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HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY  
FACULTY OF COMPUTER SCIENCE AND ENGINEERING



## DATABASE SYSTEMS (LAB) (C02014)

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### Assignment 2

# QUARANTINE CAMP DATABASE

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# 1 Topic

## 2 Requirements

### 2.1 Physical Database Design

#### 2.1.1 Implementing the database

```
1 CREATE TABLE PERSON (
2     Person_ID          CHAR(6)          PRIMARY KEY,
3     Person_address     VARCHAR(50),
4     Person_name        VARCHAR(30)      NOT NULL,
5     Gender             CHAR(1),
6     Phone_no           CHAR(10),
7     CONSTRAINT         check_person_gender CHECK (Gender = 'M' or Gender =
8     'F' or Gender IS NULL)
9 );
10 CREATE TABLE NURSE (
11     Nurse_ID           CHAR(6)          PRIMARY KEY,
12     CONSTRAINT         fk_nurse_person_id FOREIGN KEY (Nurse_ID)
13                       REFERENCES PERSON(Person_ID)
14                       ON DELETE CASCADE
15 );
16
17 CREATE TABLE DOCTOR (
18     Doctor_ID          CHAR(6)          PRIMARY KEY,
19     CONSTRAINT         fk_doctor_person_id FOREIGN KEY (Doctor_ID)
20                       REFERENCES PERSON(Person_ID)
21                       ON DELETE CASCADE
22 );
23
24 CREATE TABLE STAFF (
25     Staff_ID           CHAR(6)          PRIMARY KEY,
26     CONSTRAINT         fk_staff_person_id FOREIGN KEY (Staff_ID)
27                       REFERENCES PERSON(Person_ID)
28                       ON DELETE CASCADE
29 );
30
31 CREATE TABLE VOLUNTEER (
32     Volunteer_ID       CHAR(6)          PRIMARY KEY,
33     CONSTRAINT         fk_volunteer_person_id FOREIGN KEY (Volunteer_ID)
34                       REFERENCES PERSON(Person_ID)
35                       ON DELETE CASCADE
36 );
37
38 CREATE TABLE MANAGER (
39     Manager_ID         CHAR(6)          PRIMARY KEY,
```

```
40     Doctor_ID          CHAR(6),
41     CONSTRAINT        fk_manager_person_id FOREIGN KEY (Manager_ID)
42                       REFERENCES PERSON(Person_ID)
43                       ON DELETE CASCADE,
44     CONSTRAINT        fk_manager_doctor_id FOREIGN KEY (Doctor_ID)
45                       REFERENCES DOCTOR(Doctor_ID)
46                       ON DELETE SET NULL
47 );
```

- **TABLE PERSON**

- **Person\_ID**: is a fixed-length string with 6 characters and set to PRIMARY KEY since each person has a unique ID. For example: NUR001, DOC001, etc.
- **Person\_address**: is a variable-length string with maximum 50 characters.
- **Person\_name**: is a variable-length string with maximum 30 characters and is a NOT NULL attribute. Since the person name is the name of the staff and it helps them and the patient communicate with each other easily.
- **Gender**: is indicated by 1-character string.
- **Phone\_no**: is a fixed-length string with 10 characters.
- **CONSTRAINT check\_person\_gender**: check whether the specified value for Gender attribute is correct. 'F' for female and 'M' for male.

- **TABLES NURSE, DOCTOR, STAFF and VOLUNTEER**

- **Nurse\_ID, Doctor\_ID, Staff\_ID and Volunteer\_ID**: are a fixed-length strings with 6 characters and set to PRIMARY KEY since each person has a unique ID.
- **CONSTRAINTS fk\_nurse\_person\_id, fk\_doctor\_person\_id, fk\_staff\_person\_id and fk\_volunteer\_person\_id**: are FOREIGN KEY referencing to Person\_ID of PERSON table.  
ON DELETE CASCADE constraint is used to delete the rows from the NURSE, DOCTOR, STAFF and VOLUNTEER tables automatically, when the corresponding rows from the PERSON table are deleted.

- **TABLE MANAGER**

- **Manager\_ID**: is a fixed-length string with 6 characters and set to PRIMARY KEY since each manager has a unique ID.
- **Doctor\_ID**: is a fixed-length string with 6 characters.
- **CONSTRAINTS fk\_manager\_person\_id**: is FOREIGN KEY referencing to Person\_ID of PERSON table.
- **CONSTRAINTS fk\_doctor\_person\_id**: is FOREIGN KEY referencing to Doctor\_ID of DOCTOR table for the relationship “One doctor will be designated as the head of the camp”.

```
1 CREATE TABLE MEDICATION (
2     Unique_code        CHAR(7)          PRIMARY KEY,
3     Med_name           VARCHAR(30)      UNIQUE,
4     Effect             VARCHAR(100),
```

```
5      Price          INT,  
6      Expiration_Date DATE  
7  );
```

- **TABLE MEDICATION**

- **Unique\_code**: is a fixed-length string with 7 characters and set to PRIMARY KEY since each type of medication has a unique code. For example: MED0001, MED0002...
- **Med\_name**: is a variable-length string with maximum 30 characters and set to UNIQUE to ensure that all medication names are different, which makes no confusion for both patients and the camp.
- **Effect**: is a variable-length string with maximum 100 characters, indicating the effects of the medication.
- **Price**: is an integer number, indicating the price unit of the medication.
- **Expiration\_Date**: is a DATE type attribute, it means the expiry date of the medicine.

```
1  CREATE TABLE PATIENT (  
2      Patient_no      CHAR(6)          PRIMARY KEY,  
3      Patient_name     VARCHAR(30)     NOT NULL,  
4      ID_no           CHAR(9)          NOT NULL,  
5      Phone_no        CHAR(10),  
6      Gender          CHAR(1),  
7      Patient_address VARCHAR(50),  
8      Discharge_date  DATE,  
9      Nurse_ID        CHAR(6)          NOT NULL,  
10     Admission_date   DATE             NOT NULL,  
11     Location_before  VARCHAR(50),  
12     Staff_ID        CHAR(6)          NOT NULL,  
13     CONSTRAINT      Check_Gender CHECK (Gender = 'M' or Gender = 'F' or  
14     Gender IS NULL)  
15     CONSTRAINT      fk_patient_nurse_cares FOREIGN KEY (Nurse_ID)  
16     REFERENCES NURSE(Nurse_ID),  
17     CONSTRAINT      fk_patient_staff_admits FOREIGN KEY(Staff_ID)  
18     REFERENCES STAFF(Staff_ID)  
19 );  
20 CREATE TABLE NORMAL_SYMPTOM (  
21     Patient_no      CHAR(6),  
22     Normal_symptoms VARCHAR(50),  
23     PRIMARY KEY     (Patient_no, Normal_symptoms)  
24     CONSTRAINT      fk_normal_symptom_patient_no FOREIGN KEY  
25     (Patient_no)  
26     REFERENCES PATIENT(Patient_no)  
27     ON DELETE CASCADE  
28 );  
29 CREATE TABLE SERIOUS_SYMPTOM (  
30     Patient_no      CHAR(6),
```

```
31     Serious_symptoms    VARCHAR(50),
32     PRIMARY KEY        (Patient_no, Serious_symptoms)
33     CONSTRAINT          fk_serious_symptom_patient_no FOREIGN KEY
(Patient_no)
34                        REFERENCES PATIENT(Patient_no)
35                        ON DELETE CASCADE
36 );
37
38 CREATE TABLE PATIENT_COMORBIDITY (
39     Patient_no          CHAR(6),
40     Comorbidity          VARCHAR(50),
41     PRIMARY KEY         (Comorbidity, Patient_no),
42     CONSTRAINT          fk_comorbidity_patient_no FOREIGN KEY (Patient_no)
43                        REFERENCES PATIENT(Patient_no)
44                        ON DELETE CASCADE
45 );
```

