

Assignment 4: Decision tree learning for car evaluation

In this assignment, you will implement a **decision-tree algorithm** and apply it to car evaluation (please see the supplied dataset).

1. Implement the decision tree learning algorithm. You may program in C/C++ or Java. The **attribute selection criteria should be a parameter**. The value will be one of the following: **information gain and Gini impurity**. Please see the link for details: [Decision tree learning - Wikipedia](#)
2. Divide the data set randomly between **training (80%)** and testing (20%) sets. Use your algorithm to train a decision tree classifier using the training data and calculate it's **performance** on the test data. **Run** this experiment **20 times** randomly choosing the training and testing set. Then calculate the **average accuracy** of your algorithm. **Compare** the accuracy between information gain and Gini impurity measures.
3. Implement steps 1 and 2 with the following modifications: **instead of selecting the best attribute at each step, select one randomly from the top three attributes**. **Compare** the accuracy between information gain and Gini impurity measures.
4. Print a table as shown below.

Attribute selection strategy	Average accuracy over 20 runs	
	Information gain	Gini impurity
Always select the best attribute		
Select one randomly from the top three attributes		

5. Submit your source **code** and the performance result (above **table**). Only C++/Java programs are accepted for this assignment.