$\frac{\partial E_{in}}{\partial \vec{w}_2} = 0\vec{x}_1 + 0\vec{x}_2 + (0-1)\vec{x}_3 + 0.11\vec{x}_4 = (-0.89, -0.33, -3)^T$，

$$\frac{\partial E_{in}}{\partial \vec{w}_3} = 0\vec{x}_1 + 0\vec{x}_2 + 0\vec{x}_3 + (0.89-1)\vec{x}_4 = (-0.11, 0.33, 0)^T$$

用梯度下降法对$\vec{w}_k$进行更新：

$$\vec{w}_1^{(4)} = \vec{w}_1^{(3)} - \frac{\partial E_{in}}{\partial \vec{w}_1} = (0.40, 7.19, 4.38)^T - (1,0,3)^T = (-0.60, 7.19, 1.38)^T$$

$$\vec{w}_2^{(4)} = \vec{w}_2^{(3)} - \frac{\partial E_{in}}{\partial \vec{w}_2} = (-0.06, -3.19, -1.38)^T - (-0.89, -0.33, -3)^T$$
$$= (0.83, -2.86, 1.62)^T$$

$$\vec{w}_3^{(4)} = \vec{w}_3^{(3)} - \frac{\partial E_{in}}{\partial \vec{w}_3} = (-0.33, -4, -3)^T - (-0.11, 0.33, 0)^T$$
$$= (-0.22, -4.33, -3)^T$$

根据$\vec{w}_1^{(4)}$，$\vec{w}_2^{(4)}$和$\vec{w}_3^{(4)}$，我们用式（1）得到：

对于$\vec{x}_1$，我们有：$s_1 = \vec{w}_1^T\vec{x}_1 = (-0.60, 7.19, 1.38)\begin{pmatrix}1\\3\\0\end{pmatrix} = 20.97$，$s_2 = \vec{w}_2^T\vec{x}_1 = (0.83, -2.86, 1.62)\begin{pmatrix}1\\3\\0\end{pmatrix} = -7.75$ ， $s_3 = \vec{w}_3^T\vec{x}_1 = (-0.18, -4.45, -3)\begin{pmatrix}1\\3\\0\end{pmatrix} = -13.21$

利用式（2），我们可以得到：$\hat{y}_1 = \frac{e^{s_1}}{e^{s_1}+e^{s_2}+e^{s_3}} = 1.00$，$\hat{y}_2 = \frac{e^{s_2}}{e^{s_1}+e^{s_2}+e^{s_3}} = 0.00$, $\hat{y}_3 = \frac{e^{s_3}}{e^{s_1}+e^{s_2}+e^{s_3}} = 0.00$, 即, $\vec{\hat{Y}}_1 = (1.00, 0.00, 0.00)^T$, 对照$\vec{Y}_1 = (1,0,0)^T$, 此时对于样本$\vec{x}_1$分类是正确的。

同理：对于$\vec{x}_2$，我们有$s_1 = 29.25$，$s_2 = 1.97$，$s_3 = -31.21$，对应的我们可以计算出$\vec{\hat{Y}}_2 = (1.00, 0.00, 0.00)^T$，对照$\vec{Y}_2 = (1,0,0)^T$，此时对于样本$\vec{x}_2$分类是正确的。

对于$\vec{x}_3$，我们有$s_1 = 3.54$，$s_2 = 5.69$，$s_3 = -9.22$，对应的我们可以计算出$\vec{\hat{Y}}_3 = (0.10, 0.90, 0.00)^T$，对照$\vec{Y}_3 = (0,1,0)^T$，此时对于样本$\vec{x}_3$分类是正确的。