Assignment -4 19KUIS0

Simple linear Regression :

Sample(i)	x_i^a	y_i^a
1	7.6	157
2	7.6	174

Step-1 : Read dataset, $\eta = 0.1$ epoch = 1

$m = 1, c = -1$

Step-2 : Set iteration = 1

Step 4 : $y = mx + c$

$y = (1)(7-6) - 1 = 6.6$

Step-5 : $E = \frac{1}{2} \{y_i^a - mx_i^a - c\}^2$

$E = \frac{1}{2} \{157 - (1)(7.6) - (1)\}^2$

$= 11310.08$

Step-6 : $\frac{\partial E}{\partial m} = -(y_i^a - mx_i^a - c) x_i^a$

$= -1143.04$

$\frac{\partial E}{\partial c} = -(y_i^a - mx_i^a - c) = -150.4$

Step-7: $\Delta m = -n\frac{\partial E}{\partial m} = -(0.1)(-1143.04)$

$= 114.304$

$\Delta c = -n\frac{\partial E}{\partial c} = -(0.1)(-150.4) = 15.04$

Step:8 : $m = m + \Delta m = 1 + 114.304 =$

115.304

$c = c + \Delta c = -1 + 15.04 = 14.04$

Step-9: Sample $i = i+1 = 2$ & $i < n$ .T → Step 4

Step-4: $y = -(115.304)(7.1) + -(14.04) =$

832.69

Step-5: $E = \frac{1}{2}(174 - 832.69)^2 = 216936.25$

Step-6: $\frac{\partial E}{\partial m} = -(174 - (115.304)(7.1) - 14.04)($

$= -(174 - 832.64)(7.1)$

$= (658.64)(7.1) = 4676.69$

$\frac{\partial E}{\partial c} = -(174 - 832.69) = 658.64$

Step 7: $\Delta m = -n\frac{\partial E}{\partial m} = -467.669$

$\Delta c = n\frac{\partial E}{\partial c} = -(0.1)(658.69) = -65.8$

Step-8 : m = 115.304 + (-467.669) =

= 362.36

e' = 14.04 + (-65.869) = -31.829

Step-9 : Sample i = i+1 . 2+1=3

$i \leq n_3$. T → next step

3 2

Step-10 : iter = i . iter +1 = 1+1 = 2

iter > epochs T → next step

Step-11 : Stop