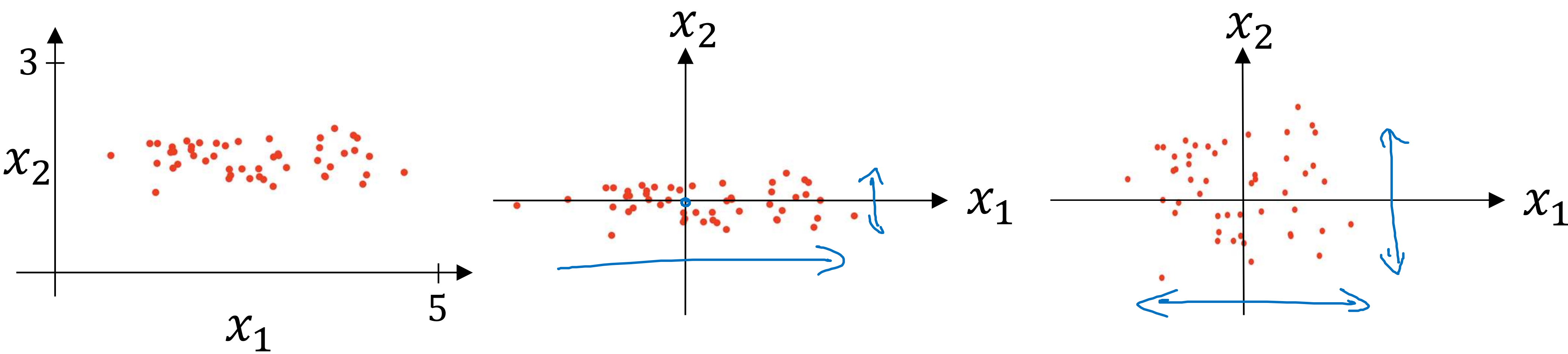
deeplearning.ai

Setting up your optimization problem

Normalizing inputs

Normalizing training sets

$x = \begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$



Subtract mean:

$$\boxed{\mu} = \frac{1}{m} \sum_{i=1}^{m} x^{(i)}$$

$$\boxed{x := x - \mu}$$

Normalize variance

$$\boxed{\sigma^2} = \frac{1}{m} \sum_{i=1}^{m} x^{(i)} ** 2$$

← element-wise

$$\boxed{x \mathbin{/}= \sigma^2}$$

Use same μ, σ^2 to normalize test set.

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Why normalize inputs?

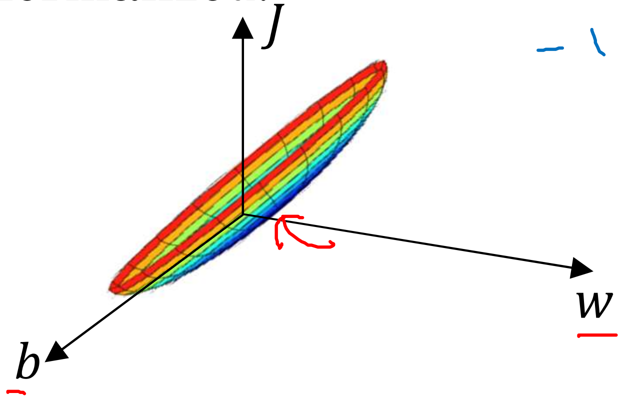
$$J(w,b) = \frac{1}{m}\sum_{i=1}^{m} \mathcal{L}\left(\hat{y}^{(i)}, y^{(i)}\right)$$

w_1 x_1: $1 \ldots 1000$ ←

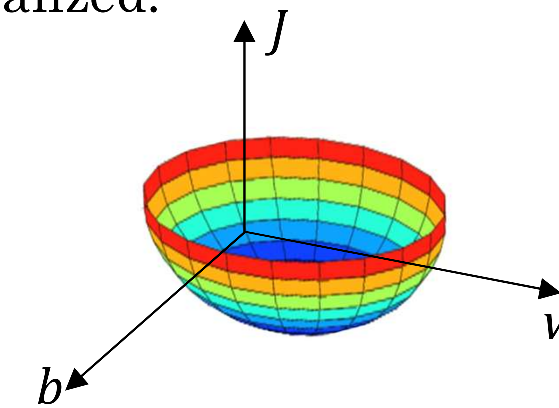
w_2 x_2: $0 \ldots 1$ ←

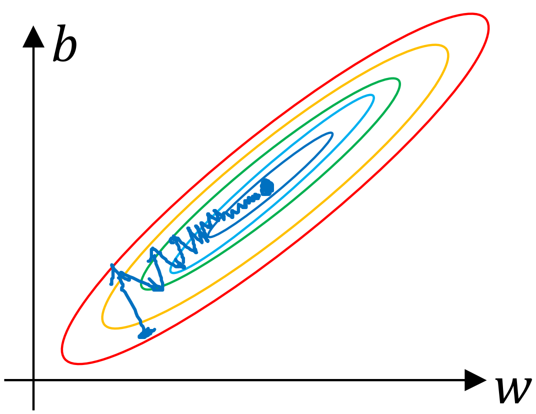
$-1 \ldots 1$

Unnormalized:



Normalized:

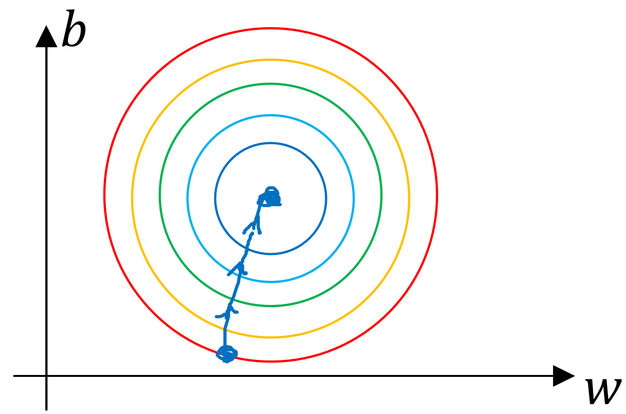




x_1: $0 \ldots 1$

x_2: $-1 \ldots 1$

x_3: $1 \ldots 2$



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