Assignment - 15: 18K41A04F6

X	Y
0.2	3.4
0.4	3.8
0.6	4.2
0.8	4.6

Consider ⇒

X	Y
0.2	3.4
0.4	3.8

Step-1: [X, Y], $m=1$, $c=-1$, $E_m = E_c = 0$, $\eta = 0.0001$,

$\gamma = 0.9$, $e = 10^{-8}$, epochs = 2.

Step-2: iter = 1

Step-3: sample = 1

Step-4: $g_m = -(y_i - mx_i - c)x_i = -0.84$

$g_c = -(y_i - mx_i - c) = -4.2$.

Step-5: $E_m = \gamma E_m + (1-\gamma)(g_m)^2 = 0.070$

$E_c = \gamma E_c + (1-\gamma)(g_c)^2 = 1.764$

Step-6: $\Delta m = \frac{-\eta}{\sqrt{E_m + e}} \cdot g_m = 0.0003$

$\Delta c = \frac{-\eta}{\sqrt{E_c + e}} \cdot g_c = 0.0003$

Step-7: $m = m + \Delta m = 1.0003$, $c = c + \Delta c = -0.9996$

Step-8: $s = s + 1 = 1 + 1 = 2$.

Step-9: if ($2 > 2$) (x)

goto Step-4.

Step-4: $g_m = -(y_i - mx_i - c)x_i = -1.759$

$g_c = -(y_i - mx_i - c) = -4.399$

Step-5: $E_m = \gamma E_m + (1-\gamma)(g_m)^2 = 0.373$

$E_c = \gamma E_c + (1-\gamma)(g_c)^2 = 3.523$

Step-6: $\Delta m = \frac{-\eta}{\sqrt{E_m + \epsilon}} g_m = 0.0002$

$\Delta c = 0.0002$

Step-7: $m = m + \Delta m = 1.0006$, $c = c + \Delta c = -0.9994$

Step-8: $s = s + 1 = 2 + 1 = 3 > 2$

goto next step

Step-9: $iter = iter + 1 = 1 + 1 = 2$

Step-10: if $(2 > 2)$ (x)

goto step-3.

Step-3: sample = 1

Step-4: $g_m = -(y_i - mx_i - c)x_i = -0.539$

$g_c = -(y_i - mx_i - c) = -4.199$

Step-5: $E_m = \gamma E_m + (1-\gamma)(g_m)^2 = 0.406$

$E_c = \gamma E_c + (1-\gamma)(g_c)^2 = 4.934$

Step-6: $\Delta m = \frac{-\eta}{\sqrt{E_m + \epsilon}} \cdot g_m = 0.0001$

$\Delta c = \frac{-\eta}{\sqrt{E_c + \epsilon}} \cdot g_c = 0.0001$

Step-8: $s = s+1 = 1+1 = 2$.

if $2 > 2$ (x)

goto step-4.

Step-4: $g_m = -1.759$, $g_c = -4.398$.

Step-5: $E_m = 0.675$, $E_c = 6.375$.

Step-6: $\Delta m = 0.002$, $\Delta c = 0.0001$

Step-7: $m = m + \Delta m = 1.0009$.

$c = c + \Delta c = -0.9990$.

Step-8: $s = s+1 = 2+1 = (3 > 2)$ ✓

goto next step.

Step-9: iter = iter + 1 = 2 + 1 = 3.

Step-10: if $(3 > 2)$ ✓

goto next step.

Step-11: print m, c.