CSCI 4900/6900 Data Mining

Assignment Number 2: Due 2/13/2014 **(in class)**

1. [**25 points**] Consider the following training set of samples for data mining:

Example	A1	A2	A3	A4	label
1	1	2	2	2	0
2	1	1	1	1	0
3	2	3	2	1	1
4	1	3	3	3	0
5	3	1	2	1	1
6	1	1	1	2	0

The attributes **A1** through **A4** are integers with values in the range [1,2,3] each.

(a) Give a minimal size (measured by the total number of nodes) decision tree that can correctly classify all the training examples.

(b) How would the tree given in Part (a) above classify the following examples: (1,2,2,3) and (3,2,1,1)?

(c) Give three association rules consistent with this training set and specify the support and confidence for each rule.

2. [**25 points**] **Short answers please**

(a) How can a decision tree be converted to a set of rules?

(b) Can over-fitting happen even in the absence of noise? Briefly explain.

(c) Why are there usually many more association rules that can be inferred from a data-set than there are classification rules?

(d) Give one advantage to using the information Gain Ratio measure over the information Gain measure for constructing decision trees.

(e) Give one advantage for using two-fold cross-validation over ten-fold cross-validation.

3. [**50 points**] Do exercise 17.2 on page 566 of the text book.