Chapter 3

1. Implement the $queueFull$ and $queueEmpty$ functions for the noncircular queue.
2. Implement the $queueFull$ and $queueEmpty$ functions for the circular queue.
3. Implement the $Inqueue$ and $Dequeue$ functions for the noncircular queue.
4. Write the postfix from of the following expressions :
   (a) $a * b * c$
   (b) $-a + b - c + d$
   (c) $a * -b + c$
   (d) $(a + b) * d + e/(f + a * d) + c$
5. Obtain a data representation that maps a stack and a queue into a single array, $memory[MEMORY\_SIZE]$. Write C functions that add and delete elements from these two data objects. What can you say about the suitability of your data representation?
6. We must represent two stacks in an array, $memory[MEMORY\_SIZE]$. Write C functions that add and delete an item from stack i, $0 \leq i < n$. Your functions should be able to add elements to the stacks as long as the total number of elements in both stacks is less than $MEMORY\_SIZE - 1$.
7. Write a C function that transforms a infix expression into a postfix one.
8. Transform this expression from postfix to infix or prefix to infix and evaluate it.
   (1) $abc - d + /ea - *c*$(Set a = 2, b = 3, c = 4, d = 5, e = 6)
   (2) $+ * +ABC * + * D * E + DE * ABC$(Set A = 1, B = 2, C = 3, D = 4, E = 5)