**BRAC University**

**Department of Computer Science and Engineering**

**CSE 220: Data Structures**

**Lab 08**

**Program**

You have to implement a waiting room management system in an emergency ward of a hospital.  Your program will assign an Id number to a patient in a first come first serve basis. The lower the id, the sooner the service will be provided to the patient.

Your program will contain the following methods:

**RegisterPatient():** This method assigns an Id (which is auto-generated) to a patient and register him/her to the system.

**ServePatient():**This method calls a patient to provide hospital service to him/her.

**CancelAll():**This method cancels all appointments of the patients so that the doctor can go to lunch.

**CanDoctorGoHome():**This method returns true if no one is waiting, otherwise, returns false.

**ShowAllPatient():**This method shows all ids of the waiting patients in SORTED order. (Hint: use the sorting methods learnt in class using the appropriate data-structure for each task) [Sorted according to their names]

**Task 1**

Solve the above problem using an array based queue.

**Task 2**

Solve the above problem using an array based circular queue.

**Task 3**

Solve the above problem using a linked list based queue.