Assignment-15

step1:- [x, y], $\eta = 0.1$, epochs = 2, m = 1, c = -1, $\beta = 0.9$,
$Em = Ec = 0$, $\varepsilon = 10^{-8}$

X	Y
0.2	3.4
0.4	3.8
0.6	4.2
0.8	4.8

step2:- itr = 1

step3:- sample = 1

step4:- $gm = -(3.4 - (1)(0.2) + 1)\,0.2 = -0.84$

$gc = -(3.4 - (1)(0.2) + 1) = -4.2$

step5:- $Em = (0.9)(0) + (1 - 0.9)(-0.84)^2 = 0.07$

$Ec = (0.9)(0) + (1 - 0.9)(-4.2)^2 = 1.764$

step6:- $\Delta m = \dfrac{-0.1 \times -0.84}{\sqrt{0.07 + 10^{-8}}} = 0.31$

$\Delta c = \dfrac{-0.1 \times -4.2}{\sqrt{1.76 + 10^{-8}}} = 0.31$

step7:- $m = m + \Delta m = 1 + 0.31 = 1.31$

$c = c + \Delta c = -1 + 0.31 = 0.69$

step8:- sample = sample + 1 $\Rightarrow$ 1 + 1 = 2.

step9:- if (sample > ns) goto step 10
else
step 4

step4:- $g_m = -(3.8 - (1.31)(0.4) + 0.69)\,0.4$

$= -1.5$

$g_c = -(3.8 - (1.31)(0.4) + 0.64) = -3.9$

step5:- $E_m = (0.9)(0.07) + (0.1)(-1.5)^2 = 0.28$

$E_c = (0.9)(1.76) + (0.1)(-3.9)^2 = 3.1$

step6:- $\Delta m = \frac{-0.1 \times -1.5}{\sqrt{0.28 + 10^{-8}}} = 0.28$

$\Delta c = \frac{-0.1 \times -3.4}{\sqrt{3.1 \times 10^{-8}}} = 0.22$

step7:- $m = m + \Delta m = 1.31 + 0.28 = 1.59$

$c = c + \Delta c = -0.69 + 0.22 = -0.47$

step8:- sample = sample + 1 ⇒ 2 + 1 = 3

step9:- if (sample > ns)

go to step10

else step4

step10:- itr = itr + 1

$= 1 + 1 = 2$

step11:- if (itr > epochs) goto step12

else step3

step3:- sample = 1

step4:- $g_m = -(3.4 - (1.59)(0.2) + 0.47)(0.2) = -0.7$

$g_c = -(3.4 - (1.59)(0.2) + 0.47) = -3.3$

step5:- $E_m = (0.9)(0.28) + (0.1)(-0.7)^2 = 0.3$

$E_c = (0.9)(3.1) + (0.1)(-9.5)^2 = 4.0$

step6:- $\Delta m = \frac{-0.1 \times -0.7}{\sqrt{0.3 + 10^{-8}}} = 0.12$

$\Delta c = \frac{-0.1 \times 3.5}{\sqrt{4.0 \times 10^{-8}}} = 0.17$

step7:- $m = m + \Delta m = 1.59 + 0.17 = 1.71$

$c = c + \Delta c = -0.47 + 0.17 = 0.3$

step8:- sample = sample + 1 = 1 + 1 = 2.

step9:- if (sample > n_s) step10

else step4

step4:- $g_m = -(3.8 - (1.71)(0.4) + 0.3)0.4 = -1.4$

$g_c = -(3.8 - (1.71)(0.4) + 0.3) = -3.6$

step5:- $E_m = (0.9)(6.3) + (0.1)(-1.4)^2 = 0.46$

$E_c = (0.9)(4.0) + (0.1)(-3.6)^2 = 4.89$

step6:- $\Delta m = \frac{-0.1 \times 1.4}{\sqrt{0.46 + 10^{-8}}} = 0.2$

$$\Delta C = \frac{-0.1 \times -3.6}{\sqrt{4.89 + 10^{8}}} = 0.16$$

step 7: $m + \Delta m = 1.71 + 0.2 = 1.91$

$c = -0.3 + 0.16 = -0.14$

step8: sample = 2+1 = 3

step9: if (sample > ns) step10

else step4

step10: iter = 2+1=3

step11: if ($itr^{3} > epochs^{2}$)

step12

else

step3.

step12: m = 1.91

c = -0.14