Arsalaan Ansari (aaa2325)

ELENE4903 HW 3

Problem 1b)

Variance

b value

	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
5	1.96628	1.93314	1.92342	1.9222	1.92477	1.92921	1.93463	1.94058	1.94682	1.95321
7	1.92016	1.90488	1.90808	1.9159	1.9248	1.9337	1.94225	1.95038	1.95809	1.96544
9	1.89765	1.90252	1.91765	1.93251	1.9457	1.95723	1.9674	1.97649	1.98474	1.99234
11	1.89051	1.91498	1.93885	1.95794	1.97322	1.98576	1.99638	2.0056	2.01384	2.02134
13	1.89585	1.93559	1.9646	1.9855	2.00131	2.01388	2.02431	2.03331	2.04132	2.04864
15	1.9096	1.95955	1.9908	2.01192	2.02737	2.03947	2.04946	2.0581	2.06585	2.07298

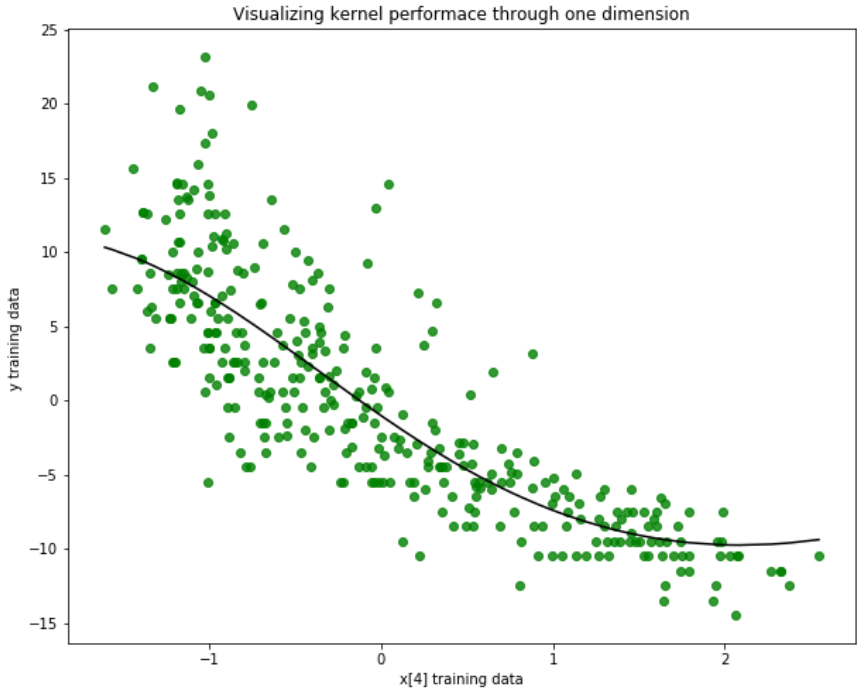
RSME for given b and variance value

Problem 1c)

The RSME value 1.89051 for which b = 11 and the variance = 0.1 is the lowest RSME found in the table. The lowest RSME found in Homework 1 was around 2.2 which is considerably higher than the RSME value of 1.89051, and is larger than all of the values in the table as well.

