

Name:

John

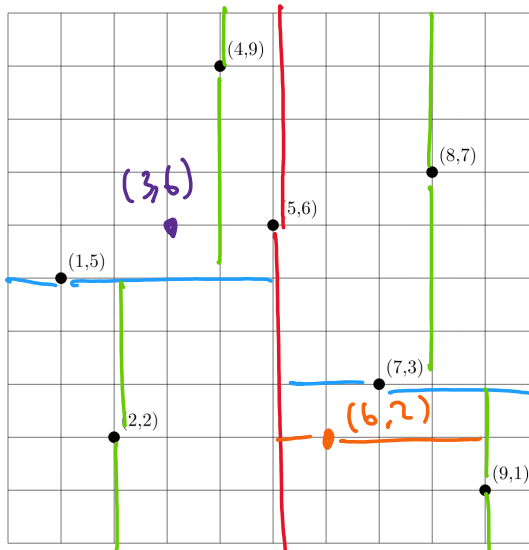
SID:

Please complete this worksheet during your lab, and turn it in to your TA by the end of your section. You are encouraged to work with your neighbors collaboratively.

Section Number: (01) ~~(02)~~ (03) (04) (05) (06) (07) (08) (09) (10) (11) (12)

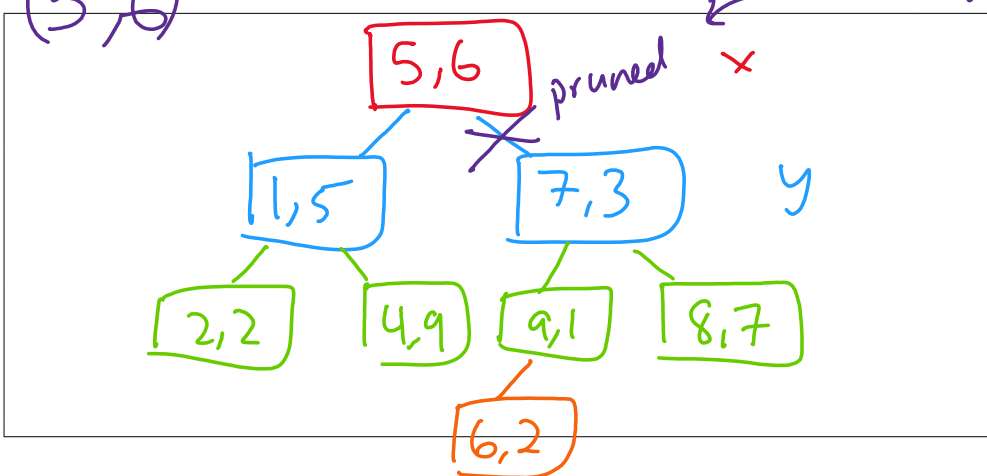
1 K-D Trees

- 1.1 Given the points shown in the grid to the right, draw a perfectly balanced k -d tree in the box below. For this tree, first split on the x dimension. The resulting tree should be complete with height 2. Then, draw the corresponding splitting planes on the grid to the right.
- 1.2 Insert the point $(6, 2)$ into the k -d tree you drew below. Then, add that point to the grid and draw the corresponding splitting plane.
- 1.3 Find the nearest point to $(3, 6)$ in your k -d tree. Mark each branch that is not visited (pruned in execution of nearest) with an X through the branch.



① = first x split
 ② = second y split
 ③ = third x split
 ④ = add 6, 2, y split

(5,6)



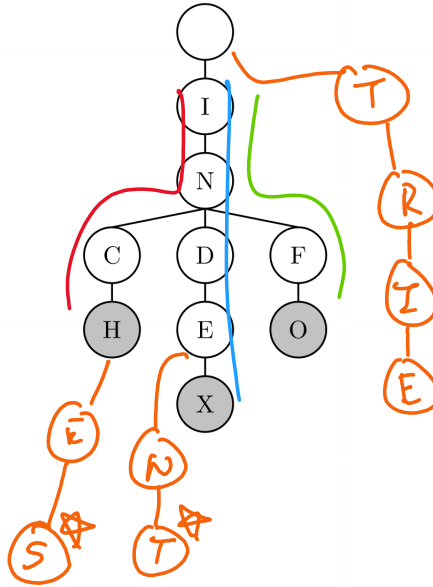
why? no point to the right of $(5,6)$ (can be closer than $(5,6)$)

2 Tries

- 2.1 What strings are stored in the trie on the right?

inch
index
info

- 2.2 Insert the strings *indent*, *inches*, and *trie* into the trie on the right.



- 2.3 How could you modify a trie so that you can efficiently determine the number of words with a specific prefix in the trie?

each node stores # words below, on insert, add 1 to each node along the path