- **TABLE PATIENT**

- **Patient\_no**: is a fixed-length string with 6 characters and set to PRIMARY KEY since each patient has a unique number. For example: PAT001, PAT001, etc.
- **Patient\_name**: is a variable-length string with maximum 30 characters and is a NOT NULL attribute. Since the patient name helps the camp staffs and the patient communicate with each other easily.
- **ID\_no**: is a fix-length string with 9 characters attribute, storing their national identity card number. This attribute is NOT NULL attribute since the camp want to know more information (if neccessary) related to ID card number.
- **Phone\_no**: is a fixed-length string with 10 characters, storing the patient's phone number.
- **Gender**: is indicated by 1-character string.
- **Patient\_address**: is a variable-length string with maximum 50 characters, indicating where the patient are living.
- **Discharge\_date**: is a DATE type attribute, indicating the discharge date from the camp of the patient.
- **Nurse\_ID**: Explained above.
- **Admission\_date**: is a DATE type attribute, indicating the admission date of the patient.
- **Location\_before**: is a variable-length string with maximum 50 characters, indicating where the patient are moved to the camp.
- **Staff\_ID**: Explained above.
- **CONSTRAINT Check\_Patient\_Gender**: is the same as Check\_Gender.
- **CONSTRAINT fk\_patient\_nurse\_cares** is FOREIGN KEY referencing to Nurse\_ID of NURSE table for the relationship “Each inpatient is taken care of by a nurse; a nurse can take care of many inpatients at the same time”.
- **CONSTRAINT fk\_patient\_staff\_admits** is FOREIGN KEY referencing to Staff\_ID of STAFF table for the relationship “A staff may admit many patients, and a patient is admitted by a staff”.

- **TABLES** NORMAL\_SYMPTOM, SERIOUS\_SYMPTOM and PATIENT\_COMORBIDITY

- **Patient\_no**: Explained above.
- **Normal\_symptoms**, **Serious\_symptoms** and **Serious\_symptoms**: are variable-length strings with maximum 50 characters and are respectively combined with the **Patient\_no** to form the PRIMARY KEY of NORMAL\_SYMPTOM, SERIOUS\_SYMPTOM and PATIENT\_COMORBIDITY tables.
- **CONSTRAINT fk\_normal\_symptom\_patient\_no**, **fk\_serious\_symptom\_patient\_no** and **fk\_comorbidity\_patient\_no**: are FOREIGN KEY referencing to **Patient\_no** of PATIENT table.  
ON DELETE CASCADE constraint is used to delete the rows from the NORMAL\_SYMPTOM, SERIOUS\_SYMPTOM and PATIENT\_COMORBIDITY tables automatically, when the corresponding rows from the PATIENT table are deleted.

```
1 CREATE TABLE ROOM (  
2     Room_no          CHAR(3)          PRIMARY KEY,  
3     Building_no      CHAR(3),  
4     Floor_no         SMALLINT,  
5     Capacity         SMALLINT,  
6     Room_Type        VARCHAR(12)  
7 );
```

- **TABLE** ROOM

- **Room\_no**: is a fixed-length string with 3 characters and set to PRIMARY KEY since each room has a unique room number. For example: 102, 304,...
- **Building\_no**: is a fixed-length string with 3 characters. For example: A04, B12,...
- **Floor\_no**: is a integer number, indicating the floor number
- **Capacity**: is a integer number, indicating the maximum patient slots the room can house.
- **Room\_type**: is a variable-length string with a maximum of 12 characters, indicating the type of room.

```
1 CREATE TABLE ASSIGNED_TO (  
2     Patient_no       CHAR(6),  
3     Room_no          CHAR(3)          NOT NULL,  
4     Staff_ID         CHAR(6),  
5     Patient_condition VARCHAR(30),  
6     PRIMARY KEY      (Patient_no, Staff_ID),  
7     CONSTRAINT       fk_assign_room_no FOREIGN KEY(Room_no)  
8                     REFERENCES ROOM(Room_no),  
9     CONSTRAINT       fk_assign_patient_no FOREIGN KEY(Patient_no)  
10                    REFERENCES PATIENT(Patient_no),  
11     CONSTRAINT       fk_assign_staff_ID FOREIGN KEY(Staff_ID)  
12                    REFERENCES STAFF(Staff_ID)
```

13 );

- **TABLE ASSIGNED\_TO**

- **Patient\_no** and **Staff\_ID**: are fixed-length strings with 6 characters and set to combination PRIMARY KEY.
- **Room\_no**: is a fixed-length string with 3 characters and is a NOT NULL attribute, since the camp want to know more information related to which patients are assigned to which rooms.
- **Patient\_condition**: is a variable-length string with maximum 30 characters, indicating the current condition of the patient.
- **CONSTRAINTS** **fk\_assign\_room\_no**, **fk\_assign\_patient\_no** and **fk\_assign\_staff\_ID** are FOREIGN KEY referencing to **Room\_no**, **Patient\_no** and **Staff\_ID** of **ROOM**, **PATIENT** and **STAFF** tables respectively for the relationship “*When admitted by a staff, a patient is assigned into a room based on his or her current condition*”

```
1 CREATE TABLE PA_LOCATION (  
2     Patient_no          CHAR(6),  
3     Staff_ID            CHAR(6),  
4     Locations           VARCHAR(50),  
5     PRIMARY KEY         (Patient_no, Staff_ID, Locations),  
6     CONSTRAINT          fk_location_assign FOREIGN KEY (Patient_no,  
7                                     Staff_ID)  
8                                     REFERENCES ASSIGNED_TO(Patient_no, Staff_ID)  
9                                     ON DELETE CASCADE  
10 );
```

- **TABLE PA\_LOCATION**

- **Patient\_no** and **Staff\_ID**: are fixed-length strings with 6 characters and set to combination PRIMARY KEY.
- **Locations**: is a variable-length string with maximum 50 characters and also set to combination PRIMARY KEY.
- **CONSTRAINTS** **fk\_location\_assign** is FOREIGN KEY referencing to **ASSIGNED\_TO** table. **ON DELETE CASCADE** constraint is used to delete the rows from the **PA\_LOCATIONS** table automatically, when the corresponding rows from the **ASSIGNED\_TO** table.

```
1 CREATE TABLE TREATS (  
2     Patient_no          CHAR(6),  
3     Doctor_ID           CHAR(6),  
4     Medication_code     CHAR(7),  
5     Start_date          DATE,  
6     End_date            DATE,  
7     Treat_result        VARCHAR(255),  
8     PRIMARY KEY         (Patient_no, Doctor_ID, Medication_code),  
9     CONSTRAINT          fk_treat_medication_code FOREIGN KEY  
10                        (Medication_code)
```



```

10 REFERENCES MEDICATION(Unique_code),
11 CONSTRAINT fk_treat_doctor_id FOREIGN KEY (Doctor_ID)
12 REFERENCES DOCTOR(Doctor_ID),
13 CONSTRAINT fk_treat_patient_no FOREIGN KEY (Patient_no)
14 REFERENCES PATIENT(Patient_no)
15 ON DELETE CASCADE
16 );

