Exercise Session 08

Exercise 1.
(CLRS 12.3-1) Implement a recursive variant of the TREE-INSERT procedure.

Exercise 2.
(CLRS 12.3-3) We can sort a sequence of n numbers by iteratively inserting each number in a binary search tree and then performing an inorder tree walk. Write the pseudocode of this algorithm. What are the worst-case and best-case running times for this sorting algorithm?

Exercise 3.
Consider the binary search tree T depicted in Figure 1. Delete the node with $key = 10$ from T by applying the procedure TREE-DELETE(T, z) as described in CLRS pp. 298.

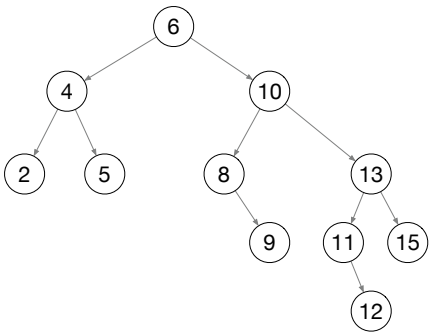

Figure 1: Binary Tree

Exercise 4.
(CLRS 11.1-1) Show the red-black trees that result after successively inserting the keys 41; 38; 31; 12; 19; 8 into an initially empty red-black tree.

Exercise 5.
Consider the red-black tree T depicted in Figure 3. Insert first a node with $key = 15$ in T, then delete the node with $key = 8$ Show all the intermediate transformations of the red-black tree with particular emphasis on the rotations.

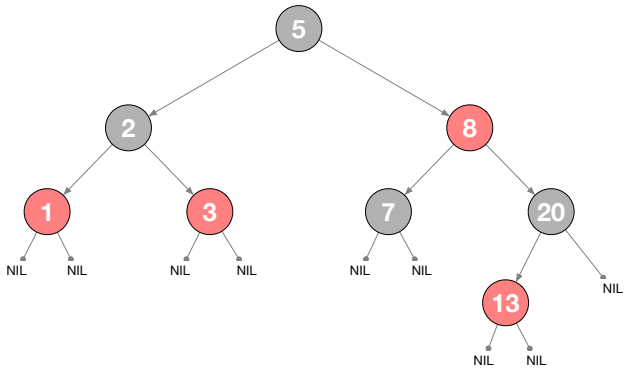

Figure 2: RB-tree