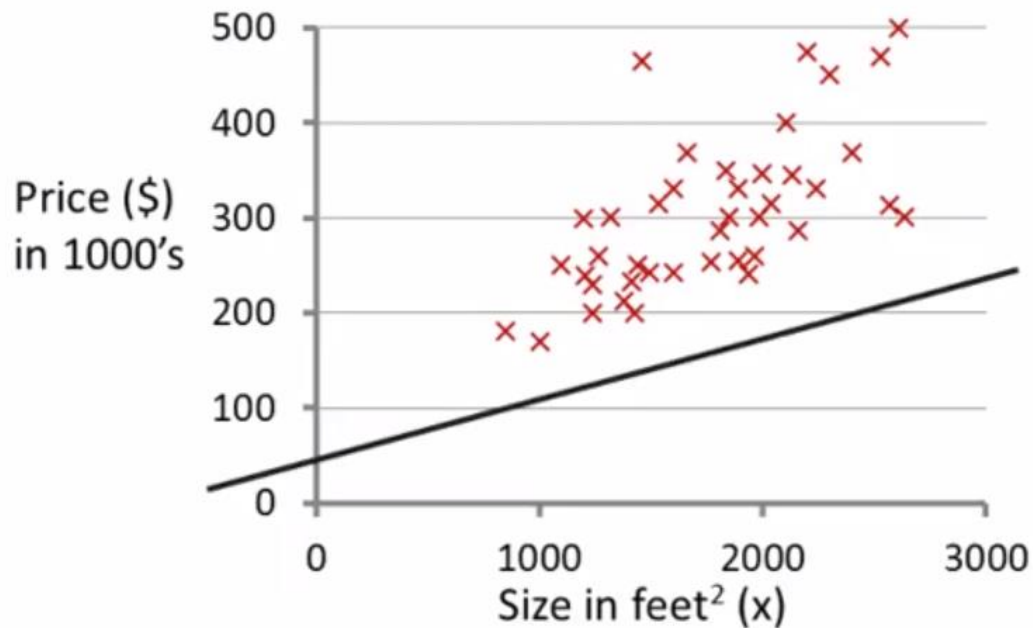
$$J(\theta_0, \theta_1)$$

(function of the parameters θ_0, θ_1)

Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$\underline{h_{\theta}(x)}$$

(for fixed θ_0, θ_1 , this is a function of x)



