

Csci 41: Introduction to Data Structures

Lab Exercise 4

Lab Instructor: Alex Liu

Feb. 26, 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. Singly Linked List (continued)

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 a SLL (Singly Linked List) class
 - a. Introduce a “front” and “back” private data member
 - b. Introduce a SLL constructor and destructor
 - c. Introduce insertToFront function
 - d. Introduce insertToEnd function
 - e. Introduce deleteLast function
 - f. Introduce deleteFront function
 - g. Introduce removeAllTargetNodes (int target) function
 - h. Introduce removeFirstTargetNode (int target) function
 - i. Introduce removeAllBUTFirstTargetNodes (int target) function (i.e., keep first target node and remove the rest of the target nodes, if found)
 - j. Introduce bool unique() function. Check if the SLL has unique values or not. If there is any node that has duplicate value, return false. For example, 1->2->3->4->5 is unique. 1->2->3->2->4 is not because 2 repeats.

(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 YourLastName-Lab4.zip (e.g., Liu-Lab4.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-g by the end of the lab.