INDEXES

N: number of input neurons ($0 \le i < N$)
L: number of hidden neurons ($0 \le j < L$)
M: number of output neurons ($0 \le k < M$)
Q: number of learning patterns ($0 \le p < Q$)

FORMULAS

$$net_j^h = \sum_{i=0}^{N-1} x_{ip} w_{ji}^h$$

$$y_j^h = f(net_j^h)$$

$$net_k^o = \sum_{j=0}^{L-1} y_j^h w_{kj}^o$$

$$y_k = f(net_k^o)$$

$$\delta_k^o = (d_{kp} - y_k) y_k (1 - y_k)$$

$$\delta_j^h = y_j^h (1 - y_j^h) \sum_{k=0}^{M-1} \delta_k^o w_{kj}^o$$

$$w_{kj}^o += \alpha \delta_k^o y_j^h$$

$$w_{ji}^h += \alpha \delta_j^h x_{ip}$$

$$Error = \frac{1}{2} \sum_{k=0}^{M-1} \left(\delta_k^{\,o} \right)^2$$

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