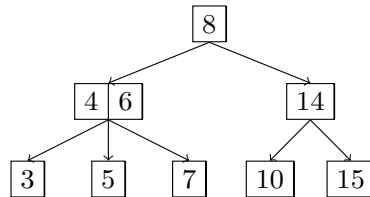


1 2-3 Trees and LLRB's

a) Draw what the following 2-3 tree would look like after inserting 18, 38, 12, 13, and 20.

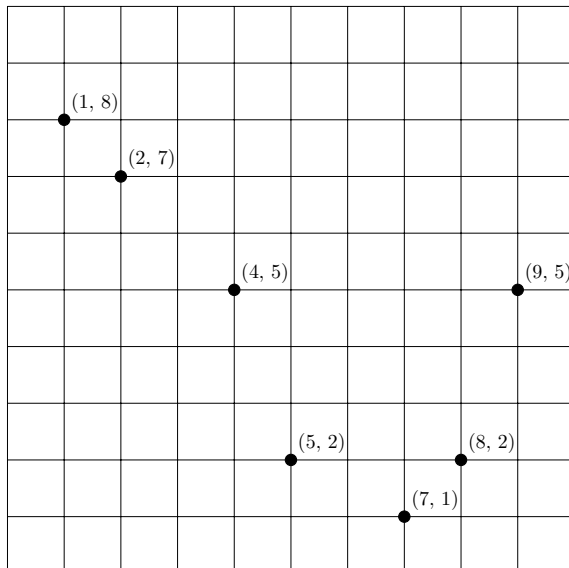


b) Now, convert the resulting 2-3 tree to a left-leaning red-black tree.

c) If a 2-3 tree has depth H (that is, there are H number of edges in the path from leaf to the root), what is the maximum number of comparisons done in the corresponding red-black tree to find whether a certain key is present in the tree?

2 KD Trees

Given the points shown in the grid to the right, draw a perfectly balanced k -d tree. 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.



3 Trie Me

The Big Baller Brand has decided to use a trie to have fast lookup of their Big Ballers. Currently, the state of the trie is as follows:

