CS691 Quiz 2   Name _____

1. We have f binary features and s samples. We have generated a decision tree that only separates one sample at each level. How deep is this decision tree? (3 points)

2. Assume you have already generated a depth-1 decision tree. You now must repeat the steps in the greedy algorithm on the second level of the tree. Will you use the same feature on both paths of the tree, always, sometimes, or never? Explain. (3 points)

3. What depth is needed in a binary decision tree to achieve 100% accuracy on the training data provided below? Explain. (2 points)
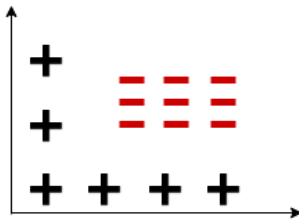
4. What is the best accuracy that can be achieved on the following data using a decision tree of any depth? Explain. (2 points)

Sample	F1	F2	F3	F4	Label
1	0	1	0	1	1
2	1	0	1	0	0
3	1	1	0	0	0
4	0	1	1	0	0
5	1	0	0	1	1
6	0	0	1	1	0
7	0	1	0	1	0

CS491 Quiz 2   Name _____

1. Answer the following questions using the data provided in the table below.

Sample	F1	F2	F3	F4	Label
1	0	1	0	1	1
2	1	0	1	0	0
3	1	1	0	0	0
4	0	1	1	0	0
5	1	0	0	1	1
6	0	0	1	1	0
7	0	1	0	1	1

(a) Using the greedy algorithm learned in class, generate the best depth-1 decision tree for the given training data. What accuracy does your model achieve on the training data? Show your work. (5 points)

(b) What is the best accuracy that could be achieved on the training data using a decision tree of any depth? How do you know? (3 points)

(c) How does your model from part (a) classify the following sample? Is the classification correct? (2 points)

Sample	F1	F2	F3	F4	Label
8	0	1	0	1	0