Pencil&Paper Assignment 2

This assignment is due by Wednesday, March 28th (in class).

The file `/g/150TP/files/HW2/examples` contains 3 lists of examples for a certain learning problem. For this problem, there are 10 binary attributes and two classes.

Simulate the behavior of each of the algorithms listed bellow on the data set, showing the hypothesis you obtain and evaluating its accuracy. You should use the first list of examples for training, the second list for evaluating the accuracy of the learned hypothesis, and the third list (only for decision trees) for the pruning phase.

The algorithms:
(1) The perceptron learning algorithm.
Use 1 as learning rate. Initialize weights to 0 and use 0 threshold.
(2) The winnow learning algorithm.
Use promotion rate $\alpha = 2$ and demotion rate $\beta = 0.5$. Initialize weights to 1 and use 10 as threshold.
(3) Sparse version of the winnow learning algorithm.
Same parameters as in (2).
(4) decision tree learning algorithm with reduced error pruning.
Use the information gain to select attributes.