Midwestern State University

Advanced Data Structures and Algorithms

Homework 1 – Fall 2021

This is an Individual Assignment

In order to solve this assignment you will need to read about the topics below. You can use this Book Reference (Starting out with C++ Early Objects, 8th Edition)

1. STL Link List Container (Pag 1052)
2. Iterators (Pag 1000)

Your task is to write a C++ implementation that will make use of the **STL list container**. Your solution MUST allow the creation of a student record (database) implemented as a linked list. In the link list that you are about to design, the value fields corresponds/is associated with the information described in line #.

The table below has only eight entries; however, your program should not be limited to a specific number of entries. In simple words, the user should be able to add as many entries as he/she decide to it. The values on the table are for you to test the correctness of your program.

Line #	Name	Last Name	Gender	Age	Id
1	Eduardo	Colmenares	M	10	1
2	Catherine	Stringfellow	F	20	2
3	Tina	Johnson	F	30	3
4	Terry	Griffin	M	40	4
5	Nelson	Passos	M	50	5
6	Richard	Simpson	M	60	6
7	Ranette	Halverson	F	70	7
8	JOHN	DOE	M	100	8

The following actions MUST be completed in this order.

1. Populate the records. Here you will the user to enter student records until he/she does not want to do it anymore **[30 Points]**
2. Display the whole linked list as follows **[15 Points]**

```
Eduardo Colmenares - id:1      (HEAD)
Catherine Stringfellow - id:2
Tina Johnson - id:3
Terry Griffin - id:4
Nelson Passos - id:5
Richard Simpson - id:6
Ranette Halverson - id:7
JOHN  DOE -       id:8         (TAIL)
```

3. Remove the node at the head **[10 Points]**
4. Remove the node at the tail **[10 Points]**
5. Allow the user to add more student records at the tail (as many as he/she wants)

[20 Points]

6. Show the list again (just the name, no last name, no id) **[15 Points]**

- Restrictions
  1. Use the STL list container (-100 if not respected)
  2. Cannot use Arrays (-30 if not respected)
  3. Cannot use the linked list code that was explained in class (-100 if not respected)
  4. Nodes cannot be defined as objects (-40 if not respected)
  5. Your code will be graded taking savvy usage of memory into consideration.

- Deliverables and Due Date:
  Code:
  1. Your code must be named as follows: NameLastNameH1.cpp.
  2. Must be delivered via D2L by 10:00 am on Wednesday September 22, 2021

- Hardcopy of the code:
  1. Delivered at the beginning of class on Wednesday September 22, 2021 (To be enforced)
  2. All pages must be stapled (-7 if they are not)