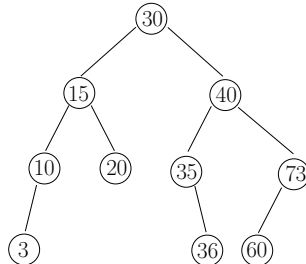


CSCI2100: Special Exercise Set 9

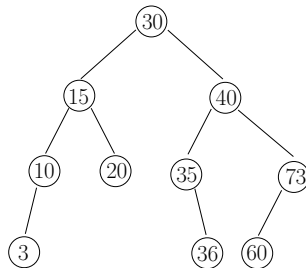
Prepared by Yufei Tao

Problem 1. Consider the binary search tree (BST) below:



Show the sequence of nodes visited to find the predecessor of 33.

Problem 2. Consider the binary search tree (BST) below:



Show the sequence of nodes visited to find the successor of 33.

Problem 3 (Textbook Exercise 12.2-1). Which of the following sequences could not be the sequence of nodes visited in a predecessor query?

- A. 2, 252, 401, 398, 330, 344, 397, 363.
- B. 924, 220, 911, 244, 898, 258, 362, 363.
- C. 925, 202, 911, 240, 912, 245, 363.
- D. 2, 399, 387, 219, 266, 382, 381, 278, 363.

Problem 4. Let T be a balanced BST storing a set of n integers. Give an algorithm to find the smallest integer in $O(\log n)$ time.

Problem 5. Let T be a balanced BST storing a set of n integers. Give an algorithm to report all these integers in ascending order in $O(n)$ time.

Problem 6. Let T be a BST storing a set S of integers. Let u be a node in T with key k . Suppose that u is an internal node with a right child. Prove that the node whose key succeeds k in S must either be a leaf, or have no left child.