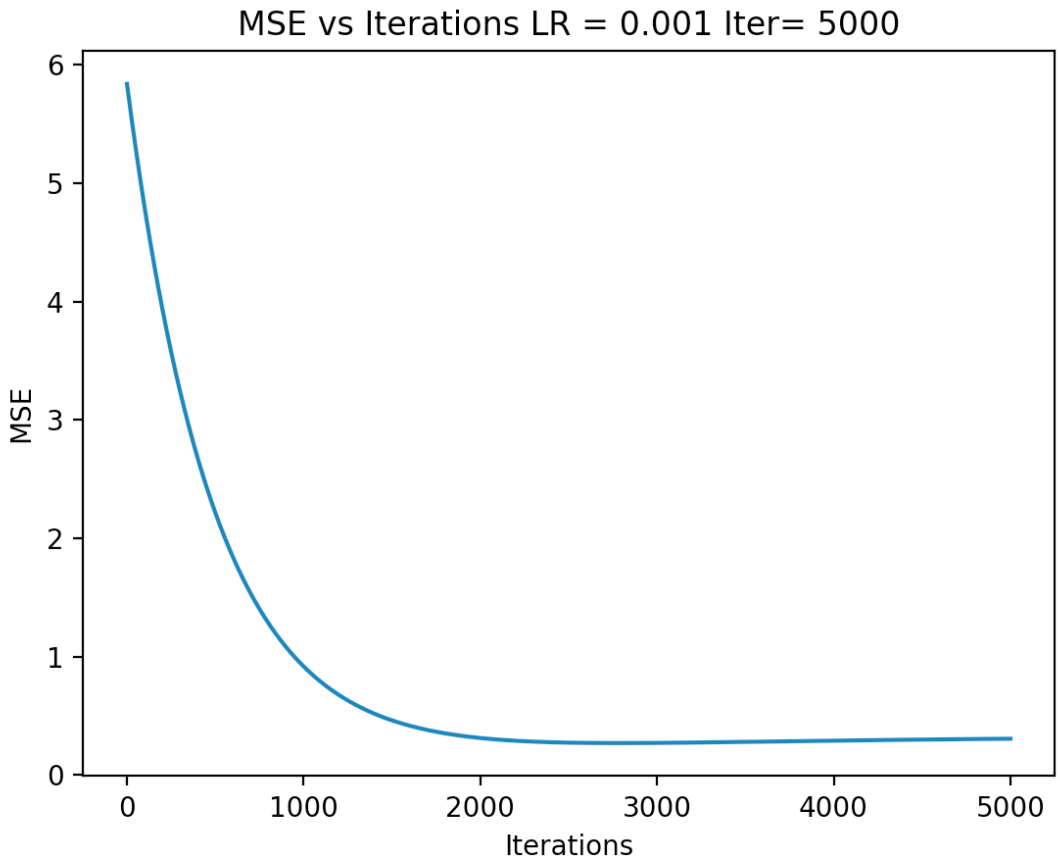
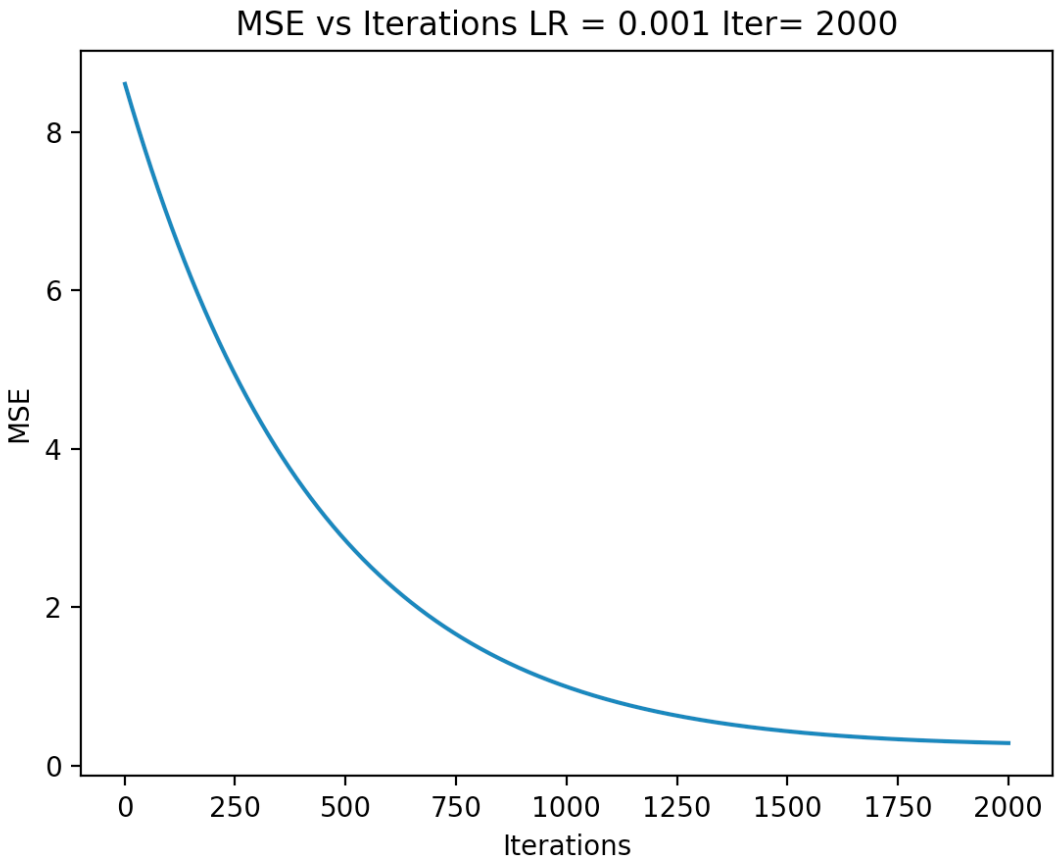
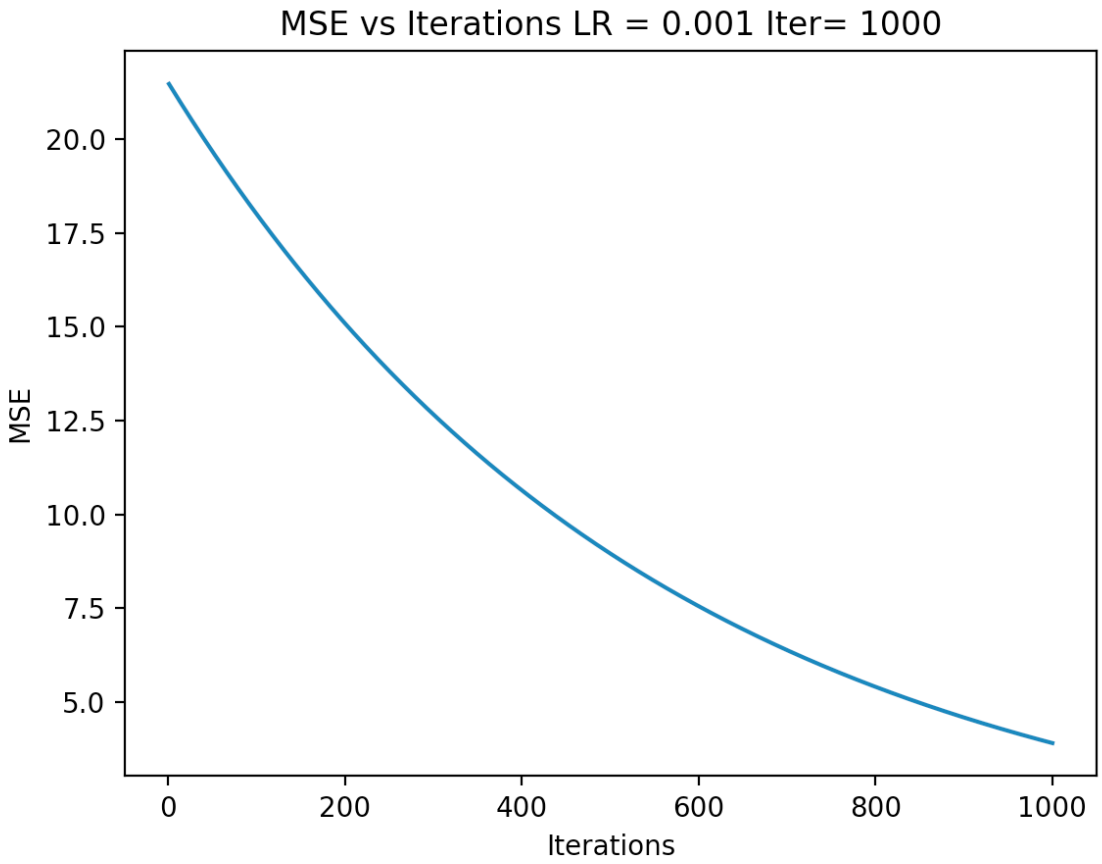
Assignment report part1

