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Basics of Neural Network Programming

Logistic Regression Gradient descent

Logistic regression recap

$$\Rightarrow z = w^{T}x + b$$

$$\Rightarrow \hat{y} = a = \sigma(z)$$

$$\Rightarrow \mathcal{L}(a, y) = -(y \log(a) + (1 - y) \log(1 - a))$$

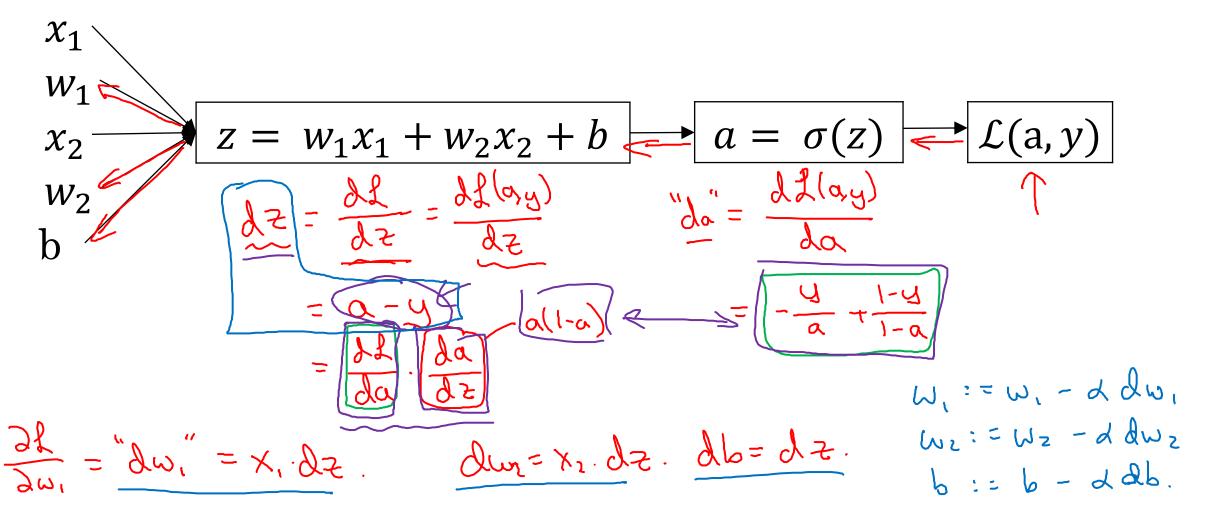
$$\begin{cases} \lambda_{1} \\ \lambda_{2} \\ \lambda_{3} \\ \lambda_{4} \end{cases}$$

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$$\begin{cases} \lambda_{2} \\ \lambda_{3} \\ \lambda_{4} \end{cases}$$

Logistic regression derivatives





Basics of Neural Network Programming

Gradient descent on *m* examples

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Logistic regression on m examples

$$\frac{J(\omega,b)}{J(\omega,b)} = \frac{1}{m} \sum_{i=1}^{m} f(\alpha^{(i)}, y^{(i)})$$

$$\frac{J(\omega,b)}{J(\omega^{(i)})} = G(z^{(i)}) = G(\omega^{T} x^{(i)} + b)$$

$$\frac{J(\omega,b)}{J(\omega,b)} = \frac{1}{m} \sum_{i=1}^{m} \frac{J(\alpha^{(i)}, y^{(i)})}{J(\alpha^{(i)}, y^{(i)})}$$

Logistic regression on *m* examples

$$J=0$$
; $d\omega_{1}=0$; $d\omega_{2}=0$; $db=0$
 $Z^{(i)}=\omega^{T}x^{(i)}+b$
 $Z^{$

$$d\omega_1 = \frac{\partial J}{\partial w_1}$$
 $\omega_1 := \omega_1 - d d \omega_2$
 $\omega_2 := \omega_2 - d d \omega_2$
 $b := b - d d b$

Vectorization