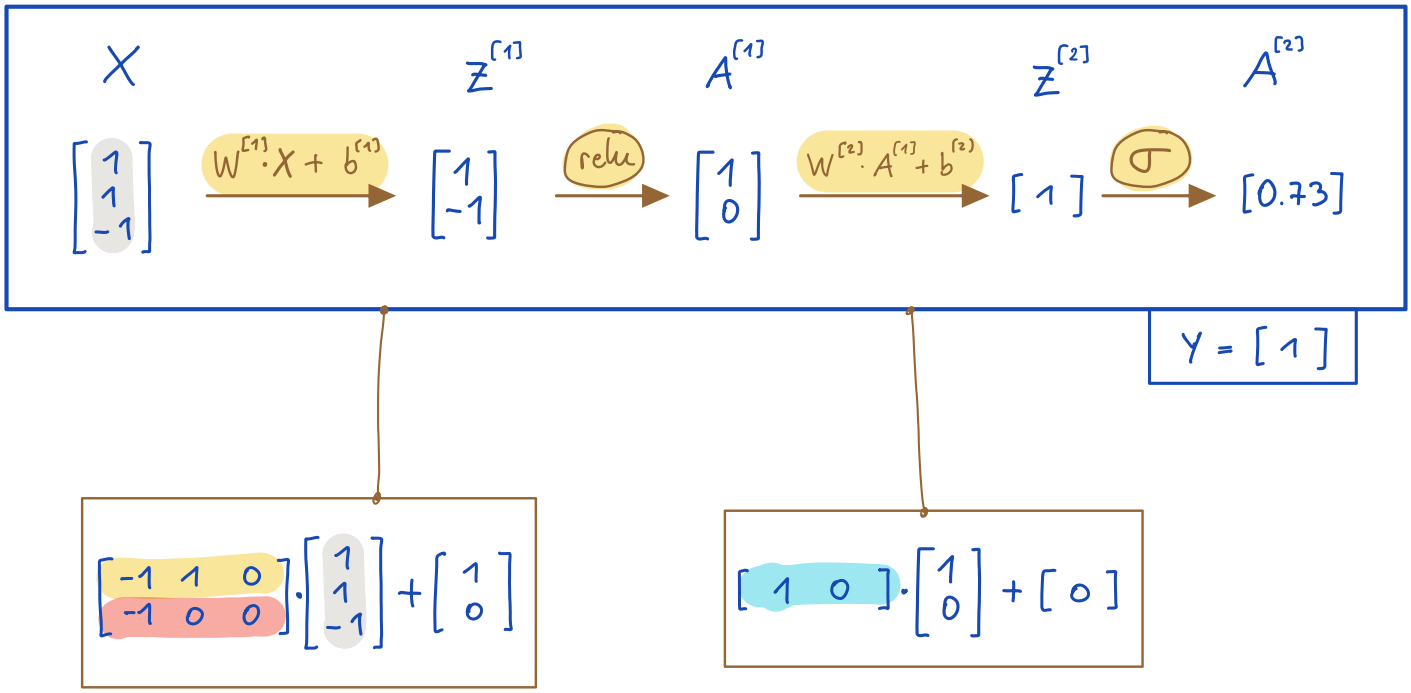
VORWÄRTSLAUF

- Schicht 1) $W^{[1]} = \begin{bmatrix} -1 & 1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$ $b^{[1]} = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$ Aktivierung = Relu
- Schicht 2) $W^{[2]} = \begin{bmatrix} 1 & 0 \end{bmatrix}$ $b^{[2]} = [0]$ Aktivierung = Sigmoid

- Lernrate : $\alpha = 0.1$
- Loss : $\mathcal{L} = J = -y \log(\hat{y}) - (1-y) \cdot \log(1-\hat{y})$ (Binary Cross-Entropy)

