COL 774

Assignment 1 Report

B.SAI DEEP 2012CS10223

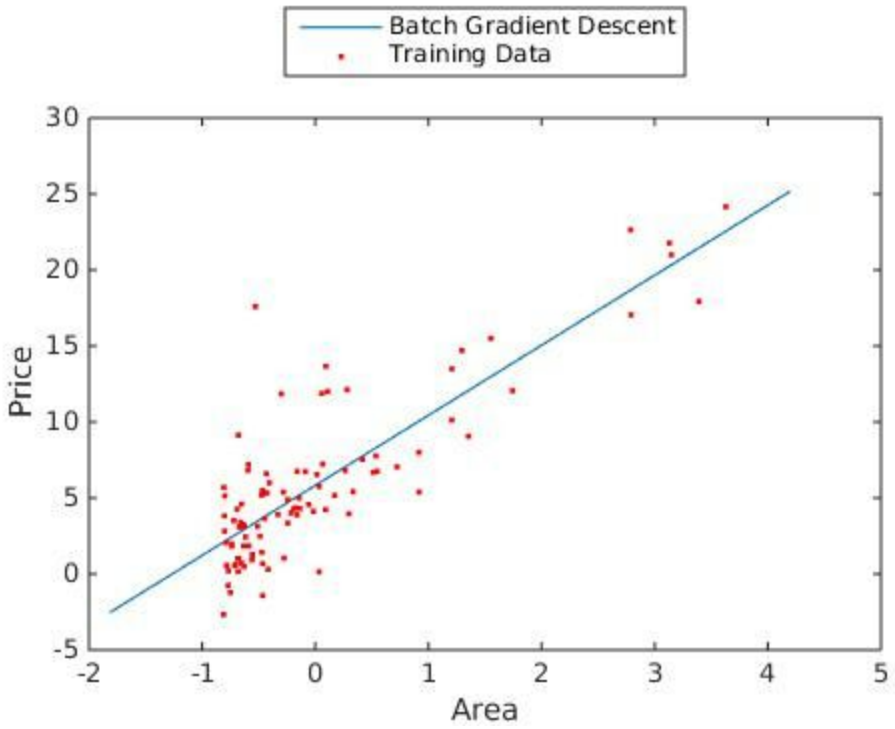
Q1

a) **Learning Rate = 0.001**

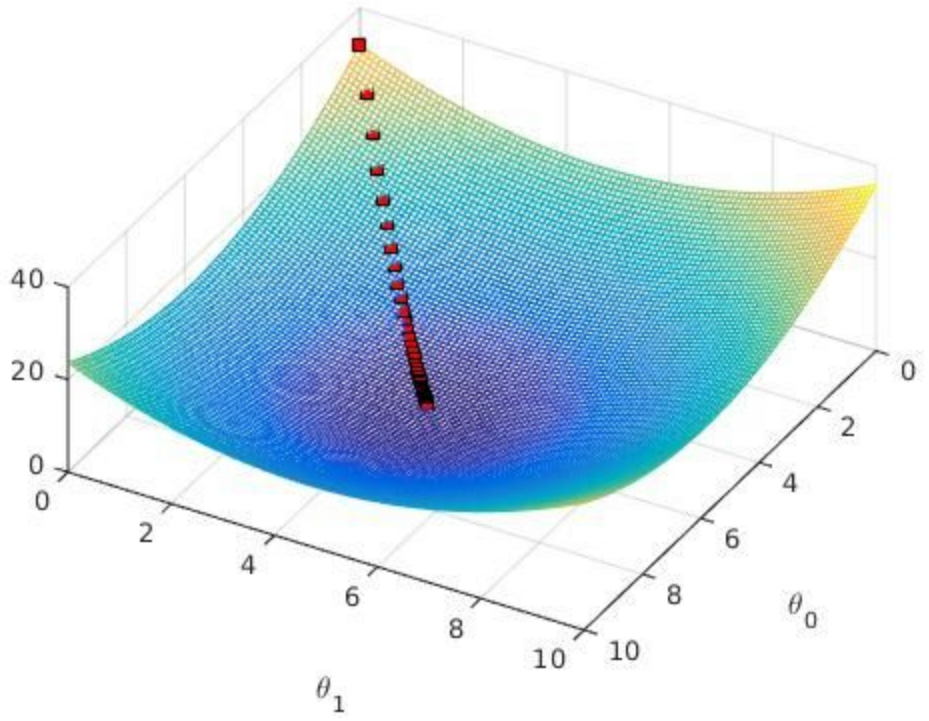
Stopping Criteria : |theta - theta_old | < 0.000001

