C201 Homework #8 Due 4/9/14

The purpose of this assignment is to get some experience working with pointer variables and linked lists. The program to be written will present the user with a menu having options as indicated below.

A(ddNode B(uildList D(eleteNode Z(apList Q(uit =>

The menu items are explained below

B Build a (new) singly linked list of characters with a dummy head node containing a 1(happy face char), and a tail node that points to NULL. The order of the characters should be preserved, i.e. the first character entered should be the first character in the linked list, the second character entered should be the second character, etc. (This means you can't copy the routine from program 28!)

Don't use Add node to build list (minus 5 point if you do)

A Add a single new character to the tail end of the current linked list.

D Delete a character from the list. If a list contains multiple occurrences of a letter, then only the first occurrence will be deleted.

Z Zap the list, i.e. delete all nodes **except the dummy head node.**
Do *not* simply copy the delete function from *program 28*! It deletes the dummy head node.

Q Quit the program and return to the operating system.

Suggestions, Hints and Warnings

To enable you to concentrate on the linked list aspects of this program, there is written a main program, some of the needed functions and all of the function header comments. A program shell is available only on my website and is called "a8shell.cpp", copy this to use.

Take some time to study and understand the program shell. After you feel comfortable with the design of the shell, plan a strategy and as much as possible, *write the routines one at a time.* If you commit Deadly Programming Sin VI, plan to spend extra time completing this assignment!

If your code doesn't work, don't start hacking. Retreat to a quiet place and draw pictures!

Recall that code involving pointer variables is not self-documenting. Any code involving linked structures should have comments alongside the C++ statements. (if no comments then lose 3 points)

The routines you write to perform linked list manipulations should be logically coherent, i.e. they should perform a single, well- defined task. This means that a routine that changes a linked structure should not produce output!

Think carefully about your test strategy. Be sure to include handwritten annotations alongside your test session output. The points normally given to category C, program organization will be divided equally between categories B and D. Please do not create gigantic lists! Adequate testing can be done with short lists. Also, there is no need to insert "special" characters into the list. Characters are just small ints in C++ and one is pretty much like any other.

The test functions are written to facilitate ease of reading output. Please don't change them and make the output less readable!

Pay close attention to the individual function header comments in A8shell.cpp. These describe how each function should behave.

Please don't hand in the entire program. Create a file that contains just the functions that you write along with comments and hand that in with the usual test data and annotations. (Loss of 3 points if you hand in the entire program.)