Assignment- 6(A)

Sample set-1

Price(Y)	SqFt-living(X)
221900	1180
538000	2570

Sample set-2

Price(Y)	SqFt-living(X)
180000	770
604000	1960

⇒(1) $\eta = 0.1$, epochs = 1, $m = 1$, $c = -1$, $n = 2$

⇒(2) Set iteration = 1

⇒(3) Set batch = 1

⇒(4) $\frac{dE}{dm} = -(0.1)[(221900 - 1 \times 1180 + 1) \times 1180 + (538000 - 1 \times 2570 + 1)(2570)]$

$= -81825225$

$\Rightarrow \frac{dE}{dc} = -(0.1)[(221900 - 1(1180) + 1) + (538000 - 1(2570 + 1))]$

$= -378076$

⇒(5) Steplength, $\Delta m = -(0.1)(-81825225)$

$\Rightarrow 81825225$

$\Delta c = (-0.1)(-378076)$

$\Rightarrow 37807.6$

⇒(6) Update $m = 1 + 81825225$ & $c = -1 + 37807.6$

$m = 81825223.5$ and $c = 37806.6$

→ ① Set batch $i = i+1 = 2$, and $i = 2$

Repeat Step-4 :-

$$\frac{\partial E}{\partial m} = -(0.5)\left[(1180000 - 81825423.5 \times 1770 - 37806.6)1770 + \right.$$

$$\left.(604000 - 81825423.5 \times 1960 - 37806.6) \times 1966\right]$$

$$\frac{\partial E}{\partial m} = 1.5526604 e^{14}$$

$$\frac{\partial E}{\partial c} = -0.5\left(-1.6669989 e^{11}\right) = 8.3349945 e^{10}$$

Repeat Step 5 : $\Delta m = -(0.1)(1.5526604 e^{14})$

$$= -1.5526604 e^{13}$$

$$\Delta c = -(0.1)(8.333994489 e^{10})$$

$$= -8.333994489 e^{9}$$

Repeat Step 6 : $m = 81825423.5 - 1.5526604 e^{13}$

$$m = -1.5526522 e^{13}$$

$$c = 37806.6 - 8.333994489 e^{9}$$

$$c = 8.3379570 8 e^{9}$$