Assignment-11

-18K41A0545

Let us consider a sample dataset have one input (x_i) & one output (y_i) & no. of samples 4. Develop a SLR model using nestrov accelerated gradient (NAG) optimizer.

Sample (i)	x_i	y_i
1	0.2	3.4
2	0.4	3.6
3	0.6	4.2
4	0.8	4.6

Do manual calculations for 2 iterations with 2 Samples.

Sol:- Step 1:- [X, Y], m=1, c=-1, η=0.1, epoches=2, γ=0.9, v_m=

$v_c = 0$, $n_s = 2$

Step 2:- it 1

Step 3:- s = 1

Step 4:- $g_m = \frac{\partial E}{\partial m} = -(y_i - (m+\gamma v_m)x_i - (c+\gamma v_c))x_i$

$= -((3.4 - (1+(0.9)0)0.2 - (-1+(0.9)0)0.2)$

$= -0.84$

$g_c = \frac{\partial E}{\partial c} = -(y_i - (m+\gamma v_m)x_i - (c+\gamma v_c))$

$= -(3.4 - (1+0.9)\times 0)0.2$

$= -(-1+(0.9)0)$

$= -4.2$

Step 5:- $v_m = \gamma v_m - \eta g_m$

$= (0.9)0 - (-0.1) * (-0.84)$

$= -0.084$

$v_c = \gamma v_c - \eta g_c$

$= (0.9)(0) - (-0.1)(-4.2) = -0.42$

Step-6 :- $m = m + vm$

$1 - 0.084 = 0.916$

$c + = vc = -1 - 0.42$

$= -1.42$

Step-7 :- $s + = 1$

$1 + 1 = 2$

Step-8 :- if (sample > no)

step 9

else

step 4

Step-4 :- $gm = \frac{\partial \varepsilon}{\partial m} = -(3.8 - (0.916 + (0.9 \times -0.084)) \bullet .4 - (-1.42$

$+ (0.92 - 0.034) \times 0.4)$

$= -1.983$

$gc = \frac{\partial \varepsilon}{x} = -4.959$

Step-5 :- $vm = \delta vm - \eta gm$

$= (0.9 \times -0.084) - (-0.1 \times -1.983) = -0.2739$

$Nc = (0.9 \times -0.42) - (-0.1 \times -4.959) = 0.8739$

Step-6 :- $m + = vm$

$= 0.916 - 0.2739 \Rightarrow 0.6421$

$c + = c + vc$

$= -1.42 - 0.8739 \Rightarrow -2.2939.$

Step 7 :- $s + = 1$

$1 + 2 = 3$

Step 8 :- if ($s > n$)

step 4

else

step 3

Step 3 :- $s = 1$

Step 4 :- $\frac{\partial \varepsilon}{\partial m} = -1.171$

$\frac{\partial \varepsilon}{x} = -5.859$

Step-5: $v_m = \beta v_m - \eta g_m$

$= -0.3627$

$v_c = -1.3407$

Step-6: $m_t = v_m = 0.2794$

$c_t = v_c = -3.6646$

Step-7: $s_t = 1$

$t+1 = 2$

Step-8: if ($s >$ ns)

step9

else

step 4

Step 4: $\frac{\partial \varepsilon}{\partial m} = -2.985 \rightarrow g_m$

$\frac{\partial \varepsilon}{\partial c} = -7.4645 \rightarrow g_c$

Step 5: $v_m = -0.6249$

$v_c = -1.9800$

Step6: $m_t = v_m = -0.3275$

$c_t = v_c = -4.6446$

Step 7: $s_t = 1$

$2+1 = 3$

Step 8: if ($s >$ ns)

step9

else

step 4

step 9: $i+1$

$2+1 = 3$

Step 10: if ($i >$ epochs)

step 4

else

step-3

Step 11: $m = 0.3275$

$c = -4.6446.$