Assignment-5 (A)

apsara

Date: ___/___/___

Iteration-1

x	y
75.1	577.8
74.3	577
88.7	570.9

$\eta = 0.1,\ m = 1,\ c = 1$

$$\frac{\partial E}{\partial m} = -\frac{1}{2}\left[\left((y_{a_1} - m \cdot x_1 - c) \times x_1\right) + \left((y_{a_2} - m x_2 - c) \times x_2\right) + \left((y_{a_3} - m x_3 - c) \times x_3\right)\right]$$

$$= -\frac{1}{2}\left[\left((577.8 - (1)(75.1) + 1) \times 75.1\right) + \left((577 - (1)(74.3) + 1) \times 74.3\right) + \left((570.9 - (1)(88.7) + 1) \times 88.7\right)\right]$$

$$\frac{\partial E}{\partial m} = -59056.31$$

$$\frac{\partial E}{\partial c} = -\frac{1}{2}\left[(y_{a_1} - m x_1 - c) + (y_{a_2} - m x_2 - c) + (y_{a_3} - m x_3 - c)\right]$$

$$= -745.3$$

Date:

$$\Delta m = -\eta \frac{dE}{dm} = -(0.1)(-59056.31)$$

$$= 5905.631$$

$$\Delta c = -\eta \frac{dE}{dc} = -(0.1)(-745.3)$$

$$= 74.53$$

$$\therefore m = m + \Delta m$$

$$= 1 + 5905.631 = 5906.631$$

$$c = c + \Delta c$$

$$= 1 + 74.53 = 73.53$$

Iteration-2

$$m = 5906.631, \quad c = 73.53$$

$$\frac{dE}{dm} = -\frac{1}{2}\left[-1122730855.855\right)$$

$$= -501365542.928$$

$$\frac{dE}{dc} = -\frac{1}{2}\left[-1404863.731\right)$$

$$= 7024931.865$$

$$\Delta m = -(0.1)(56136542.928)$$

$$= -5613654.293$$

$$\Delta c = -(0.1)(702431.665)$$

$$= -70243.167$$

$$\therefore m = m + \Delta m = -5607747.662$$

$$c = c + \Delta c = -70169.657$$