

$\frac{\partial \mathcal{L}}{\partial \mathbf{w}_1} = \frac{\partial \mathcal{L}}{\partial \mathbf{z}_1} \frac{\partial \mathbf{z}_1}{\partial \mathbf{w}_1}$
 $\frac{\partial \mathcal{L}}{\partial \mathbf{w}_2} = \frac{\partial \mathcal{L}}{\partial \mathbf{z}_2} \frac{\partial \mathbf{z}_2}{\partial \mathbf{w}_2}$
 $\frac{\partial \mathcal{L}}{\partial \mathbf{w}_3} = \frac{\partial \mathcal{L}}{\partial \mathbf{z}_3} \frac{\partial \mathbf{z}_3}{\partial \mathbf{w}_3}$