```

- **TABLE TREATS**

- **Patient\_no**, **Doctor\_ID** and **Medication\_code**: are a fixed-length strings, which are set to combination PRIMARY KEY.
- **Start\_date** and **End\_date**: are DATE type attributes, indicating the start date and end date of the treatment period respectively.
- **Treat\_result**: is a variable-length string with a maximum 255 characters, indicating the treatment result provided by the doctor.
- **CONSTRAINT fk\_treat\_doctor\_id**: is FOREIGN KEY referencing to **Doctor\_ID** of **DOCTOR** table for the relationship “A patient can receive treatment from at least one doctor. A doctor can treat many patients at the same time, or sometimes, he has no patients to treat”.
- **CONSTRAINT fk\_treat\_medication\_code**: is FOREIGN KEY referencing to **Unique\_code** of **MEDICATION** table for the relationship “The camp needs the details of each treatment such as treatment period (start date and end date), result, and medications.”
- **CONSTRAINT fk\_treat\_patient\_no** is FOREIGN KEY referencing to **Patient\_no** of **PATIENT** table for the relationship “The camp needs the details of each treatment such as treatment period (start date and end date), result, and medications.”  
**ON DELETE CASCADE** constraint is used to delete the rows from the **TREATS** table automatically, when the corresponding rows from the **PATIENT** table.

```

1 CREATE TABLE PATIENT_TEST_RESULTS (
2     Patient_no CHAR(6),
3     SP02 DECIMAL(5,2),
4     Respiratory_rate INT,
5     PCR_test CHAR(1),
6     PCR_ct_value INT,
7     Quick_test CHAR(1),
8     Quick_ct_value INT,
9     Warning_mark CHAR(1),
10    CONSTRAINT check_boolean CHECK ((PCR_test = 'T' or PCR_test =
11    'F' or PCR_test IS NULL) and (Quick_test = 'T' or Quick_test = 'F' or
12    Quick_test IS NULL) and (Warning_mark = 'T' or Warning_mark = 'F' or
13    Warning_mark IS NULL)),
14    PRIMARY KEY (Patient_no, SP02, Respiratory_rate, PCR_test,
15    Quick_test),
16    CONSTRAINT fk_test_patient_no FOREIGN KEY (Patient_no)
17    REFERENCES PATIENT(Patient_no)
18    ON DELETE CASCADE

```

15 );

- **TABLE PATIENT\_TEST\_RESULTS**

- **Patient\_no** Explained above.
- **SP02** is the number with 0.01 accuracy, indicating the percent saturation of oxygen in the blood. For example: 56.45, 60.45,...
- **Respiratory\_rate** is a INT type attribute, indicating the number of breaths per minute.
- **PCR\_test** and **Quick\_test** is 1-character strings ('T' or 'F'), indicating the test result True or False respectively.
- **PCR\_ct\_value** and **Quick\_ct\_value** are INT type attribute, indicating the corresponding cycle threshold value in case the test result is positive.
- **Warning\_mark** is 1-character string, ('T' or 'F'), indicating whether the patient needs a healthcare action from the doctors.
- **CONSTRAINT check\_boolean** is the same as **Check\_Gender**.
- **CONSTRAINT fk\_test\_patient\_no**: is the FOREIGN KEY referencing to the **Patient\_no** of the **PATIENT** table.  
ON DELETE CASCADE constraint is used to delete the rows from the **PATIENT\_TEST\_RESULTS** table automatically, when the corresponding rows from the **PATIENT** table.

### 2.1.2 Insert data

```

1  INSERT INTO PERSON VALUES('NUR001', '24 Le Loi Str, HCM City'
    'Nguyen Van A' , 'F', '0945519390');
2  INSERT INTO PERSON VALUES('NUR002', '69 Nguyen Binh Khiem Str, HCM City'
    'Thay Giao Ba' , 'M', '0838963738');
3  INSERT INTO PERSON VALUES('NUR003', '44/32 Phan Xich Long Str, HCM City'
    'Takahashi N' , 'M', '0904445454');
4  INSERT INTO PERSON VALUES('NUR004', '497 Hoa Hao Str, HCM City'
    'Nguyen Van A' , 'F', '0788757051');
5  INSERT INTO PERSON VALUES('NUR005', '168 Ly Thuong Kiet Str, HCM City'
    'Nobi Nobita' , 'M', '0789788124');
6  INSERT INTO PERSON VALUES('NUR006', '26 Le Lai Str, HCM City'
    'Nguyen Van B' , 'F', '0857871872');
7  INSERT INTO PERSON VALUES('NUR007', '6 Nguyen Trai Str, Dong Nai Province',
    'Thay Giao Bon' , 'M', '0386272293');
8  INSERT INTO PERSON VALUES('NUR008', '44 Nguyen Thuong Hien, HCM City'
    'Satoshi' , 'M', '0829397332');
9  INSERT INTO PERSON VALUES('NUR009', '497 30 Thang 4, Vinh Long Province'
    'Shin Nohara' , 'F', '0819739173');
10 INSERT INTO PERSON VALUES('NUR010', '168 Ly Thuong Kiet Str, Ha Noi'
    'Nobi Doraemon' , 'M', '0819379733');
11
12 INSERT INTO PERSON VALUES('DOC001', '1 Tran Hung Dao Str, HCM City'
    'Tran Thi B' , 'F', '0786543678');

