Linked Lists

Objective: After completion of this lab, you will be able to

- identify operations of a linked list.
- implement a new function to a linked list in C++.

Reference

- Chapter 6.4 and 6.5

Discussion

Download the sample code of a linked list class **(LinkedList.h, LinkedList.cpp and Sample_LinkedList_Tester.cpp)** from **iLearn**.

Create a project called **`lab`** with the three files. Then, execute the project and identify operation of the programs.

Lab Exercises

(a) Add a function member called **maxItem( )** to determine the maximum value among the elements in the list. You have to declare the function at the **LinkedList.h** and provide the implementation at the **LinkedList.cpp**. Then, invoke the function at the **linked_list_tester.cpp** to test it. When you finished your implementation, you have to make sure that your code works properly with an empty list, a list with one element, and a list with many elements. Note that in the case of an empty list, your function should display an error message on the screen and return -1 as a max value. This is the prototype of the method.

```
ElementType maxItem();
```

(b) Add a function member called **isAscendingOrder()** to check if all elements in the list are in the ascending order or not. If the elements are in the ascending order, your function should return true. Otherwise, it should return false. You have to declare the function at the **LinkedList.h** and provide the implementation at the **LinkedList.cpp**. Then, invoke the function at the **linked_list_tester.cpp** to test it. When you finished your implementation, you have to make sure that your code works properly with an empty list, a list with one element, and a list with many elements. Note that your function should always return true if the list is empty or if it has only one element. This is the prototype of the method.

```
bool  isAscendingOrder();
```

You may need to modify the Sample_LinkedList_Tester.cpp file to show that your code works correctly.

Grading

I will download your code on my computer and execute it. If your code does not compile, you may lose more than 50% of your points (based on my discretion). If your code compiles, but still produces incorrect results you may still lose more than 30% of your points (based on my discretion).

You are expected to provide code which will execute on Visual Studio and display the output.

Your code should have the following characteristics for you to get full points on the assignment

1. Compile without error.
2. Produce correct output.
3. Good programming structure.
4. Comments. (Title, Abstract, Author, ID, and Date are mandatory.)
5. Meaningful and related variable names.

What to turn in?

Submit your source programs (**LinkedList.h, LinkedList.cpp and Sample_LinkedList_Tester.cpp) and 'LabSubmission_yourlastname.pdf' as a single zipped file** on iLearn.

If you do not submit the above mentioned documents in the format specified your assignment will not be graded.

LabSubmission_yourlastname.pdf
For each lab, you are expected to submit screenshots of the results obtained from running your code. You should also explain what each screenshot means and why the result on the screenshot is correct.

This link explains how to take screenshots in Mac and Windows.
http://www.take-a-screenshot.org/