AND and OR GATE

$$y = w_1 x + w_2 x + b$$

$$C = (Y - \hat{y})^2 / 2 = u$$

$$\frac{dC}{dy} = \frac{d(Y-\hat{y})^2}{dy} = \frac{du^2}{dy}$$

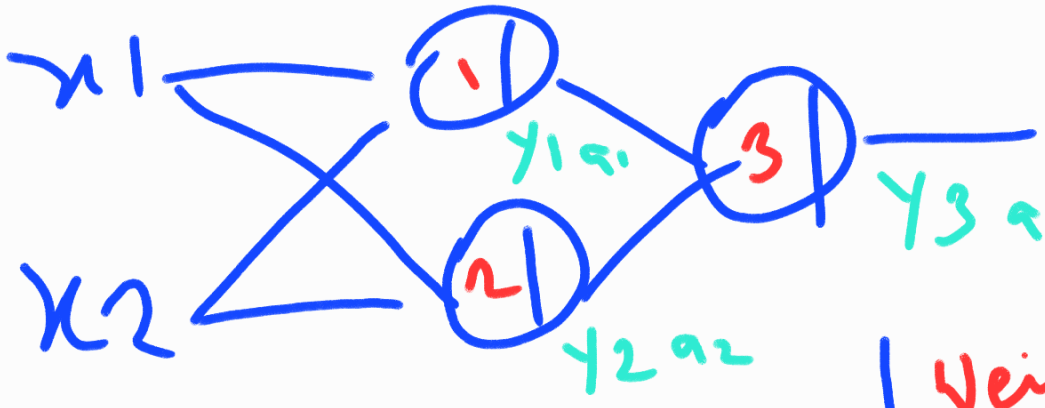
$$\frac{dL}{dy} = -y = 2u$$

$$\frac{dy}{dw_1} = x_1 \qquad \frac{dy_1}{dw_2} = x_2$$

$$\frac{dy}{db} = 1$$

EXOR GATE

3 neuron



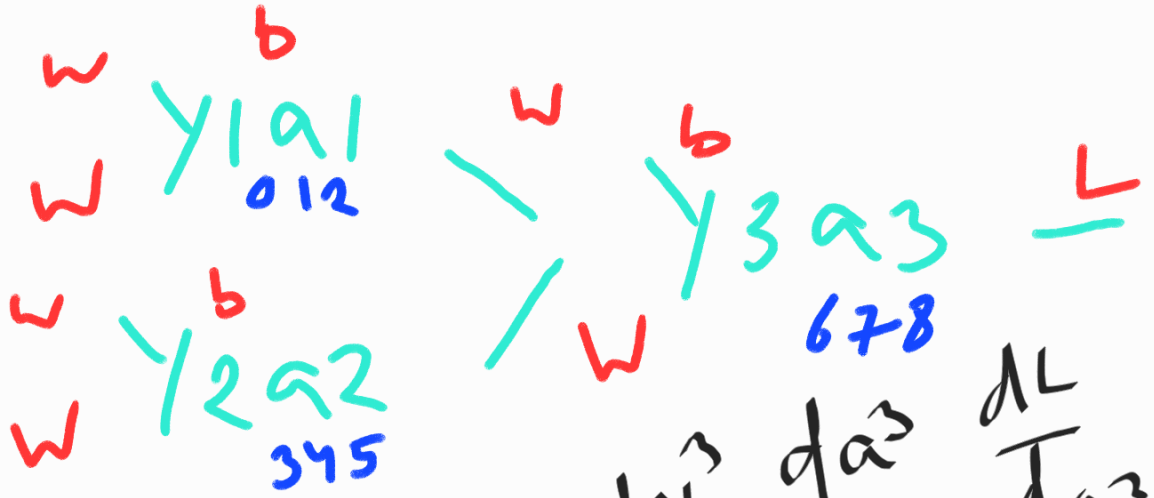
	w1	w2	b	Weights[i]
1 →	w1	w2	b	0 1 2
2 →	w1	w2	b	3 4 5
3 →	w1	w2	b	6 7 8

$y_1 = x_1 w_1 + x_2 w_2 + b$ w[0 1 2]

$y_2 = x_1 w_1 + x_2 w_2 + b$ w[3 4 5]

$y_3 = x_1 w_1 + x_2 w_2 + b$ w[6 7 8]

Chain Rule



$$\frac{dy}{dp} \quad \frac{da^1}{dy^1} \quad \frac{dy^3}{da^1}$$

$$\frac{dy^2}{dp} \quad \frac{da^2}{dy^2} \quad \frac{dy^3}{da^2}$$

$$\frac{dy^3}{dp} \quad \frac{da^3}{dy^3} \quad \frac{dL}{da^3}$$