```



```
13 INSERT INTO PERSON VALUES('DOC002', '268 Ly Thuong Kiet Str, HCM City' ,  
    'Nguyen Duc D' , 'M', '0338861579');  
14 INSERT INTO PERSON VALUES('DOC003', '5 Phan Xich Long Str, Da Nang City' ,  
    'Yamada N' , 'M', '0908925454');  
15 INSERT INTO PERSON VALUES('DOC004', '565 Phan Huy Ich Str, HCM City' ,  
    'Nguyen Thi Trau' , 'F', '0972377382');  
16 INSERT INTO PERSON VALUES('DOC005', '456 Le Thai To, Tien Giang Province' ,  
    'Tran Van N' , 'M', '0782396473');  
17  
18 INSERT INTO PERSON VALUES('STA001', '497 Hoa Hao Str, HCM City' ,  
    'Nguyen Van A' , 'M', '0683286282');  
19 INSERT INTO PERSON VALUES('STA002', '24 Ly Thai To Str, HCM City' ,  
    'Le Duan' , 'M', '0789253282');  
20 INSERT INTO PERSON VALUES('STA003', '57 Phan Xich Long Str, HCM City' ,  
    'Takeshi A' , 'F', '0917637429');  
21 INSERT INTO PERSON VALUES('STA004', '123 Nguyen Kim Str, HCM City' ,  
    'Nguyen Huu Truong' , 'F', '0891638217');  
22 INSERT INTO PERSON VALUES('STA005', '98 Le Thanh Tong Str, HCM City' ,  
    'Le Quang Tin' , 'M', '0978133782');  
23 INSERT INTO PERSON VALUES('STA006', '124 Nguyen Kim Str, HCM City' ,  
    'Nguyen Minh Tho' , 'F', '0829379372');  
24 INSERT INTO PERSON VALUES('STA007', '676 Le Thanh Tong Str, Ha Noi' ,  
    'Ly Quang Tin' , 'M', '0872903782');  
25  
26 INSERT INTO PERSON VALUES('VOL001', '215 Ngo Gia Tu Str, HCM City' ,  
    'Nguyen Van A' , 'M', '0965487364');  
27 INSERT INTO PERSON VALUES('VOL002', '781 3 thang 2 Str, HCM City' ,  
    'Luong Van T' , 'F', '0897685362');  
28 INSERT INTO PERSON VALUES('VOL003', '4 Phan Xich Long Str, HN City' ,  
    'Honda N' , 'F', '0897658436');  
29 INSERT INTO PERSON VALUES('VOL004', '15 Ngo Gia Tu Str, HCM City' ,  
    'Nguyen Van B' , 'M', '0812328123');  
30 INSERT INTO PERSON VALUES('VOL005', '119 Ngo Quyen Str, HCM City' ,  
    'Nguyen Van Binh' , 'M', '0987387388');  
31  
32 INSERT INTO PERSON VALUES('MAN001', '20 Cach Mang Thang Tam Str, HCM City',  
    'Nguyen Van A' , 'M', '0763872917');  
33 INSERT INTO PERSON VALUES('MAN002', '180 Nguyen Anh Thu Str, HCM City' ,  
    'Nha Bach D' , 'F', '0989873279');  
34 INSERT INTO PERSON VALUES('MAN003', '32 Tran Hung Dao Str, HCM City' ,  
    'Nakamura R' , 'M', '0989897678');  
35 INSERT INTO PERSON VALUES('MAN004', '44 Le Loi Str, HCM City' ,  
    'Tran Van Z' , 'F', '0943567854');  
36 INSERT INTO PERSON VALUES('MAN005', '12 Bach Dang Str, HCM City' ,  
    'Nguyen Thi Ba' , 'M', '0976767578');  
37  
38 INSERT INTO NURSE VALUES('NUR001');  
39 INSERT INTO NURSE VALUES('NUR002');
```



```
40 INSERT INTO NURSE VALUES('NUR003');
41 INSERT INTO NURSE VALUES('NUR004');
42 INSERT INTO NURSE VALUES('NUR005');
43 INSERT INTO NURSE VALUES('NUR006');
44 INSERT INTO NURSE VALUES('NUR007');
45 INSERT INTO NURSE VALUES('NUR008');
46 INSERT INTO NURSE VALUES('NUR009');
47 INSERT INTO NURSE VALUES('NUR010');
48
49 INSERT INTO DOCTOR VALUES('DOC001');
50 INSERT INTO DOCTOR VALUES('DOC002');
51 INSERT INTO DOCTOR VALUES('DOC003');
52 INSERT INTO DOCTOR VALUES('DOC004');
53 INSERT INTO DOCTOR VALUES('DOC005');
54
55 INSERT INTO STAFF VALUES('STA001');
56 INSERT INTO STAFF VALUES('STA002');
57 INSERT INTO STAFF VALUES('STA003');
58 INSERT INTO STAFF VALUES('STA004');
59 INSERT INTO STAFF VALUES('STA005');
60 INSERT INTO STAFF VALUES('STA006');
61 INSERT INTO STAFF VALUES('STA007');
62
63 INSERT INTO VOLUNTEER VALUES('VOL001');
64 INSERT INTO VOLUNTEER VALUES('VOL002');
65 INSERT INTO VOLUNTEER VALUES('VOL003');
66 INSERT INTO VOLUNTEER VALUES('VOL004');
67 INSERT INTO VOLUNTEER VALUES('VOL005');
68
69 INSERT INTO MANAGER VALUES('MAN001','DOC001');
70 INSERT INTO MANAGER(Manager_ID) VALUES('MAN002');
71 INSERT INTO MANAGER(Manager_ID) VALUES('MAN003');
72 INSERT INTO MANAGER(Manager_ID) VALUES('MAN004');
73 INSERT INTO MANAGER(Manager_ID) VALUES('MAN005');
74
75 INSERT INTO MEDICATION VALUES('MED0001', 'Bromhexin hydroclorid', 'cough'
, 2000, '20-10-2022');
76 INSERT INTO MEDICATION VALUES('MED0002', 'Paracetamol', 'fever,
headache', 3000, '08-11-2022');
77 INSERT INTO MEDICATION VALUES('MED0003', 'Terpin Codein', 'cough'
, 1000, '02-10-2022');
78 INSERT INTO MEDICATION VALUES('MED0004', 'Esphelaran',
'constipation', 3000, '20-10-2022');
79 INSERT INTO MEDICATION VALUES('MED0005', 'Mythyl Orange', 'cold'
, 2500, '22-12-2022');
80
```

```
81 INSERT INTO PATIENT VALUES('PAT001', 'Peter Tran' , '323692071',
    '0948297879', 'M', 'Bien Hoa City, Dong Nai Province' , '2020-11-20',
    'NUR001', '20-10-2020', 'Bach Khoa Dormitory' , 'STA001');
82 INSERT INTO PATIENT VALUES('PAT002', 'Ben Parker' , '573723683',
    '0893797192', 'F', '268 Ly Thuong Kiet Str, HCM City' , '2020-10-20',
    'NUR002', '25-09-2020', 'Bach Khoa University' , 'STA002');
83 INSERT INTO PATIENT VALUES('PAT003', 'Nguyen Bach Cuc' , '871238978',
    '0997187933', 'F', '67 Tran Hung Dao Str, HCM City' , NULL ,
    'NUR003', '01-11-2021', '23 Tran Hung Dao Str, HCM City', 'STA003');
84 INSERT INTO PATIENT VALUES('PAT004', 'Le The Duy' , '882772739',
    '0917936782', 'M', '127 Tran Quoc Toan Str, HCM City' , '2021-04-03',
    'NUR005', '25-03-2021', 'University of Economics' , 'STA005');
85 INSERT INTO PATIENT VALUES('PAT005', 'Truong Quang Thai' , '183934678',
    '0891731933', 'F', '635 Ly Thuong Kiet Str, HCM City' , '2021-06-30',
    'NUR004', '23-06-2021', 'Ly Thuong Kiet Co.op Mart' , 'STA006');
86 INSERT INTO PATIENT VALUES('PAT006', 'Nguyen Van A' , '723972033',
    '0781673811', 'F', '36 Nguyen Tri Phuong Str, HCM City', NULL ,
    'NUR006', '25-10-2021', 'Tu Du Hospital' , 'STA007');
87 INSERT INTO PATIENT VALUES('PAT007', 'Tran Van B' , '913797193',
