Programming Assignment 2: Decision Tree

Artificial Intelligence

This assignment can be done either *individually* or in a *group* (maximum 3 members). If you want to do the assignment as a group:

- Use the discussion board or group email to call for members.
- In programming code, clearly state who wrote which parts.
  Example:

```
/* By John Doe */
public static void main(String args[]) {
......
}
```

If you are an experienced programmer, it is encouraged to invite other students (who are relatively new to programming) to your group and lead. *Every* group member, still, must be actively involved in programming. The leading programmer will earn extra credits for helping classmates.

In this assignment, you will implement `Learn-Decision-Tree` algorithm to build a ML system for the **Restaurant** example introduced in Chapter 19.

1. Use a programming language you are familiar with.
2. Refer to online resources, if needed: You will need to understand clearly what you are refereing to, and also show those with the instructor during demonstration.
3. Hard-code all functions of the algorithm. No use of API functions please.
4. Use the given three data sets for your implementation:
   - restaurant.csv: original data in simple text format (found in Chapter 19)
   - restaurant_test.csv: more data for test/evaluation
   - restaurant_predict: new data we want predictions for using a saved model
5. Use *Information Gain* to determine *importance* of an attribute.
6. Display the followings, at least, in either GUI or non-GUI:
   - the tree structure
   - the Information Gains of attributes computed
   - testing results
   - prediction results
7. Upload your source code to Blackboard.
8. Demonstrate your program to the instructor.