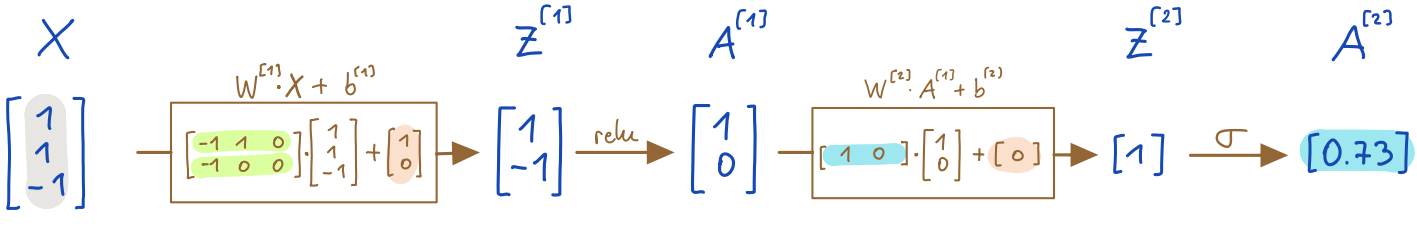
- Daten : $X = \begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix}$ $Y = [1]$



VERLUST

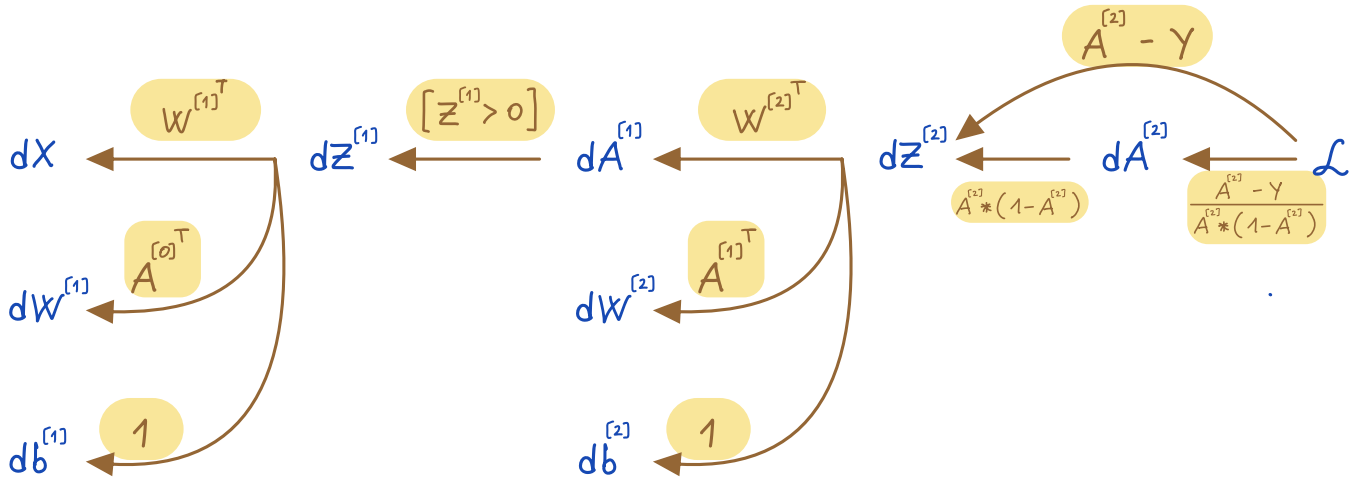
$$\mathcal{L} = -y \cdot \log(\hat{y}) - (1-y) \cdot \log(1-\hat{y}) = -1 \cdot \log(0.73) \cong 0.31$$

