

Assignment-13 (sample)

18K41A04F6.

X	Y
0.2	3.4
0.4	3.8
0.6	4.2
0.6	4.6

⇒

X	Y
0.2	2.4
0.4	3.8

Step-1: $[X, Y]$, epochs = 2, $m = 1$, $c = 1$, $\epsilon = 10^{-8}$, $\eta = 0.1$,

$$G_m = G_c = 0.$$

Step-2: iter = 0

Step-3: Sample = 1.

Step-4: $g_m = -(y_i - mx_i - c)x_i = -0.44$

$$g_c = -(y_i - mx_i - c) = -2.2.$$

Step-5: $G_m = G_m + (g_m)^2 = 0 + (-0.44)^2 = 0.1936$

$$G_c = G_c + (g_c)^2 = 0 + (-2.2)^2 = 4.84$$

Step-6: $\Delta m = \frac{-\eta}{\sqrt{G_m + \epsilon}} \cdot g_m = 0.1$

$$\Delta c = \frac{-\eta}{\sqrt{G_c + \epsilon}} \cdot g_c = 0.1$$

Step-7: $m = m + \Delta m = 1 + 0.1 = 1.1$

$$c = c + \Delta c = 1 + 0.1 = 1.1$$

Step-8: Sample = Sample + 1 = 1 + 1 = 2 > 2 (x).

goto step-4.

$$a_i = -(y_i - mx_i - c)x_i = -0.104.$$

$$g_c = -(y_i - wx_i - c) = -2.26.$$

Step-5:

$$G_m = G_m + (g_m)^2 = 1.010816$$

$$G_c = G_c + (g_c)^2 = -0.94760001.$$

Step-6:

$$\Delta m = \frac{-\eta}{\sqrt{G_m + \epsilon}} \cdot g_m = 0.08991505$$

$$\Delta c = \frac{-\eta}{\sqrt{G_c + \epsilon}} \cdot g_c = 0.07165546.$$

Step-7:

$$m = m + \Delta m = 1.18991504.$$

$$c = c + \Delta c = 1.17165546.$$

Step-8:

$$\text{Sample} = \text{Sample} + 1 = 2 + 1 = 3.$$

(3 > 2) ✓ next step.

Step-9:

~~if~~ ~~(Sample < iter)~~ iter = iter + 1 = 1 + 1 = 2.

Step-10:

2 > 2 (x) goto step-3.

Step-3:

$$\text{Sample} = 1.$$

Step-4:

$$g_m = -(y_i - wx_i - c)x_i = -0.3980$$

$$g_c = -(y_i - wx_i - c) = -1.990.$$

Step-5:

$$G_m = G_m + (g_m)^2 = 1.169$$

$$G_c = G_c + (g_c)^2 = 13.909$$

Step-6:

$$\Delta m = \frac{-\eta}{\sqrt{G_m + \epsilon}} \cdot g_m = 0.036$$

$$\Delta c = \frac{-\eta}{\sqrt{G_c + \epsilon}} \cdot g_c = 0.05.$$

Step-7: $m = m + \Delta m = 1.226$, $c = c + \Delta c = 1.225$.

Step-8: $\text{Sample} = \text{Sample} + 1 = 1 + 1 = 2 > 2(x)$ goto step-4.

Step-4: $g_m = -(y_i - m x_i - c) x_i = -0.83$

$$g_c = -(y_i - m x_i - c) = -2.08$$

Step-5: $G_m = G_m + (g_m)^2 = 1.864$

$$G_c = G_c + (g_c)^2 = 18.25$$

Step-6: $\Delta m = \frac{-\eta}{\sqrt{G_m + E}} \cdot g_m = 0.06$

$$\Delta c = \frac{-\eta}{\sqrt{G_c + E}} \cdot g_c = 0.04$$

Step-7: $m = m + \Delta m = 1.28$

$$c = c + \Delta c = 1.27$$

Step-8: $S = S + 1 = 2 + 1 = 3 > 2$ next step.

Step-9: $\text{iter} = \text{iter} + 1 = 2 + 1 = 3 > 2(\checkmark)$

goto next step

Step-10: print m, c .