



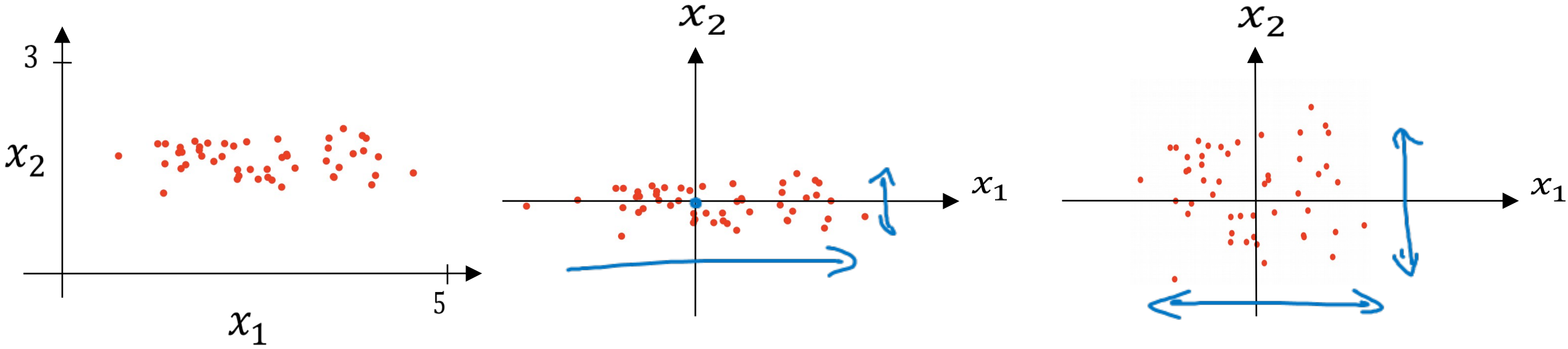
deeplearning.ai

Setting up your optimization problem

Normalizing inputs

Normalizing training sets

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



Subtract mean:

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

$$x := x - \mu$$

Normalize variance

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

← element-wise

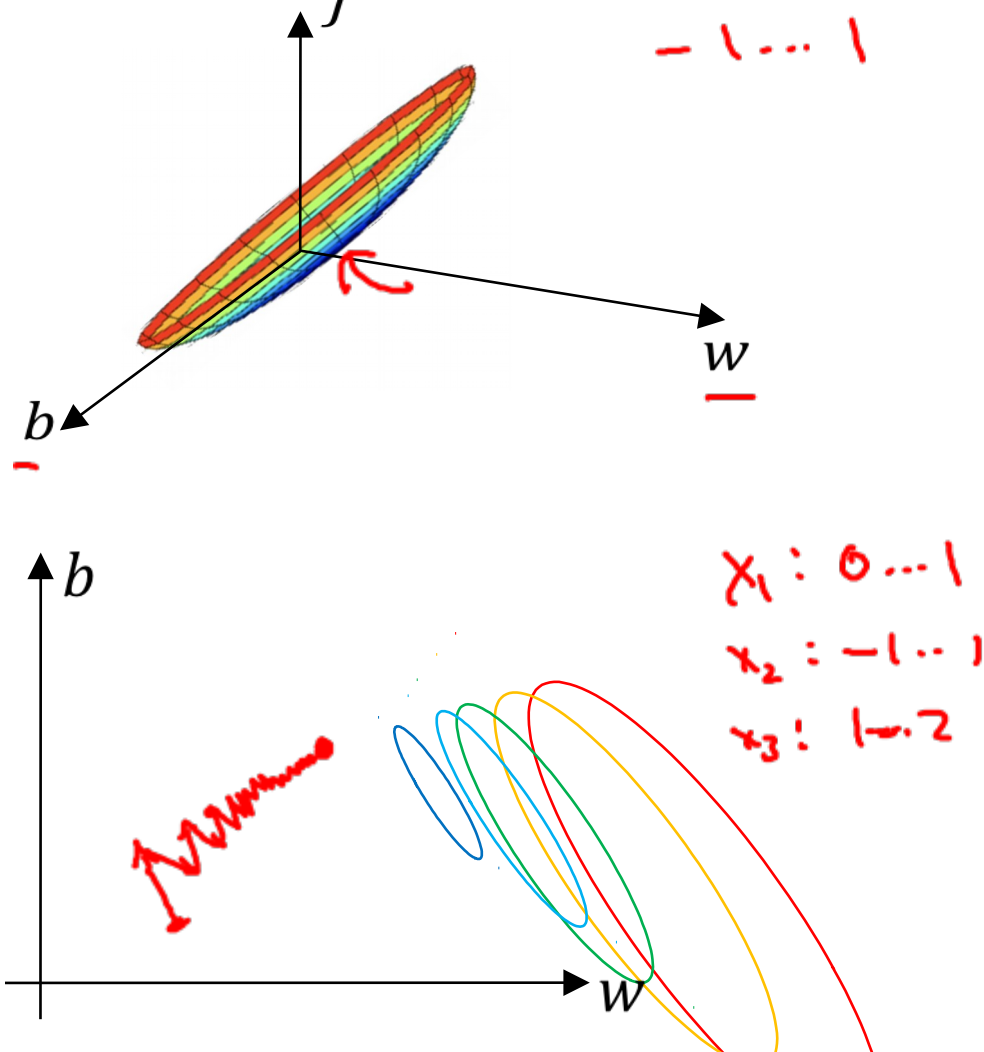
$$x /= \sigma$$

Use same μ σ^2 to normalize test set.

Why normalize inputs?

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

Unnormalized:



Normalized:

