Homework Assignment 1

Due date: Wednesday October 5th

1 – Write a C library of methods to manipulate a queue of integers, using the structured programming paradigm. As you know, a queue is a FIFO (first in first out) data structure, and a complete set of methods should at least include a function to get the current size of the queue, a method to enqueue (add a new integer to the queue) , and a method to dequeue (retrieve the next item in the queue). Note that the queue should have unlimited capacity, that is it should grow in size as required. After implementing the library, you should use it to write a C program that allows a user to perform the following operations as many times as they like:

* Add an integer to a queue
* Retrieve the next integer from the queue
* Retrieve the current size of the queue
* Display all elements in the queue

For this program, create an empty project in Visual Studio and try to stick strictly to the C language, meaning that you should avoid C++ added features like using references instead of pointers or advanced libraries.

2 – Write a C++ program to perform the same tasks outlined on problem 1 but this time use an object oriented approach. In this case you should write the library as a set of one or more objects that you can reuse. After you are done, write a paragraph explaining your impressions of applying the two different paradigms to solve the same problem.

Note: When you write the code try to pay attention to your data structures and algorithms to improve on performance when needed, that is make sure you are using all memory that you have previously allocated before allocating additional one, also make sure your algorithm scales well and doesn’t take an unreasonable amount of time when the amount of data potentially grows in the future. If you have questions about this ask me at our next class and I’ll explain it further.