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4-24-21

HW 2

1

$$D = \{(x_i, y_i)\}_{i=1}^{N}$$

$$P(D|\theta) = \prod_{i=1}^{N} P(y_i|x_i, w) = \prod_{i=1}^{N} \frac{1}{2b} e^{-\frac{|y_i - w^T x_i|}{b}}$$

$$P(D|\theta) = \frac{1}{2b} e^{-\sum_{i=1}^{N} \frac{|y_i - w^T x_i|}{b}}$$

$$\log(P(D|\theta)) = \log\left(\frac{1}{2b}\right) - \frac{1}{b} \sum_{i=1}^{N} |y_i - w^T x_i| \propto SAE(w)$$

2

t	Recall	Precision	
.0	.5	1	
.2	.57	1	
.4	.8	.72	
.6	.8	.88	
.8	.53	.89	
1	.5	1	

4 weight vector - [-.2434, .5965, .2895, .2426, -.509, -.2771, .3372, -.282]
accuracy - 86.08%.

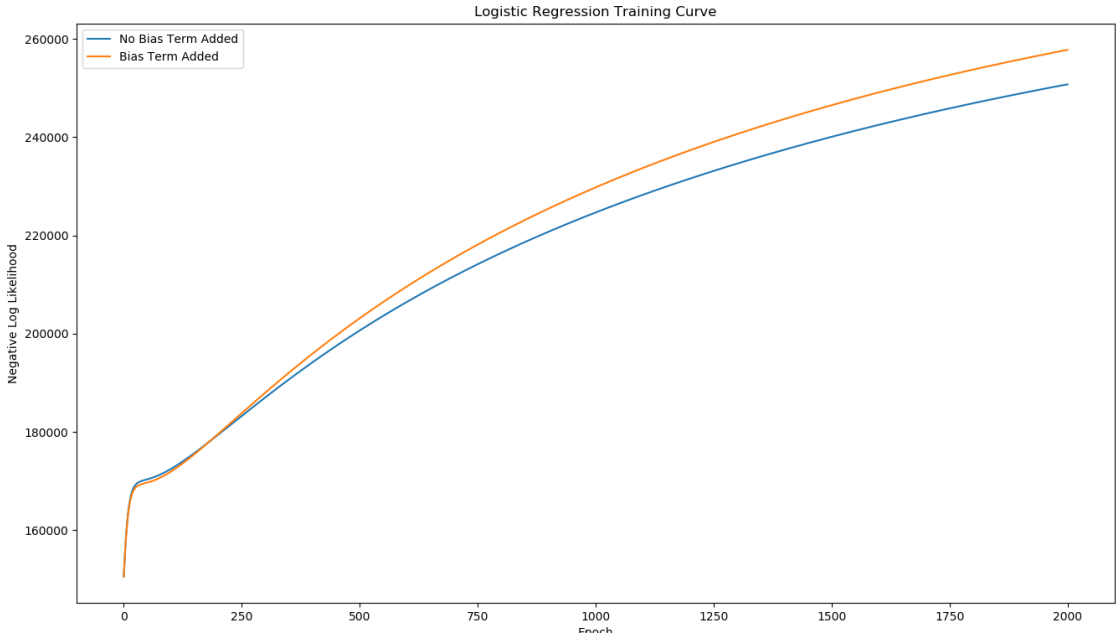
5 weight vector - [-.2466, .8873, .1892, .2788, -.6833, -.3344, .438, -.3511]
accuracy - 97.0%.
Yes it made a huge difference, 13% higher accuracy.