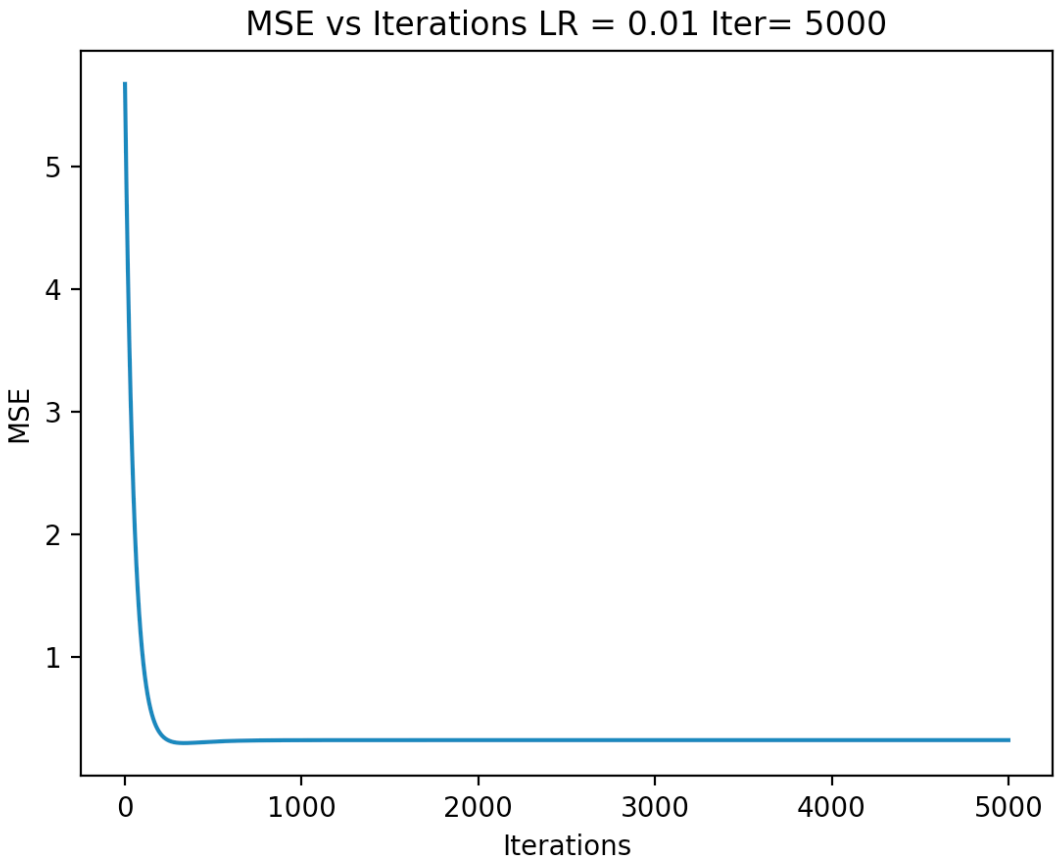
Plots:

