18K41A04D2

Assignment - 13

X	Y
0.2	3.4
0.4	3.8

ADAGRAD

[x, y],

Step 1: epochs = 2, m = 1, c = 1, Gm = Gc = 0, n = 0.1, e = 10^{-8},

Step 2: iter = 0

Step 3: sample = 0

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

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

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

$G_c = G_c + (g_c)^2 = 4.84$

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

$\Delta c = \frac{-n}{\sqrt{G_c + \epsilon}} g_m = 0.1$

Step 7: $m = m + \Delta m = 1.1$

$c = c + \Delta c = 1.1$

Step 8: sample + = 1 = 1

Step 9: if (sample < no of samples)

1 < 2

goto step 4

Step 4: $g_m = -(y_i - mx_i - c)x_i = -0.904$

$g_c = -(y_i - mx_i - c) = -2.26$

Step 5: $G_{1m} = G_{1m} + (g_m)^2 = 1.010816$

$G_c = G_{1c} + (g_c)^2 = 9.94760001$

Step 6: $\Delta m = \frac{-\eta}{\sqrt{G_{m+\epsilon}}} g_m = 0.08991505$

$\Delta c = \frac{-\eta}{\sqrt{G_{c+\epsilon}}} g_c = 0.07165546$

Step 7: $m = m + \Delta m = 1.18991504$

$c = c + \Delta c = 1.17165546$

Step 8: sample += 1 = 2

Step 9: if (sample < no of sample)

2 < 2 ✗

else

goto step 10.

Step 10: iter = iter + 1 = 0 + 1 = 1

Step 11: if (iter < epochs)

1 < 2

goto step 3.

Step 3: Sample = 0

Step 4: $g_m = -(y_i - mx_i - c)x_i = -0.39607231$

$g_c = -(y_i - mx_i - c) = -1.99036153$

Step 5: $G_m = G_{m+} (g_m)^2 = 1.16927756$

$G_c = G_{c+} (g_c)^2 = 13.90913903$

Step 6: $\Delta m = \frac{-\eta}{\sqrt{G_{m+\epsilon}}} g_m = 0.03681316$

$\Delta c = \frac{-\eta}{\sqrt{G_{c+\epsilon}}} g_c = 0.05336811$

Step 7 : $m = m + \Delta m = 1.22672821$

$c = c + \Delta c = 1.22502357$

Step 8 : sample = sample + 1 = 0 + 1 = 1

Step 9 : if (sample < no. of samples)

$1 < 2$ ✓

goto step 4.

Step 4 : $g_m = -(y_i - mx_i - c) \times i = -0.83371406$

$g_c = -(y_i - mx_i - c) = -2.08428514$

Step 5 : $G_m = G_m + (g_m)^2 = 1.86435669$

$G_c = G_c + (g_c)^2 = 18.2533836$

Step 6 : $\Delta m = \frac{-\eta}{\sqrt{G_m + \epsilon}} g_m = 0.06105941$

$\Delta c = \frac{-\eta}{\sqrt{G_c + \epsilon}} g_c = 0.0487849$

Step 7 : $m = m + \Delta m = 1.28778762$

$c = c + \Delta c = 1.27380847$

Step 8 : sample = sample + 1 = 1 + 1 = 2

Step 9 : if (sample < number of sample)

$2 \not< 2$ ×

else

goto step 10

Step 10 : iter = iter + 1 = 1 + 1 = 2

Step 11 : if (iter < epochs)

$2 \not< 2$

else

goto step 12.

Step 12: print(m, c)

m = 1.28778762

C = 1.27380547