    '0367481791', 'M', '23 Hai Ba Truong Str, HCM City' , '2021-05-03',
    'NUR008', '30-03-2021', 'Tien Giang Province' , 'STA004');
88 INSERT INTO PATIENT VALUES('PAT008', 'Nguyen Van A' , '742810139',
    '0183981613', 'M', '33 Dinh Tien Hoang Str, HCM City' , '2021-09-02',
    'NUR009', '07-08-2021', 'United State' , 'STA002');
89 INSERT INTO PATIENT VALUES('PAT009', 'Le Thi C' , '816387793',
    '0819738618', 'F', '29 Phu Dong Str, HCM City' , NULL ,
    'NUR007', '15-10-2021', 'Bach Khoa Dormitory' , 'STA003');
90 INSERT INTO PATIENT VALUES('PAT010', 'Bui Trong D' , '183834678',
    '0891379613', 'M', '99 Ngo Quyen Str, HCM City' , '2021-05-07',
    'NUR001', '01-05-2021', '56 Nguyen Trai Str, HCM City' , 'STA001');
91 INSERT INTO PATIENT VALUES('PAT011', 'Ly Van T' , '813781731',
    '0185714617', 'F', '94 Au Co Str, HCM City' , '2021-05-04',
    'NUR002', '20-04-2021', '6 Ly Tu Trong Str, HCM City' , 'STA002');
92 INSERT INTO PATIENT VALUES('PAT012', 'Tran Van V' , '123645631',
    '0312412879', 'M', '8 Tan Thuan Dong Str, HCM City' , '2021-05-20',
    'NUR001', '25-12-2021', 'Bach Khoa Dormitory' , 'STA001');
93
94
95 INSERT INTO NORMAL_SYMPTOM VALUES('PAT001', 'dry cough');
96 INSERT INTO NORMAL_SYMPTOM VALUES('PAT001', 'tiredness');
97 INSERT INTO NORMAL_SYMPTOM VALUES('PAT001', 'loss of smell');
98 INSERT INTO NORMAL_SYMPTOM VALUES('PAT002', 'fever');
99 INSERT INTO NORMAL_SYMPTOM VALUES('PAT002', 'cough');
100 INSERT INTO NORMAL_SYMPTOM VALUES('PAT003', 'discolouration of fingers');
101 INSERT INTO NORMAL_SYMPTOM VALUES('PAT003', 'sore throat');
102 INSERT INTO NORMAL_SYMPTOM VALUES('PAT004', 'aches and pains');
103 INSERT INTO NORMAL_SYMPTOM VALUES('PAT004', 'diarrhoea');
104 INSERT INTO NORMAL_SYMPTOM VALUES('PAT004', 'conjunctivitis');
```

```
105 INSERT INTO NORMAL_SYMPTOM VALUES('PAT005', 'loss of taste');
106 INSERT INTO NORMAL_SYMPTOM VALUES('PAT005', 'cough');
107 INSERT INTO NORMAL_SYMPTOM VALUES('PAT006', 'discolouration of toes');
108 INSERT INTO NORMAL_SYMPTOM VALUES('PAT007', 'sore throat');
109 INSERT INTO NORMAL_SYMPTOM VALUES('PAT007', 'fever');
110 INSERT INTO NORMAL_SYMPTOM VALUES('PAT008', 'tiredness');
111 INSERT INTO NORMAL_SYMPTOM VALUES('PAT008', 'loss of smell');
112 INSERT INTO NORMAL_SYMPTOM VALUES('PAT008', 'fever');
113 INSERT INTO NORMAL_SYMPTOM VALUES('PAT009', 'cough');
114 INSERT INTO NORMAL_SYMPTOM VALUES('PAT009', 'discolouration of fingers');
115 INSERT INTO NORMAL_SYMPTOM VALUES('PAT009', 'headache');
116 INSERT INTO NORMAL_SYMPTOM VALUES('PAT010', 'rash on skin');
117 INSERT INTO NORMAL_SYMPTOM VALUES('PAT010', 'discolouration of toes');
118 INSERT INTO NORMAL_SYMPTOM VALUES('PAT010', 'fever');
119 INSERT INTO NORMAL_SYMPTOM VALUES('PAT011', 'sore throat');
120 INSERT INTO NORMAL_SYMPTOM VALUES('PAT011', 'dry cough');
121 INSERT INTO NORMAL_SYMPTOM VALUES('PAT011', 'tiredness');
122 INSERT INTO NORMAL_SYMPTOM VALUES('PAT011', 'headache');
123
124 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT001', 'shortness of breath');
125 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT001', 'chest pain');
126 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT002', 'loss of speech');
127 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT002', 'shortness of breath');
128 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT004', 'chest pain');
129 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT005', 'shortness of breath');
130 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT006', 'chest pain');
131 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT008', 'loss of movement');
132 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT009', 'chest pain');
133 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT010', 'loss of movement');
134 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT011', 'shortness of breath');
135 INSERT INTO SERIOUS_SYMPTOM VALUES('PAT011', 'chest pain');
136
137 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT001', 'cancer');
138 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT002', 'chronic lung diseases');
139 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT003', 'diabetes');
140 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT005', 'chronic lung diseases');
141 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT005', 'cancer');
142 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT006', 'immunocompromised
state');
143 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT007', 'heart conditions');
144 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT008', 'immunocompromised
state');
145 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT010', 'heart conditions');
146 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT010', 'diabetes');
147 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT011', 'diabetes');
148 INSERT INTO PATIENT_COMORBIDITY VALUES('PAT011', 'cancer');
149
150 INSERT INTO ROOM VALUES ('200', 'B12', 2, 10, 'VIP');
```



```
151 INSERT INTO ROOM VALUES ('101', 'B12', 1, 30, 'Normal');
152 INSERT INTO ROOM VALUES ('102', 'B12', 1, 50, 'Normal');
153 INSERT INTO ROOM VALUES ('103', 'B12', 1, 40, 'Normal');
154 INSERT INTO ROOM VALUES ('304', 'D07', 3, 50, 'Normal');
155 INSERT INTO ROOM VALUES ('405', 'A04', 4, 20, 'Recuperation');
156 INSERT INTO ROOM VALUES ('406', 'A04', 4, 20, 'Recuperation');
157 INSERT INTO ROOM VALUES ('407', 'A04', 4, 20, 'Recuperation');
158 INSERT INTO ROOM VALUES ('308', 'C10', 3, 10, 'VIP');
159 INSERT INTO ROOM VALUES ('509', 'D08', 5, 50, 'Normal');
160
161 INSERT INTO ASSIGNED_TO VALUES ('PAT001', '101', 'STA001', 'Normal');
162 INSERT INTO ASSIGNED_TO VALUES ('PAT002', '101', 'STA002', 'Normal');
