Assignment - 15

x	y
0.2	3.4
0.4	3.8
0.6	4.2
0.8	4.6

S-1 :- [x, y], $\eta = 0.1$, epochs = 2,
$m = 1, c = -1, \gamma = 0.9$,
$E_m = E_c = 0$, $\varepsilon = 10^{-8}$

S-2 :- $i = 1$

S-3 :- sample = 1

S-4 :- $g_m = -(3.4 - (1)(0.2) + 1)0.2 = -0.84$

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

S-5 :- $E_m = (0.9)(0) + (1 - 0.9)(-0.84)^2 = 0.07$.

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

S-6 :- $\Delta m = \dfrac{-0.1 \times -0.84}{\sqrt{0.07 + 10^{-8}}} = 0.31$

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

S-7 :- $m = m + \Delta m = 1 + 0.31 = 1.31$

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

S-8 :- sample = sample + 1
= 1 + 1
= 2

S-9 :- if (sample > ns) goto s-10
else goto s-4

S-4 :- $g_m = -(3.8 - (1.31)(0.4) + 0.69)\ 0.4$

$= -1.5$

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

S-5 :- $E_m = (0.9)(0.08) + (0.1)(-1.5)^2 = 0.28$

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

S-6 :- $\Delta m = \dfrac{-0.1 \times -1.5}{\sqrt{0.28 + 10^{-8}}} = 0.28$

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

S-7 :- $m = m + \Delta m = 1.31 + 0.28 = 1.59$

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

S-8 :- sample = sample + 1

$= 2 + 1 = 3$

S-9 :- if (sample > n_s)

goto S-10

else

goto S-4

S-10 :- ite = ite + 1

$= 1 + 1 = 2$

S-11 :- if (ite > epochs) goto S-12

else S-2

S-3 :- sample = 1

S-4 : $g_m = -(3.4 - (1.59)(0.2) + 0.47)(0.2) = -0.2$

$g_c = -(3.4 - (1.59)(0.2) + 0.47) = -3.5$

S-5 : $E_m = (0.9)(0.28) + (0.1)(-0.2)^2 = 0.3$

$E_c = (0.9)(3.1)^2 + (0.1)(-3.5)^2 = 4.0$

S-6 : $\Delta m = \frac{-0.1 \times -0.2}{\sqrt{0.3 + 10^{-8}}} = 0.12$

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

S-7 : $m = m + \Delta m = 1.59 + 0.12 = 1.71$

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

S-8 : Sample = sample + 1

$= 1 + 1 = 2$

S-9 : if (Sample > No) S-10

else S-4

S-4 : $g_m = -(3.8 - (1.71)(0.4) + 0.3)0.4 = -1.4$

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

S-5 : $E_m = (0.9)(0.3) + (0.1)(-1.4)^2 = 0.46$

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

S-6 : $\Delta m = \frac{-0.1 \times -1.4}{\sqrt{0.46 + 10^{-8}}} = 0.2$

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

s-7 : $m = \Delta m = 1.71 + 0.2 = 1.91$

$c = -0.3 + 0.16 = -0.14$

s-8 : sample = 2 + 1 = 3

s-9 : if (sample > ns) s-10

else s-4

s-10 : ite = 2 + 1 = 3

s-11 : if (ite > epochs)

s-12

else

s-3

s-12 : m = 1.91

c = -0.14