Assignment 1
CSE 225 - Data Structures and Algorithms

Dr. Md. Mahfuzur Rahman, ECE Department, NSU

1 Using Stack, Queue, List

In this assignment, you will simulate an assumed way of serving customers at a public shop. For this, your task, as a manager, is to take incoming customers, and allow them into the shop (considered in currently serving customer list) if there are enough seats left. Every incoming customer is given a seat from the seat stack, and the seat is taken back when that customer leaves the shop. If there are no seats left, then the manager refuses the customer entry and a line (queue) starts to form. Once a customer leaves the shop, the first customer in line is allowed into the shop with a seat.

For this simulation, you will need to create the following two new classes:

- **Customer** — Represents a single person wanting to enter the shop; it has only customer name as variable or property. (Should be used for List and Queue implementation; see below)
- **Seat** — Represents a single seat in the shop. It has only two variables or properties: color, type. (Should be used for stack implementation; see below)

Consider your existing array or linked list based Stack, Queue, List implementations, and update them in the following way (hint: make changes in considering ItemType):

- **Stack** — to handle the instances of Seat class
- **List** — to handle the instances of Customer class
- **Queue** — to handle the instance of Customer class

Your Stack implementation should contain a fixed limit on the maximum number of seats that can be stored. For the assignment, assume that the shop only has 5 seats in it. (it's a VERY small shop).

Your program should take and parse a given input file called "shopevents.txt", and produce a log file called "shoplog.txt". An example input file and corresponding log file are available online along with this assignment.

Submission Guidelines:

- This assignment needs to be done individually.
- Need to submit only the **main** function (hard copy).