163 INSERT INTO ASSIGNED_TO VALUES ('PAT003', '200', 'STA003', 'Serious');
164 INSERT INTO ASSIGNED_TO VALUES ('PAT004', '308', 'STA003', 'Serious');
165 INSERT INTO ASSIGNED_TO VALUES ('PAT005', '102', 'STA003', 'Serious');
166 INSERT INTO ASSIGNED_TO VALUES ('PAT006', '405', 'STA005', 'Normal');
167 INSERT INTO ASSIGNED_TO VALUES ('PAT007', '407', 'STA006', 'Normal');
168 INSERT INTO ASSIGNED_TO VALUES ('PAT008', '103', 'STA007', 'Serious');
169 INSERT INTO ASSIGNED_TO VALUES ('PAT009', '102', 'STA004', 'Serious');
170 INSERT INTO ASSIGNED_TO VALUES ('PAT010', '308', 'STA002', 'Serious');
171 INSERT INTO ASSIGNED_TO VALUES ('PAT011', '509', 'STA005', 'Normal');
172
173 INSERT INTO PA_LOCATION VALUES('PAT001', 'STA001', 'Emergency room');
174 INSERT INTO PA_LOCATION VALUES('PAT002', 'STA002', 'Normal room');
175 INSERT INTO PA_LOCATION VALUES('PAT003', 'STA003', 'Recuperation room');
176 INSERT INTO PA_LOCATION VALUES('PAT004', 'STA003', 'Normal room');
177 INSERT INTO PA_LOCATION VALUES('PAT005', 'STA003', 'Emergency room');
178 INSERT INTO PA_LOCATION VALUES('PAT006', 'STA005', 'Normal room');
179 INSERT INTO PA_LOCATION VALUES('PAT007', 'STA006', 'Recuperation room');
180 INSERT INTO PA_LOCATION VALUES('PAT008', 'STA007', 'Normal room');
181 INSERT INTO PA_LOCATION VALUES('PAT009', 'STA004', 'Normal room');
182 INSERT INTO PA_LOCATION VALUES('PAT010', 'STA002', 'Recuperation room');
183 INSERT INTO PA_LOCATION VALUES('PAT011', 'STA005', 'Normal room');
184
185 INSERT INTO TREATS VALUES ('PAT001', 'DOC001', 'MED0001', '2022-10-20',
    '27-10-2022', 'Normal');
186 INSERT INTO TREATS VALUES ('PAT001', 'DOC001', 'MED0002', '2020-10-28',
    '05-10-2020', 'Normal');
187 INSERT INTO TREATS VALUES ('PAT001', 'DOC001', 'MED0003', '2021-10-06',
    '20-10-2021', 'Normal');
188 INSERT INTO TREATS VALUES ('PAT002', 'DOC002', 'MED0004', '2020-09-25',
    '02-10-2020', 'Normal');
189 INSERT INTO TREATS VALUES ('PAT002', 'DOC002', 'MED0005', '2021-10-03',
    '10-10-2021', 'Normal');
190 INSERT INTO TREATS VALUES ('PAT002', 'DOC002', 'MED0001', '2021-10-11',
    '01-11-2021', 'Normal');
191 INSERT INTO TREATS VALUES ('PAT003', 'DOC002', 'MED0002', '2021-11-01',
    '11-11-2021', 'Normal');
```

```
192 INSERT INTO TREATS VALUES ('PAT004', 'DOC003', 'MED0005', '2021-03-25',  
    '31-03-2021', 'Serious');  
193 INSERT INTO TREATS VALUES ('PAT004', 'DOC001', 'MED0001', '2021-04-01',  
    '03-04-2021', 'Normal');  
194 INSERT INTO TREATS VALUES ('PAT005', 'DOC002', 'MED0002', '2021-06-23',  
    '25-06-2021', 'Serious');  
195 INSERT INTO TREATS VALUES ('PAT005', 'DOC002', 'MED0003', '2021-06-26',  
    '28-06-2021', 'Serious');  
196 INSERT INTO TREATS VALUES ('PAT005', 'DOC002', 'MED0004', '2021-06-29',  
    '30-06-2021', 'Normal');  
197 INSERT INTO TREATS VALUES ('PAT006', 'DOC003', 'MED0005', '2021-10-25',  
    '25-11-2021', 'Normal');  
198 INSERT INTO TREATS VALUES ('PAT006', 'DOC003', 'MED0001', '2021-10-20',  
    '27-10-2021', 'Normal');  
199 INSERT INTO TREATS VALUES ('PAT007', 'DOC004', 'MED0002', '2021-03-30',  
    '15-04-2021', 'Normal');  
200 INSERT INTO TREATS VALUES ('PAT007', 'DOC004', 'MED0003', '2021-04-16',  
    '03-05-2021', 'Normal');  
201 INSERT INTO TREATS VALUES ('PAT008', 'DOC005', 'MED0004', '2021-08-07',  
    '27-08-2021', 'Normal');  
202 INSERT INTO TREATS VALUES ('PAT008', 'DOC005', 'MED0005', '2021-09-28',  
    '02-09-2021', 'Normal');  
203 INSERT INTO TREATS VALUES ('PAT009', 'DOC005', 'MED0001', '2021-10-15',  
    '20-10-2021', 'Serious');  
204 INSERT INTO TREATS VALUES ('PAT009', 'DOC005', 'MED0002', '2021-10-21',  
    '31-10-2021', 'Serious');  
205 INSERT INTO TREATS VALUES ('PAT010', 'DOC003', 'MED0003', '2021-05-01',  
    '02-05-2021', 'Serious');  
206 INSERT INTO TREATS VALUES ('PAT010', 'DOC002', 'MED0004', '2021-05-03',  
    '04-05-2021', 'Normal');  
207 INSERT INTO TREATS VALUES ('PAT010', 'DOC003', 'MED0005', '2021-05-05',  
    '07-05-2021', 'Normal');  
208 INSERT INTO TREATS VALUES ('PAT011', 'DOC001', 'MED0001', '2021-04-20',  
    '27-04-2021', 'Normal');  
209 INSERT INTO TREATS VALUES ('PAT011', 'DOC002', 'MED0002', '2021-04-28',  
    '30-04-2021', 'Normal');  
210 INSERT INTO TREATS VALUES ('PAT011', 'DOC003', 'MED0003', '2021-05-01',  
    '04-05-2021', 'Normal');  
211  
212 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT001', 97.88, 20, 'F', NULL,  
    'F', NULL, 'F');  
213 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT002', 99.12, 23, 'T', 35 ,  
    'T', 36 , 'F');  
214 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT003', 50.14, 25, 'F', NULL,  
    'F', NULL, 'T');  
215 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT004', 97.88, 19, 'T', 40 ,  
    'T', 50 , 'F');
```



```
216 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT005', 86.34, 17, 'T', 32 ,  
      'T', 40 , 'F');  
217 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT006', 50.88, 23, 'F', NULL,  
      'F', NULL, 'T');  
218 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT007', 98.34, 18, 'F', NULL,  
      'F', NULL, 'F');  
219 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT008', 97.54, 19, 'F', NULL,  
      'F', NULL, 'F');  
220 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT009', 50.78, 21, 'F', NULL,  
      'F', NULL, 'T');  
221 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT010', 96.34, 21, 'T', 33 ,  
      'T', 34 , 'F');  
222 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT011', 89.78, 22, 'F', NULL,  
      'F', NULL, 'F');  
223 INSERT INTO PATIENT_TEST_RESULTS VALUES ('PAT012', 90.69, 22, 'T', 30,  
      'T', 30, 'T');
```

