
Imam Mohammed Bin Saud Islamic University
College of Computer Sciences and information
CS210 – Data Structures using C++
Term Project – 2nd Semester 2008
Instructor: Manal ALSabhan

Project Regulations

Deliverables

The project is divided into three tasks; each task is a continuation of the previous one. For each task, you should hand in a printout of your completed work project to your lecturer.

Tasks need not be handed in on weekly bases. Only submission of completed phases is required.

Deadlines

Task A – Due on Saturday, April 30th.

Task B - Due on Saturday, May 21st.

Task C - Due on Saturday, Jun 11th.

General Guidelines

This project is a grouping assessment. It should be carried by the whole group.

If the group is caught cheating in any part of the code, major or minor, the group will loose the whole mark for the project, not just the assigned mark of the cheated fragment of code. So, if a group has copied a single function from another group, both groups will get zero out of 10.

Late submission of the phase will result a deduction of 25% of the assigned mark for each day of latency.

Your project should contain a main program to test all tasks. Your work will be assessed for efficiency, clarity, validation, and testing. Not just correctness.

Demonstration

You will be required to demonstrate your program after submission. No marks will be awarded for the project unless the project is demonstrated and a thorough understanding of the code is clearly evident. Students showing persistent efforts and adherence to deadlines will be exempted from the demonstrations. However, the lecturer reserves the right to request a demonstration for any student.

Emergency Room Simulator

ER Overview

This project is an imitation of the patients flow through a hospital emergency room. The simulation focuses on how to treat patients based on the severity of their problems and the constraints on the number of beds.

In an emergency room, arriving patients are first seen by a doctor, called the "*Triage Officer*", whose responsibility it is to assess the degree of urgency for medical attention. The assessment of the triage officer determines when the patient will be seen by a medical team within the emergency room. Patients with the highest urgency are given the highest priority and therefore get into the emergency room the soonest.

This challenge explores a model of the system in an emergency room, with a primary focus on the triage officer and his/her role of prioritizing patients according to their need.

In this system, we differentiate between an arriving case and a patient. An arriving case represents what is presented to the triage officer. His assessment determines whether or not that case becomes a patient for the emergency room, and if so, with what priority.

System Activities

The system models three parallel activities:

- A. Patient handling by the triage officer
- B. Patient calling
- C. The treatment of patients by the emergency room doctors

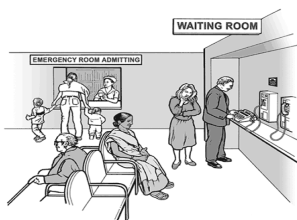
The system rollers:

- Triage officer
- The reception Nurse
- Emergency doctors who is in board

Implementation – Task A:

First, the triage officer start his work day by login to the system through his name and corresponding password, then he/she will be ready to accept the arrival patients.

Coming patients will be waiting in the "*Primary Waiting Area*" to be examined later by the Triage officer. After a while, the triage officer call patients in order and for each he/she will decides whether to accept the patient or not.



If the patient accepted, the triage officer will add the patient to another waiting area called "*To Be served*" ordering by arrival times and urgency attention scale. Triage officer will get patient information and keep it in the system. Patient information is: (patient Name, age, gender, file number, illness, and attention degree).

To assess the degree of urgency for medical attention, there

is a scale to prioritize the degree of urgency from 1 (Stable) to 5 (Critical)¹.

Then, patient will be waiting in "To Be Served Patient" area and waiting the reception nurse to call hem/her for treatment.

Two structures are provided as the central support to these two activities.

- The schedule of arriving patients.
- Patients waiting to be treated in the emergency room.

Implementation – Task B:

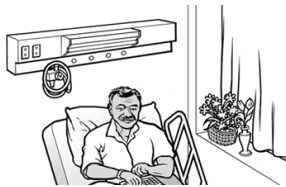
The reception nurse login to the system using her name and password. She checks the patient list. If there is any available patient need to be treated, she checks if there is any available emergency room. Then, she sends the patient with a nurse to that room. Patient will be removed from "To Be Served Patient" area. After that, she searches quickly for any available doctor who is in call and bleeping him.



When doctor arrives to the emergency reception, nurse gives him/her the patient room number. If the doctor didn't show in five minute, the nurse report that doctor as "late" and bleep another free doctor.

Implementation – Task C:

When the doctor arrives to the patient room, he examines the patient and treats him/her. After that, doctor will update the patient file. If the patient is new, the doctor will open a new file for him/her and add the file to patients file archive. The patient file contains a history of all patients' visits and giving treatments. When the doctor examines the patient, he/she will fill a report and place it on the top of the last report on the file.



At the end, if the patient has been treated, doctor decides to dismiss or admit the patient. If the patient needs continue treatment, his file will be sent to the "Patient Admission Department" else patient will send home.

¹ To solve this problem you need a new ADT called "Priority Queue"

Project Evaluation Criteria

Student Names:

- 1.
- 2.
- 3.

Section:

Note: Students achieving 7 or higher are normally not asked for demonstration.

Criteria (points)	Task A	Task B	Task C
Correctness (4)			
Validation (2)			
Testing (2)			
Efficiency (1)			
Comments & clarity (1)			
Total (out of 10 points)			

Total Mark out of 10:

_____ =
3