

Lab #7

C++ Polymorphism, Inheritance and Memory Management

Purpose:

The purpose of this lab is to write some code in C++ that uses aspects of the language that has been covered in class thus far.

Source code files for the lab are on Canvas. You will save all your source files for the lab to the GitHub account you created in Lab 0.

Preparation:

Review class presentations and chapters from the text according to the syllabus.

Procedure:

- 1) Start up CodeLite and open the workspace ECEGR2020 you created for Lab 0
- 2) In the workspace, create a new project: File -> New -> New Project. Name the project Lab_4 and make the Type a “Simple executable (g++)”
- 3) For each function below, program, run and debug each. In your lab report, be sure to place the output of each function to show that your program worked.

Program the Following:

Time to wrap up the C++ app for this class. Instead of just a Student list app, you’ll be creating an app that manages the following type of college people in a directory: Students, Professors and Employees.

Each college person has the following information

| Student | Professor | Employee |
|--|--|---|
| int ID; string firstName; string lastName; float GPA; | int ID; string firstName; string lastName; float salary; bool tenured; Department department; | int ID; string firstName; string lastName; float salary; |

- A) Create a class hierarchy for the information above

B) Create an app that can manage the directory and save the information to a file and read that information from a file.

C) The menu for the app will have the following:

- 1) List
- 2) Add
- 3) Remove
- 4) Update
- 5) Quit

You can add any additional user interface to make the program functional

D) The objects need to be managed in a single linked list

E) Use new() and delete() to manage the lifetime of the objects

F) Leverage the OOP functionality of the C++ language to implement your design