Programming Assignment #3

Fun with stacks

CS 3358.253, Spring 2015
Instructor: Jill Seaman

Due: Wednesday, 3/25/2013 (upload electronic copy by 1:30pm)

Problem (two parts):

Implement a Stack:

In the Stack_3358_LL class demo, we used a linked list to implement the Stack_3358 interface. Your job is to implement the Stack_3358 interface using a List_3358 list to store the elements of the stack. Since the Stack_3358 interface is a template, you will need to choose one of the List_3358 implementations (class demo or PA#2) and make it a template. Then use that to implement Stack_3358. Use the following header file to get started with your stack: **stack_3358.h** (on the class website). Hint: you need a member variable of type List_3358<?>.

Evaluate a postfix expression:

Use your Stack_3358 to implement a function that evaluates a postfix expression. A postfix expression is a mathematical expression in the following format: A B O where

A is a (positive) integer number or a postfix expression.
B is a (positive) integer number or a postfix expression.
O is an operator (+, _, *, or /).

The expression may contain spaces between the numbers and operators (but not inside of the numbers).

The main function should ask the user to enter a postfix expression to be evaluated (on a single line), and then output the result, or an error message if an error occurred. The following inputs should cause error messages to be reported:

12 + 13
+ 12 13
12 13 7 +
(an empty string)
12 13 !

The following expression should return 14:

20 3 1 * + 9 -

Some hints/help:

- isdigit(x) returns true when the char variable x is one of these: '0', '1', …, '9'
- isspace(x) returns true when the char variable x is a space, tab, or newline character.
- x-'0' is an easy way to convert a char variable x containing a digit character to its corresponding integer value.

NOTES:

- The default copy constructor should work for Stack_3358 implemented using List_3358.

Style:

See the Style Guidelines document on the course website.

Logistics:

Please submit the following files in a single zip file (assign3_xxxxxx.zip):

```
list_3358.h stack_3358.h evalPostfix.cpp
```

The xxxxx is your TX State NetID (your txstate.edu email id).

Submit: an electronic copy only, using the Assignments tool on the TRACS website for this class.