$$h_{\theta}(x) = 50 + 0.06x$$

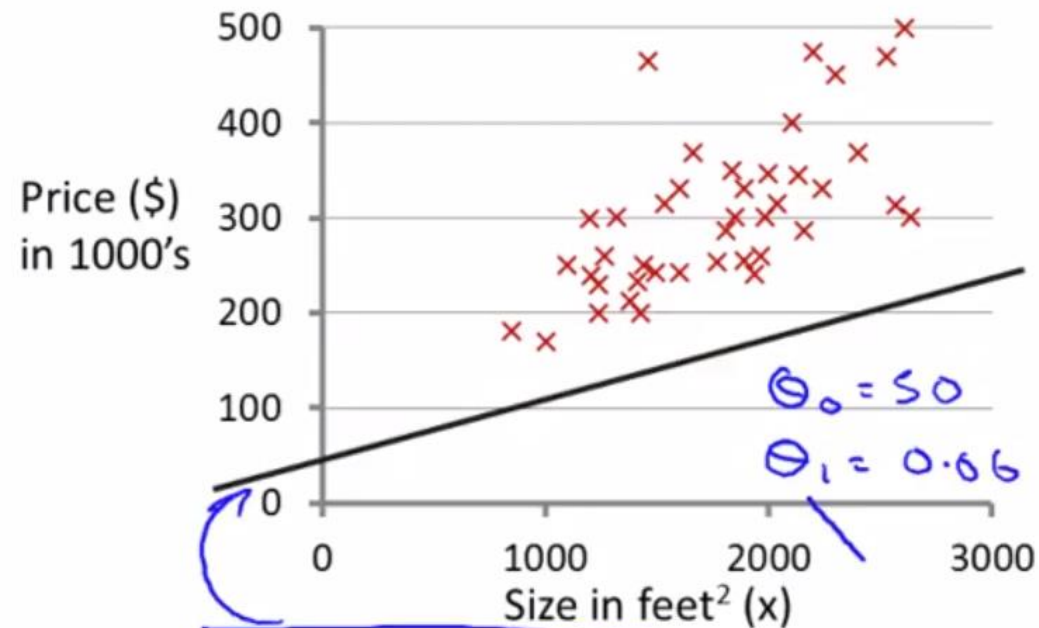
$$\underline{J(\theta_0, \theta_1)}$$

(function of the parameters θ_0, θ_1)

Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$\underline{h_{\theta}(x)}$$

(for fixed θ_0, θ_1 , this is a function of x)



$$h_{\theta}(x) = 50 + 0.06x$$

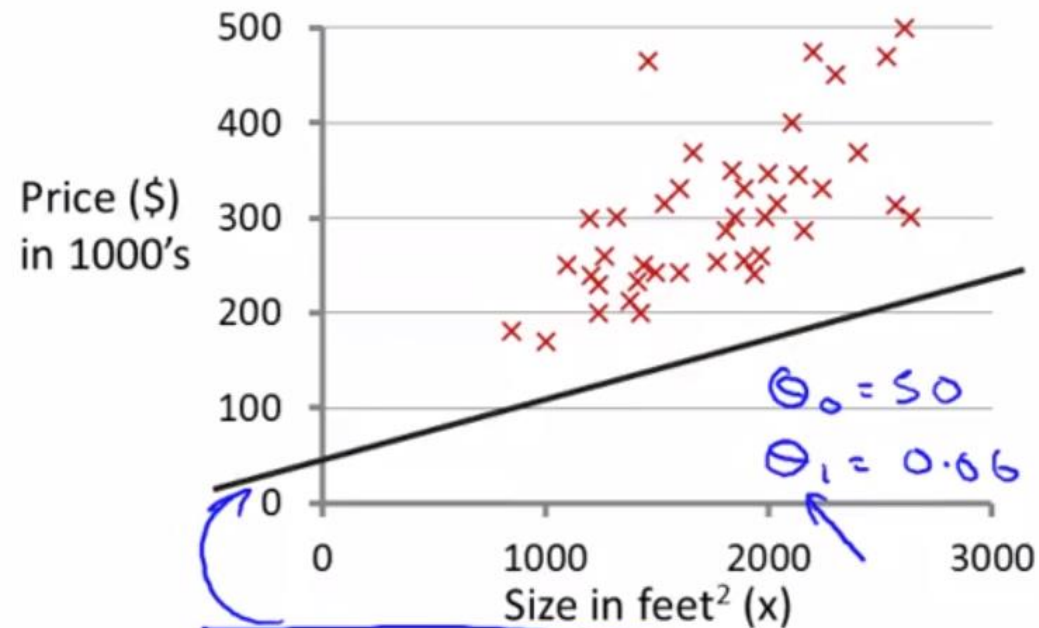
$$\underline{J(\theta_0, \theta_1)}$$

(function of the parameters θ_0, θ_1)

Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$\underline{h_{\theta}(x)}$$

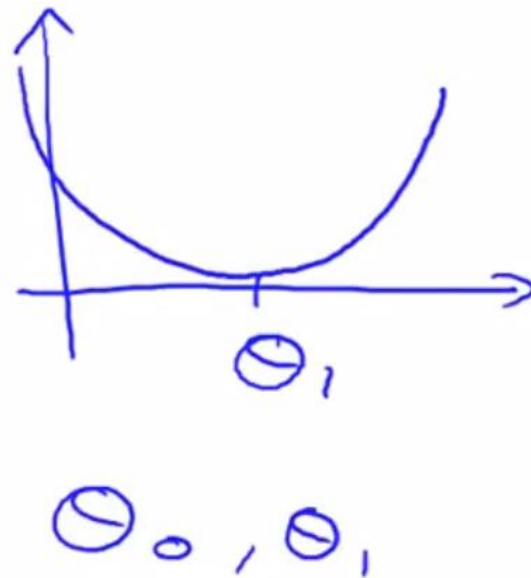
(for fixed θ_0, θ_1 , this is a function of x)



