

Question 1:

Gradient Descent

Discussion

The data consist of outliers so we applied normalization on the data.

Input Training data after min-max normalization.

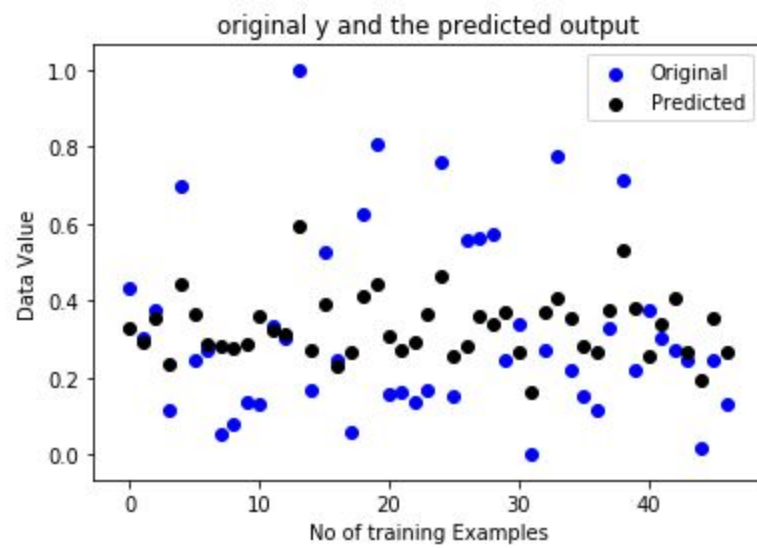
	00	Living Area	No of Bedrooms		Prices
0	1	0.345284	0.50	0	0.433962
1	1	0.206288	0.50	1	0.301887
2	1	0.426917	0.50	2	0.375660
3	1	0.155543	0.25	3	0.117170
4	1	0.592388	0.75	4	0.698113
5	1	0.312466	0.75	5	0.245283
6	1	0.188086	0.50	6	0.273585
7	1	0.158577	0.50	7	0.054904
8	1	0.145615	0.50	8	0.079434
9	1	0.177055	0.50	9	0.136981

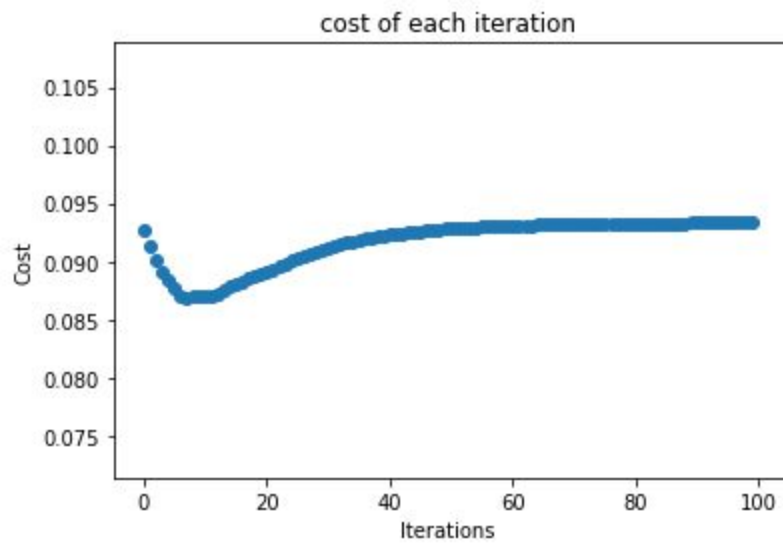
Result with

Initial theta value [0.1,0.1,0.1]

