

Problem 1.

$$\begin{aligned}\frac{\partial y}{\partial z} &= - \frac{1}{(1+e^z)^2} \cdot e^{-z} \cdot (-1) \\ &= \frac{e^{-z}}{(1+e^{-z})^2}\end{aligned}$$

Problem 2:

$$\frac{\partial J}{\partial x} = \frac{\partial J}{\partial y} \cdot \frac{\partial y}{\partial z} \cdot \frac{\partial z}{\partial x}$$

$e \in \mathbb{R}^{m \times n}$     $f'$     $w$

$$\begin{aligned}\frac{\partial J}{\partial w} &= \frac{\partial J}{\partial y} \cdot \frac{\partial y}{\partial z} \cdot \frac{\partial z}{\partial w} \\ &= \frac{\partial J}{\partial z} \cdot X\end{aligned}$$

$$\begin{aligned}\frac{\partial J}{\partial b} &= \frac{\partial J}{\partial y} \cdot \frac{\partial y}{\partial z} \cdot \frac{\partial z}{\partial b} \\ &= \frac{\partial J}{\partial z} \cdot \underline{1}\end{aligned}$$