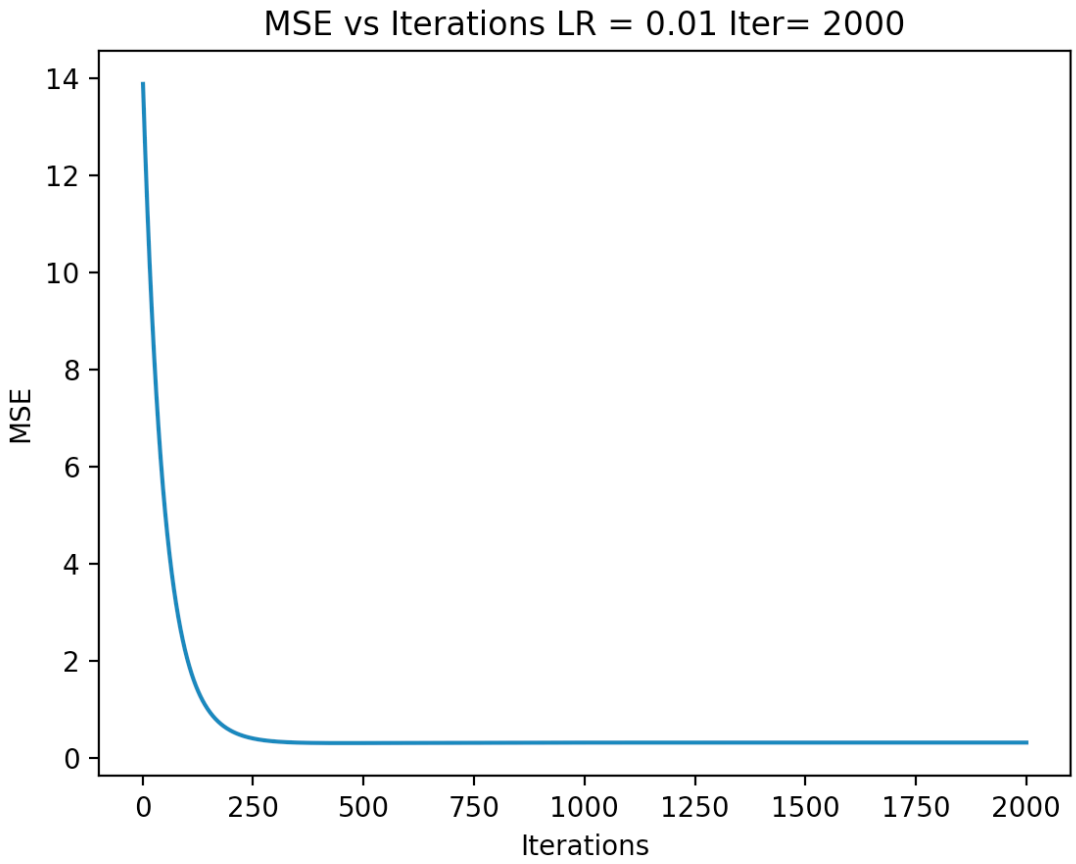
MSE vs Iterations for different alpha

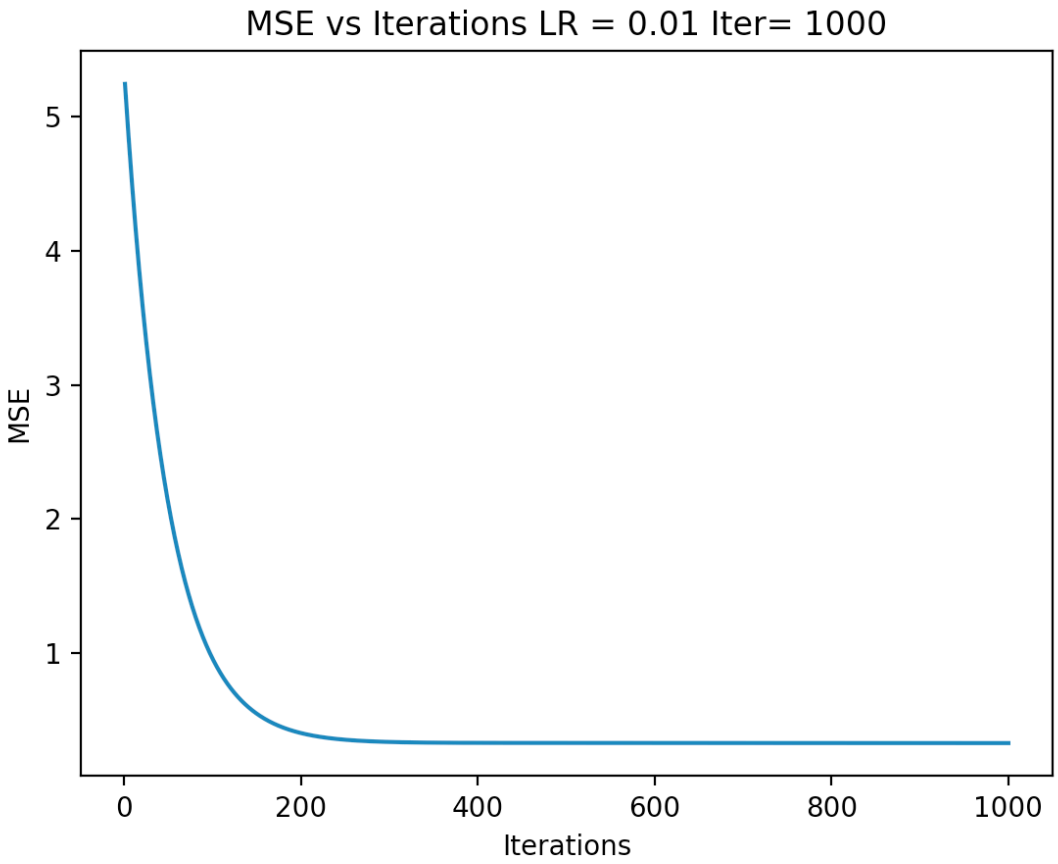


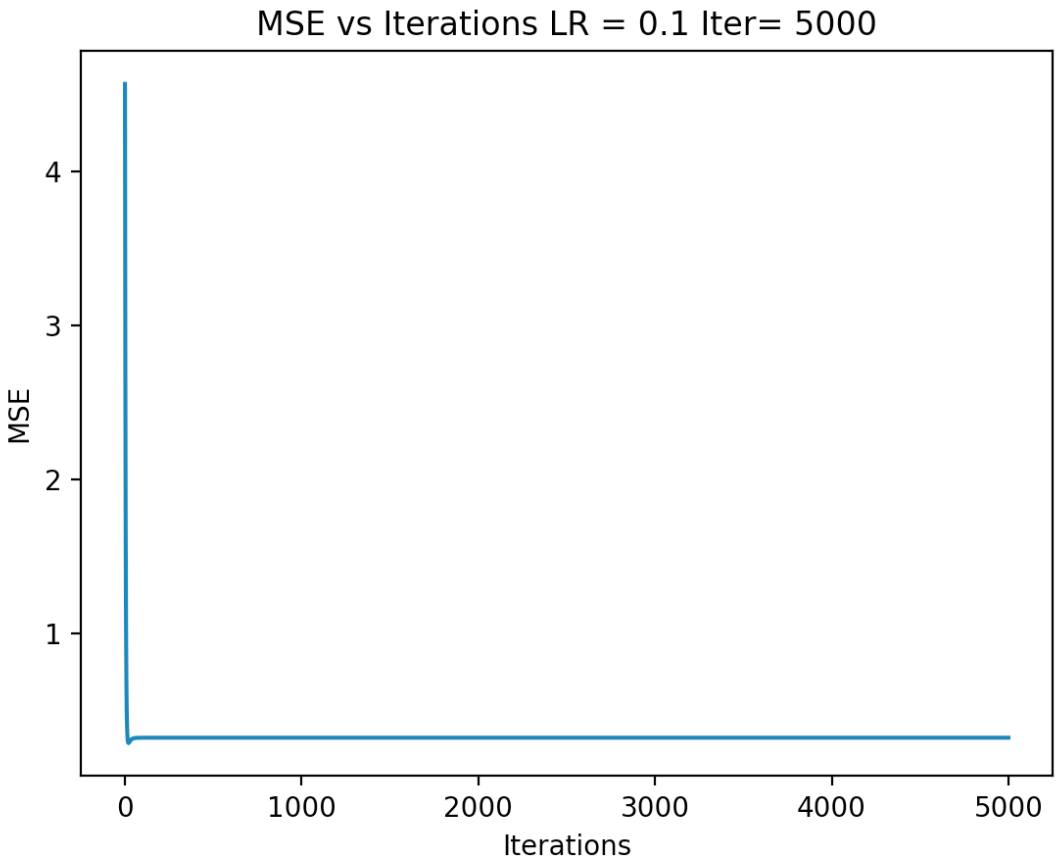

MSE vs Iterations LR = 0.001 Iter= 2000
MSE
0
2
4
6
8
0
250
500
750
1000
1250
1500
1750
2000
Iterations

