CS691 Quiz 1 — Name Solution + Rubric

1. We have f 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)

binary

$f < s$: depth $= f$ -1 $\quad f \geq s$: depth $= s-1$ -1

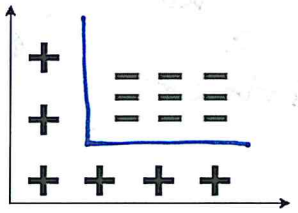
incorrect or nonsense -3

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)

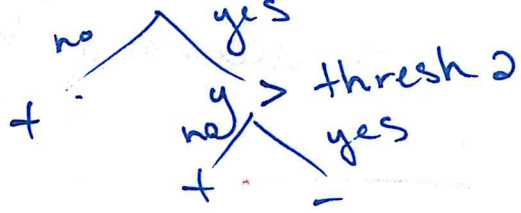
always/never -3

If the same feature leads to the best training accuracy on both sides of the tree, then yes. -1 -1
This is not always (actually not usually) the case!

3. What depth is needed in a binary decision tree to achieve 100% accuracy on the training data provided below? (2 points)



2 -1

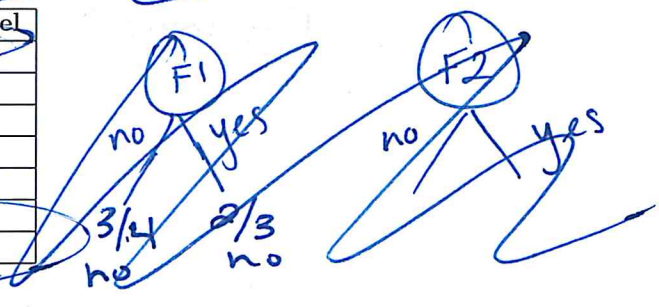


-1 no tree or explanation

4. Using the greedy algorithm from class, generate a depth-1 decision tree using the above training data. What accuracy does your model achieve? Show your work. (3 points)

Best acc 2 pts

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



6/7 -1

1 ≥ 7 conflict will only get one right. -1 if no explanation

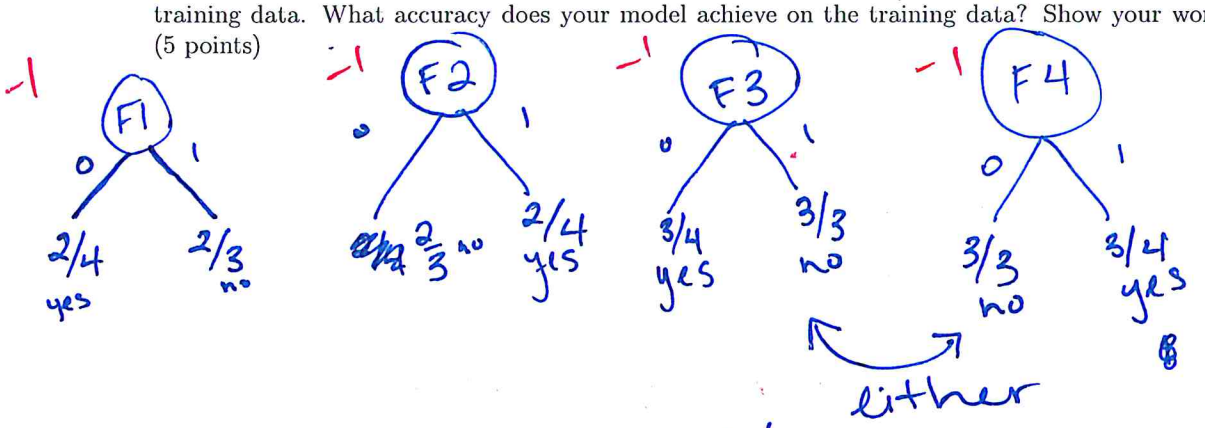
OK: if they do ... to show.

CS491 Quiz 4 Name Solution + Rubric

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)



-1 accuracy 6/7

(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)

-1 → 100% no conflicting features

F4 then F3

-1 if they don't explain it this way.

(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

1 no.

-1 -1