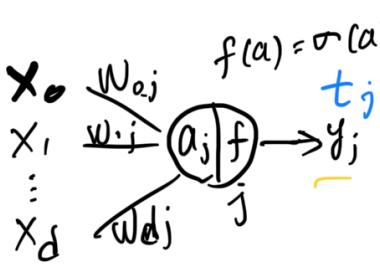

$f(a) = \sigma(a) = \frac{1}{1+e^{-a}}$

t_j

$e_j = y_j^n - t_j^n$

$y_j = f(a_j^n)$

$a_j^n = \sum_i w_{ij} x_i^n$

$E^n = \frac{1}{2} \sum_j (e_j^n)^2$

$$\frac{\partial E^n}{\partial w_{ij}} = \frac{\partial E^n}{\partial e_j} \frac{\partial e_j}{\partial y_j} \frac{\partial y_j}{\partial a_j} \frac{\partial a_j}{\partial w_{ij}}$$

$$= e_j^n \cdot f'(a_j^n) \cdot x_i^n$$

$$= e_j^n f'(a_j^n) x_i^n = \delta_j^n x_i^n$$

$\Delta w_{ij} = \alpha \delta_j^n x_i^n$

$$\delta_j^n = \frac{\partial E^n}{\partial a_j^n} = \frac{\partial E^n}{\partial e_j^n} \frac{\partial e_j^n}{\partial y_j^n} \frac{\partial y_j^n}{\partial a_j^n} = e_j^n f'(a_j^n)$$