

CENG 112 – DATA STRUCTURES

Homework 5

April 28, 2015

Due Date: 12 May 2015

Prog. Assignment 1.1 Priority Queue for Emergency Service

We want to write a program that simulates the emergency service at a hospital. You should store patient information in a structure as follows:

```
struct Patient {  
    int national_id;  
    int condition; // 1-9, 1 being the most urgent  
};
```

Your program should read patients from a file “patients.txt” in the same directory as the program. This file should contain one line per patient and each line should contain two integers: the id and the condition. Your program should be able to read as many patients as there are in the file. An example file:

```
12345678908 5  
23455636901 3  
75852523507 8  
23523578901 1  
09345866901 2  
78578526786 6  
23454234567 9  
09873243234 4
```

As your program reads the patients, it should insert them into a priority queue that stores the patient with the lowest condition at the top. You can modify the code in “pqueue.c” to work with patient data instead of floats.

After inserting every three patients, it should pop out the one with the lowest condition and print its id. Once all the patients are inserted, it should pop and print patients from the priority queue until the queue is empty.

So if there are seven patients, the sequence of operations will be

```
insert, insert, insert, pop-min, insert, insert, insert, pop-min,  
insert, pop-min, pop-min, pop-min, pop-min, pop-min
```

The output of the program for the example file above would be:

```
23455636901 23523578901 09345866901 09873243234 (continues below)  
12345678908 78578526786 75852523507 23454234567
```