

Lab 9

Goals-

Implement linear data structures using STL Containers

You will create two data structures a stack and a queue. You will use STL containers to demonstrate basic ADTs.

QUEUE

For the queue you will simulate a buffer. You will have one function that randomly generates a value. You will have a user specified percentage. If the user enters 25, then there is a 25% chance of a value being created and put in the queue. The function uses this percentage to randomly create a value to put in the buffer.

You will have another user specified percentage, which is the chance of a value being removed from the buffer.

The user will also enter a number for the number of turns to run your simulation. After each round of the simulation calculate and display the average length of the queue. Does your buffer behave as expected, i.e. get longer if the input chance is greater?

STACK

Use a stack to create a function that creates a palindrome, i.e. a string that is the same forwards and backwards. It does not need to be an actual word. The function will receive a string and it will return the string with the palindrome.

TESTING

Create a program for the user to test your buffer or to create a palindrome.

For the queue prompt them to enter the chance of an item arriving, the chance of an item being removed and the total number of rounds (turns). Display the results to the screen.

For the stack prompt them to enter a string. Create the palindrome and then display the it.

What to submit-

You will submit the following files to TEACH in your zip file-

Code to implement your stack, both header and source files

Code to implement your queue, both header and source files

Code to demonstrate the operation of your stack and queue.

Grading

Programming style- 1 point

Code to implement your stack

header file- 1 point

source file- 2 points

Code to implement your queue

header file- 1 point

source file- 2 points

Code to demonstrate the operation of your buffer and palindrome creator- 3 points