$$h_{\theta}(x) = 50 + 0.06x$$

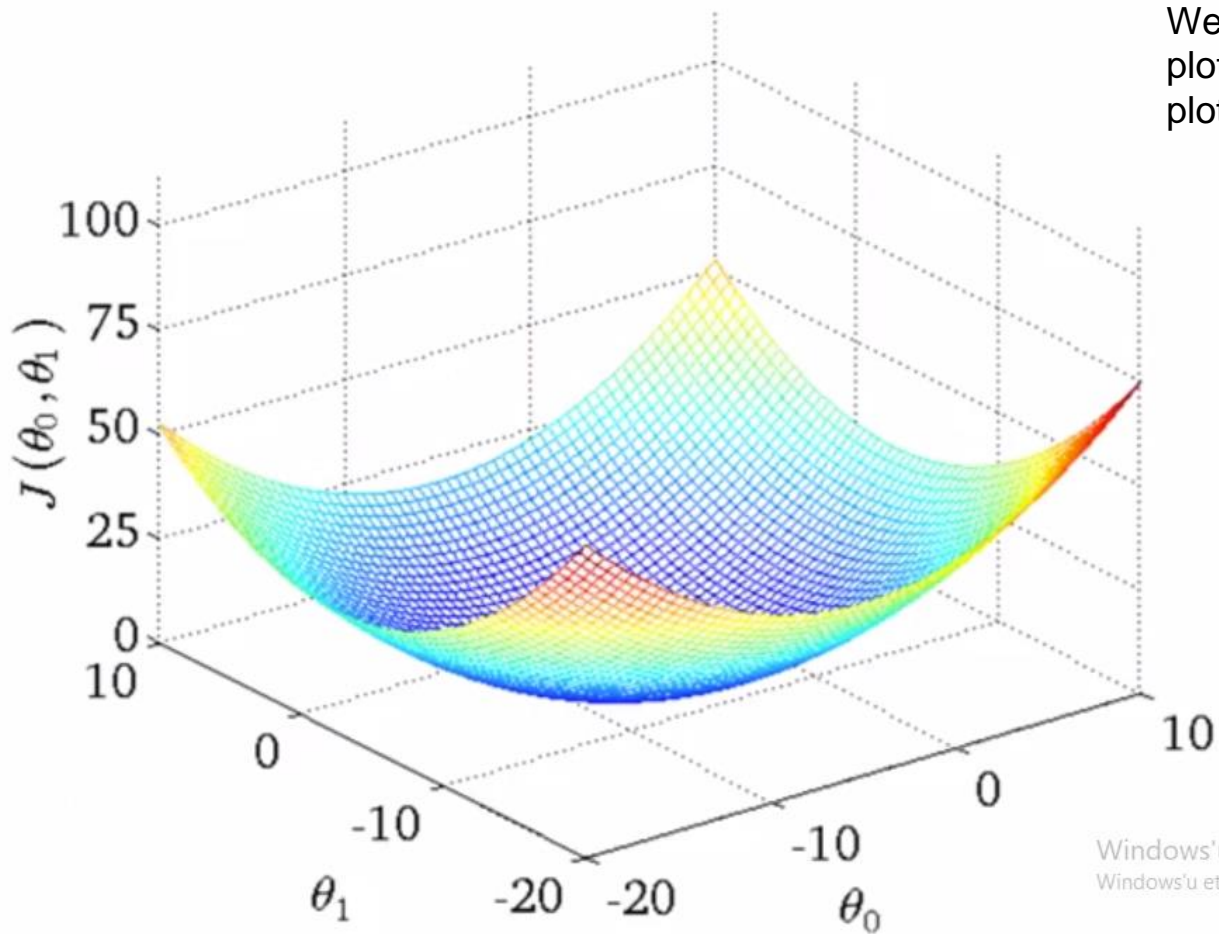
$$\underline{\underline{J(\theta_0, \theta_1)}}$$

