CS 601
Programming Assignment 1

This is an individual homework assignment. As it appears in the course syllabus, for the homework assignments, students are expected to turn in the results of your own effort (not the results of a friend's efforts or other resources). Even when not explicitly asked, you are supposed to explain and justify your answers concisely.

Consider the following problem and implement its corresponding algorithm ONLY **in C++ or Java**:
We have an array A of size n <= 10 to store some integer values. The integer numbers correspond to the customer IDs for a store department. Here we assume we have at most 10 customers.

1. Use array A and write a function (or a set of functions) that treat the array like a stack. That means if we want to add a customer to the stack (here the array A) we do that by **pushing** the ID into the stack. And for customer removal, the **pop** operation is going to be implemented.
2. Similarly, use array A and write a function or a set of functions that treat the array like a queue. That means if we want to add a customer to the queue (here the array A) we do that according to enqueue operation. And for customer removal, the dequeue operation is going to be implemented.

Initially, the array is empty. The user running the program decides on whether having a Stack of Customer IDs or a Queue. The program then waits for the user to determine if they want to Add a new customer ID into the array (stack/queue) or Delete next customer from the array. The program runs until the user decides to Exit. The array content should be displayed to the user after each requested operation.
At each step, the program must provide appropriate respond to the user and guide the user on what to do next or what is expected to be entered.

For the grader to be able to run your programs and test them easier and for you to practice reading from the file, we add two more rules here:

(1) The program should read from an input file, named as input.txt. Here is an example of the input file:

```
S
Add
2
Add
3
Add
1
Delete
Delete
Delete
```

Exit

Explanation of the input file:
S : means the user chooses stack implementation. It will be Q if the queue is preferred.
Add: means add next entered number to the stack
2 : the program adds 2 to the stack
Add
3
Add
1
Delete: means delete the appropriate ID from the array (here the stack)
Delete : as above
Delete: as above
Exit: means finish running the program

While the program you deliver reads from the file, it still provides appropriate message to the user and takes the right decision. For example, the user might have asked for deleting a customer from the stack while the stack is empty. In such a situation, the program provides appropriate feedback and then reads the next requested operation by the user. The process ends once the Exit operation is read.

(2) The output should be written on an output file generated by the program, called output.txt

Note: You need to submit all your program files on Canvas in the related digital repository (located under the Assignments section) by the specified deadline. The grader should be able to run your code without any issue otherwise no points will be assigned to the assignment.

Important NOTE: Don't share your solutions with others to avoid academic dishonesty. All submissions will be checked for that. Academic dishonesty and/or plagiarism in this course will result in a failure of the assignment, or the course, plus an AD report to the department and the university. Please be careful and present the result of your own effort.