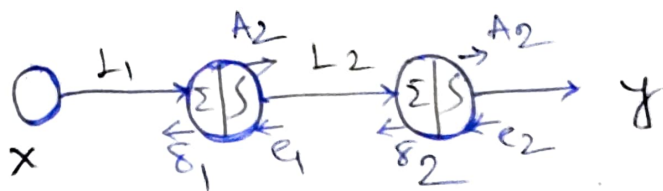


Assignment 2



Let consider,

L_1 & L_2 are weights & b_1 & b_2 are the bias of layer 1 & 2 respectively.

Forward Pass:-

$$Z_1 = (x \cdot L_1) + b_1$$

$$a_1 = \text{relu}(Z_1)$$

$$Z_2 = (a_1 \cdot L_2) + b_2$$

$$a_2 = \text{softmax}(Z_2)$$

Backpropagation:-

$$e_2 = a_2 - y$$

$$\delta_2 = e_2 * \text{softmax}'(Z_2)$$

$$e_1 = \delta_2 \cdot L_2$$

$$\delta_1 = e_1 * \text{relu}'(Z_1)$$

Update rule:-

$$\Delta L_1 = x^T \cdot \delta_1$$

$$\Delta L_2 = a_1^T \cdot \delta_2$$

$$\Delta b_1 = \sum \delta_1$$

$$\Delta b_2 = \sum \delta_2$$

Finally we can apply,

$$L_1 = L_1 - \text{learning_rate} * \Delta L_1$$

$$L_2 = L_2 - \text{learning_rate} * \Delta L_2$$

$$b_1 = b_1 - \text{learning_rate} * \Delta b_1 \quad \& \quad b_2 = b_2 - \text{learning_rate} * \Delta b_2$$