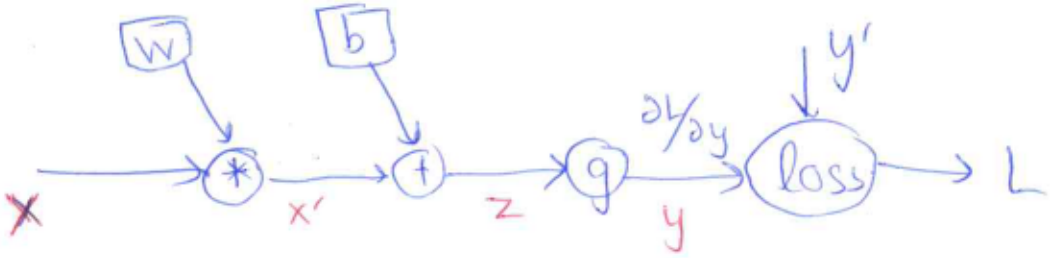

~~$y \in \mathbb{R}^N$~~ $\quad y, z, x \in \mathbb{R}^N$

$$\frac{\partial L}{\partial y} = \begin{bmatrix} \partial L/\partial y_1 \\ \vdots \\ \partial L/\partial y_N \end{bmatrix} \qquad \frac{\partial L}{\partial z_i} = \left(\frac{\partial L}{\partial y}\right)^T \left(\frac{\partial y}{\partial z_i}\right)$$

matrix

$$\begin{bmatrix} \partial L/\partial y_1 \\ \vdots \\ \partial L/\partial y_N \end{bmatrix} \qquad \begin{bmatrix} \partial y_1/\partial z_i \\ \vdots \\ \partial y_N/\partial z_i \end{bmatrix}$$

$$\frac{\partial L}{\partial z} = \left(\frac{\partial L}{\partial y}\right)^T \frac{\partial y}{\partial z} \rightarrow \begin{bmatrix} \partial y_1/\partial z_1 & \cdots & \partial y_1/\partial z_N \\ \vdots & \ddots & \vdots \\ \partial y_N/\partial z_1 & \cdots & \partial y_N/\partial z_N \end{bmatrix}$$

$(1 \times N)$ ~~$1 \times N$~~ $\qquad (N \times N)$

$(1 \times N) * (N \times N) = (1 \times N)$