

Lab 4 Queues and Stacks

UWYO COSC 2030

1 Lab: Introduction to Queues and Stacks

Stacks and Queues are two useful data structures in C++ and other programming languages as well. Stacks follow the last in first out principle whereas Queues use first in first out.

- <http://www.cplusplus.com/reference/stack/stack/>
- <http://www.cplusplus.com/reference/queue/queue/>

2 Lab: C++ Queues and Stacks

Using the C++ program Lab4.cpp on the website (<https://classroom.github.com/a/X7L1H7T8>) complete the functions stringReverse and parenCheck and print the output. String reverse will use a stack, parenCheck will use a queue.

2.1 String reversal

Stacks use the last in first out style for storing data. This means if you push in the characters 'h','e','l','l','o' into a stack that it will come out in the reverse order.

2.2 parenCheck

For this you will check sets of parenthesis to ensure they are done properly. Each time you get a '(' push it on to the queue. You will pop it when you get a matching ')'. For a perfectly matched string you should have an empty queue by the end. What happens when you find a ')' with no matching '(' to pop?

3 Lab: Python Queues and Stacks

Now you will solve the same problems in Python. There are two different ways you can run python scripts on the windows machines:

3.1 Option 1

- Open up the windows search bar
- Type in python
- Select file::open
- Open the file you downloaded, it should open in a new window
- Make your changes in the new window
- In the new window, select run::run module to run your script

3.2 Option 2

- Go to https://www.onlinegdb.com/online_python_interpreter

4 Intro to Python

If you need a refresher on Python, this is a good resource to use:

- <https://www.w3schools.com/python/>

5 Turn in on Github. Make sure you include a readme with your name and lab section.