Lab Exercises 20

Date: 11 Nov 2025

Implementation of Decision Tree Classifier

from sklearn.tree import DecisionTreeClassifier, plot_tree

20. Implement a Decision Tree Classifier on the Wine Quality Dataset to predict wine quality based on its physicochemical properties and to evaluate model performance using multiple metrics.

Performance Evaluation: Answer the following six evaluation questions based on your model results:

1. **What is the accuracy of the Decision Tree Classifier on the test data?**
2. **Compute and interpret the confusion matrix.**
3. **Calculate precision, recall, and F1-score for each class.**
4. **Generate a classification report and interpret the results.**
5. **Visualize the Decision Tree and explain one of the decision paths.**
6. **Compare the model's performance using different splitting criteria (gini vs. entropy).**