Pre-lab Worksheet
CS163 Lab Session #3 –Stacks and Queues

Each group member should collaborate on this worksheet. All online students should participate!
The goal of these worksheets is to help prepare you for the next step in programming!

Goals:

Experience ADTs for Stacks and Queues
Evaluate the use of linked data structures in situations that do not require the full range of operations (unlike the previous list classes discussed)
Build test plans and experience unit testing as member functions are developed

Develop an ADT: Create a stack and a queue of single characters.

_____1. Develop the member function prototypes for the stack. Think about what kind of information would need to flow from the application to the ADT:

i. Stack();
ii. ~Stack();

Your turn!

iii. int push(char & newChar);
iv. int pop(char & fndChar);
v. int peek(char & fndChar);

_____2. Develop the member function prototypes for the queue. Think about whatkind of information would need to flow from the application to the ADT:

i. Queue();
ii. ~Queue();

Your turn!

iii. int queue(char & newChar);
iv. int dequeue(char & fndChar);
v. int peek(char & fndChar);

_____3. Create the algorithm for determining if a sentence is a palindrome using your stack and queue functions: (A palindrome is one where the characters are the same forward and backwards – e.g., “dad”)

1. Get length
    a. If odd,
        i. Compare first and last, if equal
            1. Compare first + n and last - n untill (n = (size-1)/2)
            2. If completely successful, then it is a palindrome
        ii. Else, it is not a palindrome
    b. If even,
        Compare first and last, if equal
            1. Compare first + n and last - n untill (n = size/2)
            2. If completely successful, then it is a palindrome
        ii. Else, it is not a palindrome