

$$\frac{\partial R^{(1)}}{\partial s_1} = \frac{-I(y^{(1)}=1)}{g_1} \cdot \frac{\partial g_1}{\partial s_1} - \sum_{j \neq 1} \frac{I(y^{(1)}=j)}{g_j}$$

$$\cdot \frac{\partial g_j}{\partial s_1} = \frac{-I(y^{(1)}=j)}{g_j} \cdot \frac{\partial g_1}{\partial s_1} \cdot 2(1-g_1) + \sum_{j \neq 1}$$

$$\frac{I(y^{(1)}=j)}{g_j} \cdot g_1 \cdot g_j = -I(y^{(1)}=1) + g_1 - I(y^{(1)}=1) + g_1$$

$$\cdot \sum_{j \neq 1} I(y^{(1)}=j) = -I(y^{(1)}=1) + g_1 \cdot \sum I(y^{(1)}=j) =$$

$$= g_1 - I(y^{(1)}=1)$$