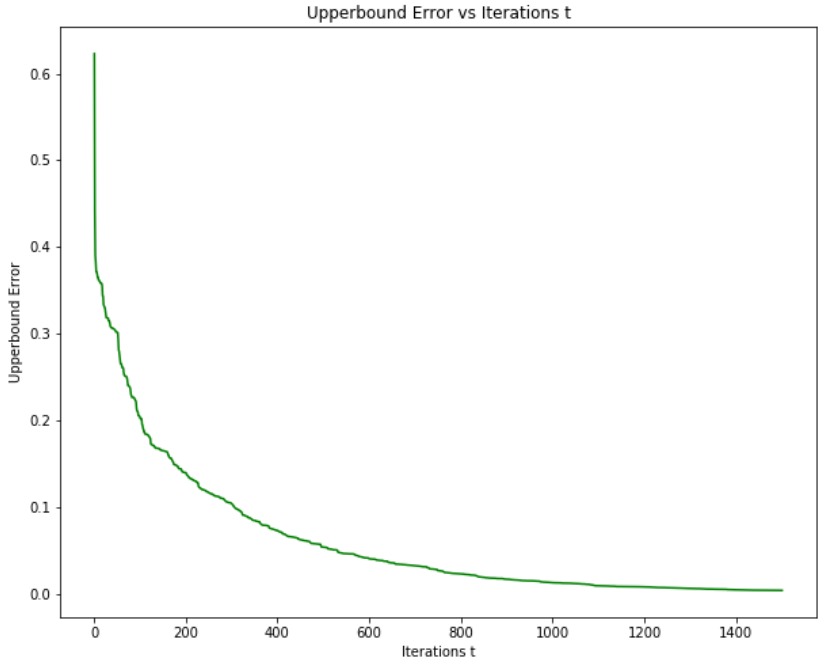
There are a few disadvantages to using the Gaussian process method. First is that the Gaussian process method scales worse with larger data sets than ridge regression with a complexity of O(N^3), meaning that performance is impacted for large datasets. Second it is much more difficult to implement sparse feature selection in a Gaussian process compared to Ridge Regression.

Problem 1d)

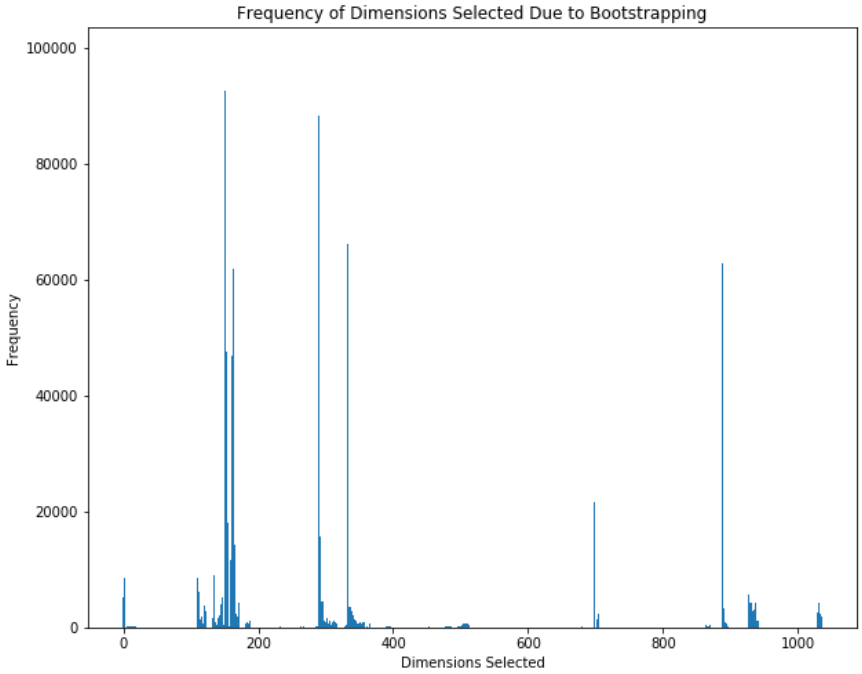


Problem 2a)

