Definition of Error:

$$E \;=\; \sum_{\alpha}\sum_{i}(t_i{}^{(\alpha)} \;-\; h_i{}^{(\alpha)})^2$$

Sigmoid activation function and its derivative:

$$F(x) = 1/(1+e^{-x}), \qquad F^{'}(x) = F(x)(1-F(x))$$

For each pattern α:

I.Forward Pass:
Present pattern $f^{(\alpha)}$ to input layer
For each hidden unit j calculate activation:

$$g_j{}^{(\alpha)} \;=\; F(x_j{}^{(\alpha)}) \;=\; F(\sum_{k} W_{jk}{}^{(fg)} f_k{}^{(\alpha)})$$

For each output unit i, calculate activation:

$$h_i{}^{(\alpha)} \;=\; F(x_i{}^{(\alpha)}) \;=\; F(\sum_{j} W_{ij}{}^{(gh)} g_j{}^{(\alpha)})$$

II. Backward Pass:
For each output unit i,

Calculate output unit's delta:

$$\delta_i{}^{(\alpha)} \;=\; -\frac{\partial E}{\partial x_i{}^{(\alpha)}} \;=\; 2\,(t_i{}^{(\alpha)} \;-\; h_i{}^{(\alpha)})\; F^{'}(x_i{}^{(\alpha)})$$

For each incoming weight calculate output unit's weight change:

$$\Delta W_{ij}{}^{(gh)} \;=\; \eta \sum_{\alpha} \delta_i{}^{(\alpha)}\; g_j{}^{(\alpha)}$$

For each hidden unit j,

Calculate hidden unit's delta:

$$\delta_j{}^{(\alpha)} \;=\; -\frac{\partial E}{\partial x_j{}^{(\alpha)}} \;=\; \sum_{i \in outputs} \delta_i{}^{(\alpha)}\; W_{ij}{}^{(gh)}\; F^{'}(x_j{}^{(\alpha)})$$

For each incoming weight, calculate hidden unit's weight change:

$$\Delta W_{jk}{}^{(fg)} \;=\; \eta \sum_{\alpha} \delta_j{}^{(\alpha)}\; f_k{}^{(\alpha)}$$

Until convergence