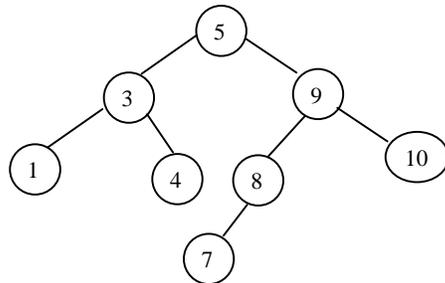


Homework 3: Splay trees and KD trees

1. (12 points) The following questions concern splay trees.

- a) Is it true that the **worst case** time performance of insert operation is $O(\log n)$? Briefly explain your answer.
- b) Draw the tree after deleting item **8** from the following splay tree.

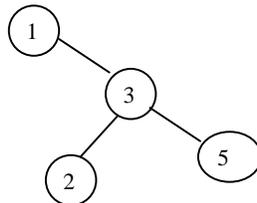


c) Draw the tree after inserting item **8** back to the splay tree generated in b).

2. (8 points) Prove the following theorem:

If all nodes in a splay tree are accessed in sequential order (from small to large of the key values), the resulting tree consists of a chain of left children.

Hint: Use this example splay tree to prove to yourself this statement is true.



3. (5 points) Draw the 2-D tree after Inserting item (50, 30) into the 2-D tree below:

