

## Assignment 6

Price	Sqft-living
221900	1180
538000	2570
180000	770
604000	1960

Sample set 1 / Batch-1

Price (y)	Sqft-living (x)
221900	1180
538000	2570

Sample set 2 / Batch-2

Price (y)	Sqft-living (x)
180000	770
604000	1960

Step 1:  $\eta = 0.1$ , epochs = 1,  $m = 1$ ,  $c = -1$ ,  $n = 2$

Step 2: set iteration = 1

Step 3: set batch = 1

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

$$= -(0.5) (1636508480)$$

$$= -818254225$$

$$\text{Step 5: } \frac{\partial E}{\partial c} = -(0.5) [(221900 - 1 * 1180 + 1) + (538000 - 1 * 2570 + 1)]$$

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

$$= -378076$$

step 5: step length.

$$\Delta m = -(0.1)(-81825422.5) \\ = 81825422.5$$

$$\Delta c = -(0.1)(-37807.6) \\ = 37807.6$$

step 6: update  $m, c$

$$m = 1 + 81825422.5$$

$$m = 81825423.5$$

$$c = -1 + 37807.6$$

$$c = 37806.6$$

step 7: set batch  $i = i + 1 = 2$   
&  $i = 2$

Repeat step 4:

$$\frac{\partial E}{\partial m} = -(0.5) \left[ (180000 - 81825423.5 * 770 - 37806.6) \right. \\ \left. * 770 + (604000 - 81825423.5 * 1960 - 37806.6) \right. \\ \left. * 1960 \right] \\ = -(0.5)(-3 - 10532013e^{14}) \\ = 1.55266047e^{14}$$

$$\text{step 5 } \Delta m = -(0.1)(1.55266047e^{14}) = -1.55266047e^{13} \\ \Delta c = -(0.1)(8.33399489e^{10}) = -8.33399489e^9$$

$$\text{step 6: } m = 81825423.5 - 1.55266047e^{13} \\ = -1.55265229e^{13}$$

$$c = 37806.6 - 8.33399489e^9 \\ = -8.333395708e^9$$