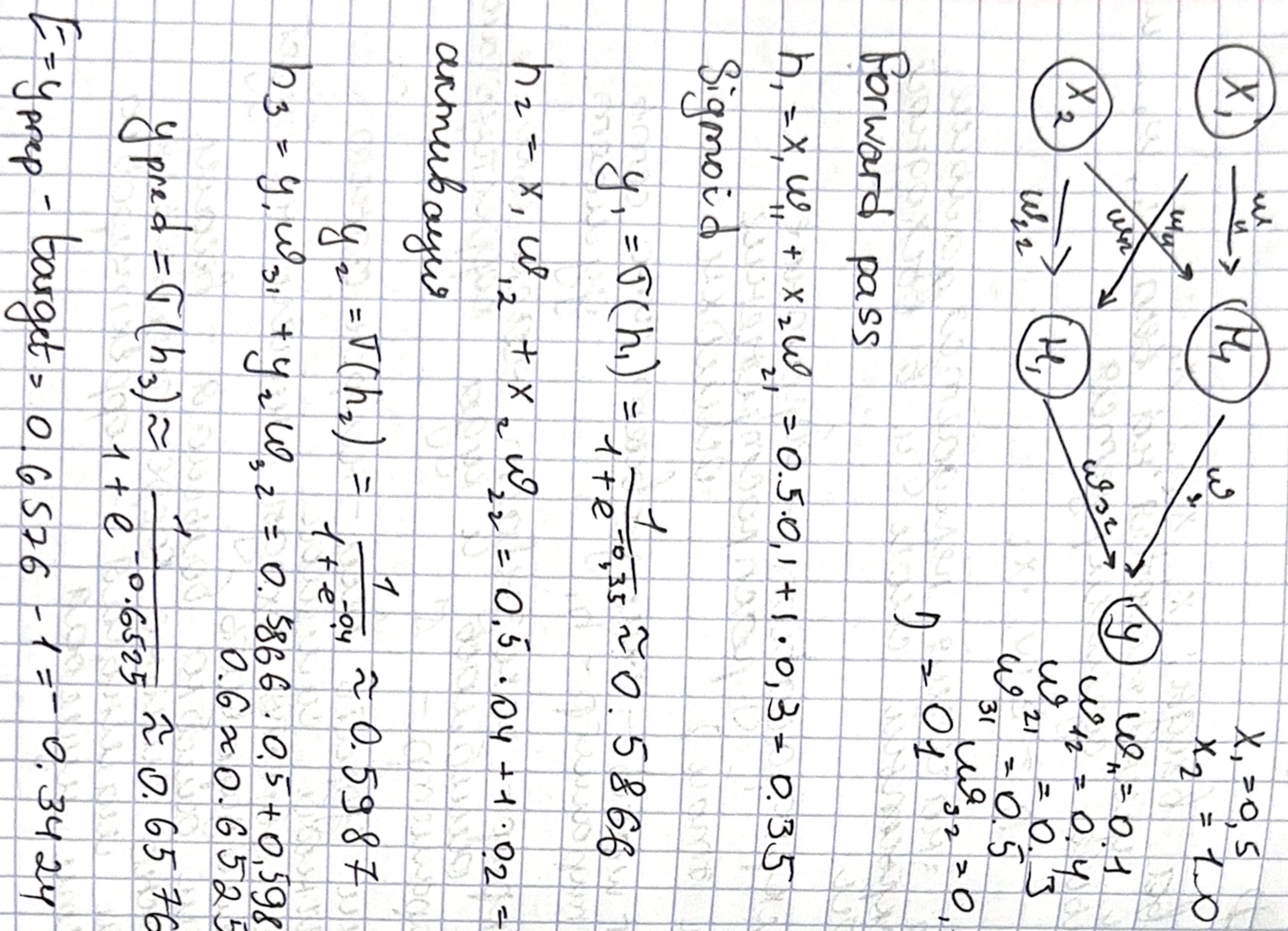


# MLP



$$\nabla_3 = y_{\text{prep}}(1 - y_{\text{prep}})(y_{\text{prep}} - \text{target})$$

$$\nabla_3 \approx 0.6576 \cdot (1 - 0.6576) \cdot (0.6576 - 1)$$

$$\nabla_3 \approx 0.6576 \cdot 0.3424 \cdot (-0.3424) \approx -0.0771$$

$$\nabla_1 = y_1(1 - y_1) \cdot (w_{31}, \nabla_3)$$

$$\nabla_1 = y_1(1 - y_1) \cdot (w_{32}, \nabla_3)$$

$$\nabla_1 = 0.5866 \cdot (1 - 0.5866) \cdot (0.5 - 0.5866) \approx -0.00935$$

$$\Delta w_{31} = 0.5866 \cdot (1 - 0.5866) \cdot (0.5 - 0.5866) \cdot (0.6 - 0.00935) \approx -0.01111$$

$$\Delta w_{31, \text{new}} = 0.5 + (-0.00452) \approx 0.49548$$

$$\Delta w_{32} = 0.1 \cdot 0.5866 \cdot (-0.0771) \approx -0.00162$$

$$\Delta w_{11} = 0.1 \cdot 0.5 \cdot (-0.00935) \approx -0.00047$$

$$w_{11, \text{new}} \approx 0.1 - 0.00047 = 0.09953$$

$$y_{\text{pred}} = \sigma(h_3) \approx \frac{1}{1+e^{-0.6525}} \approx 0.6576$$

$$E = y_{\text{prep}} - \text{target} = 0.6576 - 1 = -0.3424$$