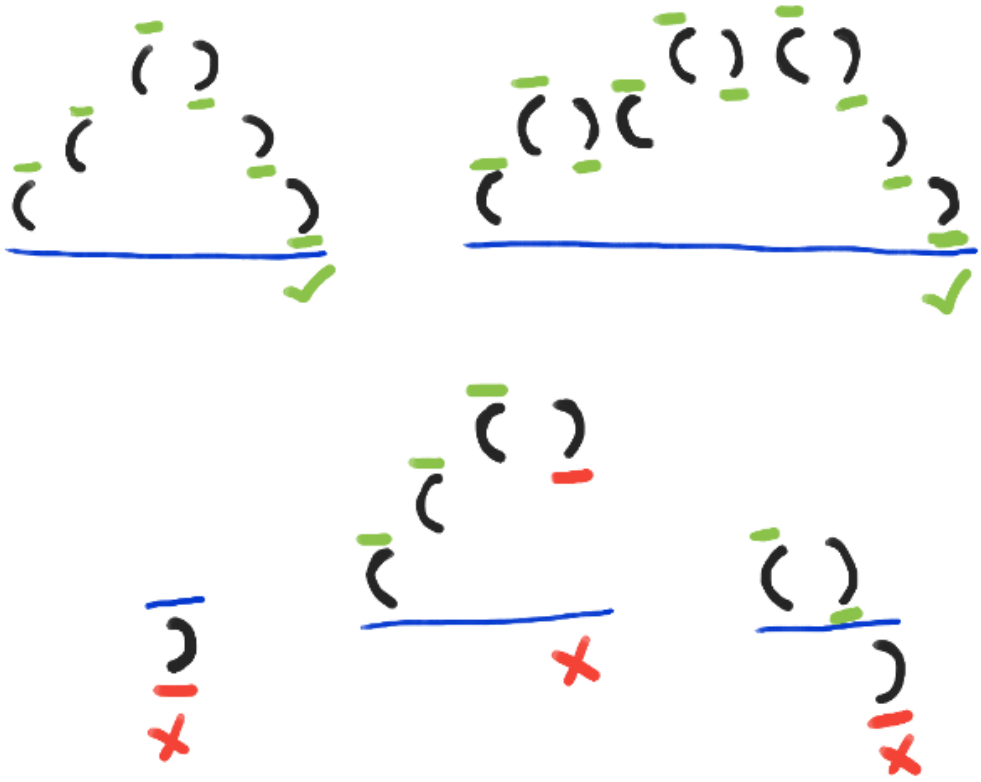
Lab Assignment 7

Start Assignment

Due Tuesday by 11:59pm **Points** 21 **Submitting** a file upload
Available Oct 27 at 8am - Nov 4 at 11:59pm 9 days

Stack Applications



Balanced Parentheses

Make sure you have read and understood

- ***Unit module 9***
- ***C++ Coding Style Guidelines*** **(https://ohlone.instructure.com/courses/18987/files/3097729/download?download_frd=1)**

before submitting this assignment. Hand in only one submission.

Lab Assignment Objectives

1. Define a function template to be used as a tool for creating a set of functions that have the same code logic but whose code can be applied to different data types.
2. Separate interface and application files for a template function.

Stack Application - Balancing Parentheses

We have seen in this week's lesson module that the act of balancing parenthesis is a commonly suited application supported by a stack data structure. For this lab you will will a stack application that can be used to check whether or not parentheses in a user supplied expression are balanced.

Understand the Application

Write an STL stack that can be used to test for balanced expressions in a string.

Test Run Requirements:

Validate user input candidate string contains a (or). ***Pigeonhole*** the user until a string that contains at least one parenthesis is entered.

Demonstrate test cases for the following:

- validating user input
- unmatched left paren
- unmatched right paren
- matched parentheses

Additional Requirements

- Personalize the nameguard on your header file.
- ***Notice:*** Post in the **required lab 7 discussion**.

What to Turn In

Hand in 3 files: **No zip files.**

- **paren.h :** interface file
- **paren.cpp:** implementation file
- **a7.cpp :** application file

Your responses to the **required lab 7 discussion** questions.

