

Bài tập:

Tìm back-propagation của hàm sau:

$$f = \frac{1}{e^{-(w_1 \cdot x_1 + w_2 \cdot x_2 + w_3)} + 1}$$

Và cho biết giá trị của mỗi nút sau tại:

$w_1=1; x_1=2; w_2=-2; x_2=4; w_3=-1$

Đáp án:

$$\frac{\partial f}{\partial d} = -\frac{1}{d^2} = -8,3 \cdot 10^{-7}$$

$$\frac{\partial f}{\partial c} = \frac{\partial f}{\partial d} \cdot \frac{\partial d}{\partial c} = e^c \cdot \left(-\frac{1}{d^2}\right) = -9,1 \cdot 10^{-4}$$

$$\frac{\partial f}{\partial b} = \frac{\partial f}{\partial c} \cdot \frac{\partial c}{\partial b} = (-9,1 \cdot 10^{-4}) \cdot (-1) = 9,1 \cdot 10^{-4}$$

$$\frac{\partial f}{\partial a_1} = \frac{\partial f}{\partial b} \cdot \frac{\partial b}{\partial a_1} = 9,1 \cdot 10^{-4} \cdot 1 = 9,1 \cdot 10^{-4}$$

$$\frac{\partial f}{\partial a_2} = \frac{\partial f}{\partial b} \cdot \frac{\partial b}{\partial a_2} = 9,1 \cdot 10^{-4} \cdot 1 = 9,1 \cdot 10^{-4}$$

$$\frac{\partial f}{\partial a_3} = \frac{\partial f}{\partial b} \cdot \frac{\partial b}{\partial a_3} = 9,1 \cdot 10^{-4} \cdot 1 = 9,1 \cdot 10^{-4}$$

$$\frac{\partial f}{\partial w_1} = \frac{\partial f}{\partial a_1} \cdot \frac{\partial a_1}{\partial w_1} = 9,1 \cdot 10^{-4} \cdot x_1 = 1,82 \cdot 10^{-3}$$

$$\frac{\partial f}{\partial w_2} = \frac{\partial f}{\partial a_2} \cdot \frac{\partial a_2}{\partial w_2} = 9,1 \cdot 10^{-4} \cdot x_2 = 3,64 \cdot 10^{-3}$$

$$\frac{\partial f}{\partial w_3} = \frac{\partial f}{\partial a_3} \cdot \frac{\partial a_3}{\partial w_3} = 9,1 \cdot 10^{-4}$$

