BLG 233E DATA STRUCTURES AND LABORATORY

EXPERIMENT 8 – STACKS AND QUEUES

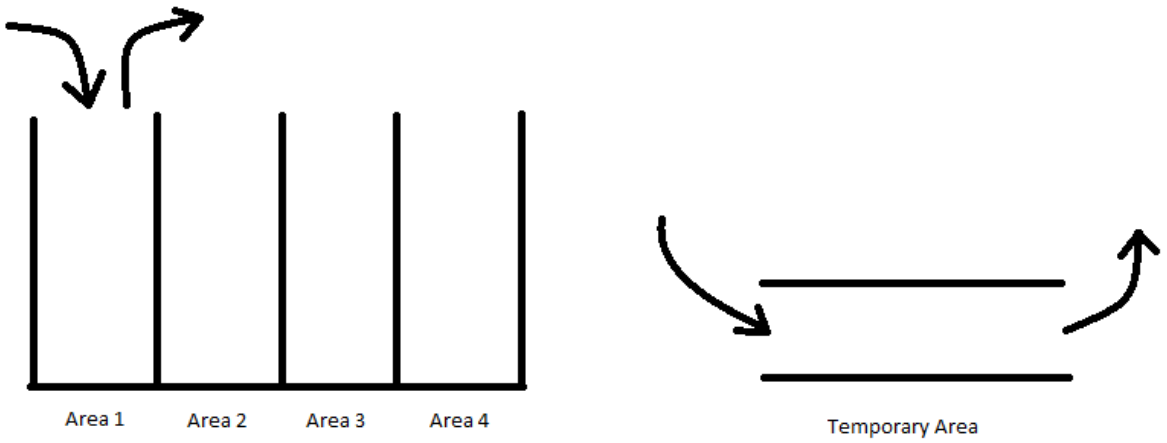
IMPORTANT REMINDERS

1. It is not allowed to use USB sticks during the lab sessions.
2. You should unplug your ethernet cables during the lab sessions.
3. Any reference book or help material (C++) is allowed.

In this experiment, you are required to simulate a car park. In this park, there are 4 areas and each area has a capacity of N cars at a time. Each area has width of 1 car so that more than one car may not be parked side by side.

When a car needs to leave the park, the cars that are parked in front of that car has to leave that area so that car may leave the park (there is only one gate for each area and this gate is used for both as entrance and exit). But the cars that are temporary left the area should also be parked to somewhere else either to another parking area (which is not full) or to a temporary location (if all the other areas are full). Since the temporary location is outside the parking area in the street, it should be used as the last option and in FIFO manner.

A simple illustration of the park is given below;



Write your code for this model separately as cpp files and headers. Write your data structures (stacks and queues) as generic as possible using typedef for the stored data types. For instance, in this model, cars are represented with their license plates (char*), but in the future, you may want to represent cars with unique numbers (int).

To do so, write the function that takes the license plate as a parameter and takes the car out of the park if it exists in the car park. Your function should give an error message if the given car is not in the park.