

Fall 2000  
Midterm Exam. Solutions

1. See class notes and textbook
2. See Figure 1.

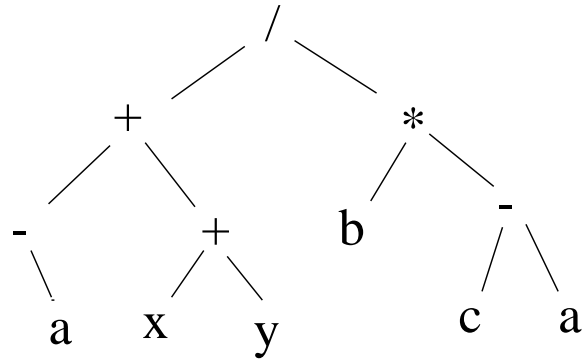


Figure 1: Prob. # 2

3. See Figure 2.

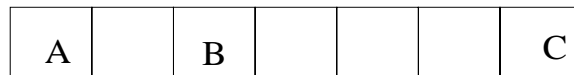


Figure 2: Prob. # 3

4. (1)  $O(\log n)$  (2)  $O(n)$  (3)  $O(n)$  (4)  $O(n)$  (5)  $O(\log n)$  (6)  $O(\log n)$  (7)  $O(n)$  (8)  $O(\log n)$
5. See Figure 3.

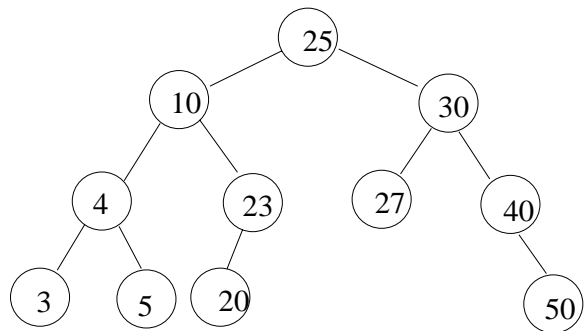


Figure 3: Prob. # 5

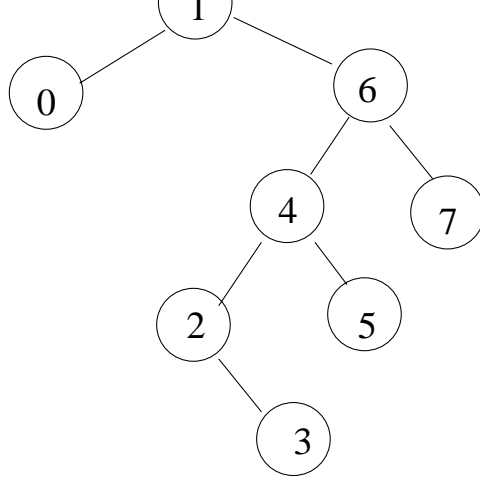


Figure 4: Prob. # 7

6. Arrange A into, for example, an AVL tree. Then perform search for each of the elements in B. The entire procedure can be done in  $O(n \log n)$  time.

7. See Figure 4.

8. See Figure 5.

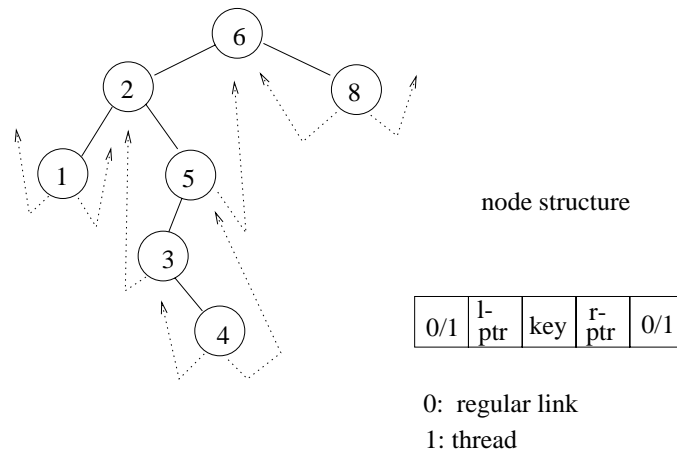


Figure 5: Prob. # 8

9. See Figure 6.

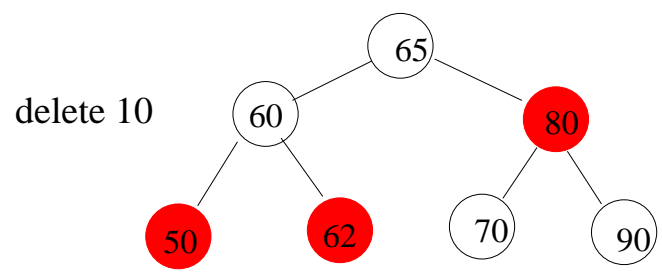
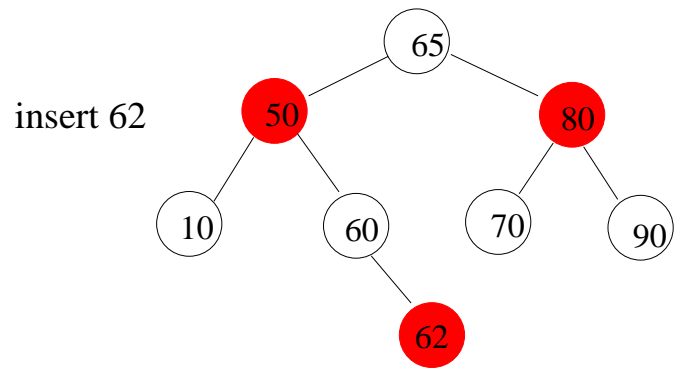


Figure 6: Prob. # 9