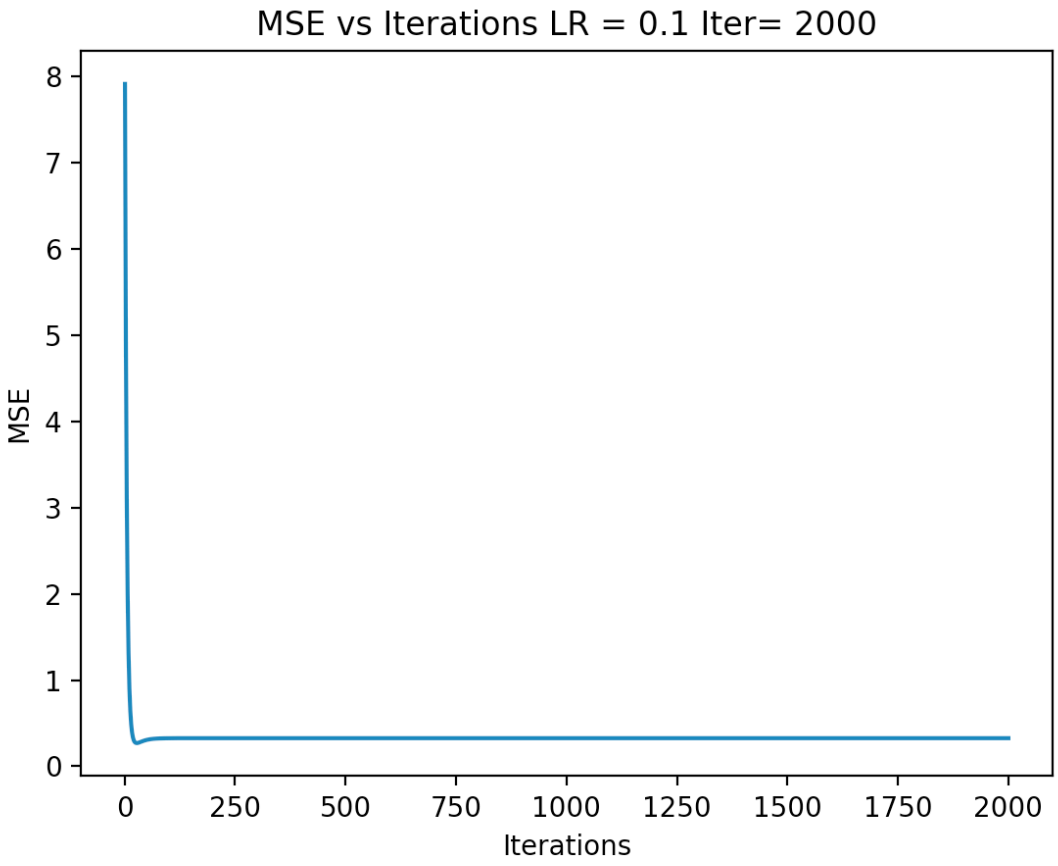

MSE vs Iterations LR = 0.001 Iter= 1000
MSE
20.0
17.5
15.0
12.5
10.0
7.5
5.0
0
200
400
600
800
1000
Iterations

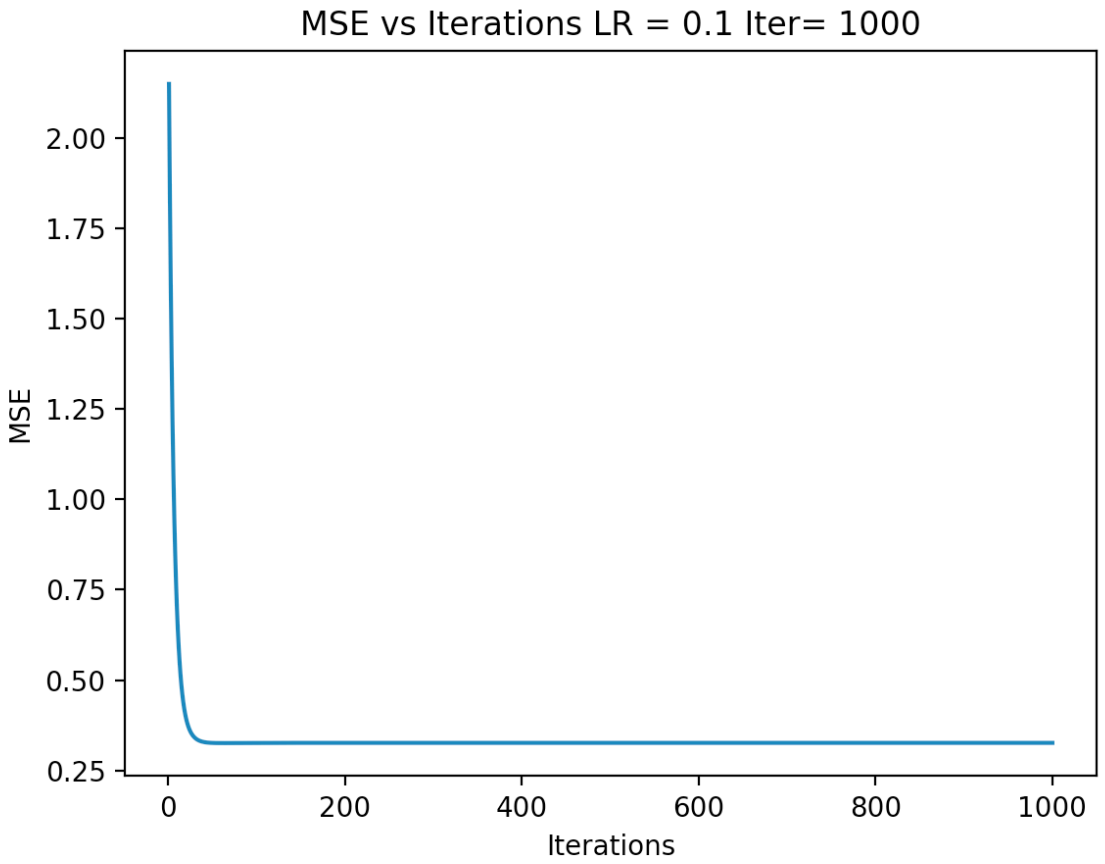

MSE vs Iterations LR = 0.01 Iter= 5000
MSE
5
4
3
2
1
0
1000
2000
3000
4000
5000
Iterations