6. It looks like it will continue to drop if max_iters is set higher

Q6

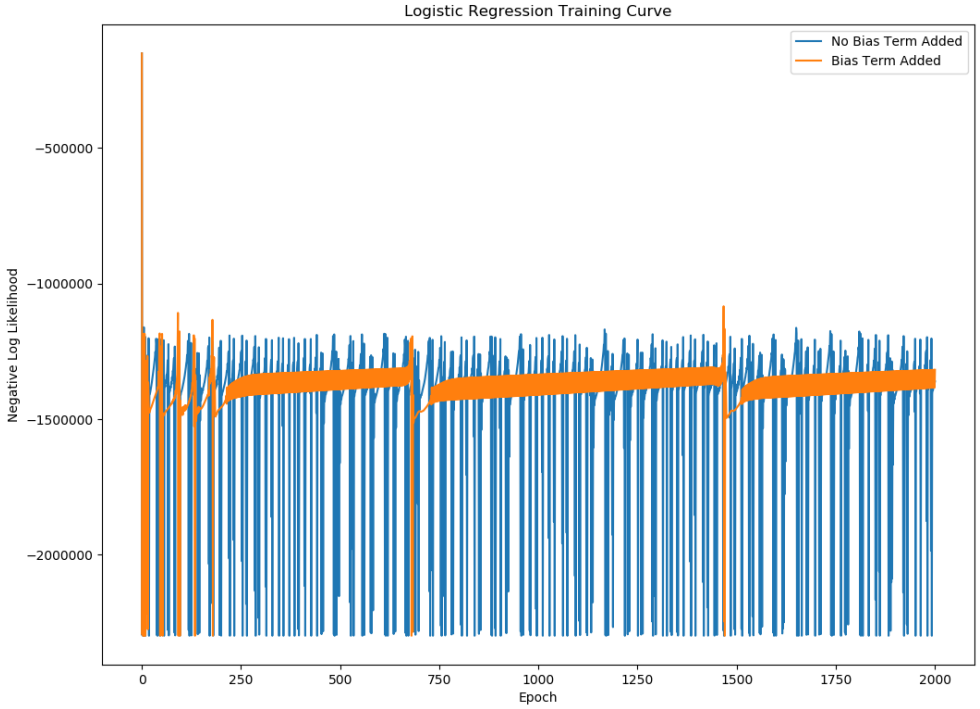
Step size of .00001

Accuracy – 92.27%



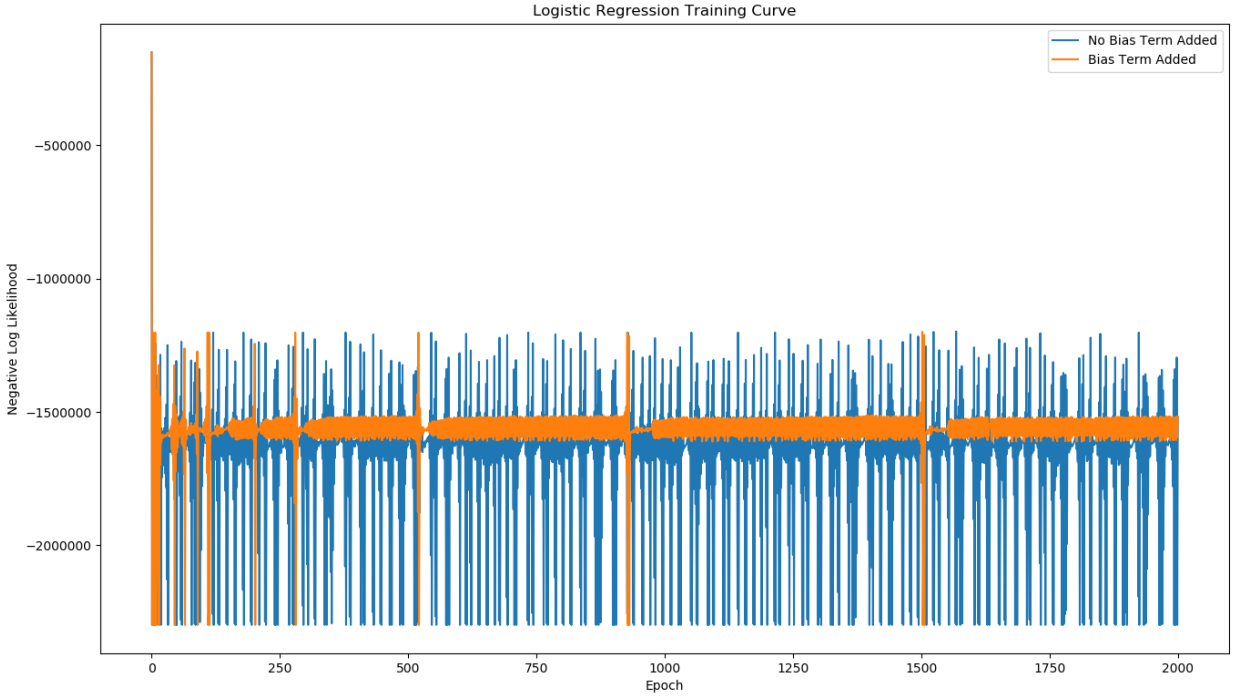
Step size of .01

Accuracy – 95.06%



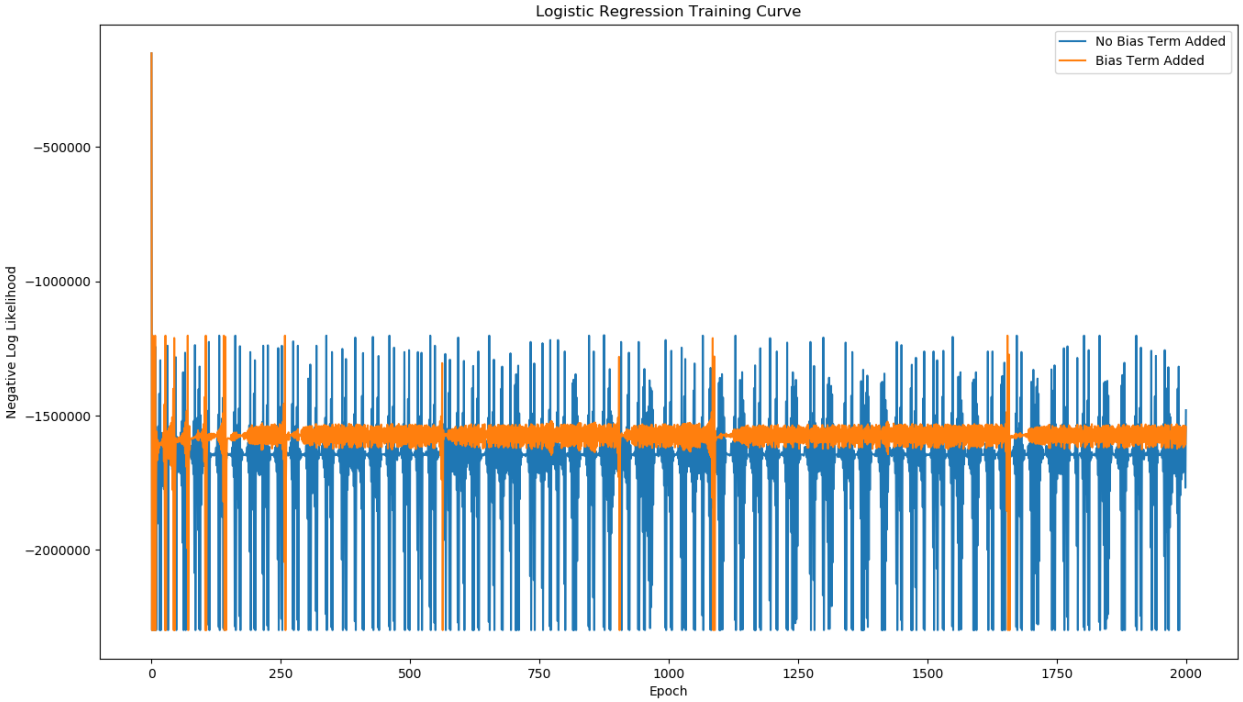
Step size of .1

Accuracy: 95.06%



Step size of 1

Accuracy: 83.26%



Q7

Msecond submission had 100% accuracy so it is hard to evaluate how the different k values changed the accuracy of my submission. However, the logs show that as the number of folds increases, the accuracy goes up and the standard deviation goes up. It seems based on the logs that 4-fold provides a happy medium between accuracy and overfitting.

Debriefing

1. 14 hours, but only because I made a lot of silly mistakes and did not go to office hours.
2. Moderate.
3. Alone.
4. 60%. It's an easier problem set, which allowed me to get away with not understanding the material as deeply.
5. I liked HW 1 a more because it was more in depth. I felt like I could complete this assignment without fully understanding the material.