Learning Rate = 0.05

Epochs = 100

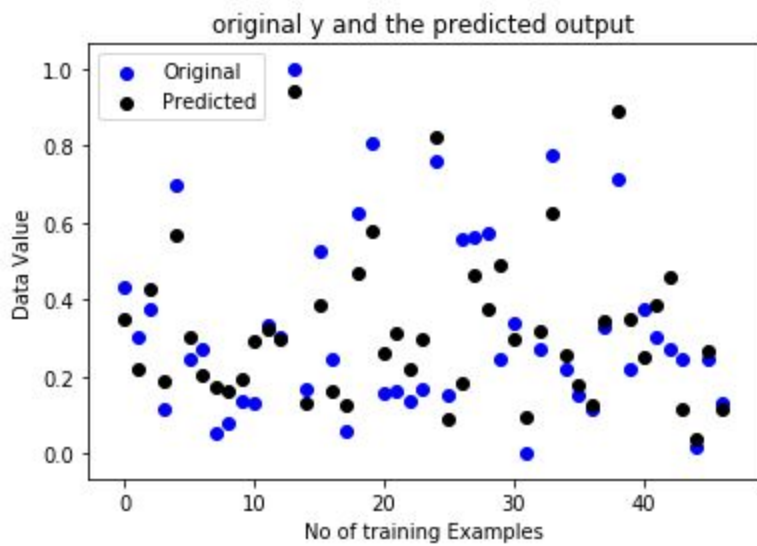


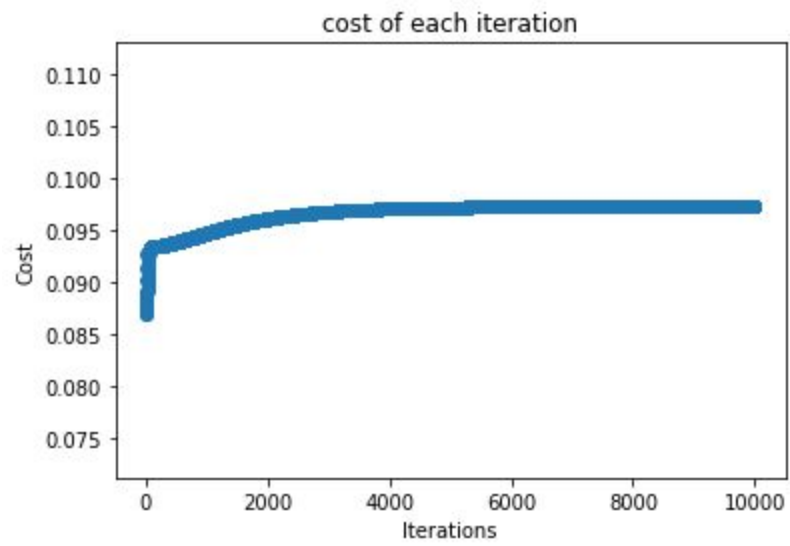


Initial theta value $[0.1, 0.1, 0.1]$

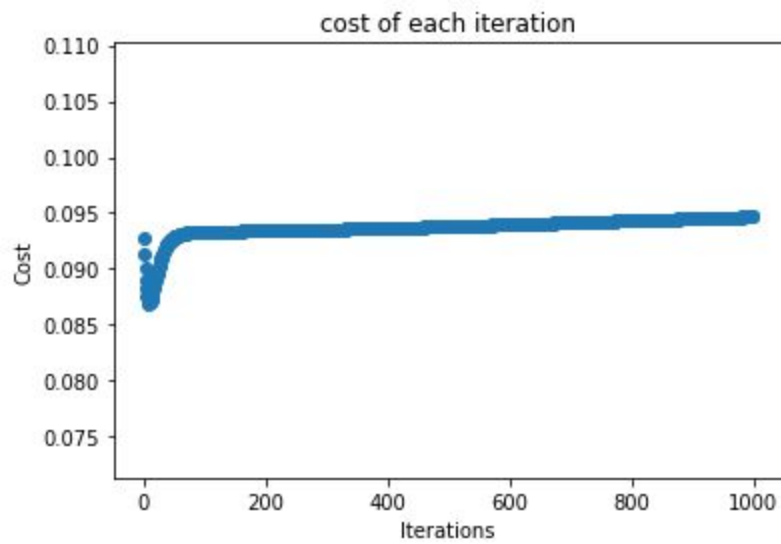
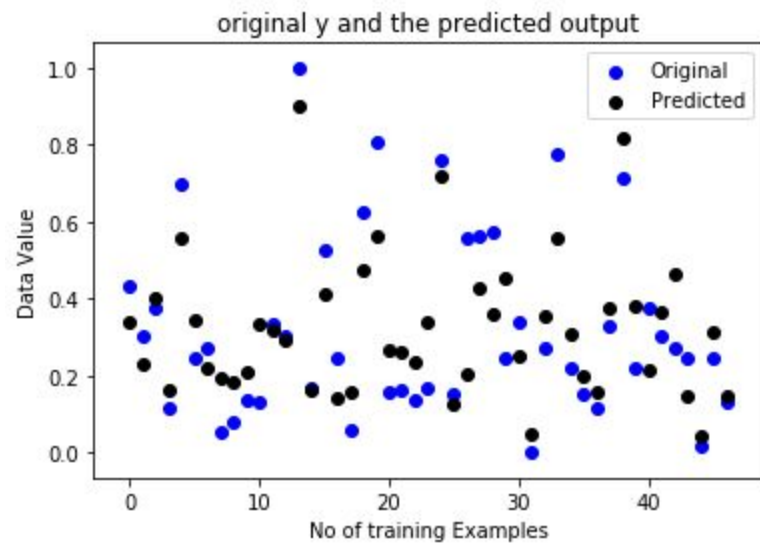
Learning Rate = 0.05

