PFII Lab 13: Templates

In this lab I learned about the implementation of Template classes through their use in previously covered concepts of stacks and queues. Something interesting that I observed during this lab was the implementation of template classes being entirely within the header files with methods implemented underneath the class declaration. In order to use a template class, we had to change the variables of the pre-existing Stack and Queue classes to the name of the template class (T) and specify the template class before each method and class declaration to convert it to the template class. An example of this is the Queue class’s front() method which had to be implemented with *template<class T>* above it, T& as the type instead of int&, and the Queue<T>:: as the scope resolution. Overall, this lab helped review Stacks and Queues while introducing the key concept of template classes in C++.

Program Output:

Stack contains: [ 0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 ]

Stack size: 8

Top: 0.07

Stack contains: [ 0 0.01 0.02 0.03 0.04 0.05 0.06 ]

Stack size: 7

Top: 0.06

Stack contains: [ 0 0.01 0.02 0.03 0.04 0.05 ]

Stack size: 6

Top: 0.05

Stack contains: [ 0 0.01 0.02 0.03 0.04 ]

Stack size: 5

Top: 0.04

Stack contains: [ 0 0.01 0.02 0.03 ]

Stack size: 4

Top: 0.03

Stack contains: [ 0 0.01 0.02 ]

Stack size: 3

Top: 0.02

Stack contains: [ 0 0.01 ]

Stack size: 2

Top: 0.01

Stack contains: [ 0 ]

Stack size: 1

Top: 0

Queue contains: [ 0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 ]

Queue size: 10

Front: 0

Queue contains: [ 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 ]

Queue size: 9

Front: 0.01

Queue contains: [ 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 ]

Queue size: 8

Front: 0.02

Queue contains: [ 0.03 0.04 0.05 0.06 0.07 0.08 0.09 ]

Queue size: 7

Front: 0.03

Queue contains: [ 0.04 0.05 0.06 0.07 0.08 0.09 ]

Queue size: 6

Front: 0.04

Queue contains: [ 0.05 0.06 0.07 0.08 0.09 ]

Queue size: 5

Front: 0.05

Queue contains: [ 0.06 0.07 0.08 0.09 ]

Queue size: 4

Front: 0.06

Queue contains: [ 0.07 0.08 0.09 ]

Queue size: 3

Front: 0.07

Queue contains: [ 0.08 0.09 ]

Queue size: 2

Front: 0.08

Queue contains: [ 0.09 ]

Queue size: 1

Front: 0.09