Assignment - 5

x_i^a	y_i^a
75.1	577.8
74.3	577
88.7	570.9

Step-1 :- $[x_i^a, y_i^a]$, $\eta = 0.01$, epochs $= 1$, $m=1$,

$c = -1$, iter $= 1$

Iteration $= 1$ (example -1)

Step-2 :- $\left.\dfrac{\partial E}{\partial m}\right|_{m=1} = \dfrac{-1}{2}(y_i^a - m x_i^a - c)(x_i^a)$

$= \dfrac{-1}{2}\Big[(577.8) - (1)(75.1)+1)(75.1) + (577 - (1)(74.3)+1)(74.3)$

$\qquad\qquad + (570.9 - (1)(88.7)+1)(88.7)\Big]$

$= -59056.3)$

$\left.\dfrac{\partial E}{\partial c}\right|_{c=-1} = \dfrac{-1}{2}(y_i^a - m x_i^a - c)(x_i^a)$

$= \dfrac{-1}{2}\Big[(577.8) - (1)(75.1)+1) + (577 - (1)(74.3)+1) +$

$\qquad\qquad (570.9 - (1)(88.7)+1)\Big]$

$= -745.3$

Step-3 :- $\Delta m = -\eta \dfrac{\partial E}{\partial m} = -(0.01)(-59056.31) = 590.5631$

$\Delta c = -\eta \dfrac{\partial E}{\partial c} = -(0.01)(-745.3) = 7.453$

Step-4 :- $m = m + \Delta m = 1 + 590.5631 = 591.5631$

$c = c + \Delta c = -1 + 7.453 = 6.453$

Step-5 :- iter $=$ iter $= 1+1 = 2 >$ epochs $= 1 \to$ (stop)