

Algo

Forward and Backward Propagation

Inputs:

- w : weights
- b : biases
- X, Y

Outputs:

- Cost
- Grads

Forward

$$A = \sigma(w^T X + b)$$

$$J = -\frac{1}{m} \sum_{i=1}^m (y^{(i)} \log(a^{(i)}) + (1 - y^{(i)}) \log(1 - a^{(i)}))$$

En numpy : $A = \text{sigmoid}(np.dot(w.T, X) + b)$

$$J = (1/m)^* np.sum(Y * np.log(A) + (1 - Y) * np.log(1 - A))$$

Backward

$$\frac{\partial J}{\partial w} = \frac{1}{m} X (A - Y)^T$$

$$dw = \frac{1}{m} * np.dot(X, (A - Y).T)$$

$$\frac{\partial J}{\partial b} = \frac{1}{m} \sum_{i=1}^m (a^{(i)} - y^{(i)})$$

$$db = \frac{1}{m} * np.sum(A - Y)$$

Return : $\text{Cost}(J), \text{Grads}(dw, db)$