Data Structures Lab(CS111), B.Tech 2nd Semester

Instructions

1. This is only for practice. No need to submit it.

2. Complete it by 5:00 PM today. Your completion will be reviewed by the Teaching Assistants.

Q1. A chain of sensors is connected one after another. Each sensor knows only the next sensor. Write a C program to compute the total number of sensors active in the chain. Report the time complexity.

Q2. Write a C program to delete all nodes containing a given key value. Key value is user-defined.

Q3: Write a C program to find the n-th node from the end of a singly linked list. The value of n is user-defined.

Q4: Write a C program to remove duplicate elements from an unsorted singly linked list.

Q5: Train coaches are connected linearly. Write a C Program to determine if coach numbers form a palindrome, using recursion. Report the time complexity.

ADDITIONAL QUESTIONS

Q1. Write a C program to check if a singly linked list contains a cycle. If a cycle is found, you must break it so that the list becomes a standard linear linked list again.
Input: 1 -> 2 -> 3 -> 4 -> 5 -> [points back to 3]
Output: 1 -> 2 -> 3 -> 4 -> 5 -> NULL

Q2. Given the heads of two sorted singly linked lists, merge them into a single, sorted linked list. The merge should be done in-place by splicing together the nodes of the original lists (do not create new nodes).
Input: List 1: 1 -> 3 -> 5
List 2: 2 -> 4 -> 6
Output: 1 -> 2 -> 3 -> 4 -> 5 -> 6

Q3. Write a C program to find all pairs of nodes whose values sum to a given number.
Input: 1 2 3 4 5 6 7,Sum = 8
Output: (1,7) (2,6) (3,5)