6a)

Price	Sqft_living
221900	1180
538000	2570
180000	770
604000	1960

Sample Set1 / Batch1

Price (Y)	Sqft_living (X)
221900	1180
538000	2570

Sample Set2 / Batch2

Price (Y)	Sqft_living (X)
180000	770
604000	1960

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

2) Set iteration = 1

3) Set batch i = 1

4) $\frac{\partial E}{\partial m} = -(0.5)\left[(221900 - 1 * 1180 + 1) * 1180 + (538000 - 1 * 2570 + 1) * 2570\right]$

$= -(0.5)(1636508450) = -818254225$

$\frac{\partial E}{\partial c} = -(0.5)\left[(221900 - 1 * 1180 + 1) + (538000 - 1 * 2570 + 1)\right]$

$= -(0.5)(756152) = -378076$

5) Step Length : $\Delta m = -(0.1)(-818254225)$

$= 81825422.5$

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

$= 37807.6$

6) Update $m = 1 + 81825422.5$ and $c = -1 + 37807.6$

$\underline{m = 81825423.5}$ and $\underline{c = 37806.6}$

7) Set batch $i = 1+1 = 2$ and $i = 2$

Repeat 4: $\frac{\partial E}{\partial m} = -(0.5)[(180000 - 81825423.5 * 770 - 37806.6) * 770 + (604000 - 81825423.5 * 1960 - 37806.6) * 1960]$

$= -(0.5)[-3.10532093e^{14}]$

$= 1.55266047e^{14}$

$\frac{\partial E}{\partial c} = -(0.5)[(180000 - 81825423.5 * 770 - 37806.6) + (604000 - 81825423.5 * 1960 - 37806.6)]$

$= -(0.5)(-1.66679896e^{11}) = 8.33399489e^{10}$

Repeat 5: Step length : $\Delta m = -(0.1)(1.55266047e^{14})$

$= -1.55266047e^{13}$

$\Delta c = -(0.1)(8.33399489e^{10})$

$= -8.33399489e^{9}$

Repeat 6 : $m = 81825423.5 - 1.5526604 \times 10^{13}$

$m = -1.55265229 \times 10^{13}$

$c = 37806.6 - 8.33399489 \times 10^{9}$

$c = -8.33395708 \times 10^{9}$