CS561 - ARTIFICIAL INTELLIGENCE LAB

ASSIGNMENT-3: Naive Bayes Classifier

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1. K-Fold Cross Validation Accuracy Comparison

	Accuracy
MultiNomial Navie Bayes	98.13
MultiVariate Naive Bayes	96.20

2. Classification Matrix Comparision

Multinomial Naive Bayes

	Spam	Ham
Spam	673	74
Ham	30	4797

Multivariate Naive Bayes

	Spam	Ham
Spam	714	33
Ham	179	4648

Observation: Multinomial Naive Bayes classifier performs better as compared to multivariate Naive Bayes classifier. However, the results for this task are almost comparable.
Reason: Multivariate model uses binary occurrence information, hence ignoring the number of occurrences. On the other hand, multinomial keeps track of multiple occurrences. In this particular use case, the count of features is important, and hence multinomial Naive Bayes is performing better than multivariate Naive Bayes. The results for this task are comparable as the sentences in the training data are relatively short and don't contain many repeating words. Hence, we can see that although multinomial performs better than multivariate the difference is not very high.