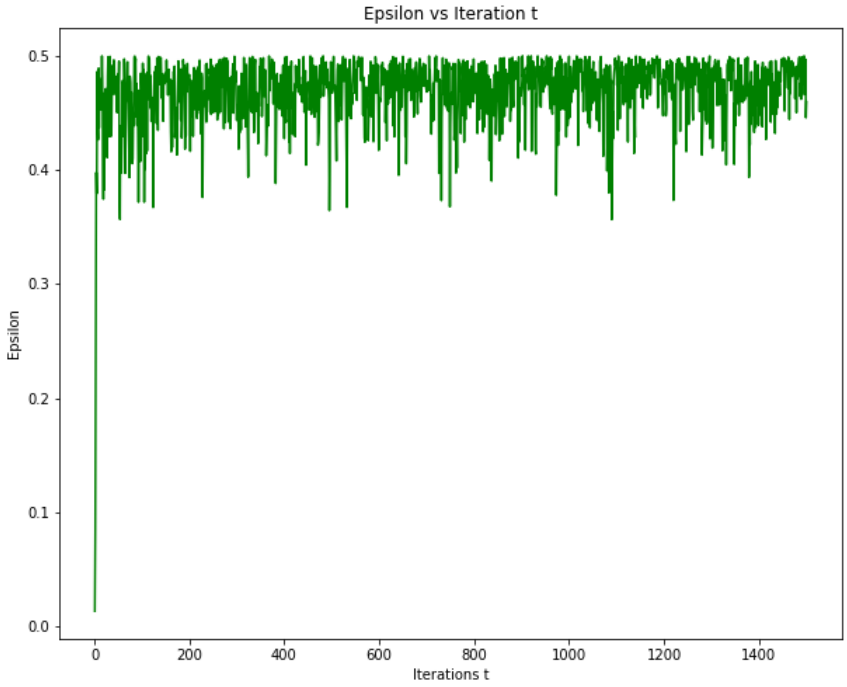
Problem 2b)

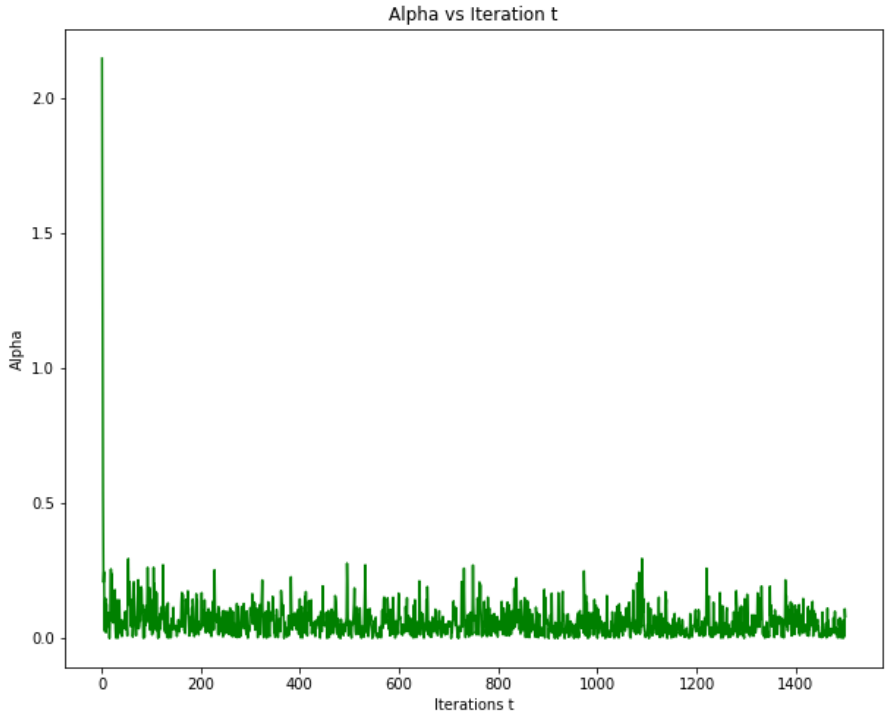


Problem 2c)



Problem 2d)


Epsilon vs Iteration t
Epsilon
Iterations t
0.0
0.1
0.2
0.3
0.4
0.5
0
200
400
600
800
1000
1200
1400


Alpha vs Iteration t
Alpha
Iterations t
0.0
0.5
1.0
1.5
2.0
0
200
400
600
800
1000
1200
1400