

Csci 41: Introduction to Data Structures

Lab Exercise 3

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Feb. 19, 2019

Deadline: Please submit your work at the end of this lab.

**(Please continue to work on the lab exercise.
Submit your final updated one by next lab)**

Objectives:

1. Node and Singly Linked List

Exercise Summary:

Implement following classes and functions (Either C or C++ style is fine). Please note, it is better to practice on your own first. Do not refer to any material until getting stuck.

1. Node class that can store integer data and the address of next Node.
2. Introduce at least 5 nodes in **main function**, **then program 2a-2f in main function**.
 - a. Connect them together.
 - b. Introduce a node and insert it before the first node of the 5 nodes
 - c. Introduce a node and insert it in the middle of the 5 nodes
 - d. Traverse the 5 nodes and print all elements out
 - e. Traverse to the end of 5 nodes and delete the last node
 - f. Traverse to the middle of 5 nodes and delete the middle node.
3. Introduce a SLL (Singly Linked List) class (home practice if no time)
 - a. Introduce a “front” private data member
 - b. Introduce a SLL constructor and destructor
 - c. Introduce insertToFront function similar to 2b
 - d. Introduce printAll function similar to 2dThe following 3 are harder questions. Please try them first.
 - e. Introduce deleteLast function similar to 2e
 - f. Introduce insertToMiddle function similar to 2c
 - g. Introduce deleteMiddle function similar to 2f

(If there are even number of nodes, for convenience, the left of the two nodes in the middle of SLL is your middle node)

When the lab session is over, compress your **cpp** file(s) (and **header** file(s), if any) into a **single zip file** called Your**LastName**-Lab3.zip (e.g., Liu-Lab3.zip) and upload it to Blackboard. (**DO NOT** upload the entire project. **Do not send me exe file.**)

You are very welcome to discuss algorithms and code with TA or classmates during lab session. **However, please do not copy/paste code from peers since it won't help you improve your problem solving and coding skills at all.**

Minimum requirements during lab session: Please finish at least Node class and 3 functions out of 2a-f by the end of the lab.