KC RESEARCH HOSPITAL

ASSIGNMENT LEARNING OBJECTIVES:

- Group programming and task assignment
- Creation of queue as a stand-alone class or as the child of a linked list class (using nodes/pointers - not vectors or any built-in containers)
    - Proper implementation of the base class and any derived classes
    - Proper implementation of all class functions (constructors, accessors, mutators, overloaded operators)
- Read a CSV file for basic patient information and produce errors as needed
- Implement 2 menus (1 based on clinic and 1 based on actions for the clinic)

THE PROBLEM:

You have been tasked with developing a patient management system for Research Hospital. The hospital has 3 departments: Heart Clinic, Pulmonary Clinic, and Plastic Surgery Clinic. You will need to read an input file to get the list of patients that need to be added at the start of the day. Then

DATA INPUT:

This patient management system will begin the day by loading scheduled patients into the clinic's 'queue' as listed in the **pa HYPERLINK "https://umkc.box.com/s/i9ewr0w0cfn5o7azt9y3b0ek3cdp9gbn"t HYPERLINK "https://umkc.box.com/s/i9ewr0w0cfn5o7azt9y3b0ek3cdp9gbn"ient.csv** file. These are patients that have scheduled appointments in each clinic.

This input file contains the following data:

clinicName,firstName,lastName,SSN

- The clinicName can be HC (heart clinic), PC (pulmonary clinic) or PSC (plastic surgery clinic). Any other input for clinicName is invalid and should be written to the transaction file.
- The SSN (social security number) must be numeric. If not, there should be an error written to the transaction file.
- If the clinic is full (each clinic can only hold 10 patients), then any additional attempts to add patients to the clinic are rejected and written with the error to the transaction file.
- If the transaction is successful, that should be written to the transaction file as well.

CLINIC MENU:

Once that is complete, the hospital program will ask the user to select the department they wish to work with (Menu 1) and provide the options for that department (Menu 2)

Figure 1. The application's Main screen	Figure 2. The screen for each department

The queue for each department includes patients of the current department only. Users of your software can do the following functions within each department (see figure 2 above).

- **ADD NEW PATIENT**

The **"*Add patient*"** will add a new patient entry into the queue for the correct clinic. Each patient must have a first name, last name, and a social security number (cannot be empty, must be numeric, but can be of any length for simplicity, e.g. 123 is accepted). If the social security number is empty (return character), the operation should be canceled with cancelation message.

The maximum number of patients any department can have is 10.

Note that after adding a new patient, your application should confirm the entered data of the patient. After confirming the entered data, the user can press any key to return to the department's menu. You do not need to ask the user if the entered data is correct or not. Just confirm it by re-printing it. Patients added should also be added to the record of patients in the transaction log (an output file that is recording all transactions by clinic – even those that error)

Example of Add New Patient (Heart Clinic)

```
Enter Patient's SSN: 456
Heart Clinic Patient (Regular):  Bubba Wubba was added to the waiting room.
```

Screen:

```
Donald          Duck                    19      R
Bubba           Wubba                   456     R
```

Bubba should be added to the list of patients in the Heart Clinic at the end:

Bubba should now appear in the transaction file:

Heart Clinic Patient (Regular): Bubba Wubba was added to the waiting room.

2. ADD CRITICALLY ILL PATIENTS (emergency cases)

The "*Add critically ill patient*" will add a new patient (first name, last name, social security number) at the beginning of the current queue – passing all regular patients in the queue and after any other critically ill patients previously added. This means that patients entered the queue as critically ill will have operation before other patients, even if they entered the queue after the regular patients. Your application can add any number of patients as critically ill, but not more than 10 patients in total within each department, both regular and critically ill patients. Note that, if you have several critically ill

patients then they have operations in the same order they entered the queue (First in, first out). Once all critically ill patients have been taken out to operation (removed from the queue), the application continues with the regular patients –also in a first in, first out manner. Note that after adding a new patient, your application should confirm the entered data of the patient. After confirming the entered data, the user can press any key to return to the department's menu. You do not need to ask the user if the entered data is correct or not. Just confirm it by re-printing it. Patients added should also be added to the transaction file which is recording all transactions by clinic – even those that error.

Example of Adding New Critically Ill Patient (Heart Clinic)

```
Enter Patient's SSN: 789
Heart Clinic Patient (Critical): Taylor Swift was added to the waiting room.
```

Screen:

```
Donald          Duck                    19     R
Bubba           Wubba                  456     R
```

Taylor should be put at the top of the list of patients

Taylor should be added to the transaction file:

Heart Clinic Patient (Critical): Taylor Swift was added to the waiting room

```
Bubba           Wubba                  456     R
```

If another critically ill patient is added, this person should be added after other critically ill patients in the clinic.

For example, if we added Patrick Mahommes as a critical patient in this clinic, the list would now show:

The transaction file would read:

Heart Clinic Patient (Critical) : Patrick Mahommes was added to the waiting room.

3. TAKE OUT A PATIENT FOR AN OPERATION

This feature is responsible to move patients to the operation room (remove them from the queue). Of course, this should be a first-come first-served operation. Note that having critically ill patients will give them higher priority to enter the operations room (to be removed from the queue first, even if they have been added after the regular patients). After moving a patient to the operation room, your application should print the data of the moved patient (first and last name) on the screen and on the transaction log. If no patients are left, your application should print a notification message to the screen “No more patients.” (this does not need to be recorded on the transaction file)

```
Please enter your choice: 3
Heart Clinic Patient: Taylor Swift was taken to the operating room.
```

Screen:

The new list should now show:

```
Bubba            Wubba                    456     R
```

The transaction file would read:

Heart Clinic Patient: Taylor Swift was taken to the operating room.

4. CANCEL PATIENT

```
Please enter your choice: 4
Enter Patient SSN: 10

ERROR Heart Clinic: Unable to find patient: 10 in the waiting room.
```

This feature will ask the user to input the social security number of the patient and then remove that patient from the queue. If such a patient does not exist, a notification message is printed to the screen “Patient Does Not Exist.” If the patient does exist, their name should be written to the screen and this information added to the transaction log. If the patient was cancelled, a notice should also be provided on the screen & in the transaction file.

The transaction file would read:

ERROR: Unable to find patient: 10 in the Heart Clinic

```
Please enter your choice: 4
Enter Patient SSN: 17
Heart Clinic Patient: Jennifer Lopez was removed from the waiting list.
```

The transaction file would read:

Heart Clinic Patient: Jennifer Lopez was removed from the waiting list.

5. LIST ALL CURRENT PATIENTS

This feature lists all patients currently in the queue (first name, last name, social security number) including status (regular and critically ill patients)

6. EXIT THE CURRENT DEPARTMENT

This function exists the current department, clear the screen, and print the main application menu (Figure 1).

AFTER TRANSACTIONS ARE DONE (The day is done…)

At the end of the day, your transaction file should show:

- The record of all patients added to each clinic at the beginning of the day
- The record of patients added, operated on, or cancelled throughout the day along with their status (regular or critical)

Thoughts:

You could use a strut called *patient* to define patients using first name, last name, social security number and status.

Your application must have a ***Clinic Class*** that includes the aforementioned functions (methods) as member functions of the class such as, AddPatient(); AddCriticalPatient(); OperatePatient(); CancelPatient(); etc. Feel free to create your own methods –these are just examples.