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Manual calculations:

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

$E_m = E_c = 0$

Step 2: iter = 1

Step 3: sample = 1

Step 4: $g_m = -(3.4 - (1)(0.2) + 1)\,0.2 = -0.84$

$g_c = -4.2$

Step 5: $E_m = (0.9)(0.9) + (0.1)(-0.84)^2 = 0.0705$

$E_c = (0.9)(0) + (0.1)(-4.2)^2 = 1.764$

Step 6: $\Delta m = \dfrac{-0.1}{\sqrt{0.07 + 10^{-8}}}(0.84) = 0.317$

$\Delta c = \dfrac{-0.1}{\sqrt{1.76 + 10^{-8}}}(-4.2) = 0.322$

Step 7: $m = m + \Delta m = 1 + (-0.314) = 0.686$

$c = c + \Delta c = -1 - 0.322 = -1.322$

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

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Step 9: if (sample > ns) → (2 > 2) go to step 4

Step 10: $g_m = -(3.8 - (0.6867 \times 0.4) + 1.392) \times 0.4$

$= -1.93904$

$g_c = -4.8476$

Step 11: $E_m = (0.9)(0.0705) + (0.1)(-1.93904)^2$

$= 0.4394$

$E_c = (0.9)(1.764) + (0.1)(-4.8476)^2$

$= 3.9375$

Step 12: $\Delta m = \frac{-0.1}{\sqrt{0.4394 + 10^{-8}}} (-1.93904) = 0.2925$

$\Delta c = \frac{-0.1}{\sqrt{3.9375 + 10^{-8}}} \times (-4.8476) = 0.2442$

Step 13: $m = m + \Delta m = 0.9785$

$c = c + \Delta c = -1.0778$

Step 14: sample = sample + 1 = 2 + 1 = 3 > no. of samples

Step 15: iter = 1 + 1 = 2 < epochs

Step 16: sample = 1

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Step 17: $g_m = -(3.4 - (0.9785 \times 0.2) + 1.0778) \times 0.2$

$= -0.85642$

$g_c = -4.2821$

Step 18: $E_m = (0.9)(0.4394) + (0.1)(-0.85642)^2$

$= 0.46957$

$E_c = (0.9 \times 3.9375) + (0.1)(-4.2821)^2$

$= 5.3773$

Step 19: $\Delta m = \frac{-0.1}{\sqrt{0.46957 + 10^{-8}}} \times (-0.85642) = 0.05868$

$\Delta c = \frac{-0.1}{\sqrt{5.3773 + 10^{-8}}} \times (-4.2821) = 0.18466$

Step 20: $m = m + \Delta m = 0.9785 + 0.0586 = 1.0371$

$c = c + \Delta c = -1.0778 + 0.18466 = -0.89314$

Step 21: sample = sample + 1

Step 22: $g_m = -(3.8 - (1.0371 \times 0.4) + 0.89314) \times 0.4$

$= -1.71132$

$g_c = -4.2783$

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Step 23: $E_m = (0.9)(0.46957) + (0.1)(-1.71132)^2$

$= 0.71547$

$E_c = (0.9)(5.3773) + (0.1)(-4.2783)^2$

$= 6.6699$

Step 24: $\Delta m = \frac{-0.1}{\sqrt{0.71547 + 10^{-8}}} \times (-1.71132) = 0.20231$

$\Delta c = \frac{-0.1}{\sqrt{6.6699 + 10^{-8}}} \times (-4.2783) = 0.16565$

Step 25: $m = m + \Delta m = 1.0371 + 0.20231 = 1.23941$

$c = c + \Delta c = -0.89314 + 0.16565 = -0.72749$

Step 26: sample = 2+1 = 3 > no. of samples

Step 27: iter = iter + 1 = 3 > no. of epochs

Step 28: print (m, c)

$\Rightarrow (1.23941, -0.72749)$

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Step 29: calculating mean squared error.

$$mse = \frac{1}{2\times 2}\left[3.4 - (1.23941 \times 0.2) + 0.72749)^2 + \right.$$

$$\left. (3.8 - ((1.23941 \times 0.4) + (0.72749))^2 \right]$$

$$\Rightarrow \frac{1}{4}\left[15.05135 + 16.25481 \right]$$

$$mse = 7.82654$$