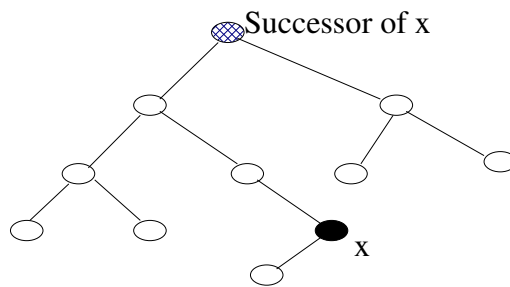


Exercises on Trees

1. Pre-order traversal of a binary tree gives A B C D E F G H I and the in-order traversal gives C D E B F A I H G. Draw the tree.
2. In a Binary Search Tree (BST), show that if a node has two children, then its successor has no left child and its predecessor has no right child.
3. Suppose we have numbers from 1 to 1000 in a BST and want to search for 363. Which of the following sequences, if any, could NOT be the sequence of nodes examined?
 - a. 2, 252, 401, 398, 330, 344, 397, 363
 - b. 925, 202, 911, 240, 912, 245, 363
 - c. 935, 278, 347, 621, 299, 392, 358, 363
4. Prove that if the right subtree of a node x in a BST is empty and x has a successor y , then y is the lowest ancestor of x whose left child is also an ancestor of x .



5. Let B represent a BST. Write an algorithm `Tree_MAX(x)` that returns the node with maximum value.
6. Let B represent a BST. Write an algorithm `Tree_MIN(x)` that returns the node with minimum value.
7. Let B represent a BST and x a given node in B . Write an algorithm to find the successor (node following x in an in-order traversal) of x . (See question 4.)
8. Let B represent a BST and x a given node in B . Write an algorithm to find the predecessor of x .