Advanced Topics in Machine Learning
Solution Assignment #1

Rathesan Iyadurai
10-107-688

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Derive the gradients $\frac{\partial L}{\partial W_1}$ and $\frac{\partial L}{\partial W_2}$.

$$L = (non(XW_1)W_2 - X)^2$$

$$non(X) = \begin{cases} X & \text{if } X \geq 0 \\ 0 & \text{if } X < 0 \end{cases}$$

$$\frac{\partial L}{\partial W_1} = \begin{cases} 2W_2X^2(non(XW_1)W_2 - X) & \text{if } XW1 \geq 0 \\ 0 & \text{if } XW1 < 0 \end{cases}$$

$$\frac{\partial L}{\partial W_2} = \begin{cases} 2non(XW1)(non(XW_1)W_2 - X) & \text{if } XW1 \geq 0 \\ 0 & \text{if } XW1 < 0 \end{cases}$$