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Assignment 2

1. [10 points] Consider a singly linked list of integers that are sorted into ascending order. The head pointer points to the first node, which contains the smallest integer. See Figure 1 (a). Write a pseudo-code algorithm to revises the list so that its data are sorted into descending order. The head pointer points to the first node, which contains the largest integer. See Figure 1 (b).

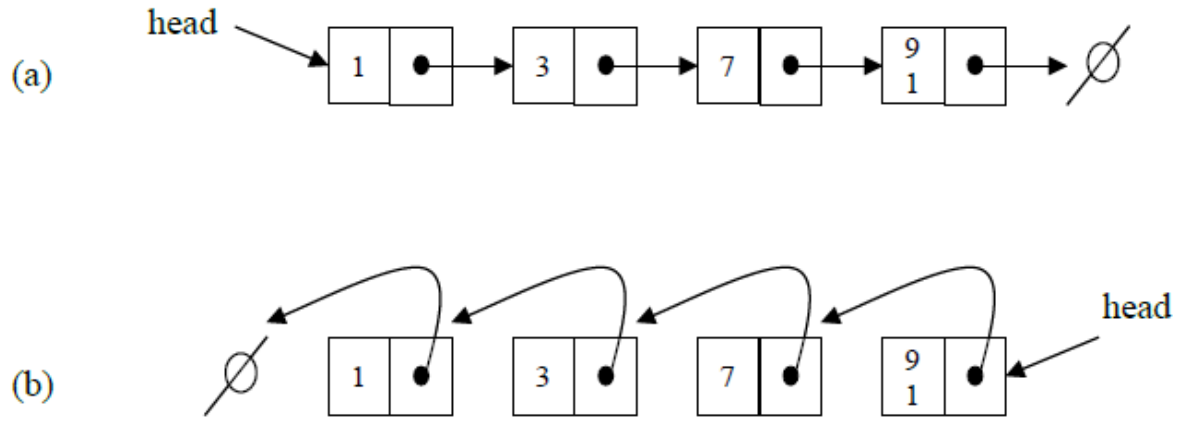

Figure 1

```
Algorithm: reverseLinkedList(head)

current  = head              // The algorithm reverses the list by changing the links
previous = NULL
while current != NULL :           // While the current node isn't NULL (the last):
      next = current.next;        // We save the next element
      current.next = previous;    // We mark the current one as the next
      previous = current;         // We marl the previous element as the current
      current = next;             // We jump to the next element
head = previous                   // The first element was the last (as in figure b)
return head                       // We return the head (pointing to the others)
```

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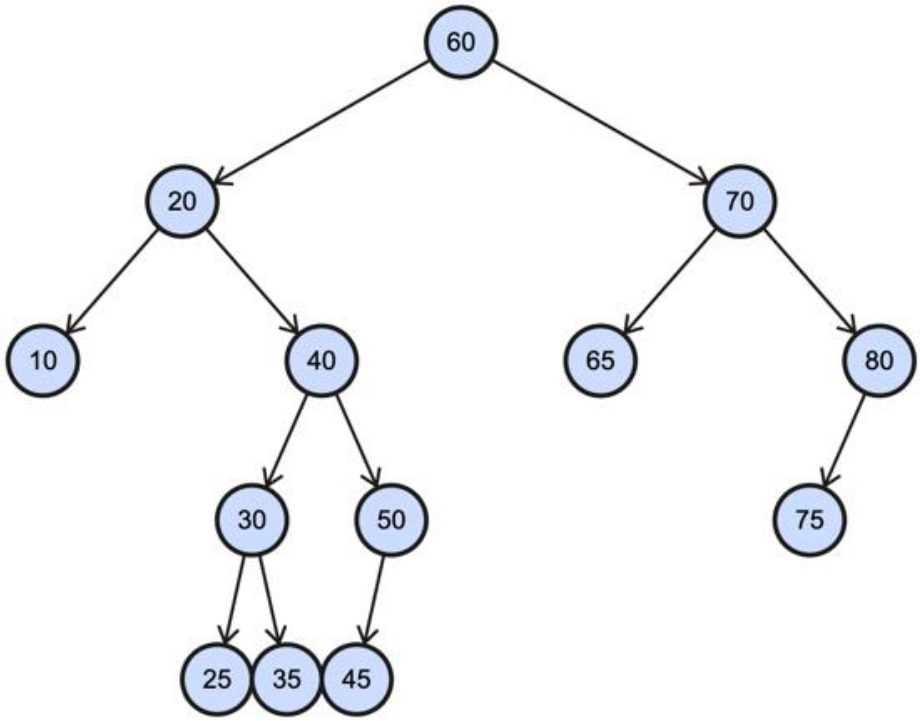
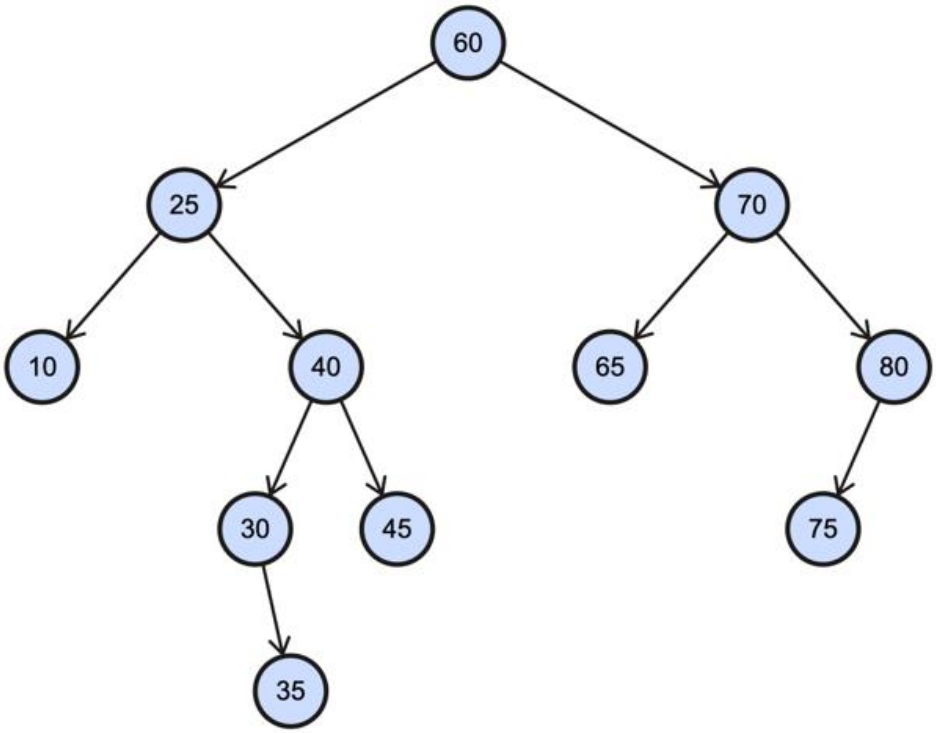
2. [5 points] Consider the binary search tree in Figure 2.

a. What tree results after you insert the nodes 80, 65, 75, 45, 35, and 25, in that order?



b. After inserting the nodes in part a, what tree results when you delete the nodes 50 and 20?



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3. [5 points] Draw a (single) binary tree T, such that
   - Each internal node of *T* stores a single character
   - A *preorder* traversal of *T* yields ALGORITHMS
   - An *inorder* traversal of *T* yields GOLATIHRMS