Assignment - 7

8 Gm

Sample	X	Y
1	0.2	3.4
2	0.4	3.8
3	0.6	4.2
4	0.8	4.6

Step1 :- $[X, Y]$, $m = 1$, $c = -1$, $\eta = 0.1$, epochs $= 2$, $n_s = 2$

Step2 :- itr $= 1$

Step3 :- $$\frac{\partial E}{\partial m} = -\frac{1}{n_s} \sum_{i=1}^{n_s} (y_i - mx_i - c)\, x_i$$

$$\Rightarrow -1/2 \left[(3.4 - (1)(0.2) + 1) \cdot 0.2 + \right.$$

$$\left. (3.8 - (1)(0.43) + 1)\, 0.4 \right]$$

$$\Rightarrow -1.34$$

$$\frac{\partial E}{\partial c} = -\frac{1}{n_s} \sum_{i=1}^{n_s} (y_i - mx_i - c)$$

$$\Rightarrow -1/2 \left[(3.4 - 0.2 + 1) + (3.8 - 0.43 + 1) \right]$$

$$\Rightarrow -4.3$$

Step4 :- $$\Delta m = -\eta \cdot \frac{\partial E}{\partial m} = (-0.1)(-1.34) = 0.134$$

$$\Delta c = -\eta \cdot \frac{\partial E}{\partial c} = (-0.1)(-4.3) = 0.43$$

Step5 :- $m = m + \Delta m = 1 + 0.134 = 1.134$

$c = c + \Delta c = -1 + 0.43 = -0.57$

Step6 :- itr $=$ itr $+ 1 \Rightarrow 1 + 1 = 2$

Step7:- if(itr > epochs)

2 > 2

↳ false.

Step3:- $\frac{\partial E}{\partial m} = -1/2 \left[(3.4-(1.13)(0.2)+0.57)\right.$

$0.2+(3.8-(1.13)(0.4)+0.57)$

$\left.0.4\right]$

$\Rightarrow -1.157$

$\frac{\partial E}{\partial c} = -1/2 \left[(3.4-(1.13)(0.2)+0.57)+\right.$

$\left.(3.8-(1.13)(0.4)+0.57)\right)$

$\frac{\partial E}{\partial c} = -3.82$

Step4:- $\Delta m = (-0.1)(-1.15) = 0.115$

$\Delta c = (-0.1)(-3.82) = 0.382$

Step5:- $m = m + \Delta m \Rightarrow 1.134 + 0.115 = 1.249$

$c = c + \Delta c \Rightarrow -0.57 + 0.38 = -0.187$

Step6:- itr = itr + 1

$= 2+1 \Rightarrow 3$

Step7:- if(itr > epochs)

3 > 2

↳ True

Step8:- Print m & c

m = 1.249 ; c = -0.187