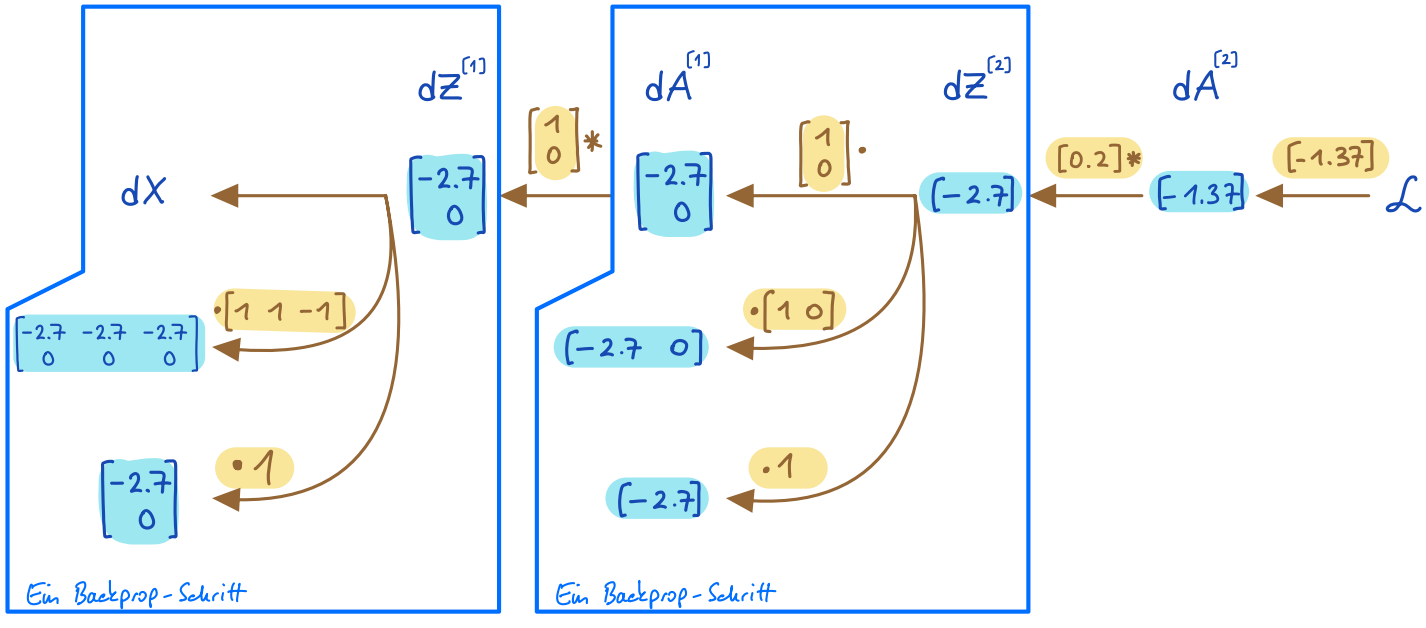
RÜCKWÄRTSLAUF



$$\frac{\partial \mathcal{L}}{\partial A^{[2]}} = dA^{[2]} = \frac{A^{[2]} - Y}{A^{[2]} * (1 - A^{[2]})} = \frac{[0.73] - [1]}{[0.73] * [0.27]} = [-1.37]$$

Gradientengraph





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GEWICHTSAKTUALISIERUNG

$$W^{[1]} = \begin{bmatrix} -1 & 1 & 0 \\ -1 & 0 & 0 \end{bmatrix} - (0.1) \cdot \begin{bmatrix} -0.27 & -0.27 & 0.27 \\ 0 & 0 & 0 \end{bmatrix}$$

$$b^{[1]} = \begin{bmatrix} 1 \\ 0 \end{bmatrix} - (0.1) \cdot \begin{bmatrix} -0.27 \\ 0 \end{bmatrix}$$

$$W^{[2]} = \begin{bmatrix} 1 & 0 \end{bmatrix} - (0.1) \cdot \begin{bmatrix} -0.27 & 0 \end{bmatrix}$$

$$b^{[2]} = \begin{bmatrix} 0 \end{bmatrix} - (0.1) \cdot \begin{bmatrix} -0.27 \end{bmatrix}$$

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