## 2.2 Store Procedure / Function / SQL

### 2.2.1 UPDATE query

**Requirement:** Update patient PCR test to positive with null cycle threshold value for all patients whose admission date is from 01/09/2020.

We set the PCR\_test attribute to 'T' (meaning positive or true) and the PCR\_ct\_value attribute to NULL.

```
1 UPDATE PATIENT_TEST_RESULTS  
2 SET PCR_test = 'T',  
3     PCR_ct_value = NULL  
4 WHERE EXISTS (SELECT Admission_date FROM PATIENT WHERE Admission_date >=  
      '1-9-2020')  
5 ;
```

11 rows updated.

Based on our database, there are 11 rows updated. Check again with the command:

```
1 SELECT *  
2 FROM PATIENT_TEST_RESULTS  
3 ;
```



PATIENT_NO	SPO2	RESPIRATORY_RATE	PCR_TEST	PCR_CT_VALUE	QUICK_TEST	QUICK_CT_VALUE	WARNING_MARK
PAT001	97.88	20 T	(null)	F	(null)	F	
PAT002	99.12	23 T	(null)	T		36 F	
PAT003	50.14	25 T	(null)	F	(null)	T	
PAT004	97.88	19 T	(null)	T		50 F	
PAT005	86.34	17 T	(null)	T		40 F	
PAT006	50.88	23 T	(null)	F	(null)	T	
PAT007	98.34	18 T	(null)	F	(null)	F	
PAT008	97.54	19 T	(null)	F	(null)	F	
PAT009	50.78	21 T	(null)	F	(null)	T	
PAT010	96.34	21 T	(null)	T		34 F	
PAT011	89.78	22 T	(null)	F	(null)	F	
PAT012	90.69	22 T		30 T		30 T	

Only patient PAT012 whose Admission\_date is 20-05-2020 has not been updated.

### 2.2.2 SELECT query

**Requirement:** Select all the patient information whose name is 'Nguyen Van A'.

```
1 SELECT *
2 FROM PATIENT
3 WHERE Patient_name = 'Nguyen Van A'
4 ;
```

Note: The figure below is a .pdf file, so if the text is too small or blurry, please zoom in for a better view.

PATIENT_NO	PATIENT_NAME	ID_NO	PHONE_NO	GENDER	PATIENT_ADDRESS	DISCHARGE_DATE	NURSE_ID	ADMISSION_DATE	LOCATION_BEFORE	STAFF_ID
PAT006	Nguyen Van A	723972033	0781673811	F	36 Nguyen Tri Phuong Str, HCM City	(null)	NUR006	25-10-2021	Tu Du Hospital	STA007
PAT008	Nguyen Van A	742810139	0183981613	M	33 Dinh Tien Hoang Str, HCM City	02-09-2021	NUR009	07-08-2021	United State	STA002

### 2.2.3 Function

**Requirement:** Write a function to calculate the testing for each patient.

- Input: Patient ID.
- Output: A list of testing.

```
1 CREATE OR REPLACE FUNCTION get_detail_patient
2 (Patient_ID in PATIENT_TEST_RESULTS.Patient_no%TYPE)
3 RETURN SYS_REFCURSOR
4 AS
5     o_cursor SYS_REFCURSOR;
6 BEGIN
7     OPEN o_cursor FOR
8         SELECT *
9         FROM PATIENT_TEST_RESULTS
10        WHERE PATIENT_TEST_RESULTS.Patient_no = Patient_ID;
11    RETURN o_cursor;
```



```
12 END
13 ;
```

```
1 SELECT get_detail_patient('PAT001') FROM DUAL;
```

```
{<PATIENT_NO=PAT001,SPO2=96.69,RESPIRATORY_RATE=20,PCR_TEST=F,
PCR_CT_VALUE=null,QUICK_TEST=F,QUICK_CT_VALUE=null,WARNING_MARK
=F>,<PATIENT_NO=PAT001,SPO2=97.88,RESPIRATORY_RATE=20,PCR_TEST=
T,PCR_CT_VALUE=null,QUICK_TEST=F,QUICK_CT_VALUE=null,
WARNING_MARK=F>,}
```

#### 2.2.4 Procedure

**Requirement:** Write a procedure to sort the nurses in decreasing number of patients he/she takes care in a period of time.

- Input: Start date, End date.
- Output: A list of sorting nurses.

We create a **PROCEDURE** sort\_nurse\_desc:

```
1 CREATE OR REPLACE PROCEDURE sort_nurse_desc
2 (start_date IN DATE, end_date IN DATE, cursorParam OUT SYS_REFCURSOR)
3 IS
4 BEGIN
5     OPEN cursorParam FOR
6         SELECT Nurse_ID AS Nurse, COUNT(Patient_no) AS Num_patient
7         FROM PATIENT
8         WHERE Admission_date >= start_date AND (Discharge_date <= end_date
9         OR Discharge_date IS NULL)
10        GROUP BY Nurse_ID
11        ORDER BY COUNT(Patient_no) DESC;
12 END
13 ;
```

Here we choose start\_date='2020-1-1' and end\_date='2022-1-1'. To run it, we can use these commands:

```
1 var c refcursor;
2 execute sort_nurse_desc('2020-1-1','2022-1-1',:c)
3 print c;
```

```
NURSE  NUM_PATIENT
-----
NUR001          3
```



```
NUR002          2
NUR009          1
NUR007          1
NUR004          1
NUR006          1
NUR003          1
NUR005          1
NUR008          1
9 rows selected.
```

The output should display the total NUM\_PATIENT equal to 12.

## 2.3 Building Application

The source code of this assignment is available [here](#).

- In Oracle SQL Developer, our database is QCD (Quarantine Camp Database).
- In XAMPP (MariaDB), our database is qcd.

### 2.3.1 Create user

**Requirement:** Log in to the database with DBA privileges such as SYS / SYSTEM ....., create a user named Manager and assign all access rights to this user.

#### 2.3.1.a Oracle SQL Developer

From SYS we create a QCD\_MANAGER user and grant it DBA permission.

```
1 CREATE USER QCD_MANAGER IDENTIFIED BY 1;
2 GRANT CREATE SESSION TO QCD_MANAGER;
3 GRANT DBA TO QCD_MANAGER;
```

```
User QCD_MANAGER created.
Grant succeeded.
Grant succeeded.
```

From QCD we grant DBA to QCD\_MANAGER.

```
1 GRANT DBA TO QCD_MANAGER;
```

```
Grant succeeded.
```

From now, QCD\_MANAGER can manager QCD Database.

```
1 SELECT
2     D.Doctor_ID AS "Doctor ID",
3     P.Person_name AS "Doctor Name",
4     P.Phone_no AS "Phone Number",
5     P.Gender,
```



```
6      P.Person_address AS "Address"  
7  FROM QCD.DOCTOR D JOIN QCD.PERSON P ON (D.Doctor_ID = P.Person_ID)  
8  ;
```

Doctor ID	Doctor Name	Phone Number	GENDER	Address
DOC001	Tran Thi B	0786543678	F	1 Tran Hung Dao Str, HCM City
DOC002	Nguyen Duc D	0338861579	M	268 Ly Thuong Kiet Str, HCM City
DOC003	Yamada N	0908925454	M	5 Phan Xich Long Str, Da Nang City
DOC004	Nguyen Thi Trau	0972377382	F	565 Phan Huy Ich Str, HCM City
DOC005	Tran Van N	0782396473	M	456 Le Thai To, Tien Giang Province

### 2.3.1.b MariaDB

In [phpMyAdmin](#), we create a table `user_manager`:

```
1  CREATE TABLE `user_manager` (  
2    `id` int(4) NOT NULL,  
3    `username` varchar(255) NOT NULL,  
4    `password` varchar(255) NOT NULL  
5  ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;  
6  
7  ALTER TABLE `user_manager`  
8    ADD PRIMARY KEY (`id`);  
9  COMMIT;
```