Epochs = 10000





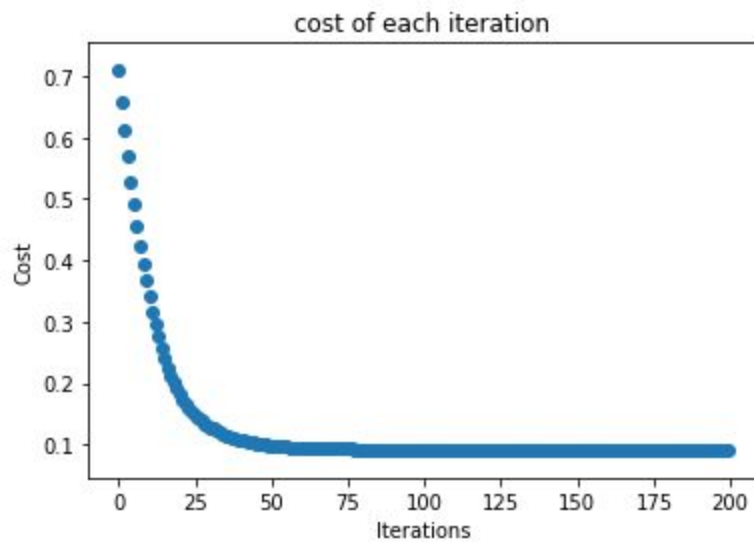
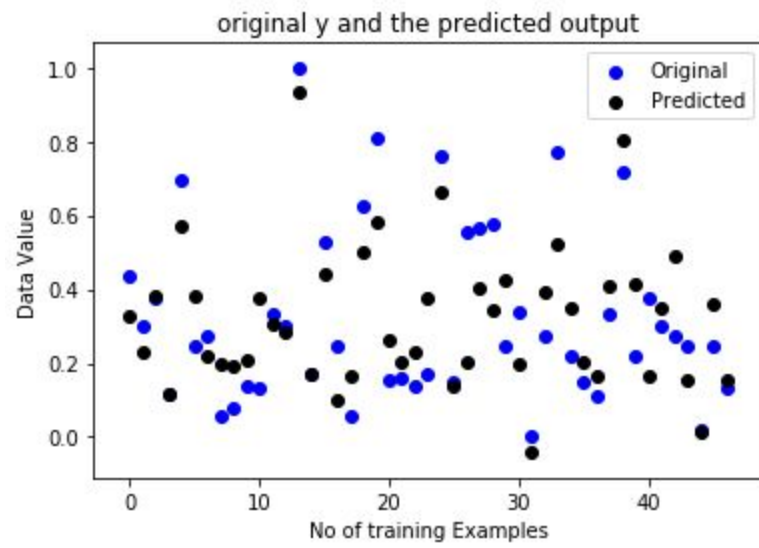
Initial theta value [0.1,0.1,0.1]
Learning Rate = 0.05
Epochs = 1000



Initial theta value [1,1,1]

Learning Rate = 0.05

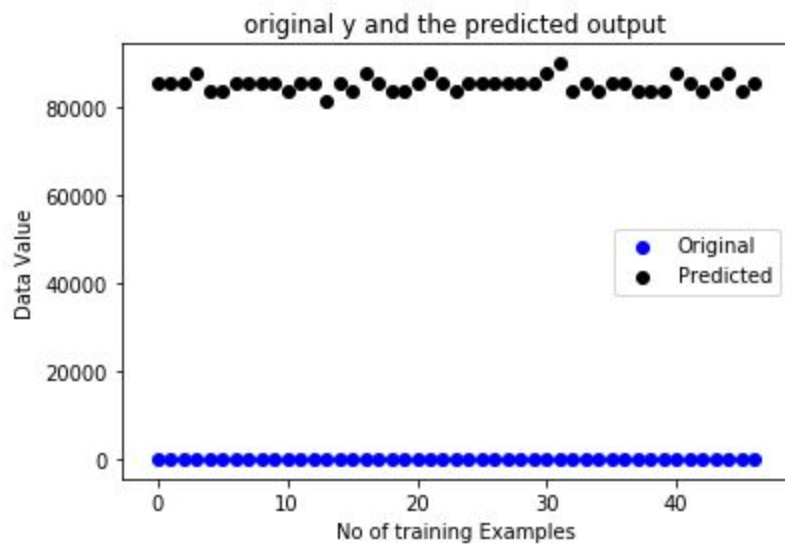
Epochs = 200



Question 1: Part B

Output values

[89802.8912661625, 138.97279961177128, -8640.304614474531]



Conclusion

The gradient descent applied in the first part gives accurate results compared to the matrix.

Question 2

Question 2 pictures are attached in the zip folder,