(function of the parameters θ_0, θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

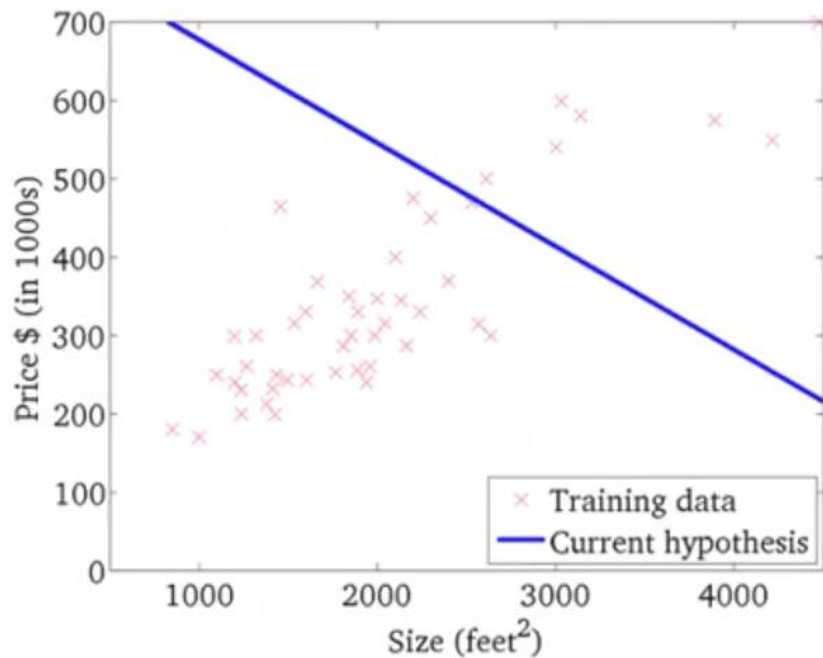
We will see contour plots instead of 3d plots.



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

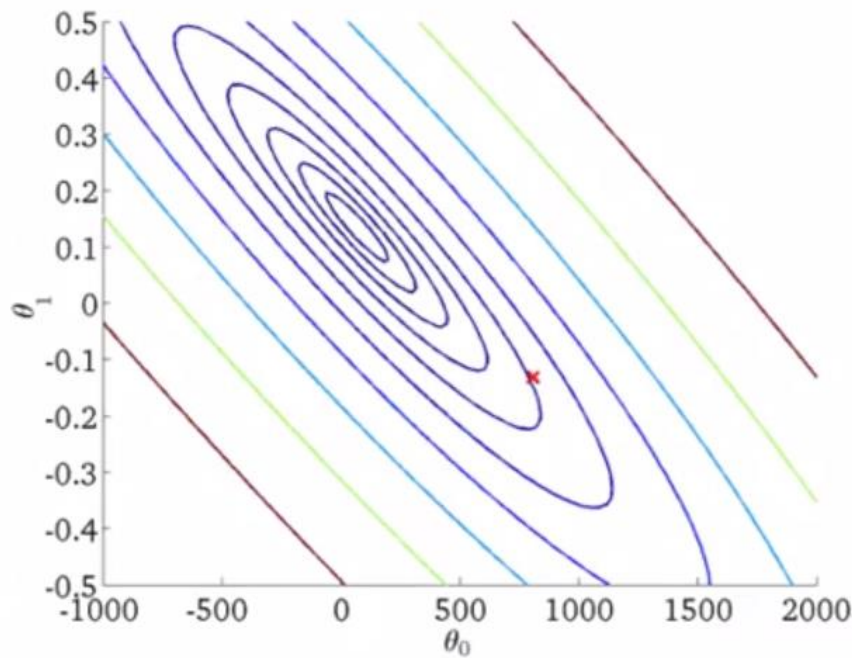
$$h_{\theta}(x)$$

(for fixed θ_0, θ_1 , this is a function of x)



