

# Assignment-5A

Iteration-1.

$$n = 0.1, m = 1, c = -1$$

$$\frac{\partial E}{\partial m} = \frac{1}{2} [(y_{a_1} - mx_1 - c) * x_1]$$

Data

x	y
75.1	577.8
74.3	577
88.7	570.9

$$+ ((y_{a_2} - mx_2 - c) * x_2) + ((y_{a_3} - mx_3 - c) * x_3)]$$

$$= -\frac{1}{2} [((577.8 - (1)(75.1) + 1) * 75.1) +$$

$$((577 - (1)(74.3) + 1) * 74.3 +$$

$$((570.9 - (1)(88.7) + 1) * 88.7)]$$

$$= -590.56.31$$

$$\frac{\partial E}{\partial c} = -\frac{1}{2} [(y_{a_1} - mx_1 - c) + (y_{a_2} - mx_2 - c) + (y_{a_3} - mx_3 - c)]$$

$$= -\frac{1}{2} (503.7 + 503.7 + 483.2)$$

$$= -745.3$$

$$\Delta m = -n \frac{\partial E}{\partial m} = -(0.1)(-590.56.31) = 59.05.631$$

$$\Delta c = -n \frac{\partial E}{\partial c} = (0.1)(-745.3) = 74.53$$

$$m = 1 + 59.05.631 = 8906.631$$

$$c = -1 + 74.53 = 73.53$$

Iteration-2:  $m = 5906.631, c = 73.53$

$$\begin{aligned}\frac{\partial E}{\partial m} &= -\frac{1}{2} \left[ ((57.78 - (5906.631)(75.1)) + 73.53) \right. \\ &\quad \left. + (577 - (5906.631)(74.3) - 73.53) + 74.3 \right) \\ &\quad + ((570.9 - (5906.631)(88.7)) + 73.53) + 88.7 \Big] \\ &= -\frac{1}{2} [112273085.858] = 56136542.928\end{aligned}$$

$$\begin{aligned}\frac{\partial E}{\partial c} &= -\frac{1}{2} \left[ (577.8 - (5906.631)75.1) + 73.53 \right. \\ &\quad \left. + (577 - (5906.631)(74.3) - 73.53) + (570.9 - \right. \\ &\quad \left. (5906.631)(88.7) - 73.53) \right] \\ &= -\frac{1}{2} [140483.731] = 702431.865\end{aligned}$$

$$\Delta m = -(0.1)(56136542.928) = -5613654.293$$

$$\Delta c = -(0.1)(702431.865) = -70243.187$$

$$\begin{aligned}m &= 5906.631 + (-5613654.293) \\ &= 5807747.662\end{aligned}$$

$$\begin{aligned}c &= 73.53 - 70243.187 \\ &= -70169.657\end{aligned}$$