Analysis of Algorithms: Assignment 7

Due date: March 19 (Wednesday)

Problem 1 (5 points)
Give an efficient algorithm TREE-COUNT(x, k) that determines the number of nodes with key k in a subtree rooted at node x. It should be more efficient than INORDER-TREE-WALK; thus, it should not traverse the whole subtree.

Problem 2 (5 points)
Suppose we apply the CONNECTED-COMPONENTS algorithm to an undirected graph G with vertices $V[G] = \{a, b, c, d, e, f, g, h, i, j, k\}$, and its edges $E[G]$ are processed in the following order: $(e, g), (a, d), (i, k), (c, g), (b, f), (b, h), (f, k), (a, k), (f, h), (d, i)$. Using Figure 22.1/21.1 in the textbook as a model, illustrate the steps of CONNECTED-COMPONENTS on this graph.