Theta = [5.8381 ; 4.6160]

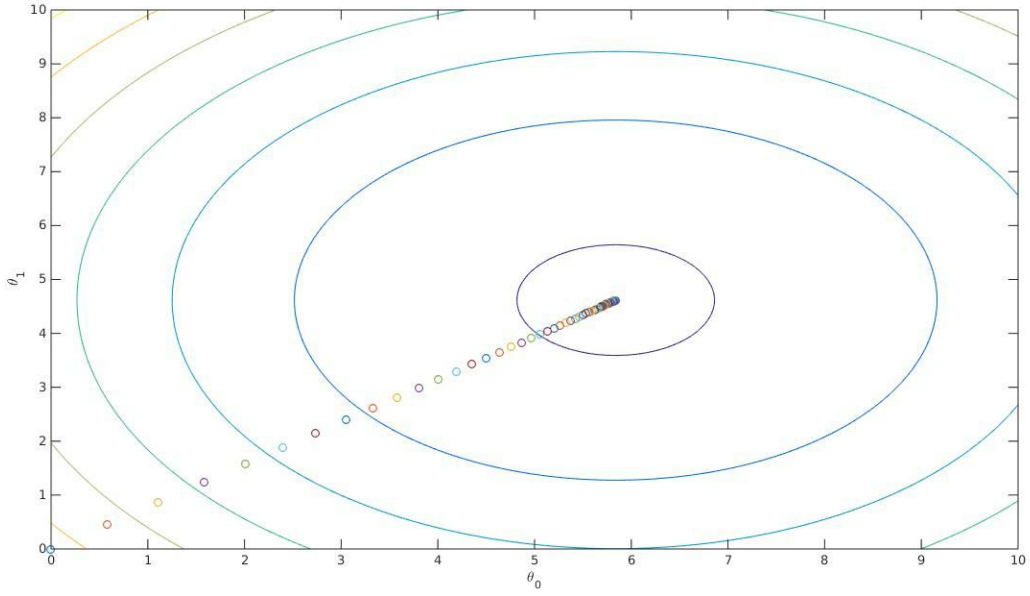
b)



c)


40
20
0
0
2
4
6
8
10
θ_1
0
2
4
6
8
10
θ_0

d)


10
9
8
7
6
5
4
3
2
1
0
θ_1
0
1
2
3
4
5
6
7
8
9
10
θ_0

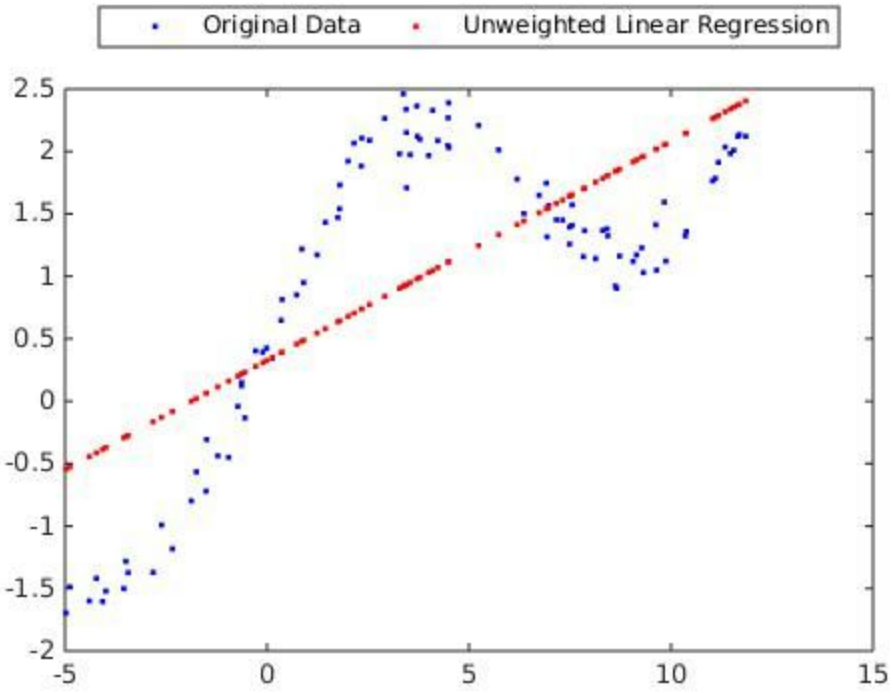
e)

