

EE5907 Programming Assignment Report

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Q1: Beta-binomial Naive Bayes

1. Plots of training and test error rates versus α



2. What do you observe about the training and test errors as α change?

As shown in the figure above, with the increase of α , both the training and test error rates tend to increase, even if there are some fluctuations. In addition, for each value of α , the test error rate is always greater than the training error rate.

3. Training and test error rates for $\alpha = 1, 10$ and 100

α	1	10	100
Training	11.06%	11.48%	13.47%
Test	11.91%	12.57%	14.78%

Q2. Gaussian Naive Bayes

1. Training and test error rates for log-transformed data

Training	16.38%
Test	18.16%

Q3: Logistic regression

1. Plots of training and test error rates versus λ



2. What do you observe about the training and test errors as λ change?

As shown in the figure above, with the increase of λ , both the training and test error rates increase correspondingly with fluctuations, even if the test error rate has a small downward trend at the beginning. By comparison, the test error rate is always greater than the training error rate for each value of λ .

3. Training and test error rates for $\lambda = 1, 10$ and 100

λ	1	10	100
Training	4.73%	5.12%	6.04%
Test	6.58%	6.32%	7.49%

Q4: K-Nearest Neighbors

1. Plots of training and test error rates versus K



2. What do you observe about the training and test errors as K change?

As shown in the figure above, both training and test error rates show an upward trend with the increase of K. Compared with test error, the growth rate of training error is greater. But the training error is still smaller than test error for each value of K.

3. Training and test error rates for K = 1, 10 and 100

K	1	10	100
Training	0.03%	5.12%	9.20%
Test	7.03%	7.75%	10.35%

Q5: Survey

I spent about 18 hours on this assignment.