x_i	y_i
7.6	157
7.1	174

Sample-1 Iteration-1

Step-1 :- [7.6, 157], $\eta = 0.01$, $m = 1$, $c = -1$

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

$= -(157 - 1(7.6) - (-1))(-7.6)$

$= (158 - 7.6)(7.6)$

$= (150.4)(7.6)$

$= 1143.04$

$\left.\frac{\partial E}{\partial c}\right|_{c=-1} = -(y_i^a - mx_i^a - c)$

$= -(157 - 1(7.6) - (-1))$

$= -(158 - 7.6)$

$= -150.4$

3) $\Delta m = -\eta \cdot \frac{\partial E}{\partial m} = -(0.01)(1143.04)$

$= -11.430$

$\Delta c = -\eta \cdot \frac{\partial E}{\partial c} = -(0.01)(-150.4) = 1.504$

4) $m = m + \Delta m = 1 + (-11.43) = -10.43$

$c = c + \Delta c = -1 + 1.504 = 0.504$

Iteration-2

1) $[7.6, 157]$, $\eta = 0.01$, $m = -10.43$, $c = 0.504$

2) $\left.\frac{\partial E}{\partial m}\right|_{m=-10.43} = -(157 - (-10.43)(7.6))\{-0.504\}(7.6)$

$= (157 + 10.43(7.6) - 0.504)(7.6)$

$= (156.496 + 79.268)(7.6)$

$= (235.764)(7.6)$

$= 1791.8$

$\left.\frac{\partial E}{\partial c}\right|_{c=0.504} = -(157 - (-10.43)(7.6) - 0.504)$

$= -235.764$

3) $\Delta m = -\eta \cdot \frac{\partial E}{\partial m} = -(0.01)(1791.8)$

$= -17.918$

$\Delta c = -\eta \cdot \frac{\partial E}{\partial c} = -(0.01)(-235.764)$

$= 2.357$

4) $m = m + \Delta m = -10.43 + (-17.918) = -28.348$

$c = c + \Delta c = 0.504 + 2.357 = 2.861$

sample-2

Iteration-1

1) [7.1, 174], $\eta = 0.01$, $m = 1$, $c = -1$

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

$= (174 - 1(7.1) - (-1))(7.1)$

$= (175 - 7.1)(7.1)$

$= 167.9(7.1) = 1192.09$

$\left.\frac{\partial E}{\partial c}\right|_{c=-1} = -(y_i^a - mx_i^a - c)$

$= -(174 - 1(7.1) - (-1))$

$= -167.9$

3) $\Delta m = -\eta \cdot \left.\frac{\partial E}{\partial m}\right|_{m=1} = -(0.01)(1192.09)$

$= -11.92$

$\Delta c = -\eta \cdot \left.\frac{\partial E}{\partial c}\right|_{c=-1} = -(0.01)(-167.9)$

$= 1.679$

4) $m = m + \Delta m = 1 + (-11.92)$

$= -10.92$

$c = c + \Delta c = -1 + 1.679$

$= 0.679$

Iteration-2

1) $(7.1, 174)$. $\eta = 0.01$, $m = -10.92$, $c = +0.679$

2) $\left.\frac{\partial E}{\partial m}\right|_{m=-10.92} = -(174 - (-10.92)(7.1) - 0.679)(7.1)$

$= (173.321 + 77.532)(7.1)$

$= (250.853)(7.1)$

$= 1781.056$

$\left.\frac{\partial E}{\partial c}\right|_{c=+0.679} = -(174 - (-10.92)(7.1) - 0.679)(1$

$= -250.853$

3) $\Delta m = -\eta \cdot \frac{\partial E}{\partial m} = (0.01)(1781.056)$

$= -17.810$

$\Delta c = -\eta \cdot \frac{\partial E}{\partial c} = -(0.01)(-250.853)$

$= 2.508$

4) $m = m + \Delta m$

$= -10.92 - 17.81$

$= -28.73$

$c = c + \Delta c$

$= 0.679 + 2.508$

$= 3.187$