Project 6 - User Document

This program involves the creation and utilization of linked lists. A menu driven system was constructed in this program to allow the user to have control over manipulating a linked list. The user is allowed to continue to make alterations to a list or make queries about a list until the user quits the program. Concepts from object-oriented programming have also been implemented by creating a list class and using this class to perform the linked list manipulations. This program also incorporates the concept of recursion into the list class by using functions that access the list as recursive functions. This allows for the client program to remain unchanged but the functionality of the class is altered in how it traverses through the data structure. As a programming exercise this illustrates how changing the back end functionality of a program does not necessarily have any impact on the client program.

The program is split into 3 files. The main program is main.cpp, the header file is List.h and the class file is List.cpp. These files are located in the project5 folder underneath the programs folder.

To compile and link the files, enter:

g++ List.h main.cpp List.cpp

To run the program, enter a.out and respond to the program’s prompts for user input. This program will terminate after the list from the file are outputted to the terminal or a file that is not available is attempted to be opened.

For example:

After compiling the program and entering a.out the user will be prompted with:

e -- Re-initialize the list to be empty.

i v -- Insert the value v into the list.

r v -- Remove the value v from the list.

m -- Is the list empty?

l -- Report the length of the list.

p v -- Is the value v present in the list?

k k1 -- Report the k1th value in the list.

w -- Write out the list.

h -- See this menu.

q -- Quit.

Once the input is entered with the desired operation an output will be displayed to the user that looks something similar to this:

--> i 30

--> i 42

--> i 15

--> i 33

--> i 14

--> m

The list is NOT empty.

--> w

List: < 14, 15, 30, 33, 42 >

--> r 33

--> w

List: < 14, 15, 30, 42 >

--> p 28

The value 28 is NOT present in the list.

--> p 30

The value 30 is present in the list.

--> k 4

The 3th element of the list is 42.

Note that the user will continue to be allowed to perform operations until they choose the option to quit.