

Below are the results I obtained from testing.

With the exception of the heartDisease set, the general pattern was:

OPTIMAL Bayesian Classifier had the best precision

LINEAR Bayesian Classifier was as good as the OPTIMAL Bayesian Classifier if not worse for precision

NAIVE Bayesian Classifier was the worst of the Bayesian Classifiers for precision

Decision tree had the worst precision

I think OPTIMAL Bayesian Classifier was the best because it provided a full variance matrix that the NAIVE Bayesian Classifier did not. LINEAR Bayesian Classifier was the second best because it provided a full variance matrix but since it was averaged it was not as precise. NAIVE Bayesian Classifier were the second worst because they provide only a diagonal variance matrix with many of the covariance's missing; the missing covariance lead to the lower precision. Decision trees were the worst in precision as they classify the data into discrete values which lowers precision as the training data is effectively limited to the set of discrete values which are much lower than the values the Bayesian Classifiers use. The heartDisease dataset unfortunately did not give consistent results for Bayesian Classifiers however it worked well for the decision tree method. I think since heartDisease has a lot more classes than the rest of the datasets there is a higher chance of misclassification hence the low precision.

The reason I feel OPTIMAL Bayesian Classifier was the best

Leave One Out Test for OPTIMAL Bayesian Classifier for heartDisease: 17.17171717171717%

Leave One Out Test for LINEAR Bayesian Classifier for heartDisease: 19.52861952861953%

Leave One Out Test for NAIVE Bayesian Classifier for heartDisease: 17.50841750841751%

Leave One Out Test for decision tree for heartDisease: 53.87205387205387%

Leave One Out Test for OPTIMAL Bayesian Classifier for iris: 99.33333333333333%

Leave One Out Test for LINEAR Bayesian Classifier for iris: 99.33333333333333%

Leave One Out Test for NAIVE Bayesian Classifier for iris: 97.33333333333334%

Leave One Out Test for decision tree for iris: 90.0%

Leave One Out Test for OPTIMAL Bayesian Classifier for wine: 100.0%

Leave One Out Test for LINEAR Bayesian Classifier for wine: 100.0%

Leave One Out Test for NAIVE Bayesian Classifier for wine: 98.87640449438202%

Leave One Out Test for decision tree for wine: 91.57303370786516%

Ten Fold Test for OPTIMAL Bayesian Classifier for heartDisease: 14.814814814814813%

Ten Fold Test for LINEAR Bayesian Classifier for heartDisease: 18.855218855218855%

Ten Fold Test for NAIVE Bayesian Classifier for heartDisease: 19.19191919191919%

Ten Fold Test for decision tree for heartDisease: 50.50505050505050%

Ten Fold Test for OPTIMAL Bayesian Classifier for iris: 99.33333333333333%

Ten Fold Test for LINEAR Bayesian Classifier for iris: 99.33333333333333%

Ten Fold Test for NAIVE Bayesian Classifier for iris: 97.33333333333334%

Ten Fold Test for decision tree for iris: 91.33333333333333%

Ten Fold Test for OPTIMAL Bayesian Classifier for wine: 100.0%

Ten Fold Test for LINEAR Bayesian Classifier for wine: 100.0%

Ten Fold Test for NAIVE Bayesian Classifier for wine: 98.87640449438202%

Ten Fold Test for decision tree for wine: 92.13483146067416%