

Assignment - 3

Samples	x	y
1	0.2	3.4
2	0.4	3.8
3	0.6	4.2
4	0.8	4.6
5		

S-1 :- $m=1, c=-1, \eta=0.1, \text{epochs}=2, n_s=2$

S-2 :- $\text{itr}=1$

S-3 :- $\text{sample}=1$

$$\text{S-4 :- } \frac{\partial E}{\partial m} = - \left((3.4) - 1(0.2) + 1 \right) \cdot 0.2$$
$$= -0.84$$

$$\frac{\partial E}{\partial c} = - \left(3.4 - 1(0.2) + 1 \right)$$
$$= -4.2$$

$$\text{S-5 :- } \Delta m = -\eta \cdot \frac{\partial E}{\partial m} = -(0.1)(-0.84) = 0.084$$

$$\Delta c = -\eta \cdot \frac{\partial E}{\partial c} = -(0.1)(-4.2) = 0.42$$

$$\text{S-6 :- } m = m + \Delta m = 1 + 0.084 = 1.084$$

$$c = c + \Delta c = -1 + 0.42 = -0.58$$

$$\text{S-7 :- } \text{sample} = \text{sample} + 1 = 1 + 1 = 2$$

S-8 :- if (sample > n_s)

goto step-9

else

goto step-4

$$\text{step-4 :- } \frac{\partial E}{\partial m} = -(3.8 - (1.084)(0.4) + 0.58)0.4$$

$$= -1.5785$$

$$\frac{\partial E}{\partial c} = -(3.8 - (1.084)(0.4) + 0.58)$$

$$= -3.9464$$

$$\text{step-5 :- } \Delta m = -(0.1)(-1.5785) = 0.1578$$

$$\Delta c = -(0.1)(-3.946) = 0.39$$

S-6 :- sample

$$m = m + \Delta m = 1.08 + 0.157 = 1.24$$

$$c = c + \Delta c = -0.58 + 0.39 = -0.18$$

S-7 :- sample = sample + 1

$$= 2 + 1$$

$$= 3$$

S-8 :- if (sample > ns)

$$3 > 2$$

goto step-9

S-9 :- ita = ita + 1 = 1 + 1 = 2

S-10 :- if (iter > epochs)

$$2 > 2$$

goto step-11

else

goto step-3.

S-3 :- sample = 1

$$\text{S-4 :- } \frac{\partial E}{\partial m} = -(3.4 - (1.2 \times 0.2) + 0.18)0.2$$

$$= -0.668$$

$$\frac{\partial E}{\partial c} = -(3.4 - (1.2 \times 0.2) + 0.18)$$

$$= -3.34$$

$$\underline{S-5)} \Delta m = (-0.1)(-0.668) = 0.0668$$

$$\Delta c = (-0.1)(-3.34) = 0.33$$

$$\underline{S-6)} m = m + \Delta m = 1.24 + 0.0668 = 1.3$$

$$c = c + \Delta c = 0.18 + 0.33 = 0.51$$

$$\underline{S-7)} \text{ Sample} = \text{sample} + 1 = 1 + 1 = 2$$

$$\underline{S-8)} \text{ if (sample} > n_s)$$

goto S-9

else

goto step-4

$$\underline{S-4)} \frac{\partial E}{\partial m} = -(3.8 - (1.3 \times 0.4) - 0.15)0.4$$

$$= -1.25$$

$$\frac{\partial E}{\partial c} = -(3.8 - (1.3 \times 0.4) - 0.15)$$

$$= -3.13$$

$$\underline{S-5)} \Delta m = -(0.1)(-1.25) = 0.12$$

$$\Delta c = -(0.1)(-3.13) = 0.31$$

$$\underline{S-6)} m = m + \Delta m = 1.3 + 0.12 = 1.42$$

$$c = c + \Delta c = 0.15 + 0.31 = 0.46$$

$$\underline{S-7)} \text{ Sample} = \text{sample} + 1 = 2 + 1 = 3$$

$$\underline{S-8)} \text{ if (sample} > n_s)$$

$$3 > 2$$

goto S-9

$$\underline{S-9)} \text{ ita} = \text{ita} + 1 = 2 + 1 = 3$$

$$\underline{S-10)} \text{ if (ita} > \text{epochs})$$

$$3 > 2$$

goto S-11

$$\underline{S-11)} \text{ Print } m \text{ \& } c$$

$$m = 1.42 ; c = 0.46$$