Assignment - 03 18K41A0416

0.2	2.4
0.4	3.8
0.6	4.2
0.8	4.6

→ for 1st 2 samples.

x_0	x_1
0.2	3.8
0.4	3.8

Step-1: $m = 1,\ c = -1,\ \eta = 0.1,$ epoch = 2

Step-2: iteration, sample = 1

Step-3: $\frac{\partial E}{\partial m} = -(y_1 - mx_1 - c)x_1 = -0.84$

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

Step-4: $\Delta m = -\eta \cdot \frac{\partial E}{\partial m} = -0.1 \times -0.84 = 0.084$

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

Step-5: $m = m + \Delta m = 1 + 0.084 = 1.084$

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

Step-6: $s = s+1 = 1+1 = 2 > 2\ (\times)$

Step-3: $\frac{\partial E}{\partial m} = -(3.8 - (1)(0.4)^{0.84} - (-0.58)0.4) = -1.578576$

$\frac{\partial E}{\partial c} = -(3.8 - (1)(0.4)^{0.84} - (-0.58)) = -3.9464$

Step-4: $\Delta m = -\eta \cdot \frac{\partial E}{\partial m} = -0.1 \times -1.578576 = 0.1578576$

$\Delta c = -\eta \cdot \frac{\partial E}{\partial c} = -0.1 \times -3.9464 = 0.39464$

Step-5: $m = m + \Delta m = 1.084 + 0.1578576$

$= 1.241858$

$c = c + \Delta c = -0.18536.$

Step-6: $S = S+1 = 3$

$S > 2$ (goto next step).

Step-7: $iter = iter + 1 = 1$

$(1 > 2) \times$ goto step-2

Step-2: Sample = 1

Step-3: $\frac{\partial E}{\partial m} = -0.66739$

$\frac{\partial E}{\partial c} = -3.336$

Step-4: $\Delta m = -0.1 \times -0.66739 = +0.066739$

$\Delta c = -0.1 \times -3.3368 = +0.3336$

Step-5: $m = m + \Delta m = 1.2418 + 0.066739$

$= 1.3085$

$C = C + \Delta C = -0.16536 + 0.3336 = 0.1683$

Step-6: $S = S+1 = 2$

$(2 > 2) \times$

Step-3: $\frac{\partial E}{\partial m} = -1.251$

$\frac{\partial E}{\partial c} = -3.12$

Step-4: $\Delta m = -0.1 \times -1.251 = 0.1251$

$\Delta C = -0.1 \times -3.12 = 0.312$

Step-5: $m = m + \Delta m = 1.3085 + 0.1251 = 1.4337$

$c = c + \Delta c = 0.1463 + 0.3128 = 0.4611$

Step-6: $s = s + 1 = 3$

$(3 > 2)$ → next step

Step-7: $\text{ite}_3 = \text{ite}_3 + 1 = 1 + 1 = 2$ ✓

Step-8: print m, c.