

COMP 2404 -- Tutorial #10

Templates and Overloaded Operators

Learning Outcomes

After this tutorial, you will be able to:

- program generically with templates
- work with overloaded operators

Instructions

1. You will begin with the code you saved from Tutorial #9.
2. Modify the `List` class to make it a class template. Note that the data will no longer be assumed to be a pointer! You should be able to use any data type in the list.
3. Modify the `Library` class to declare the book list as a templated list of `Book` pointers.
4. Modify the `Book`, `FictionBook`, and `NonFictionBook` classes to replace all the `lessThan()` functions with the overloaded less-than (`<`) operator. Change all the classes that use this function so that they now use the new operator.
5. Build and run the program. Check that each book is in the correct library, and that the books are ordered correctly, both in the forward direction and the backward direction, when both libraries are printed out at the end of the program. Fiction books should be ordered by author, and non-fiction books by call number. Check that the book server's list of books contains all the books.
6. Make sure that all dynamically allocated memory is explicitly deallocated when it is no longer used. Use `valgrind` to check for memory leaks.
7. Package together the tutorial code into a tar file, and upload it into cuLearn. Save your work to a permanent location, like a memory stick or your Z-drive.