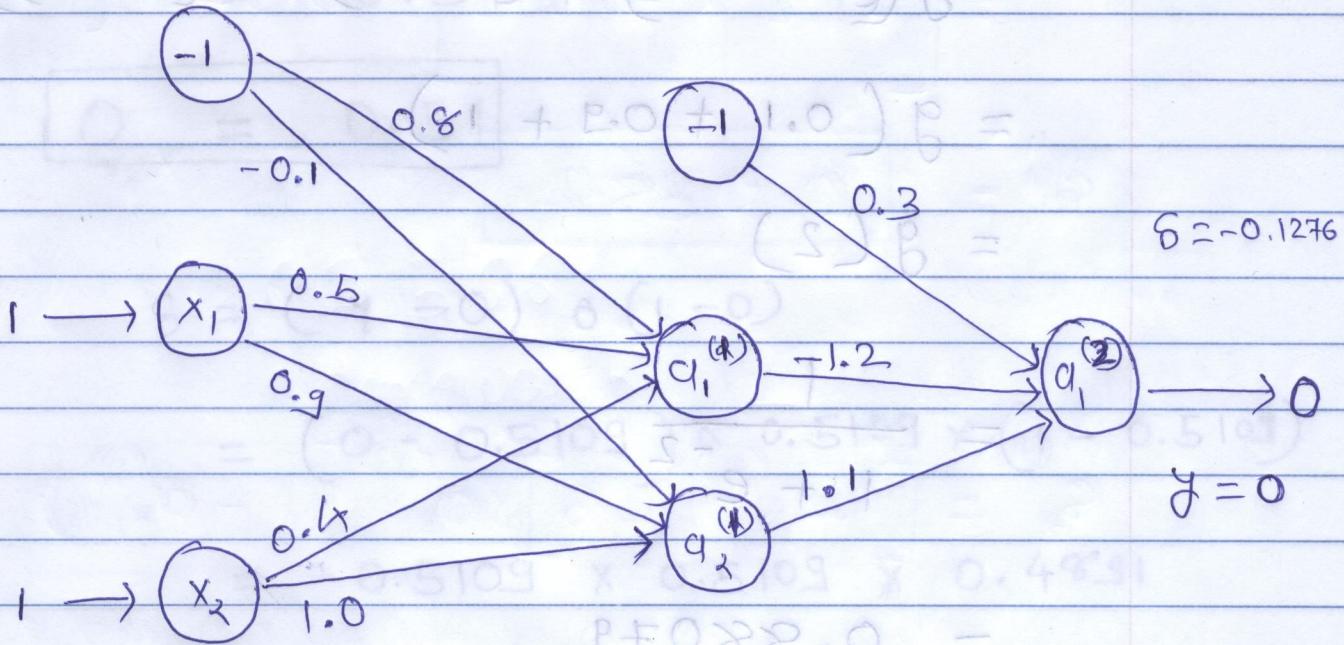


Que: 1 Back propagation.

$$(x_1, \alpha) = (1, 0) \quad \text{B} = 0.8$$

$$\alpha = 0.1$$

$$(1 \times 0.1) + (1 \times 0.8) + (1 - 1.0) \quad \text{B} =$$



$$a_1^{(1)} = g(w_{10}^{(1)} b^{(1)} + w_{11}^{(1)} a_1^{(1)} + w_{12}^{(1)} a_2^{(1)})$$

