LAB ASSIGNMENT 2

For Lab Assignment 2, you are required to download the zip file posted from the course lab web page and and complete all the additional functionality described herein. Your assignment is due at 9:59:59am on Tuesday, October 13th. There is currently a planned power outage for the Thanksgiving weekend; if the power is off, you will not be able to log into the server, work at the university in the lab, download anything from my web page, etc. so be sure that you have what you need done ***BEFORE*** the weekend so that you can enjoy yourself and not worry about this assignment.

Overview: This assignment will require you to work with Classes and Dynamic Arrays (and Copy Constructors), separate compilation, pointers and linked lists, and recursion (chapters 11-14 in your textbook).

Design the libraries for LinkedLists and Stacks as described herein so that they can support the specified operations. Note that the two libraries will comprise objects with member and non-member functions and you are required to implement the libraries in .cpp files while the header files I have provided to you are used to describe the interface. Your final task will involve dynamic arrays.

LinkedList Class: For the LinkedList class, you need to create the following member functions: a default constructor, the destructor, insert_beginning, insert_end, remove_value, remove_front, empty, sort_linkedlist, and overload the insertion and extraction operators.

Stack Class: For the Stack class, you nee to create the following member functions: a default constructor, the destructor, push, pop, remove_strings_length, empty, and overload the insertion and extraction operator.

Additional requirements:

A. You will need to tweak the library header files so that you don't have any compilation problems if your library is used as a sub-component in multiple other libraries that get compiled together (hint: check chapter 12 for more information).
B. Remember your stream functions need to support file I/O
C. Be sure to support lots of test cases and validate your code thoroughly.
D. Neither the linkedlist.cpp file nor the stack.cpp file should include main functions- they are meant to be ***libraries***. To test and evaluate your libraries, you should create a ***third*** file with a main function (e.g. linklist.cpp, stach_program.cpp). You will need this third file to demonstrate how your library works in the lab and we will provide our own application files to test your libraries when we mark it with the autochecker.

Challenge Task:

Challenge tasks are tasks that you should only perform if you have extra time, are keen, and want to show off a This challenge task is only worth 10% of your mark, but is quite a bit of work. If you don't complete the challenge task, the maximum score you can get on this lab is 90% (which is still an A+).

Your Challenge task: Similar to your StackFrame node, this object has a string and a parameter storing the number of characters in the string. You need to be able to dynamically create an array of StringObjects, initialize it with a series of strings, sort the strings alphabetically, and then be able to search for any of the strings using a binary search algorithm implemented ***recursively***. stringobjects.h in the ChallengeTask subfolder provides the interface for the class. You need to create both stringobjects.cpp and program.cpp (where you will call the member functions create your dynamic array, etc. Note, the first parameter you read from cin/a file, will be the size of the array you should create. Everything after that can be interpreted as a string (even if it is a number).