CSE 2383: Data Structures and Algorithm Analysis

Challenge 1 – The Missing Link

Submission Window Opens:
Due Date Posted to Canvas

Points Available:
90 points for a working demonstration

10 points for correct submission & understandable code

Objectives:

- Demonstrate a working singly linked list
- Demonstrate sufficient knowledge to convert a single linked list into a doubly linked list

Assignment:

In class, we have learned about singly linked lists. For this challenge, you must write a program that implements a singly linked list derived from the code provided in class. A series of function calls and their subsequent output are included below. You must demonstrate a working singly linked list to the TA. That's it (almost). As part of the demonstration process, the TA will also ask you to modify your singly linked list code such that it becomes a doubly linked list. You will also be asked to add tailDisplay and tailRemove functions that perform display and remove functions starting from the tail of your doubly listed list. Base these functions on the existing display and remove functions provided in class. DO NOT BRING DOUBLY LINKED LIST CODE FOR DEMONSTATION. Do, however, practice and study the differences between the singly and doubly linked lists. Variable renaming features and search/replace in your IDE are not permitted for the demo.

As with the previous challenge, you must fully pass the demonstration before a grade will be assigned to your submission. Grades are assigned based on day of submission (see syllabus). Once you have demonstrated your submission, you must upload it to Canvas within 48 hours.

You will need to bring your laptop to the TA for demonstration. If you cannot bring your laptop, make arrangements ahead of time with the TA to demonstrate it some other way. Arrangements must be made at least a day ahead of your planned demonstration.

Deliverables

1. Demo your working code to the class TA ***before uploading*** it to Canvas. You cannot proceed to step 2 before doing this.
2. Once your code is working and you've demoed it to the TA, upload all your code to Canvas as a single ZIP file. Name your ZIP file <netID>_2383_Ch0.zip, where <netID> is your MSU Net ID.

Example Testing Code:

```
LinkedList LL;
LL.append(5);
LL.append(33);
LL.append(1);
LL.append(7);
LL.append(33);
LL.append(12);
LL.display( cout );
LL.remove(33);
LL.display( cout );
LL.prepend(12);
LL.display( cout );
LL.remove(13);
LL.display( cout );
LL.tailDisplay( cout );
LL.tailRemove( 12 );
LL.display( cout );
```

Example Testing Output:

```
5 33 1 7 33 12
5 1 7 33 12
12 5 1 7 33 12
12 5 1 7 33 12
12 33 7 1 5 12
12 5 1 7 33
```