$$net = \sum w_i$$

$$outh =$$

$$out = \frac{1}{1+e^{-net}}$$

$$E_{total} = \sum \frac{1}{2}(target - output)^2$$

$$\partial w_5 \frac{\partial E_{total}}{\partial w_5}$$

$$\frac{\partial E_{total}}{\partial w_5} = \frac{\partial E_{total}}{\partial out_{01}} * \frac{\partial out_{01}}{\partial net_{o1}} * \frac{\partial net_{o1}}{\partial w_5} = 0.74136507 * 0.186815602 * 0.593269992 = 0.082167041$$

$$\frac{\partial E_{total}}{\partial out_{01}} = 2 * \frac{1}{2}(target_{o1} - out_{01})^{2-1} * (-1) + 0 = -(0.01 - 0.75136507) = 0.74136507$$

$$E_{total} = \frac{1}{2}(target_{o1} - out_{01})^2 + \frac{1}{2}(target_{o2} - out_{02})^2$$

$$out_{01} = \frac{1}{1+e^{-neto1}} = out_{01}(1-out_{01}) = 0.75136507(1-0.75136507) = 0.186815602$$

$$\frac{\partial out_{01}}{\partial net_{o1}} = out_{01}(1-out_{01}) = 0.75136507(1-0.75136507) = 0.186815602$$

$$net_{01} = w_5 * out_{h1} + w_6 * out_{h2} + b_2 * 1$$

$$\frac{\partial net_{01}}{\partial w_5} = 1 * out_{h1} * w_5^{(1-1)} + 0 + 0 = out_{h1} = 0.593269992$$

$$\frac{\partial E_{total}}{\partial w_1} = \frac{\partial E_{total}}{\partial out_{h1}} * \frac{\partial out_{h1}}{\partial net_{h1}} * \frac{\partial net_{h1}}{\partial w_1}$$

$$\frac{\partial E_{total}}{\partial out_{h1}} = \frac{\partial E_{01}}{\partial out_{h1}} + \frac{\partial E_{02}}{\partial out_{h1}} = 0.055399425 + -0.019049119 = 0.036350306$$

$$\frac{\partial E_{01}}{\partial out_{h1}} = \frac{\partial E_{01}}{\partial out_{01}} * \frac{\partial out_{01}}{\partial net_{01}} = 0.74136507 * 0.186815602 = 0.138498562$$

$$net_{01} = w_5 * out_{h1} + w_6 * out_{h2} + b_2 * 1$$

$$\frac{\partial out_{01}}{\partial net_{01}} = w_5 = 0.40$$

$$\frac{\partial E_{01}}{\partial out_{h1}} = \frac{\partial E_{01}}{\partial out_{01}} * \frac{\partial out_{01}}{\partial net_{01}} = 0.138498562 * 0.40 = 0.055399425$$

$$\frac{\partial E_{01}}{\partial out_{h2}} = -0.019049119$$

$$out_{h1} = \frac{1}{1+e^{-neth1}}$$

$$\frac{\partial out_{h1}}{\partial net_{h1}} = out_{h1}(1-out_{h1}) = 0.59326999(1-0.59326999) = 0.241300709$$

$$net_{h1} = w_1 * i_1 + w_3 * i_2 + b_1 * 1$$

$$\frac{\partial nett_{h1}}{\partial w_1} = i_1 = 0.05$$

$$\frac{\partial E_{total}}{\partial w_1} = \frac{\partial E_{total}}{\partial out_{h1}} * \frac{\partial out_{h1}}{\partial net_{h1}} * \frac{\partial net_{h1}}{\partial w_1} = 0.0363503 * 0.241300709 * 0.05 = 0.000438568$$

$$w_1^+ = w - n * \frac{\partial E_{total}}{\partial w_1} = 0.15 - 0.5 * 0.000438568 = 0.149780716$$

$$w_2^+ = 0.19956143$$

$$w_3^+ = 0.24975114$$

$$w_4^+ = 0.29950229$$

$$w_5^+ = w_5 - n * \frac{\partial E_{total}}{\partial w_5} = 0.4 - 0.5 * 0.082167041 = 0.35891648$$

$$\frac{\partial E_{total}}{\partial out_{h1}} = \frac{\partial E_{01}}{\partial out_{h1}} + \frac{\partial E_{02}}{\partial out_{h1}} = 0.74136507 * 0.186815602 = 0.138498562$$

$$w_6^+ = 0.408666186$$

$$w_7^+ = 0.511301270$$

$$w_8^+ = 0.561370121$$