Decision Tree Modeling of Frog Species

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1 Introduction

In this toy analysis, we applied various machine learning models to classify frog species based on MFCC data. This report presents the results of decision tree models trained on a subset of the data and evaluates their performance.

2 Methods

2.1 Data Preparation

The dataset, `Frogs_MFCCs.csv`, was split into a training set and a test set with a 75-25 ratio.

2.2 Model Training

We trained decision trees with and without pruning. A k-fold cross-validation was performed using the `caret` package to assess model performance.

3 Results

3.1 Error Rates

The error rates for each model variant are summarized in Table 1. Based on these results, we observed that the unpruned tree performed slightly better than the pruned tree.

Method	ErrorRate
Unpruned Tree (Train)	0.00
Unpruned Tree (Test)	0.01
Pruned Tree (Train)	0.00
Pruned Tree (Test)	0.01
Cross-Validated Tree	0.29

Table 1: Error rates for different model variants

3.2   Figures and Tables

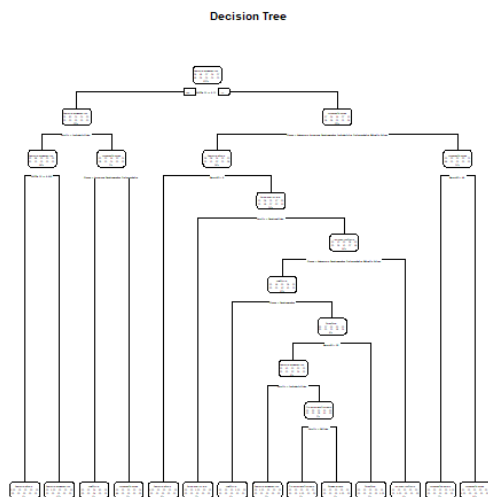Figure 1 shows the structure of the final decision tree model.

Figure 1: Decision Tree structure used for classification of frog species.

4   Supplementary Information

For additional details, refer to the Supplementary Information (SI) file [1]. I made up a random citation just to get practice with it.

5   Conclusion

I'm trying out new formats and sections here.

References

[1] Daniel C. Reuman. Machine learning in biology. *Biology Journal*, 15:100–110, 2024.