MSE vs Iterations LR = 0.01 Iter= 2000
MSE
Iterations
0
2
4
6
8
10
12
14
0
250
500
750
1000
1250
1500
1750
2000

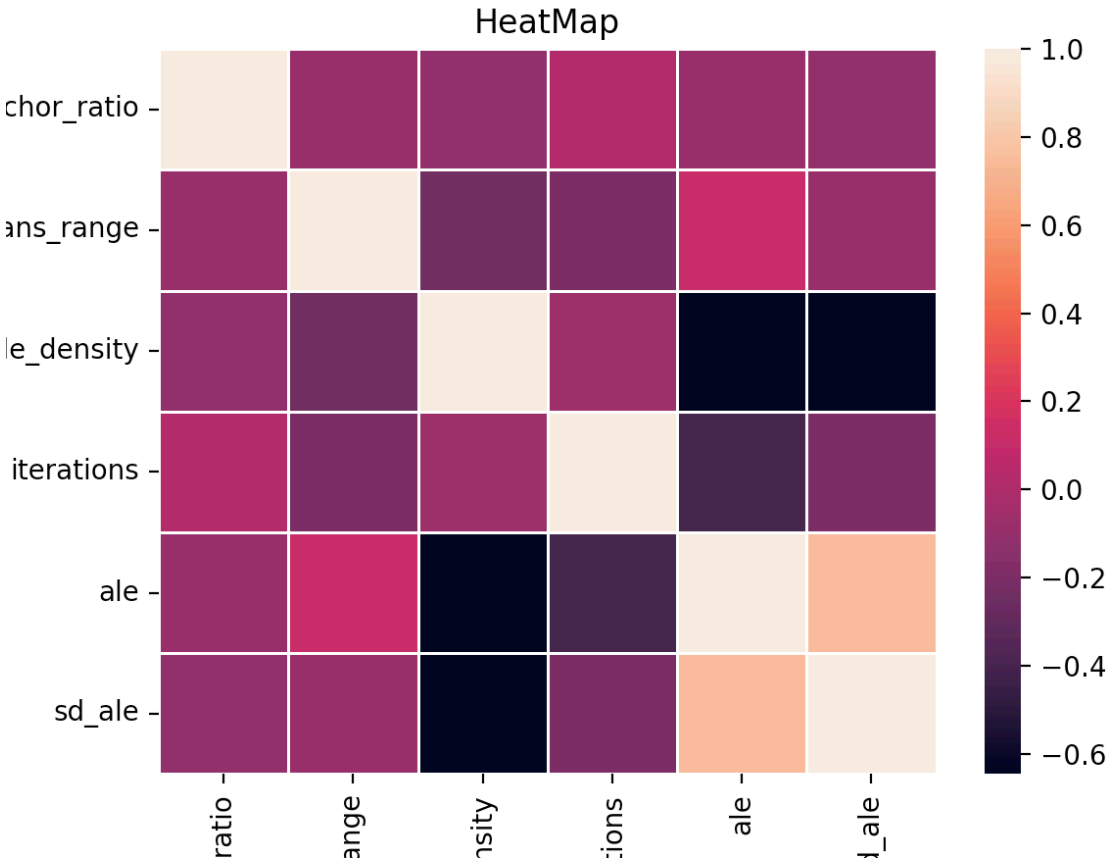

MSE vs Iterations LR = 0.01 Iter= 1000
MSE
Iterations
5
4
3
2
1
0
200
400
600
800
1000


MSE vs Iterations LR = 0.1 Iter= 5000
MSE
4
3
2
1
0
1000
2000
3000
4000
5000
Iterations

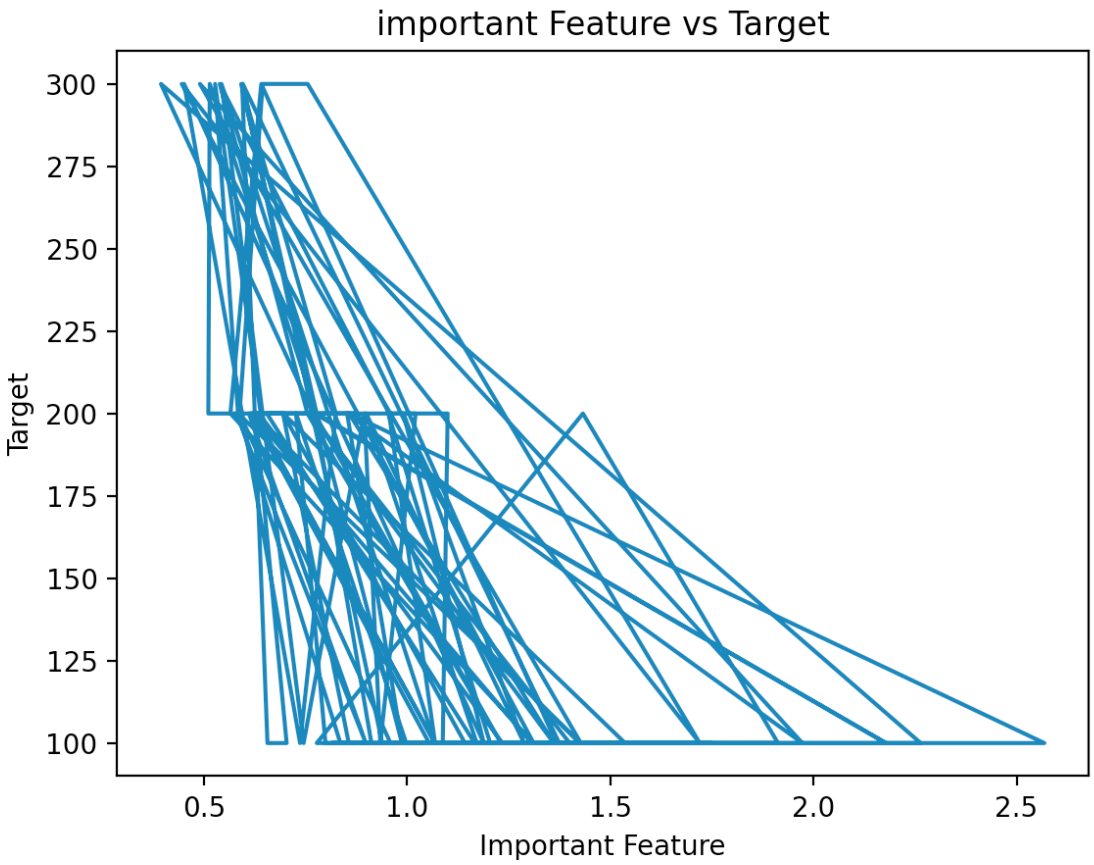

MSE vs Iterations LR = 0.1 Iter= 2000
MSE
Iterations
0
1
2
3
4
5
6
7
8
0
250
500
750
1000
1250
1500
1750
2000


