

Bayes Classifier vs. Naive Bayes

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- It is defined as the classifier that has the smallest test error rate and assumes we know $P(\text{category} \mid \text{predictors})$

It's what we would ideally use if we knew the true data generating process

Warning: The Bayes classifier should not be confused with a Naive Bayes classifier!

A probabilistic model-based approach to using Bayes classifier is:

1. Estimate the true distribution of test set from the training set
2. Use the Bayes optimal classifier for the estimated distribution

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Discriminant Analysis