Analysis of Algorithms: Assignment 5

Due date: March 8 (Wednesday)

Problem 1 (3 points)
Draw five binary search trees, with heights two, three, four, five, and six. Each tree should have seven nodes, and the keys of these nodes should be 1, 2, 3, 4, 5, 6, and 7.

Problem 2 (3 points)
Give a recursive version of the TREE-INSERT procedure.

Problem 3 (4 points)
Give a nonrecursive version of INORDER-TREE-WALK.

Problem 4 (bonus)
This problem is optional, and it allows you to get 2 bonus points toward your final grade for the course. You cannot submit this bonus problem after the deadline.

Consider the problem of printing the nodes whose keys are between two given values, *min* and *max*; we should print these nodes in the ascending order of their keys. For example, suppose that *min* is 3, *max* is 5, and the tree includes the keys 1, 2, 3, 4, 5, 6, and 7; then, we should print 3, 4, and 5, and ignore the other nodes.

Write a procedure INORDER-RANGE-WALK(x, *min*, *max*) that recursively prints all nodes between *min* and *max* in the subtree rooted at x. It should be *more efficient* than INORDER-TREE-WALK; thus, it should not traverse the whole subtree.