$$J(\theta_0, \theta_1)$$

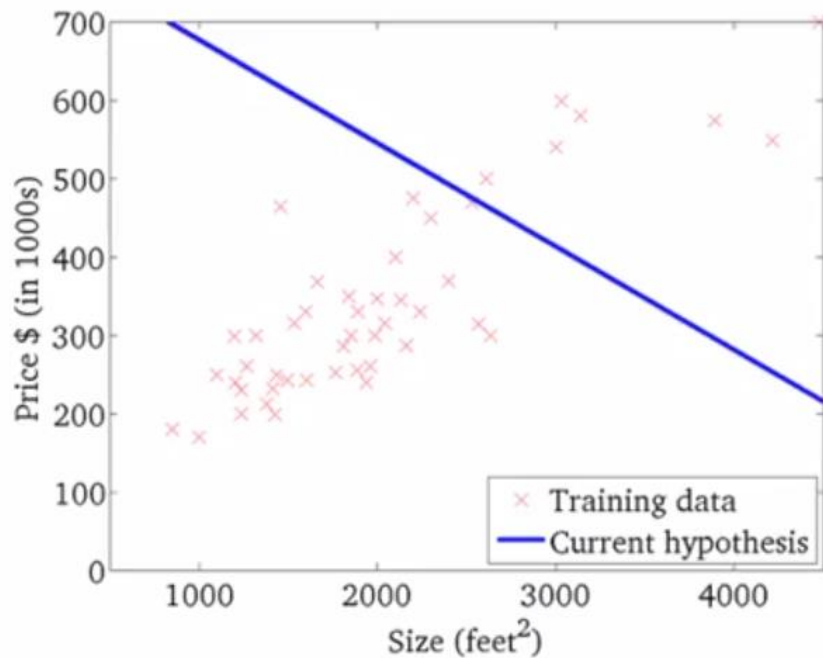
(function of the parameters θ_0, θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

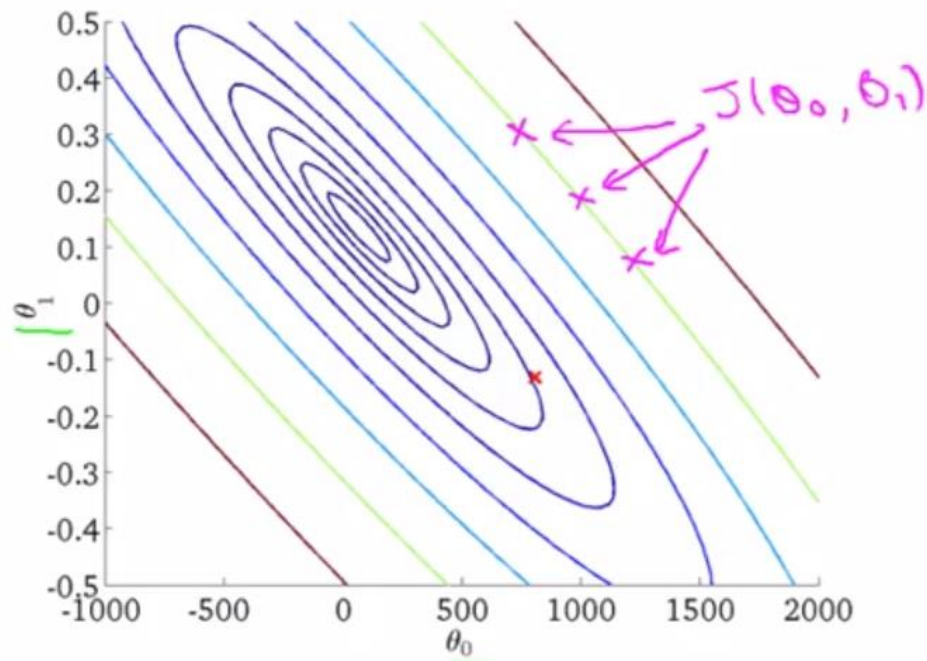
$$h_{\theta}(x)$$

(for fixed θ_0, θ_1 , this is a function of x)



$$J(\theta_0, \theta_1)$$

(function of the parameters θ_0, θ_1)



