

$$\text{MSE} = (\hat{y} - y)^2 = 3,28 \cdot 10^{-3}$$

$$\frac{\partial \text{MSE}}{\partial \text{MSE}} = 2(\hat{y} - y)$$

$$\text{MSE} = \hat{y} - y = 0,942 - 1 = -0,0573$$

$$\frac{\partial \text{MSE}}{\partial \hat{y}} = 1$$

$$-\frac{\partial \text{MSE}}{\partial y} = -1$$

$$\frac{1}{1 + e^{-\frac{14}{5}}} = 0,942$$

$$\hat{y} = \sigma(z)$$

$$\frac{\partial \hat{y}}{\partial z} = \sigma(z)(1 - \sigma(z))$$

$$z = z_1 + b_0$$

$$\frac{4}{5} + \frac{7}{5} + \frac{3}{5} = \frac{14}{5}$$

$$\frac{\partial z}{\partial z_1} = 1$$

$$\frac{\partial z}{\partial z_1} = \frac{4}{5} + \frac{7}{5} = \frac{11}{5}$$

$$-\frac{\partial z}{\partial b_0} = -1$$

$$z_1 = \underline{w}^T \underline{x}$$

$$\frac{\partial z_1}{\partial x} = \underline{w}$$

$$\frac{\partial z_1}{\partial w} = \underline{x}$$

$$\underline{w} = \begin{bmatrix} \frac{4}{5} \\ \frac{7}{5} \end{bmatrix} \quad \underline{x} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$b_0 = \frac{3}{5}$$

$$\frac{\partial \text{MSE}}{\partial x} = \frac{\partial \text{MSE}}{\partial \text{MSE}} \cdot \frac{\partial \text{MSE}}{\partial \hat{y}} \cdot \frac{\partial \hat{y}}{\partial z} \cdot \frac{\partial z}{\partial z_1} \cdot \frac{\partial z_1}{\partial x}$$

$$= 2(\hat{y} - y) \cdot 1 \cdot \sigma(z)(1 - \sigma(z)) \cdot 1 \cdot \underline{w}$$

$$= 2 \cdot (0,942 - 1) \cdot 1 \cdot 0,942(1 - 0,942) \cdot 1 \cdot \begin{bmatrix} \frac{4}{5} \\ \frac{7}{5} \end{bmatrix}$$

$$= -6,19538 \cdot 10^{-3} \begin{bmatrix} \frac{4}{5} \\ \frac{7}{5} \end{bmatrix} = \begin{bmatrix} -4,9563 \cdot 10^{-3} \\ -8,6735 \cdot 10^{-3} \end{bmatrix}$$