MSE vs Iterations LR = 0.1 Iter= 1000
MSE
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0
200
400
600
800
1000
Iterations

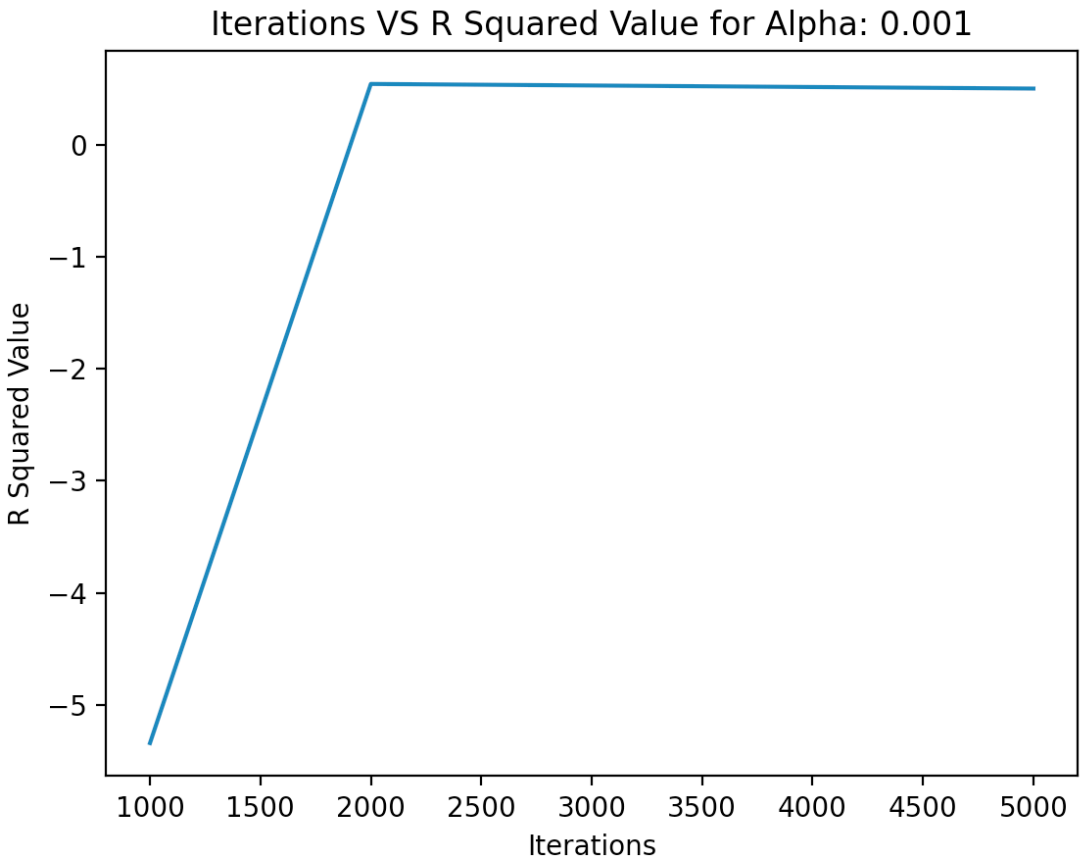
Heatmap:

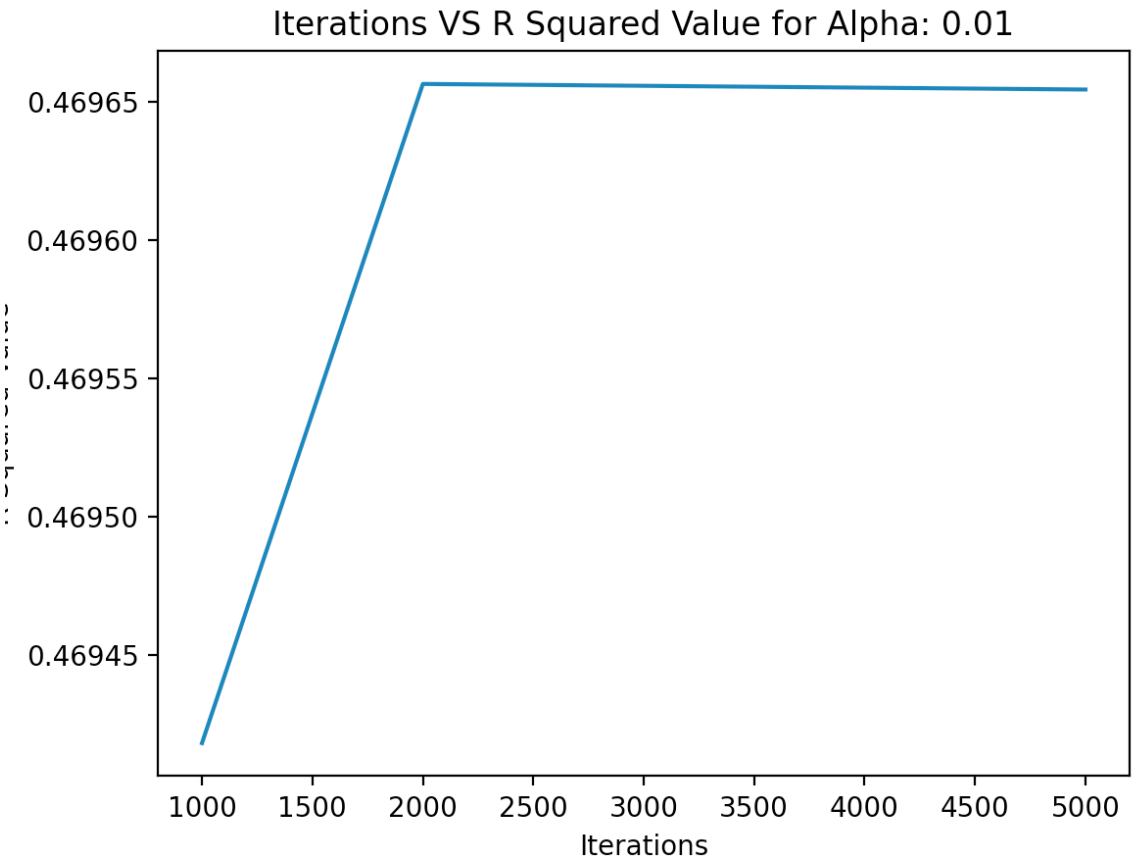

HeatMap
chor_ratio
ans_range
le_density
iterations
ale
sd_ale
ratio
ange
nsity
ions
ale
d_ale
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
−0.6