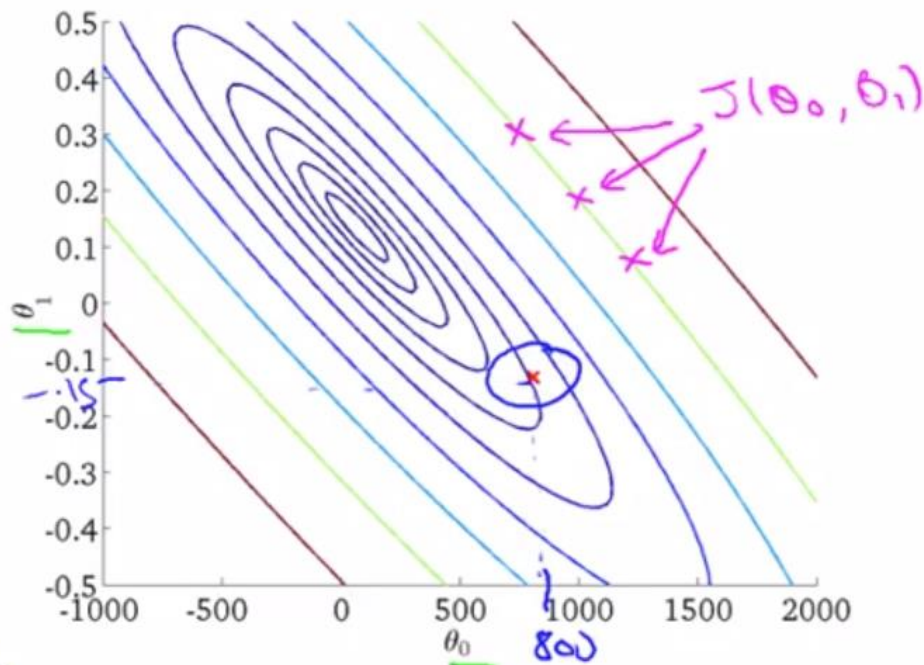
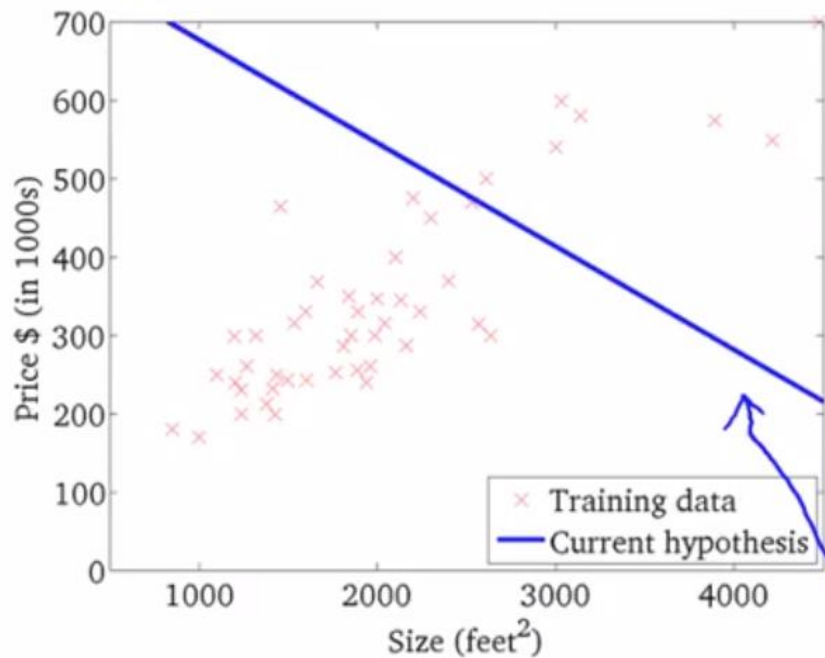
Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

$$h_{\theta}(x)$$

$$J(\theta_0, \theta_1)$$

(for fixed θ_0, θ_1 , this is a function of x)