The algorithm **converges** for η = **0.1, 0.5, 0.9** and **1.3**

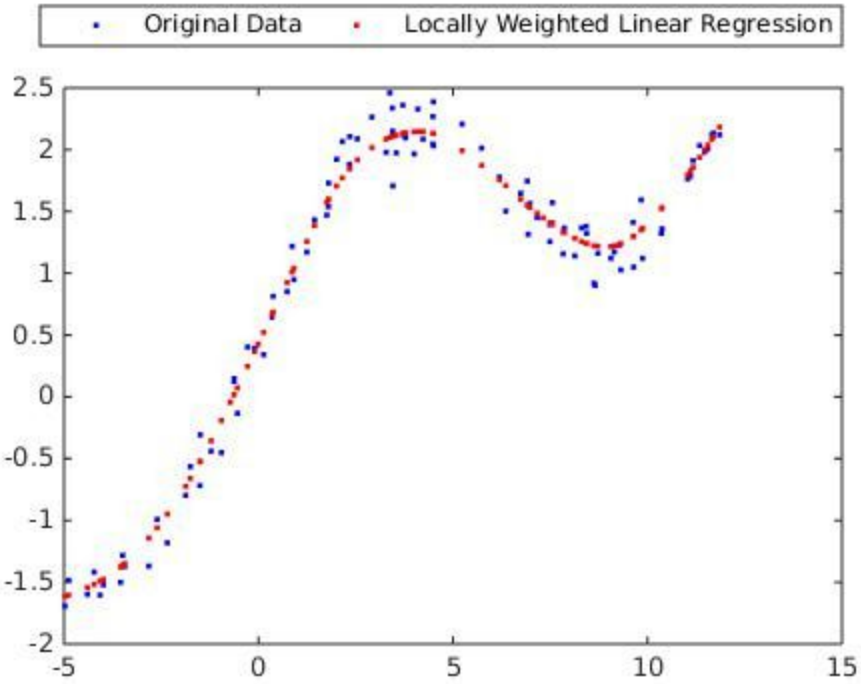
but **does not converge** at η = **2.1** and **2.5**

Q2

a)



b)

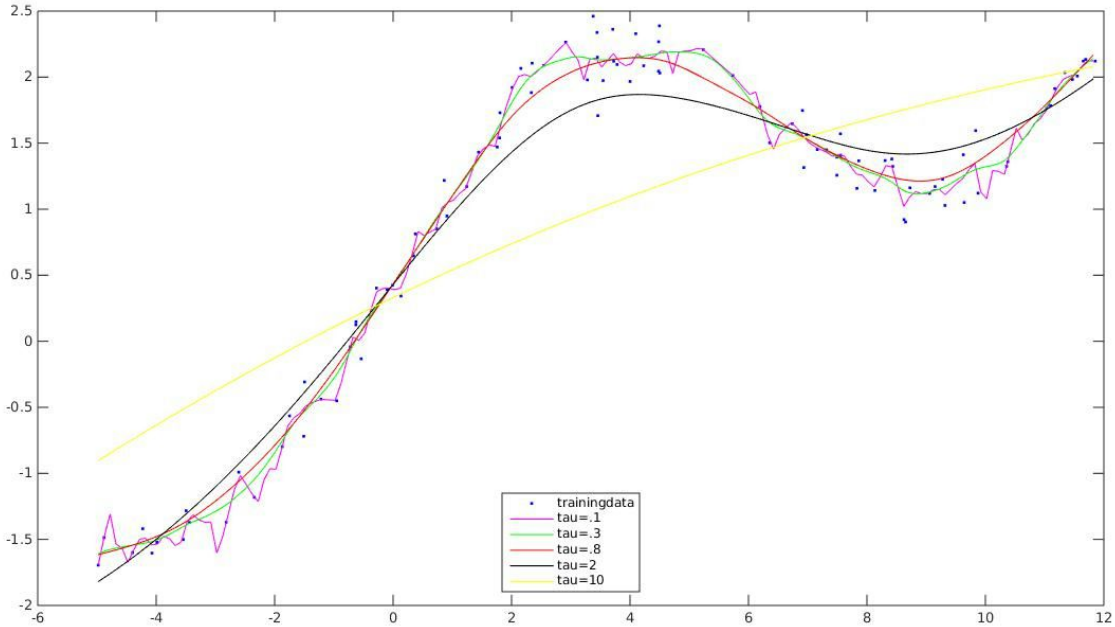


c)

