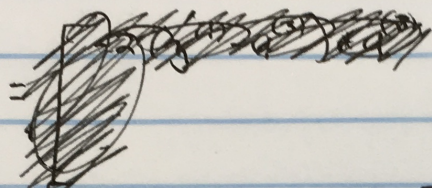


$$\Delta^{(2)} = \sum_R \Delta_R^{(2)}$$

$$\Delta_k^{(2)} = \overbrace{-2(y^{(k)} - a^{(3)}) * a^{(3)} * (1 - a^{(3)})}^{k \sigma^{(3)}} \cdot a^{(2)} = \underbrace{\sigma^{(3)}}_{\substack{R \\ (S^{(3)} \times 1)}} \cdot \underbrace{a^{(2)}}_{\substack{R \\ (1 \times S^{(2)})}}$$

$$\Delta^{(2)} \cancel{\Delta^{(2)}} = -2(Y - A^{(3)}) * A^{(3)} * (1 - A^{(3)}) \cdot [A^{(2)}]^T \quad \boxed{S^{(3)} \times S^{(2)}} \quad \text{SIZE}$$



$$A^{(2)} = \begin{bmatrix} a_1^{(2)} & a_2^{(2)} & \dots & a_k^{(2)} & \dots & a_m^{(2)} \\ 1 & 1 & & 1 & & 1 \end{bmatrix}$$

$$\Delta^{(3)} \cancel{\Delta^{(3)}}$$

$$= \begin{bmatrix} 1 & 1 & \dots & 1 & \dots & 1 \\ a_1^{(3)} & a_2^{(3)} & \dots & a_k^{(3)} & \dots & a_m^{(3)} \\ 1 & 1 & & 1 & & 1 \end{bmatrix} \cdot \begin{bmatrix} -1 & a_1^{(2)} & - \\ \vdots & \vdots & \vdots \\ -1 & a_m^{(2)} & - \end{bmatrix}$$

$S^{(3)} \times M$

$M \times S^{(2)}$

$S^{(3)} \times S^{(2)}$

$$= \begin{bmatrix} \left(\sum_R k \sigma_1^{(3)} a_1^{(2)} \right) & \dots & \left(\sum_R k \sigma_1^{(3)} a_{S^2}^{(2)} \right) \\ \vdots & \ddots & \vdots \\ \left(\sum_R k \sigma_{S^3}^{(3)} a_1^{(2)} \right) & \dots & \left(\sum_R k \sigma_{S^3}^{(3)} a_{S^2}^{(2)} \right) \end{bmatrix}$$

So it works !!