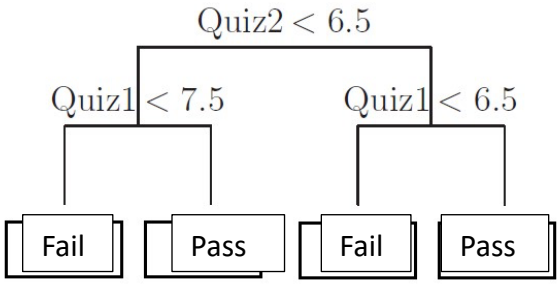
Quiz 9. Tree and tree-based methods

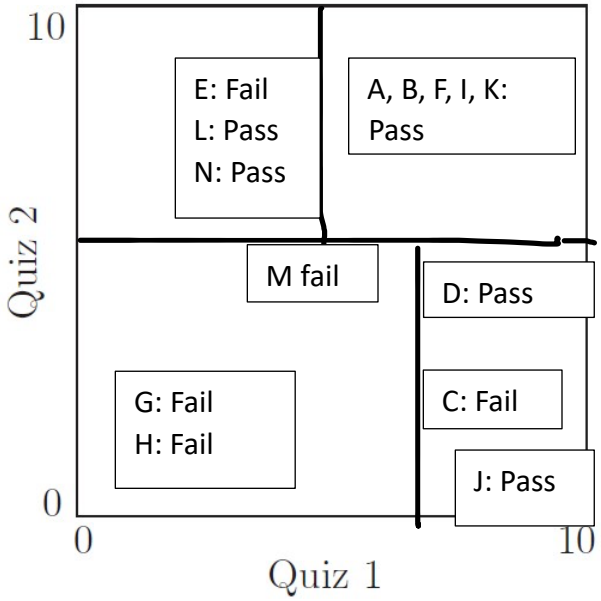
Name:Lisa Liubovich Attempt (circle one): BEFORE AFTER

Fourteen students took a certain course last year and received the following grades on the first two quizzes. Results of their performance in the course, Pass or Fail, are also recorded. (This is a made-up example. It has no real course or student information.)

Student	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Quiz 1	10	8	8	10	5	8	4	3	10	9	10	4	7	5
Quiz 2	10	7	4	6	8	9	3	2	8	4	8	7	6	7
Pass or Fail	Pass	Pass	Fail	Pass	Fail	Pass	Fail	Fail	Pass	Pass	Pass	Pass	Fail	Pass

A classification tree was constructed based on the above data, predicting the results of the course from the first two quizzes. The terminal nodes' classification was left out on purpose.





(a) According to this tree, divide the predictor space (on the right) into the correct regions. Then, identify the students (use A, B, …, N) and their outcome (Pass for Fail) in each region.

(b) State the classification for each terminal node above.

(c) Are there any pure terminal nodes (leaves)? If yes, identify the branches of each pure terminal node.

Terminal nodes quiz2 < 6.5 and quiz1 < 7.5 is pure fail
Terminal nodes quiz2 > 6.5 and quiz1 > 65 is pure pass

(d) This year, a student scored 9 on Quiz 1 and 6 on Quiz 2. According to the tree, predict whether the student will pass or fail?
They will pass