

Linked List Template Lab - CS-116

In this lab, we will practice template for class objects for a generic class object data type for linked list. So the linked list can work with any data type. I have provided most of the programs for this lab. You need to modify the following programs for this lab. I have commented in the program **(also with ??? – this is where you need to place your code where I have question marks placed)** to indicate the area where you need to modify the codes.

- **Need to MODIFY: LinkedList.h** – this header files contains all the linked list header definition and contains C++ code implement LinkedList.h header definitions. Place the cpp and header file together in this LinkedList.h file. Don't separate this .h file (ie. keep the cpp (C++ source code) implementation in this template .h file). The issue is how C++ compiler handle template which can cause linker error. So, just place the implementation C++ code in the header .h file (that is for this lab, no need to separate the .h and .cpp file for the template implementation).
 - <https://bytefreaks.net/programming-2/c/c-undefined-reference-to-templated-class-function>
 - <https://isocpp.org/wiki/faq/templates#separate-template-fn-defn-from-decl>
 - *Function needs to be implemented – NEED TO MODIFY LinkedList.h file :*
 - *insertAtFront*
 - *insertAtBack*
 - *removeFromFront*
- Wine.h - this header files contains all the Wine class data type header definition
- **Need to MODIFY: Wine.cpp** – You need to implement the class object defined in the Wine.h header file.
- Person.h - this header files contains all the Person class data type header definition
- Person.cpp – Implementation file for Person.h header file.
- PrintMeFirst.cpp – this program will print out programmer's name same as all the previous lab.
- **LinkedList_Test.cpp** – contains the test program, you **MUST** use this test program for this lab.
- Makefile – You can use the Makefile to compile the programs

All other requirement remains the same as all other lab (documentation, PrintMeFirst function call at the beginning of your code, pdf file, zip file).

After you have successfully modified the program, the program should output similar to the output below:

Course Info: CS-116 Linked List Lab
Date: Sat Apr 17 16:24:47 2021

Print using printPersonInfo

Name: Ron Age: 22
The Employee list is:
Name: Ron Age: 22
Name: Sha Age: 30

Print using printNoteInfo

The node list is:
Name: Ron Age: 22
Name: Sha Age: 30

Print using printWineInfo

The Wine list is:

Vermentino	White	27	; Rating: 85	Year: 2014
Harlan Estate Bordeaux	Red	850	; Rating: 97	Year: 2011
Vermentino	White	27	; Rating: 85	Year: 2014
Prisoner	Red	44.99	; Rating: 92	Year: 2014
Stags Chardonnay Carneros	White	45	; Rating: 89	Year: 2013
Castello Barone Reserve Cabernet	Red	92	; Rating: 92	Year: 2011
Futo Bordeaux Red	Red	324.99	; Rating: 97	Year: 2009

Print using printNoteInfo

The node list is:

Harlan Estate Bordeaux	Red	850	; Rating: 97	Year: 2011
Vermentino	White	27	; Rating: 85	Year: 2014
Prisoner	Red	44.99	; Rating: 92	Year: 2014
Stags Chardonnay Carneros	White	45	; Rating: 89	Year: 2013
Castello Barone Reserve Cabernet	Red	92	; Rating: 92	Year: 2011
Futo Bordeaux Red	Red	324.99	; Rating: 97	Year: 2009

AFTER REMOVING front node, Print using printNoteInfo

Print using printNoteInfo

The node list is:

Vermentino	White	27	; Rating: 85	Year: 2014
Prisoner	Red	44.99	; Rating: 92	Year: 2014
Stags Chardonnay Carneros	White	45	; Rating: 89	Year: 2013
Castello Barone Reserve Cabernet	Red	92	; Rating: 92	Year: 2011
Futo Bordeaux Red	Red	324.99	; Rating: 97	Year: 2009

AFTER REMOVING last node, Print using printNoteInfo

Print using printNoteInfo

The node list is:

Vermentino	White	27	; Rating: 85	Year: 2014
Prisoner	Red	44.99	; Rating: 92	Year: 2014
Stags Chardonnay Carneros	White	45	; Rating: 89	Year: 2013
Castello Barone Reserve Cabernet	Red	92	; Rating: 92	Year: 2011

Linked List using int

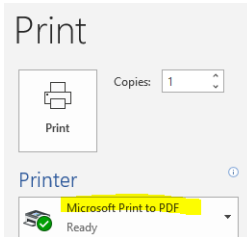
0 1 2 3 4

9 8 7 6 5

Lab Submission: See the lab submission requirements published in canvas.