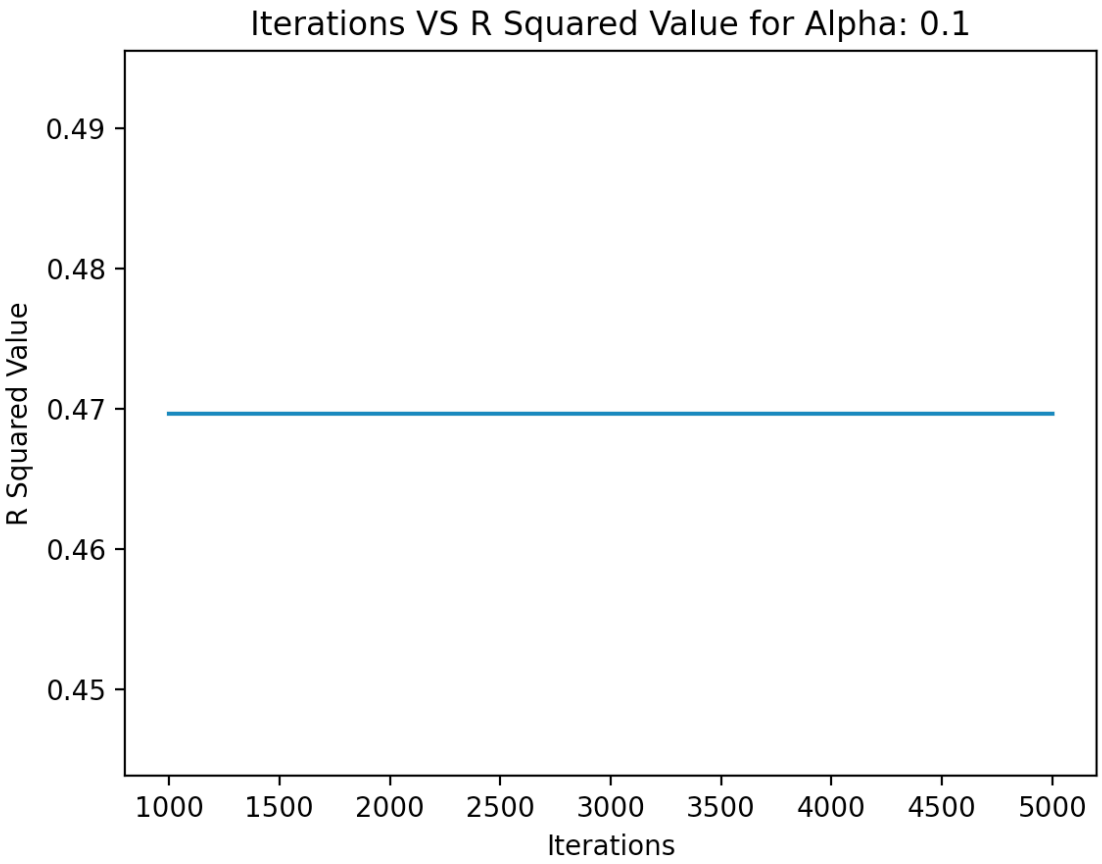
Important features vs Target:



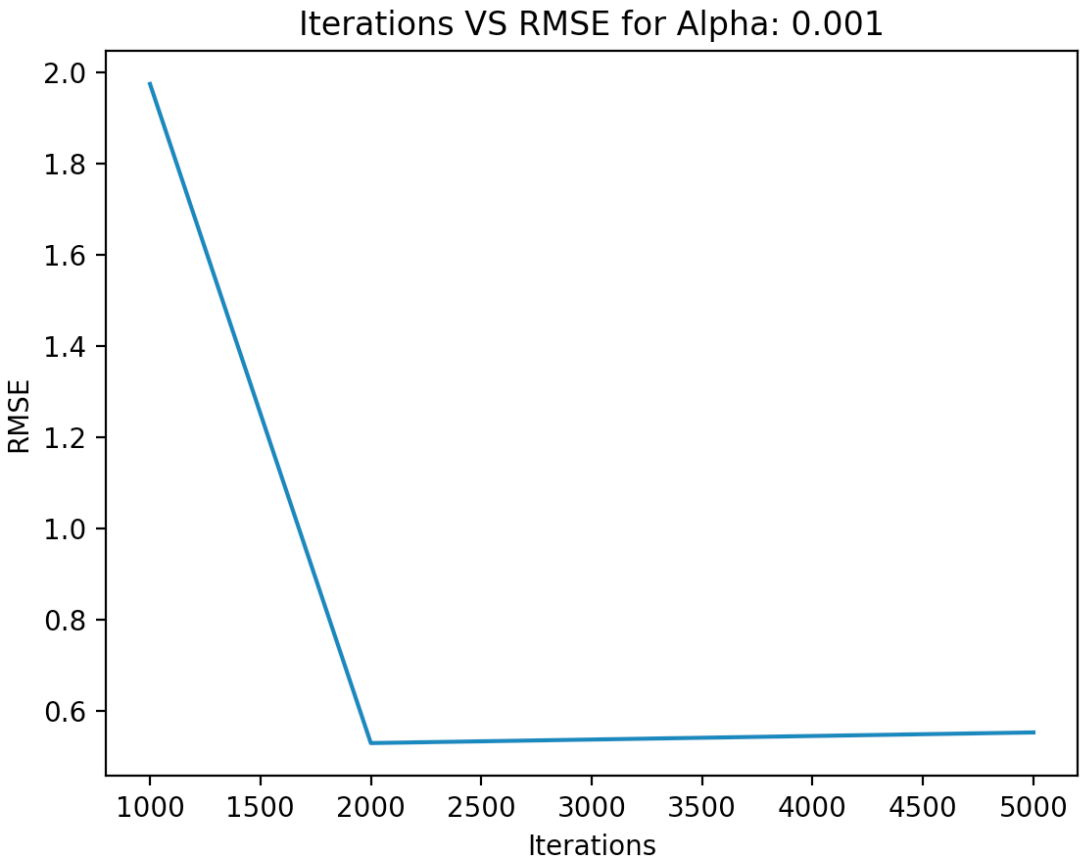
Iterations Vs Iterations:

