Forward pass

$$z = wx + b \qquad a = f_a(z) \qquad \mathcal{L} = f_{\mathcal{L}}(a)$$

$$\frac{\partial z}{\partial x, w, b}$$

$$\frac{\partial a}{\partial z}$$

$$\frac{\partial \mathcal{L}}{\partial a}$$

$$\frac{\partial \mathcal{L}}{\partial w} = \frac{\partial \mathcal{L}}{\partial z} \frac{\partial z}{\partial w}$$

$$\frac{\partial \mathcal{L}}{\partial b} = \frac{\partial \mathcal{L}}{\partial z} \frac{\partial z}{\partial b}$$

$$\frac{\partial \mathcal{L}}{\partial z} = \frac{\partial \mathcal{L}}{\partial a} \frac{\partial a}{\partial z}$$

Backward pass