

CS2040C Data Structures & Algorithms

Assignment #1

Objective

In this assignment you will begin working on data structures with a simple linked list. You will also learn how to correctly handle pointers. You will be provided a zip file that contains:

- `linked_list.h`, a header file containing the definition of the List class
- `linked_list.cpp` with empty function definitions
- `linked_list_test.cpp` with a few public tests
- `CMakeLists.txt` for building and running the project

Your task is to complete the List class so that it passes the unit tests. You may modify any of the files, but will only submit the contents of `linked_list.cpp`.

Linked List

Your task is to implement all of the methods of the List class marked as “TODO” in `linked_list.cpp`, using the design discussed in class. You have been given a few starting test cases in `linked_list_test.cpp`, but satisfying those is not sufficient for full marks. You must code for all boundary conditions, which may not be covered in the basic tests. It is suggested that you write extra tests for any boundary conditions you can think of, but note that those are not submitted nor graded.

Submission

Submit to Coursemology the contents of `linked_list.cpp` **without** the `#include "linked_list.h"` line. Coursemology will run a series of unit tests and provide you with feedback.

Extension Tasks

If you have completed the assignment, here are some additional tasks that will further help you develop your C++ skills and prepare you for future assignments:

1. Add a copy constructor and/or assignment operator.
2. Implement a destructor.
3. Make the list generic, so that types other than `int` can be stored.