$$= g(0.8 \times (-1) + (0.5 \times 1) + (0.4 \times 1))$$

$$= g(0.1) \quad \text{B} =$$

$$g(z) = \frac{1}{1+e^{-z}} \quad 0.5249$$

$$a_1^{(1)} = 0.5249 \quad \text{B} =$$

$$a_2^{(1)} = g(w_{20}^{(1)} b + w_{21}^{(1)} x_1 + w_{22}^{(1)} x_2)$$

$$= g((-0.1 \times -1) + (0.9 \times 1) + (1.0 \times 1))$$

$$= g(0.1 + 0.9 + 1)$$

$$= g(2)$$

$$= \frac{1}{1 + e^{-2}}$$

$$= 0.88079$$

$$\boxed{a_2^{(1)} = 0.88}$$

$$a_0^{(2)} = a_1^{(2)}$$

$$= g(w_{10}^{(2)} b + w_{11}^{(2)} a_1 + w_{12}^{(2)} a_2)$$

$$= g((0.3 \times 1) + (0.52 \times -1.2) + (1.1 \times 0.88))$$

$$= g(-0.3 - 0.624 + 0.968)$$

$$= g(0.044)$$

$$\frac{1}{1 + e^{-(0.044)}} = 0.51099$$

$$O = 0.51099$$

$$S = (Y - O) \cdot (1 - O)$$

$$\begin{aligned} &= (0 - 0.5109) \times 0.5109 \times (1 - 0.5109) \\ &= -0.5109 \times 0.5109 \times 0.4891 \end{aligned}$$

$$S = -0.1276$$

$$S + 10.0 = 0.88$$

$$(1 - 1) \times (-) \times [(0.5109) \times 8.0] = 0.88$$

$$5 * 1 - x 22880.0 =$$

$$22250.0 = 0.88$$

$$\delta_1^{(1)} = \left[\omega_{11}^{(2)} + s \right] a_1^{(1)} (1 - q_1^{(1)})$$

$$= \left[-1.2 \times -0.1276 \right] \times 0.52 \times (1 - 0.52)$$

$$\delta_1 = \boxed{0.0382}$$

$$\delta_2^{(1)} = \left[\omega_{12}^{(2)} + s \right] a_2^{(1)} (1 - a_2^{(1)})$$

$$= \left[1.1 \times -0.1276 \right] \times 0.88 (1 - 0.88)$$

$$= -0.14036 \times 0.88 \times 0.12$$

$$\boxed{\delta_2^{(1)} = -0.0148}$$

$$\delta_3^{(1)} = \left[0.3 \times (-0.1276) \right] \times (-1) \times (1 - (-1))$$

$$= -0.03828 \times -1 * 2$$

$$\boxed{\delta_3^{(1)} = 0.07656}$$

$$w_{11}^{(2)} = w_{11}^{(1)} + \alpha \cdot 8 \cdot a_1$$

$$= (-1.2) + 0.1 \times (-0.1276) \times (0.52)$$

$$w_{12}^{(2)} = -1.2066$$

$$w_{12}^{(2)} = w_{12}^{(1)} + \alpha \cdot 8 \cdot a_1$$

$$= 1.0 + [0.1 \times (-0.1276) \times (0.52)]$$

$$w_{12}^{(2)} = 1.0933$$

$$w_{13}^{(2)} = 0.3 + [0.1 \times (-0.1276) \times -1]$$

$$w_{13}^{(2)} = 0.31276$$

$$\begin{aligned} \omega_{11}^{(1)} &= \omega_{11}^{(1)} + \alpha \delta_1^{(1)} b \\ &= 0.8 + 0.1 (0.0382) (-1) \end{aligned}$$

$$\boxed{\omega_{11}^{(1)} = 0.79618}$$

$$\begin{aligned} \omega_{12}^{(1)} &= \omega_{12}^{(1)} + \alpha \delta_1^{(1)} x_1 \\ &= 0.5 + 0.1 (0.0382) \times 1 \end{aligned}$$