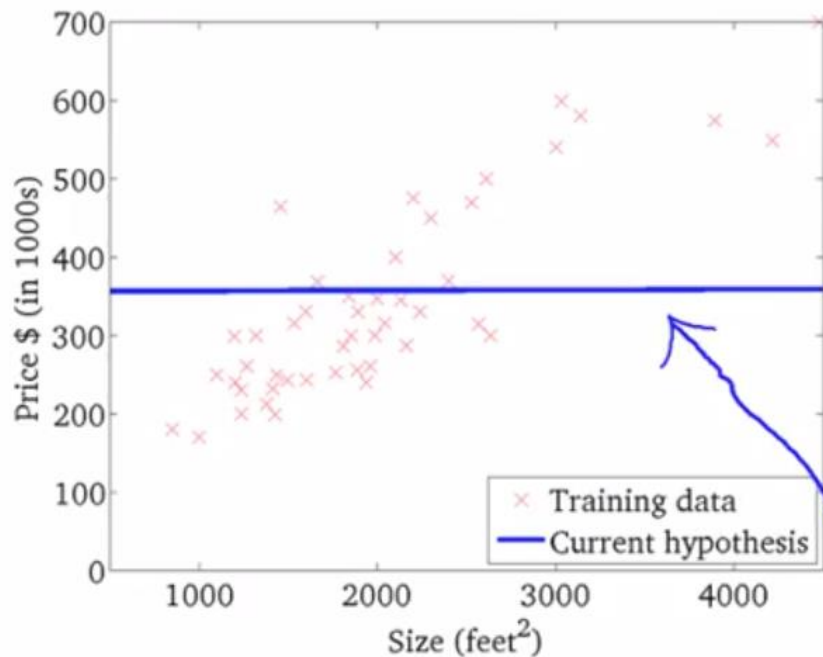
(function of the parameters θ_0, θ_1)



Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

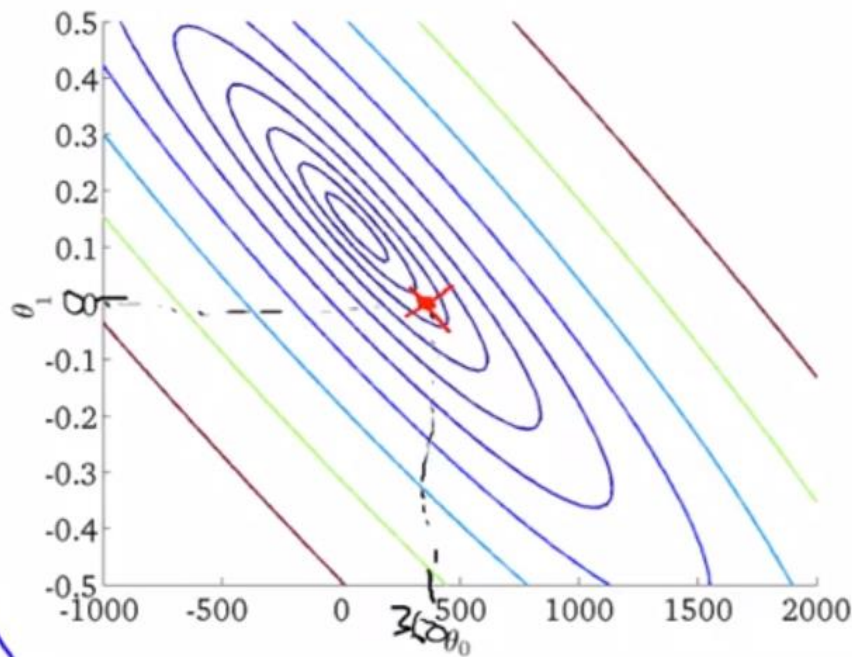
$$h_{\theta}(x)$$

(for fixed θ_0, θ_1 , this is a function of x)



$$J(\theta_0, \theta_1)$$

(function of the parameters θ_0, θ_1)

