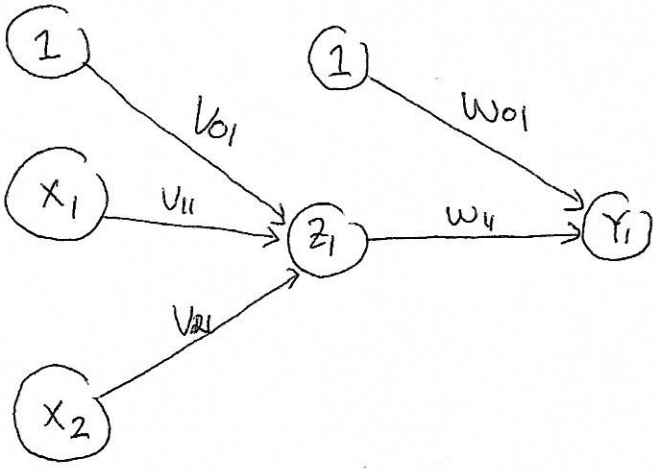
Hal 1

Data

X_1	X_2	Y
0	0	0
0	1	0
1	0	0
1	1	1

Arsitektur NN



step 0 – Inisialisasi

$V_{01} = 1{,}7 \qquad W_{01} = -0{,}5$

$V_{11} = -1{,}2 \qquad W_{11} = 0{,}5$

$V_{21} = -1{,}1 \qquad \alpha = 0{,}01$

Iterasi 1 – Data 1

target (t)

$X_1 = 0 \quad X_2 = 0 \quad \boxed{Y = 0}$

Step 4

$$Z\_in_1 = \boxed{X_0 * V_{01} + X_1 * V_{11} + X_2 * V_{21}} \rightarrow \text{yang menuju ke } Z_1$$

$$= 1 * 1{,}7 + 0 * -1{,}2 + 0 * -1{,}1$$

$$= 1{,}7$$

$$Z_1 = f(Z\_in_1) = \frac{1}{1 + e^{(-1{,}7)}} = 0{,}8455$$

Step 5

$$Y\_in_1 = \boxed{Z_0 * W_{01} + Z_1 * W_{11}} \rightarrow \text{yang menuju ke } Y_1$$

$$= 1 * -0{,}5 + 0{,}8455 * 0{,}5$$

$$= -0{,}0773$$

$$Y_1 = f(Y\_in_1) = \frac{1}{1+e^{(-(-0,0773))}} = 0,4807$$

$$\delta_1 = \boxed{(t - Y_1) * f(Y\_in_1) * (1 - f(Y\_in_1))} \rightarrow \text{error dari output 1 } (Y_1)$$

$$= (0 - 0,4807) * 0,4807 * (1 - 0,4807)$$

$$= -0,12$$

$$\Delta W_{01} = \alpha * \delta_1 * z_0$$
$$= 0,01 * (-0,12) * 1$$
$$= -0,0012$$

$$\Delta W_{11} = \alpha * \delta_1 * z_1$$
$$= 0,01 * (-0,12) * 0,8455$$
$$= -0,001$$

hitung delta bobot yang terhubung dengan Y_1

Step 6

$$\delta_{in_1} = \boxed{\delta_1 * W_{11}} \rightarrow \text{error dari hidden node 1 } (z_1)$$

$$= -0,12 * 0,5$$
$$= -0,06$$

$$\delta_1 = \delta\_in_1 * f'(z\_in_1)$$
$$= \delta\_in_1 * f(z\_in_1) * (1 - f(z\_in_1))$$
$$= -0,06 * 0,8455 * (1 - 0,8455)$$
$$= -0,0078$$

