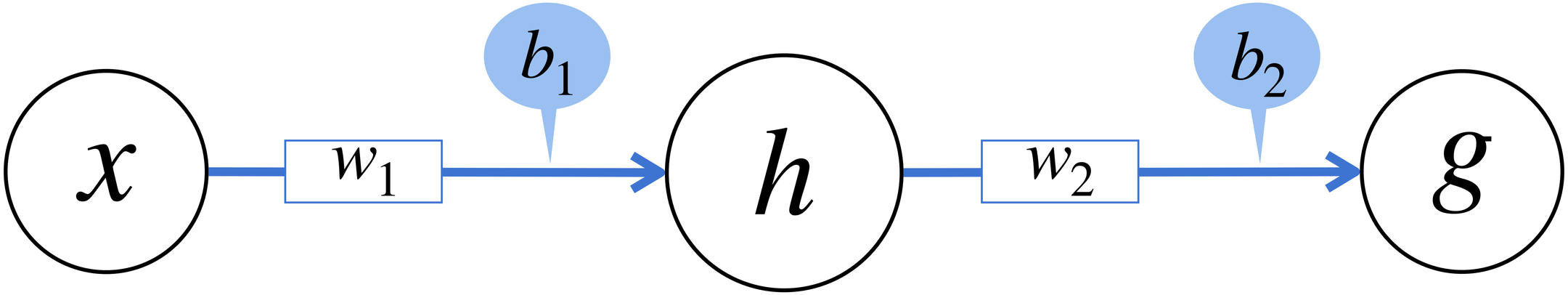
Backpropagation



$$h = w_1 \cdot x + b_1$$

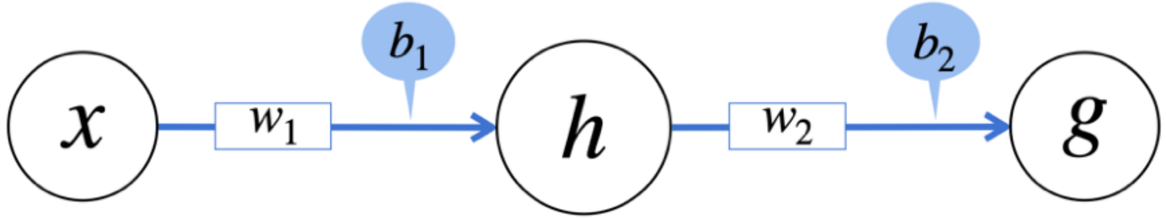
$$g = w_2 \cdot x + b_2$$

how close is g to our actual value?

Loss function (MSE):

$$\frac{1}{N}\sum_{i}^{N}(y_i - g_i)^2 \quad \Longrightarrow \quad \frac{1}{N}\sum_{i}^{N}(y_i - (w_2 \cdot \underbrace{(w_1 \cdot x_i + b_1)}_{=h} + b_2)^2$$

Backpropagation



$$\frac{1}{N}\sum_{i}^{N}(y_i - g_i)^2 \implies \frac{1}{N}\sum_{i}^{N}(\underbrace{y_i}_{\text{actual}} - \underbrace{(w_2 \cdot (w_1 \cdot x_i + b_1) + b_2)}_{\text{predicted}})^2$$

this is what the gradient tells us!

- How change w_1 to reduce our loss?
- How change w_2 to reduce our loss?
- How change b_1 to reduce our loss?
- How change b_2 to reduce our loss?