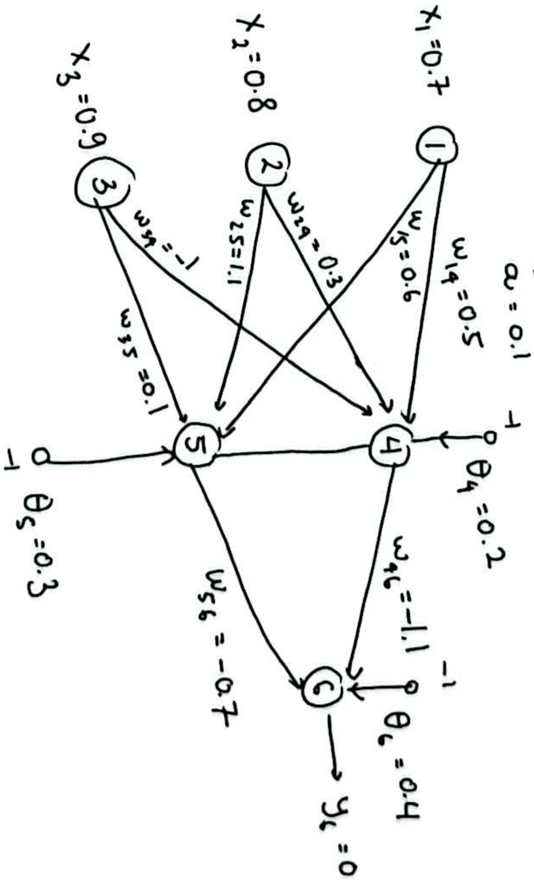
Kelompok 1 :

1. Ahmed Basyaleh
2. Vincent Arlen Santoso
3. Nadia Rahmadianty.



$x_1 = 0.7$
$x_2 = 0.8$
$x_3 = 0.9$
Threshold = -1
$y_6 = 0$
$\alpha = 0.1$

Answer Sheet :

Step #1 : $y_4 = \text{Sigmoid}(x_1.w_{14} + x_2.w_{24} + x_3.w_{34} - \theta_4)$

$$y_4 = \frac{1}{(1+e^{-(0.7.0.5 + 0.8.0.3 + (0.9.-1) - (1.0.2))}}$$

$$y_4 = \frac{1}{1+e^{-(0.35 + 0.24 + (-0.9) - 0.2)}} = 0.375$$

$y_5 = \text{Sigmoid}(x_1.w_{15} + x_2.w_{25} + x_3.w_{35} - \theta_5)$

$$y_5 = \frac{1}{(1+e^{-(07.0.6 + 0.8.1.1 + 0.9.0.1 - 1.0.3))}} = 0.748$$

$y_6 = \text{Sigmoid}(y_4.w_{46} + y_5.w_{56} - \theta_6)$

$$y_6 = \frac{1}{(1+e^{-(0.375.-1.1 + 0.748.-0.7 - 0.4))}} = 0.208$$

Step #2 ~nilai error :

$e = y_{d6} - y_6$

$e = 0 - 0.208 = -0.208$

Step #3 ~error gradient δ_6 :

$\delta_6 = y_6(1-y_6)e$

$= 0.208 \times (1-0.208) \times -0.208$

$\delta_6 = -0.034$

Step #4 ~weight correction :

$\Delta w_{46} = \alpha \times y_4 \times \delta_6$

$= 0.1 \times 0.375 \times (-0.034) = -1.275 \times 10^{-3}$

$= -0.001275$

$\Delta w_{56} = \alpha \times y_5 \times \delta_6$

$= 0.1 \times 0.748 \times (-0.034) = -2.54 \times 10^{-3}$

$= -0.00254$

$\theta_6 = \alpha \times -1 \times \delta_6$

$= 0.1 \times -1 \times (-0.034) = 3.4 \times 10^{-3}$

$= 0.0034$

Step #5 ~error gradient δ_4 & δ_5 :

$\delta_4 = y_4(1-y_4) \times \delta_6 \times w_{46}$

$= 0.375 \times (1-0.375) \times (-0.034) \times (-1.1) = 8.76 \times 10^{-3}$

$= 0.00876$

$\delta_5 = y_5(1-y_5) \times \delta_6 \times w_{56}$

$= 0.748 \times (1-0.748) \times (-0.034) \times (-0.7) = 4.486 \times 10^{-3}$

$= 0.00448$

Step #6 : ~weight corrections

$\Rightarrow \Delta w_{14} = a \times x_1 \times \delta_4$
$= 0.1 \times 0.7 \times 0.00876 = 6.132 \times 10^{-4}$

$\Rightarrow \Delta w_{15} = a \times x_1 \times \delta_5$
$= 0.1 \times 0.7 \times 0.00448 = 3.136 \times 10^{-4}$

$\Rightarrow \Delta w_{24} = a \times x_2 \times \delta_4$
$= 0.1 \times 0.8 \times 0.00876 = 7.008 \times 10^{-4}$

$\Rightarrow \Delta w_{25} = a \times x_2 \times \delta_5$
$= 0.1 \times 0.8 \times 0.00448 = 3.584 \times 10^{-4}$

$\Rightarrow \Delta w_{34} = a \times x_3 \times \delta_4$
$= 0.1 \times 0.9 \times 0.00876 = 7.889 \times 10^{-4}$

$\Rightarrow \Delta w_{35} = a \times x_3 \times \delta_5$
$= 0.1 \times 0.9 \times 0.00448 = 4.032 \times 10^{-4}$

$\Rightarrow \Delta \theta_4 = a \times (-1) \times \delta_4$
$= 0.1 \times (-1) \times 0.00876 = -8.76 \times 10^{-4}$

$\Rightarrow \Delta \theta_5 = a \times (-1) \times \delta_5$
$= 0.1 \times (-1) \times 0.00448 = -4.48 \times 10^{-4}$

Step #7 : ~updated weights & threshold

$\Rightarrow w_{14} = w_{14} + \Delta w_{14}$
$= 0.5 + [6.132 \times 10^{-4}] = 0.5006$

$\Rightarrow w_{15} = w_{15} + \Delta w_{15}$
$= 0.6 + [3.136 \times 10^{-4}] = 0.6003$

$\Rightarrow w_{24} = w_{24} + \Delta w_{24}$
$= 0.3 + [7.008 \times 10^{-4}] = 0.3007$

$\Rightarrow w_{25} = w_{25} + \Delta w_{25}$
$= 1.1 + [3.584 \times 10^{-4}] = 1.10035$

$\Rightarrow w_{34} = w_{34} + \Delta w_{34}$
$= -1 + [7.884 \times 10^{-4}] = -0.9992$

$\Rightarrow w_{35} = w_{35} + \Delta w_{35}$
$= 0.1 + [4.032 \times 10^{-4}] = 0.1004$

$\Rightarrow \theta_4 = \theta_4 + \Delta \theta_4$
$= 0.2 + [-8.76 \times 10^{-4}] = 0.19912$

$\Rightarrow \theta_5 = \theta_5 + \Delta \theta_5$
$= 0.3 + [-4.48 \times 10^{-4}] = 0.29955$

$$\therefore w_{4b} = w_{4b} + \Delta w_{4b}$$
$$= -1.1 + [-1.275 \times 10^{-3}] = -1.101275$$

$$\therefore w_{5b} = w_{5b} + \Delta w_{5b}$$
$$= -0.7 + [-2.54 \times 10^{-3}] = -0.70254$$

$$\therefore \theta_b = \theta_b + \Delta \theta_b$$
$$= 0.4 + [3.4 \times 10^{-3}] = 0.4034$$