Sample Output

Here are some sample test runs:

```
/* TEST RUN - VALIDATE USER INPUT: UNMATCHED LEFT PAREN
```

```
/* TEST RUN - VALIDATE USER INPUT; UNMATCHED LEFT PAREN
EVALUATING EXPRESSION PARENTHESIS
This program will detect unbalanced expression parentheses.

Type in a string with some parenthesis: hi

Type in a string with some parenthesis: (

The string does not have balanced parentheses.
*/

/* TEST RUN 2 - UNMATCHED RIGHT PAREN
EVALUATING EXPRESSION PARENTHESIS
This program will detect unbalanced expression parentheses.

Type in a string with some parenthesis: )

The string does not have balanced parentheses.
*/

/* TEST RUN - UNMATCHED RIGHT PAREN
EVALUATING EXPRESSION PARENTHESIS
This program will detect unbalanced expression parentheses.

Type in a string with some parenthesis: (1 * 3) + 2)

The string does not have balanced parentheses.
*/
/* TEST RUN - UNMATCHED LEFT PAREN
EVALUATING EXPRESSION PARENTHESIS
This program will detect unbalanced expression parentheses.

Type in a string with some parenthesis: ((4 / 2) * 3

The string does not have balanced parentheses.
*/
/* TEST RUN - MATCHED PARENS
EVALUATING EXPRESSION PARENTHESIS
This program will detect unbalanced expression parentheses.

Type in a string with some parenthesis: (((1 + 2) * 3 ) / 3)

The string has balanced parentheses.
*/
```

Tips and Requirements

1. Ensure that your solution is well organized. Provide a program header and comments to document and organize your source code. User defined function(s) need be documented.
2. Include a name guard on your header file.

3. Provide a commented out copy of your program run. Enclose the run inside of multi-line comment delimiters so that your program will run in the grader test bed. Place the run after your program source code in the a7.cpp file.
4. Title your submission files in the format ***firstinitalsecondinital***.filename. (Example: **A**nn **O**hlone would submit files **ao**a7.cpp, **ao**paren.cpp and **ao**.h).
5. Answer the questions in the **Lab 7 Required Discussion** thread.

Submission Resources

For more information on how to submit your assignment, please visit:

- **How do I submit an online assignment? Canvas Student Guide (https://community.canvaslms.com/docs/DOC-9539)**
- **Assignments Overview Canvas Video Guide (https://community.canvaslms.com/videos/1122-assignments-overview-students)**
- **Assignments Submissions Canvas Video Guide (https://community.canvaslms.com/videos/1121-assignment-submissions-students)**

Submitting multiple files to an assignment

Your lab 7 assignment requires uploading more than one file; you should upload these 3 files as one submission. In this assignment you need to upload 2 **.cpp** files (a7.cpp and paren.cpp) and 1 **.h** file (paren.h). To add these files, the **Add Another File button** is clicked to **upload the two files one by one. Check to make sure that both files uploaded okay.** When finished click **Submit Assignment.**

Questions?

Feel free to **ask** in the forum!

Lab 7 Rubric

Criteria	Ratings			Pts
On time submission	**4 pts** **On time submission**	**2 pts** **One day late**	**0 pts** **Two days late**	4 pts
paren.h Satisfies the paren.h requirements : naming guard, contains function prototype(s) for paren.cpp.	**2 pts** **Full Marks**	**0 pts** **No Marks**		2 pts
paren.cpp paren matching and stack STL template implementation. Satisfies the paren.cpp base implementation specifications.	**6 pts** **Full Marks**	**0 pts** **No Marks**		6 pts
Test Driver file a7.cpp : Satisfies the test run validation source statements as specified in the assignment	**4 pts** **Full Marks**	**0 pts** **No Marks**		4 pts
Commented out test validation run included A copy of the program test validation run output is attached after the source code in the main.cpp test driver file (enclosed within comment delimiters). The run matches the source code submitted.	**3 pts** **Full Marks**	**0 pts** **No Marks**		3 pts
Coding Style Includes a program header that describes the application. Code is correctly formatted (i.e. follows code style rules). Class methods are documented.	**2 pts** **Full Marks**	**0 pts** **No Marks**		2 pts
				Total Points: 21