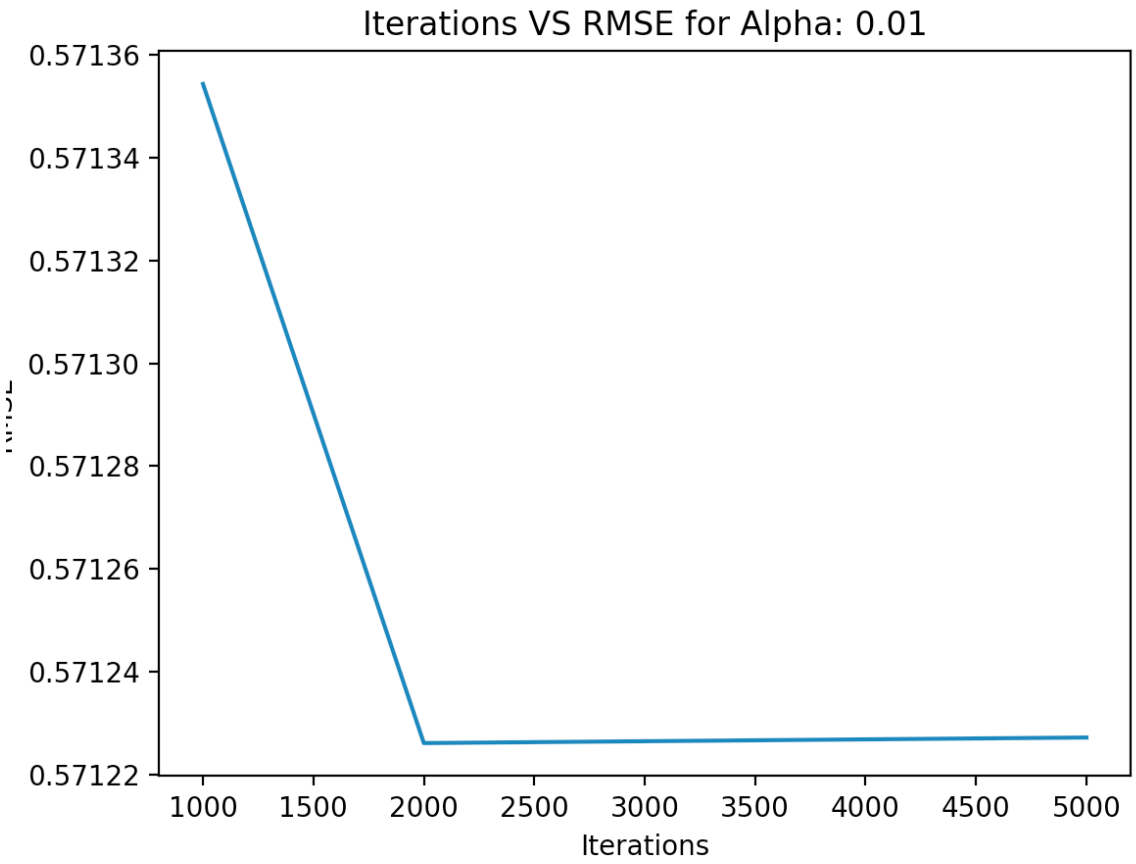

Iterations VS R Squared Value for Alpha: 0.001
R Squared Value
0
−1
−2
−3
−4
−5
1000
1500
2000
2500
3000
3500
4000
4500
5000
Iterations

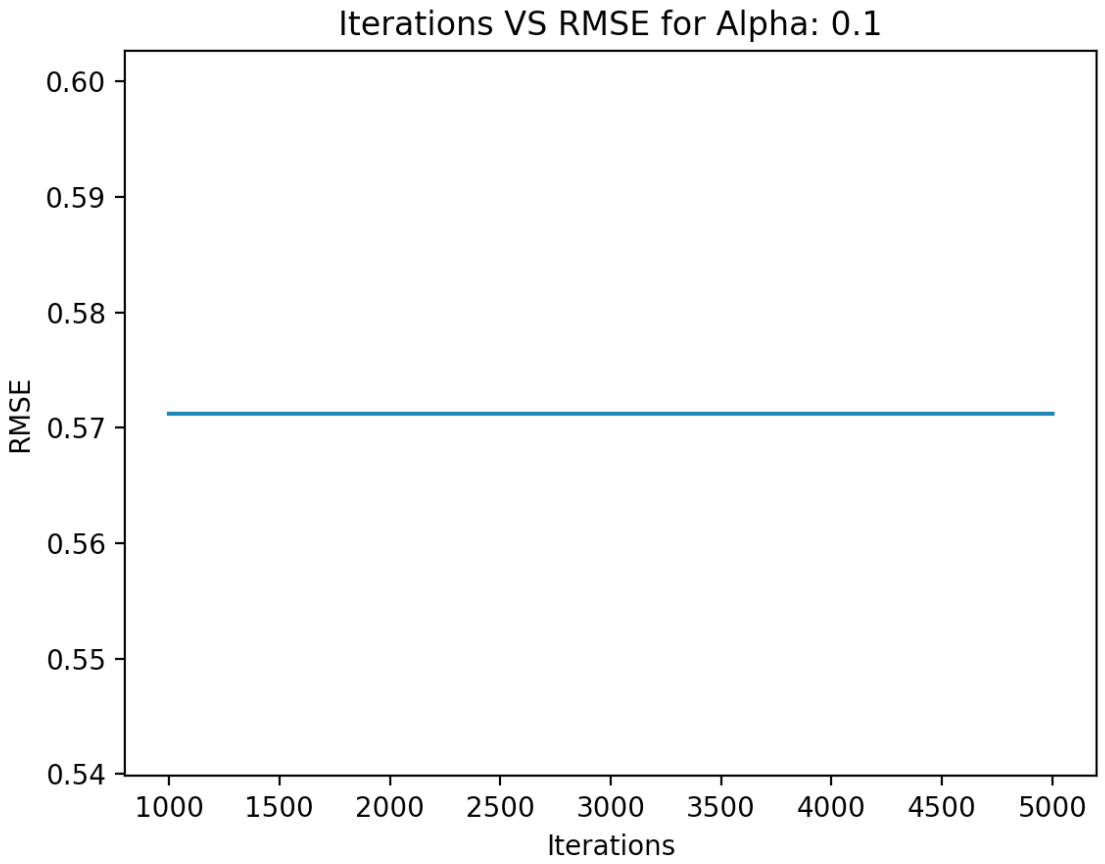

Iterations VS R Squared Value for Alpha: 0.01
0.46965
0.46960
0.46955
0.46950
0.46945
1000
1500
2000
2500
3000
3500
4000
4500
5000
Iterations



Iterations vs RMSE:


Iterations VS RMSE for Alpha: 0.001
RMSE
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
1000
1500
2000
2500
3000
3500
4000
4500
5000
Iterations


Iterations VS RMSE for Alpha: 0.01
0.57136
0.57134
0.57132
0.57130
0.57128
0.57126
0.57124
0.57122
1000
1500
2000
2500
3000
3500
4000
4500
5000
Iterations



Explanation of Results:

The model designed works well for the dataset. An ideal model would have residual values of R^2 as 1 and 0 Root mean squared error which is not applicable for real-world scenarios. The outcome of this model shows a good scenario with no noticeable patterns. An R^2 value of around 60% is noticed providing a model which is good considering the dataset used.