Tau = 0.8 works the best ;

When Tau is too small it can lead to **overfitting**

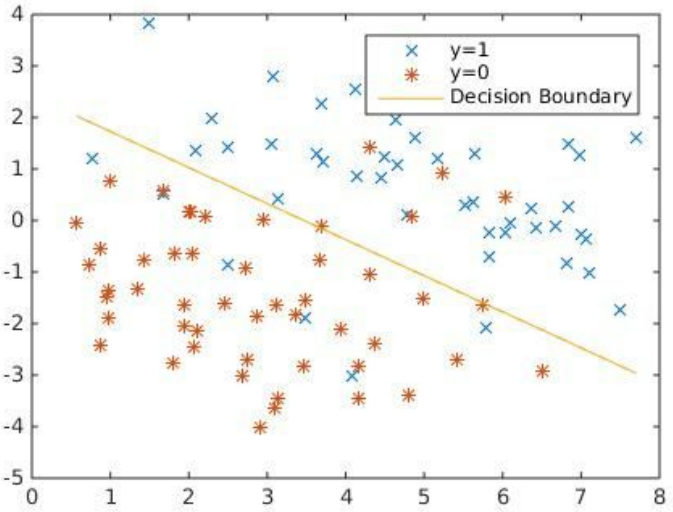
When Tau is too large it leads to **underfitting**.



Q3

a) theta = [-0.0540 ;0.0156 ; 0.0222]

b)



b)

Q4

a)

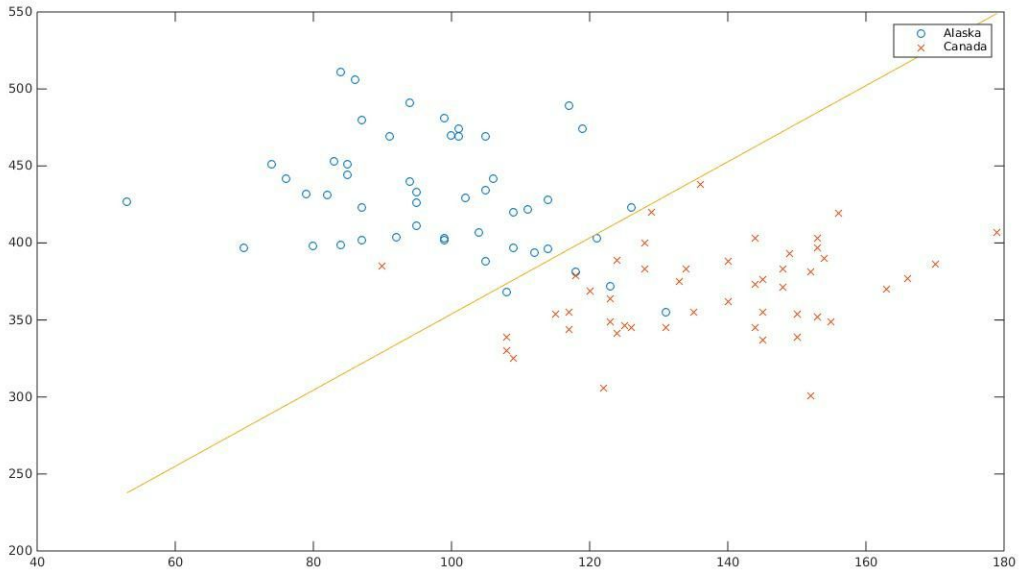
Alaska Mean = [98.3800 ; 429.6600]

Canada Mean = [137.4600 ; 366.6200]

Covariance Matrix = 1.0e+03 * [0.2875 -0.0267

-0.0267 1.1233]

b) c)



d)

Covariance Alaska = 1.0e+03 * [0.2554 -0.1843

-0.1843 1.3711]

Covariance Canada = [319.5684 130.8348

130.8348 875.3956]