Step 7

$\Delta V_{01} = \alpha * \delta_1 * x_0$

$= 0,01 * -0,0078 * 1$

$= 0$

$\Delta V_{11} = \alpha * \delta_1 * x_1$

$= 0,01 * -0,0078 * 0$

$= 0$

$\Delta V_{21} = \alpha * \delta_1 * x_2$

$= 0,01 * -0,0078 * 0$

$= 0$

hitung delta bobot untuk yang terhubung dengan z_1

$W_{01} = W_{01}(\text{lama}) + \Delta W_{01}$

$= -0,5 + (-0,0012)$

$= -0,5012$

$W_{11} = W_{11}(\text{lama}) + \Delta W_{11}$

$= 0,5 + (-0,001)$

$= 0,499$

$V_{01} = V_{01}(\text{lama}) + \Delta V_{01}$

$= 1,7 + 0$

$= 1,7$

$V_{11} = V_{11}(\text{lama}) + \Delta V_{11}$

$= -1,2 + 0$

$= -1,2$

$V_{21} = V_{21}(\text{lama}) + \Delta V_{21}$

$= -1,1 + 0$

$= -1,1$

step 8.

Iterasi 1 – Data 2

$x_1 = 0 \quad x_2 = 1 \quad [Y = 0]$ ← target (t)

Nilai baru hasil perhitungan sebelumnya

$$Z\_in_1 = x_0 * v_{01} + x_1 * v_{11} + x_2 * v_{21}$$
$$= 1 * 1{,}7 + 0 * (-1{,}2) + 1 * (-1{,}1)$$
$$= 0{,}6$$
$$z_1 = f(z\_in_1) = 0{,}6457$$

Step 4

nilai baru hasil perhitungan sebelumnya

$$Y\_in_1 = z_0 * w_{01} + z_1 * w_{11}$$
$$= 1 * (-0{,}5012) + (0{,}6457) * (0{,}499)$$
$$= -0{,}179$$
$$Y_1 = f[Y\_in_1) = 0{,}4554$$

Step 5

$$\delta_1 = (t - Y_1) * f(Y\_in_1) * (1 - f(Y\_in_1))$$
$$= (0 - 0{,}4554) * (0{,}4554) * (1 - 0{,}4554)$$
$$= -0{,}1129$$

$$\Delta w_{01} = \alpha * \delta_1 * z_0$$
$$= 0{,}01 * (-0{,}1129) * 1$$
$$= -0{,}0011$$

$$\Delta w_{11} = \alpha * \delta_1 * z_1$$
$$= 0{,}01 * (-0{,}1129) * 0{,}6457$$
$$= -0{,}0007$$

Step 6

$$\delta_{in1} = \delta_1 * w_{11}$$
$$= -0{,}1129 * 0{,}499$$
$$= -0{,}0563$$
$$\delta_1 = \delta\_in_1 * f(z\_in_1) * (1 - f(z\_in_1))$$
$$= -0{,}0563 * 0{,}6457 * (1 - 0{,}6457)$$
$$= -0{,}0129$$

Step 7

$\Delta v_{01} = \alpha * \delta_1 * x_0$

$= 0,01 * (-0,0129) * 1$

$= -0,0001$

$\Delta v_{11} = \alpha * \delta_1 * x_1$

$= 0,01 * (-0,0129) * 0$

$= 0$

$\Delta v_{21} = \alpha * \delta_1 * x_2$

$= 0,01 * (-0,0129) * 1$

$= -0,0001$

$w_{01} = w_{01}\ (lama) + \Delta w_{01}$

$= -0,5012 + (-0,0011)$

$= -0,5023$

$w_{11} = w_{11}\ (lama) + \Delta w_{11}$

$= 0,499 + (-0,0007)$

$= 0,4983$

$v_{01} = v_{01}\ (lama) + \Delta v_{01}$

$= 1,7 + (-0,0001)$

$= 1,6999$

$v_{11} = v_{11}\ (lama) + \Delta v_{11}$

$= -1,2 + 0$

$= -1,2$

$v_{21} = v_{21}\ (lama) + \Delta v_{21}$

$= -1,1 + (-0,0001)$

$= -1,1001$

step 8

dst hingga error kecil atau max iterasi tercapai

sebuah siklus iterasi baru error dihitung (semua data sudah diproses)