NN chapter 2 Excercise

Back Propogation with single neuron

→

According to sigmoid function

$$\sigma(z) = \frac{1}{1+e^{-z}}$$

As per given excersise function f is other than sigmoid function.
i.e. we can replace,

$\sigma(z)$ with $f(z)$

$$z = \sum_j w_j x_j + b$$

According back propogation algo.

$$\delta^L = \nabla_a C \cdot \sigma'(z^L)$$

here $L = 1$ as single layer

$$\delta = \nabla_a C \cdot f'(z)$$

$\delta^1 = \nabla_a C \; f'(x)$ is output error

Back propogate error

$\delta^l = (w^{l+1})^T \delta^{l+1} \odot \sigma'(z^l)$

- according to BP algo.

here $l = L-1, L-2$

but this is single layer.

$l = 1-1 = 0$

$\delta^0 = (w^1)^T \delta^1 \odot f'(x^0)$

final step → Output: gradient of cost function is given by

$$\frac{dc}{dw_{jk}} = a_1^{l-1} \delta_j^1$$

and $$\frac{dc}{db_j} = \delta_j^1$$