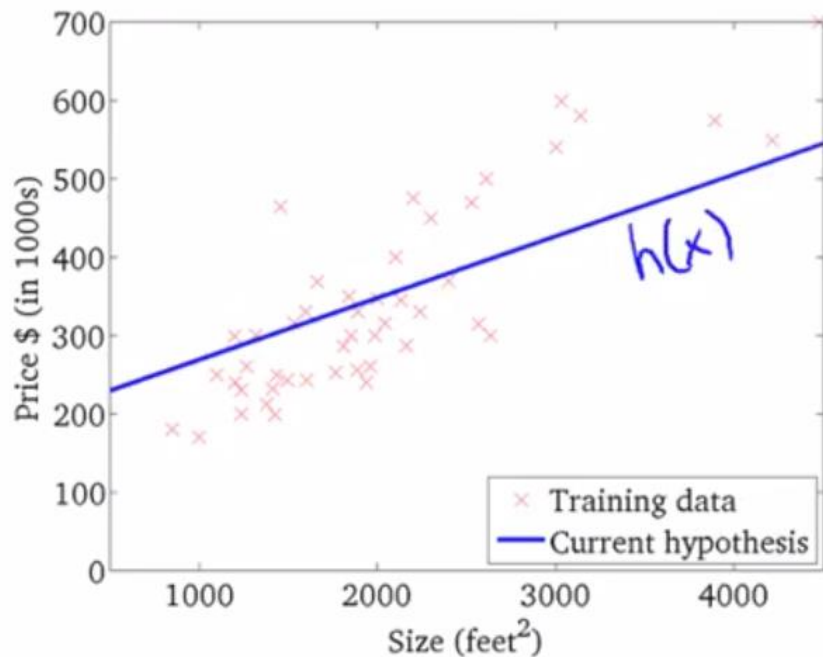


$$\begin{cases} \theta_0 = 360 \\ \theta_1 = 0 \end{cases}$$

Windows'u Etkinleştir
Windows'u etkinleştirmek için Ayarlar'a gidin.

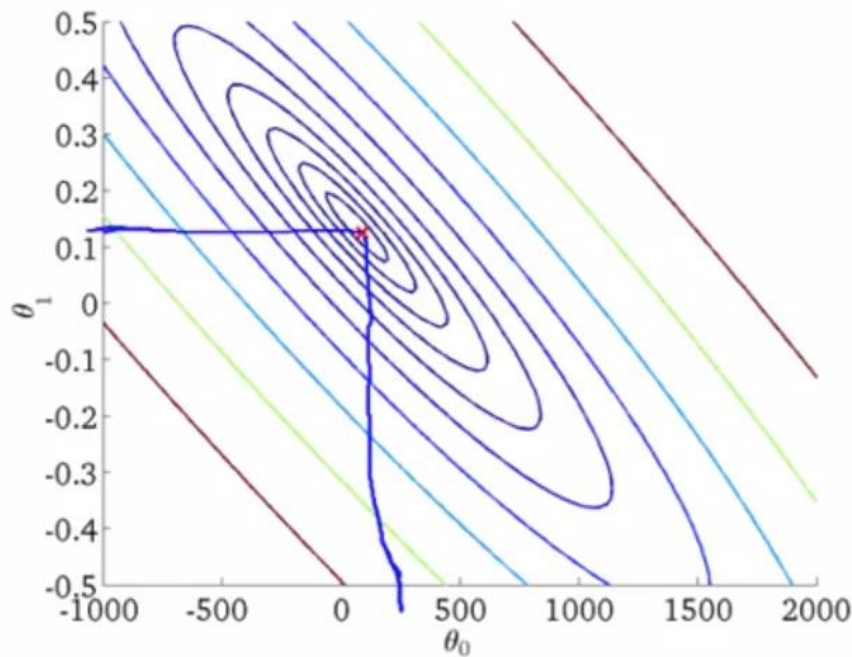
$$h_{\theta}(x)$$

(for fixed θ_0, θ_1 , this is a function of x)



$$J(\theta_0, \theta_1)$$

(function of the parameters θ_0, θ_1)



Windows'u Etkinleştir
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