let us consider a sample dataset have one input (x_i^a) and one output (y_i^a) and number of sample 2.

Develop a sing' simple linear regression model using RMS prop optimizer.

Sample (i)	x_i^a	y_i^a
1	0.2	3.4
2	0.4	3.8
3	0.6	4.2
4	0.8	4.6

step 1 :- $[x, y]$, $\eta = 0.1$, epochs = 2, m=1, c=-1, $\beta = 0.9$, $E_m = E_c = 0$,

$$\varepsilon = 10^{-8}$$

step -2 :- itr = 1

step 3 :- sample = 1

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

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

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

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

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

$\Delta c = \dfrac{-0.1}{\sqrt{1.764 + 10^{-8}}} \times -4.2$

$\eta = 0.31$

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

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

step-8 : sample = sample + 1

$= 1 + 1 = 2$

step 9 : if (sample > ns) goto step-10

$2 > 2$

else

goto step-4

step 4 : $g_m = -(3.8 - (1.31)(0.4) + 0.69) 0.4 = -1.5$

$g_c = -(3.8 - (1.31)(0.4) + 0.69) = -3.9$

step 5 : $E_m = (0.9)(0.07) + (0.1)(-1.5)^2 = 0.28$

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

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

$\Delta c = \dfrac{-0.1}{\sqrt{3.1 + 10^8}} \times -3.9 = 0.22$

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

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

step-8 : sample = sample + 1

$= 2 + 1 = 3$

step 9 : if (sample > ns) goto step-10

$3 > 2$

else

step-4

step 10 : iter = iter + 1

$= 1 + 1 = 2$

step-11 : if (ite > epoches)

　　　　　goto step-12

　　　else

　　　　　goto step-3

step-3 :- sample = 1

step 4 : $gm = -(3.4 - (1.59)(0.2) + 0.47)(0.2) = -0.7$

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

step 5 : $Em = (0.9)(0.28) + (0.1)(-0.7)^2 = 0.3$

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

step 6 :- $\Delta m = \dfrac{-0.1}{\sqrt{0.3 + 10^{-8}}} * -0.7 = 0.12$

　　　　$\Delta c = \dfrac{-0.1}{\sqrt{4.0 + 10^{-8}}} * -3.5 = 0.17$

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

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

step 8 :- sample = sample + 1

　　　　　　　　= 1 + 1 = 2

step 9 :- if (sample > ns)

　　　　　2 > 2　goto step-10

　　　else

　　　　　goto step-4

step 4 :- $gm = -(3.8 - (1.71)(0.4) + 0.3) \times 0.4 = -1.4$

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

step-5 :- $Em = (0.9)(0.3) + (0.1)(-1.4)^2 = 0.46$

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

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

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

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

$c = c + \Delta c = -0.3 + 0.16 = -0.14$

step-8 :- Sample = sample + 1

$= 2 + 1 = 3$

step 9 :- if (sample > ns)

$3 > 2$ goto step-10

else

goto step-4

step 10 : ite = ite + 1

$= 2 + 1 = 3$

step-11 :- if (ite > epoches)

$3 > 2$ goto step-12

else

goto step-3

step-12 = $m = 1.91$

$c = -0.14$