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CS313 Professor Fried

Homework #2

Question 4:

I created a templated class for the array-based stack so we could use any type like a string or integer or even an object we make using a separate class. I have the typical functions set up, such as initialize, push, and pop. Initialize will initialize a stack, creating an empty one of a specific size. Push will check if the stack is full, and if it isn’t, then it will add a new value and change the top of the stack to be the position of the new value we just put in. Pop will check if the stack is empty. If it isn’t then it will change the top of the stack to be the position of the element before the current top of the stack, meaning the element we popped will have no association to our stack anymore.

Now the important functions that I made are the printElements and changeValue functions. printElements will have a variable that is the same as the top of the stack. We made this separate variable instead of using the original so that we do not mess with our stack in case we want to do more things to it after we call this function. Now we traverse through the stack starting from the top. As we work our way down, we print out the element in the position of the stack we are currently in. changeValue takes in the position of the stack, and the new value we want to insert into that position. If the position is too high, it will not do anything. We have an iterator just to keep track of the position as we go through the stack from the top all the way down. We keep lowering the iterator until we get to our given position. Once we get to the proper position, we set the value in that position to the new value we passed in. In the main method, I tested all the functions using stacks of different types.