

COMP 5511 / Fall 2020 Section DD

BIPIN C DESAI

Assignment 2

Group 9

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Question 1

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 revise 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).

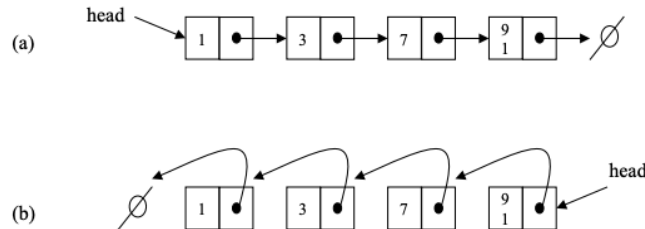


Figure 1

This program will reverse a singly linked list sorted in ascending order so that the data is sorted in descending order. The head pointer will point to the first node, which contains the largest integer. The program will use an iterative method:

Algorithm ReverseLinkedList(head)

Input: The head node of a linked list sorted in ascending order

Output: The reversal of the linked list so that the data is sorted in descending order (the head node pointing to the largest number)

Node current = head

head = null

Node next = null

while current != null:

 next = current.next

 current.next = head

 head = current

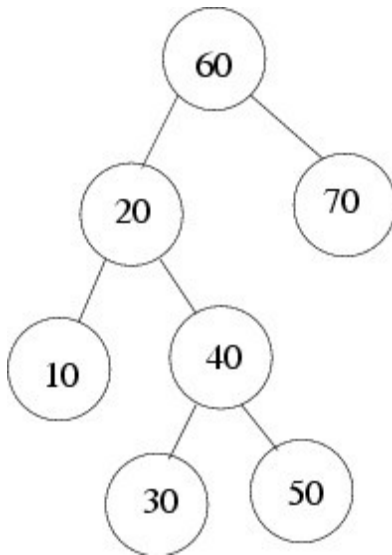
 current = next

return head

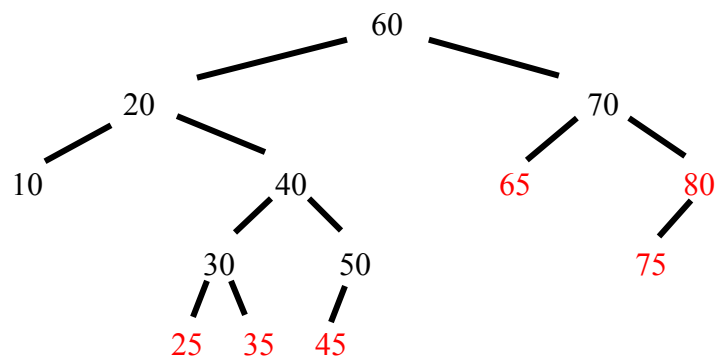
This function will take the head from a linked list as an argument, and iterate through the linked list, reversing it so that it is sorted in descending order.

Question 2 and 3:

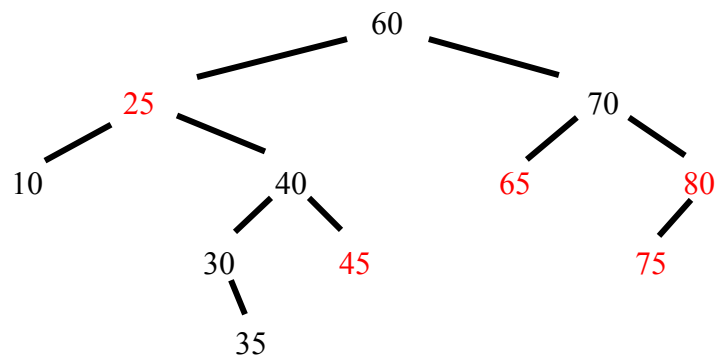
2. [5 points] Consider the binary search tree in Figure 2.



a. What tree results after you insert the nodes 80, 65, 75, 45, 35, and 25, in that order? Note: **Red** are the nodes that moved



b. After inserting the nodes in part a, what tree results when you delete the nodes 50 and 20? Note: **Red** are the nodes that moved



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 GOLATIHRRMS

