$$t_1 = 0.01$$
$$t_2 = 0.99$$

(For calculating new weight of W_{11}, i have marked the chain rule path)

$$h_{1in} = W_{11}x_1 + W_{21}x_2 + W_{31}x_3 + b_1 = 0.377$$

$$h_1 \text{ out} = Act((h_1)in) = 0.593$$

$$h_{2in} = W_{12}x_1 + W_{22}x_2 + W_{32}x_3 + b_2 = 0.39$$

$$h_2 \text{ out} = Act((h_2)in) = 0.596$$

$$(y_1)in = h_1 \text{ out} * W_{h11} + h_2 \text{ out} * W_{h21} + b_3 = 1.105$$

$$(y_1) \text{ out} = Act((y_1)in) = 0.751$$

$$y_{2in} = h_1 \text{ out} * W_{h12} + h_2 \text{ out} * W_{h22} + b_4 = 1.224$$

$$y_{2 \text{ out}} = Act((y_2) \text{ out}) = 0.772$$

$$\text{Error Total} = \frac{1}{2}\left[(target - y_{out})^2\right] = \frac{1}{2}\left[(t_1 - y_{1out})^2 + (t_2 - y_{2out})^2\right]$$

$$= \frac{1}{2}\left[(0.1 - 0.751)^2 + (0.99 - 0.772)^2\right]$$

$$= 0.2983$$

$$(W_{h11}) \text{new} = (W_{h11}) \text{old} - \eta \frac{\partial E_{Total}}{\partial W_{h11}}$$

$$\frac{\partial E_{Total}}{\partial w_{h11}} = \frac{\partial E_{Total}}{\partial y_{1out}} * \frac{\partial y_{1out}}{\partial y_{1in}} * \frac{\partial y_{1in}}{\partial w_{h11}}$$

$$= (y_{1out} - t_1) * y_{1out}(1-y_{1out}) * h_{1out}$$

$$= 0.651 * 0.751 * 0.249 * 0.593$$

$$= 0.0721$$

$$(w_{h11})_{new} = (w_{h11})_{old} - \eta \frac{\partial E_{Total}}{\partial w_{h11}}$$

$$= 0.40 - 0.5 * 0.0721$$

$$= 0.40 - 0.036$$

$$= 0.364$$

$$(w_{h12})_{new} = \frac{\partial E_{Total}}{\partial y_{2out}} * \frac{\partial y_{2out}}{\partial y_{2in}} * \frac{\partial y_{2in}}{\partial w_{h12}}$$

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$$(w_{11})_{new} = \frac{\partial E_{Total}}{\partial y_{1out}} * \frac{\partial y_{1out}}{\partial y_{1in}} * \frac{\partial y_{1in}}{\partial h_{1out}} * \frac{\partial h_{1out}}{\partial h_{1in}} * \frac{\partial h_{1in}}{\partial w_{11}}$$

$$+ \frac{\partial E_{Total}}{\partial y_{2out}} * \frac{\partial y_{2out}}{\partial y_{2in}} * \frac{\partial y_{2in}}{\partial h_{1out}} * \frac{\partial h_{1out}}{\partial h_{1in}} * \frac{\partial h_{1in}}{\partial w_{11}}$$

$$\Rightarrow (y_{1out} - t_1) * y_{1out}(1-y_{1out}) * (w_h)_{out}^{w_{h11}} * (h_1)_{out}*(1-h_1)_{out} * x_1$$

$$+ (y_{2out} - t_2) * y_{2out}(1-y_{2out}) * w_{h12}*(h_1)_{out}*(1-h_1)_{out}*x_1$$

$$\Rightarrow (h_{1out}(1-h_1)_{out}* x_1 \left[(y_{1out} - t_1)(y_{1out}(1-y_{1out}) + (y_{2out}-t_2)* y_{2out}(1-y_{2out}) \right]$$

$$\Rightarrow (\text{...})$$

w_{11} new $= w_{11}$ old $- \eta \frac{\partial E}{\partial w_{11 old}}$ Similarly calculate for w_{31}, w_{22} ?