$$\boxed{\omega_{12}^{(1)} = 0.50382}$$

$$\omega_{13}^{(1)} = 0.4 + 0.1 (0.0382) \times 2$$

$$\boxed{\omega_{13}^{(1)} = 0.40382}$$

$$w_{21}^{(1)} \text{ (new)} = w_{21}^{(1)} + \alpha s_2^{(1)} b$$

$$= -0.1 + 0.1 (-0.0148) (-1)$$

$$w_{21}^{(1)} \text{ (new)} = -0.09852$$

$$w_{22}^{(1)} \text{ (new)} = w_{22}^{(1)} + \alpha s_2^{(1)} x_1$$

$$= \cancel{-0.1} + 0.1 (-0.0148) \times 1$$

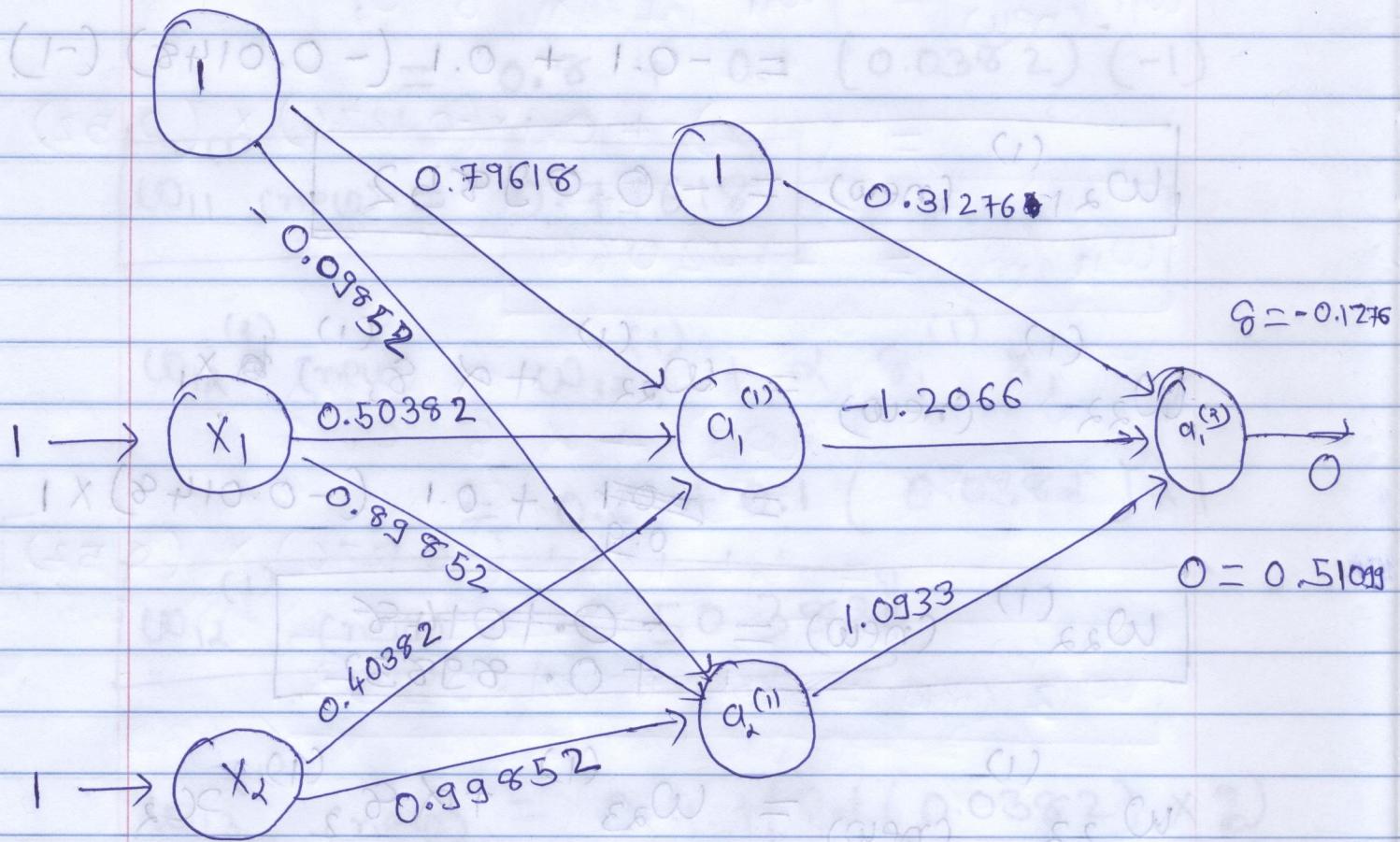
$$w_{22}^{(1)} \text{ (new)} = \cancel{-0.10148} + 0.09852$$

$$w_{23}^{(1)} \text{ (new)} = w_{23}^{(1)} + \alpha s_2^{(1)} x_2$$

$$= 1.0 + (0.1 \times (-0.0148) \times 1)$$

$$w_{23}^{(1)} \text{ (new)} = 0.99852$$

⇒ updated network



$$(1 \times (2 + 100) \times 1.0) + 0.1 =$$

$$520.0 = 0.51093$$