To submit your assignment in canvas, you must submit **TWO files (one pdf and one zip) as follows:**

1. **Attach pdf file** which contains source codes you have written and program output screenshot so I can easily read in one file. You can use a word editor to place all the required programs and screenshots, and then use 'Print' to 'Microsoft Print to PDF' to save to a pdf file



The **pdf file** **MUST** have the following sections (1. Program Description, 2. Program Source Code and 3. Program Output).

1. Program Description

- brief *description* of the purpose of the *program* and
- an explanation of what your software does and what problem it solves

2. Program Source Code

- Include all the source codes (program files) you have written for this lab (screenshots are ok)
- Your program must have adequate documentation for your source codes:
 - Program description – see above on Program Description
 - **You must put the following function headers for each function (the function header **MUST** be placed just above the function declaration in your source code). For Functions, it must have:**
 - *Function name: name of this function*
 - *Function description: the purpose of this function and how to use it*
 - *@param param_name and what the parameter/argument is used for*
 - *@return what is returned from the function*

- Make sure your screenshots are readable (not too small)

Below is an example of source code

File: print_me_first_main.cpp (list the program file individually)

```

1 //print_me_first_main.cpp
2 #include <iostream>
3 #include <string>
4 #include <iomanip>
5
6 using namespace std;
7
8 /**
9  * @Purpose - this function print out the person who wrote the program,
10  * and date/time the program run.
11  * @parm - name - the author of the program
12  * @parm - courseInfo - the name of the course
13  * @return - none
14  * @author - Ron Sha
15  */
16
17 void PrintMeFirst(string name, string courseInfo)
18 {
19     cout << " Program written by: " << name << endl; // put your name here
20     cout << " Course info: " << courseInfo << endl;
21     time_t now = time(0); // current date/time based on current system
22     char* dt = ctime(&now); // convert now to string for
23     cout << " Date: " << dt << endl;
24 }

```

File: list other cpp files separately

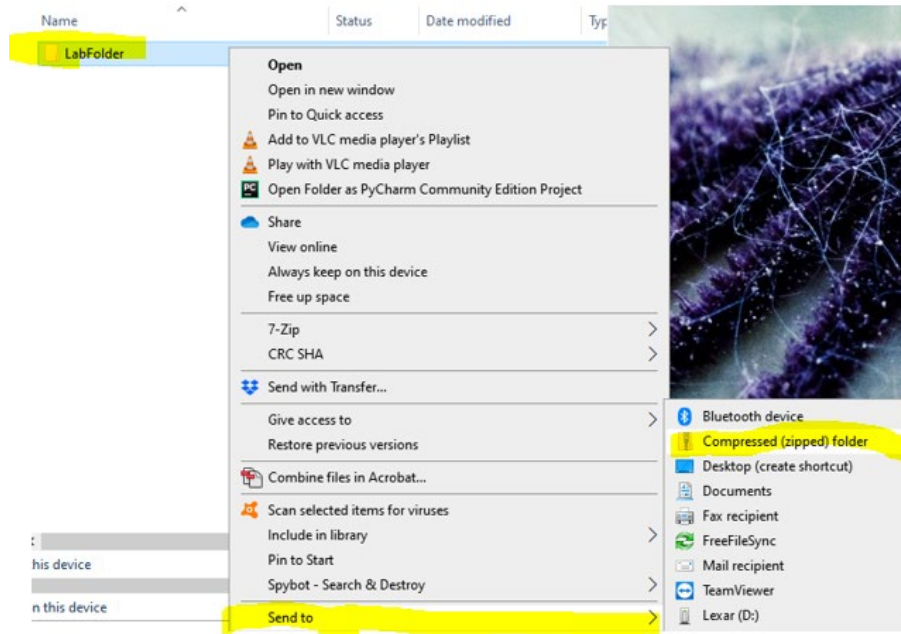
3. Program Output

- Attach all the program outputs (screenshots)
- Don't place Source code and program output side by side as it is not readable in screenshot
- Make sure your screenshots are readable (not too small)
- Your main program outputs MUST include your name printout (use the print_me_first function/program).

2. **Attach zip file** which contains all your source code (you can zip the folder) and functions.

Even if you only have one source file, you MUST still do a zip file of the folder. I must be able to compile and run your program from all the source code programs after I unzip your zip file.

You should create a folder for each lab, and place all your programs, functions and all other files related to this lab in this lab folder. To submit the lab folder, you can use "Send to -> compress" in window file explorer to create a zip file of the folder.



3. Now you can upload both the **pdf file** and **zip file** separately as your assignment submission in canvas.