Then we create an account with:

- `id=1`
- `username='admin'`
- `password='123456'`

```
1  INSERT INTO `user_manager` (`id`, `username`, `password`) VALUES  
2  (1, 'admin', '123456');
```

We use this account to login to our database in `index.php`.

```
1  <?php  
2  $ret=mysqli_query($con,"SELECT * FROM user_manager WHERE  
   username='".$$_POST['username']."' and password='".$$_POST['password']."'");  
3  $num=mysqli_fetch_array($ret);  
4  
5  if($num>0)  
6  {  
7      $extra="dashboard.php";//  
8      $_SESSION['login']=$$_POST['username'];  
9      $_SESSION['id']=$num['id'];  
10     $host=$_SERVER['HTTP_HOST'];  
11     $uri=rtrim(dirname($_SERVER['PHP_SELF']),'/\\');
```

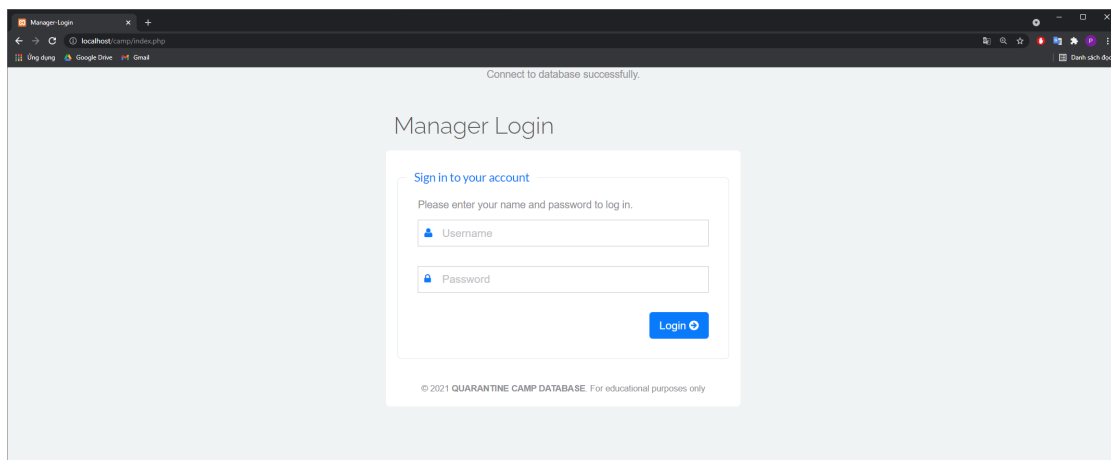
```
12     header("location:http://$host$uri/$extra");
13     exit();
14 }
15 else
16 {
17     $_SESSION['errmsg']="Invalid username or password.";
18     $extra="index.php";
19     $host = $_SERVER['HTTP_HOST'];
20     $uri = rtrim(dirname($_SERVER['PHP_SELF']),'/\\');
21     header("location:http://$host$uri/$extra");
22     exit();
23 }
24 ?>
```

### 2.3.2 Requirement function

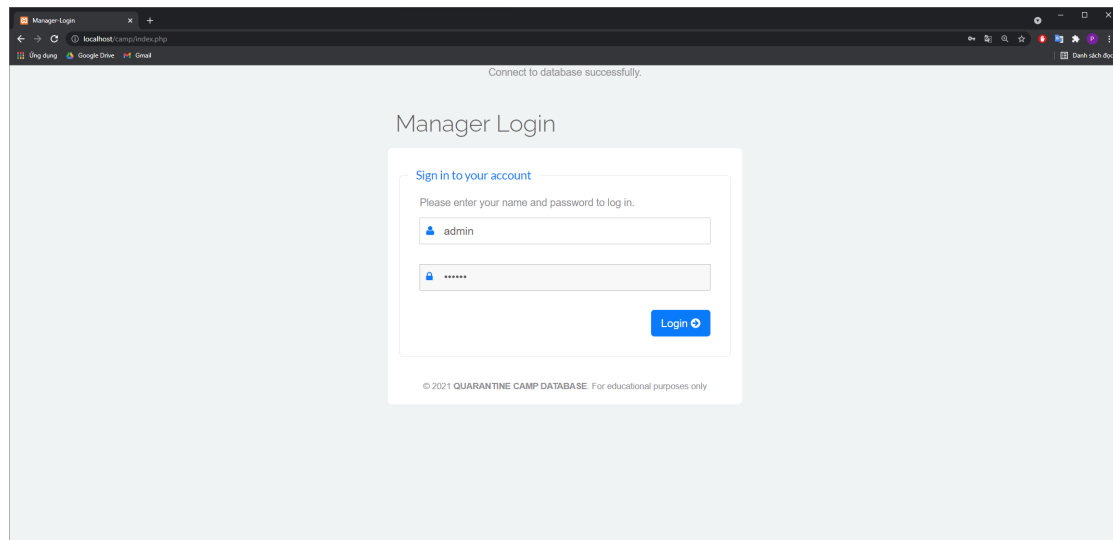
#### 2.3.2.a Log in / Log out function

**Requirement:** Log in, log out (enter the user name/password for Manager account to log in/out).

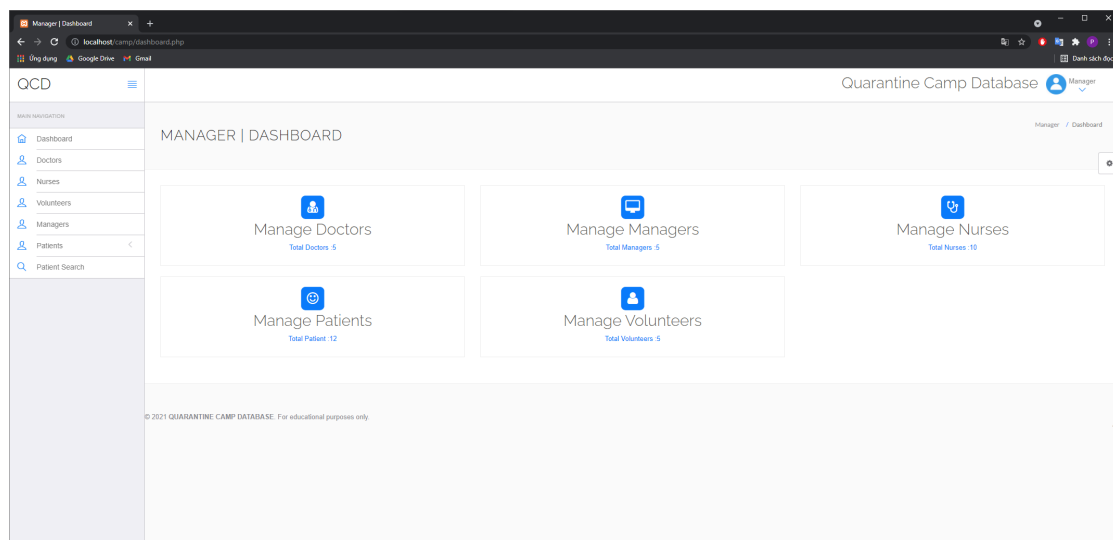
- Our interface for login function:



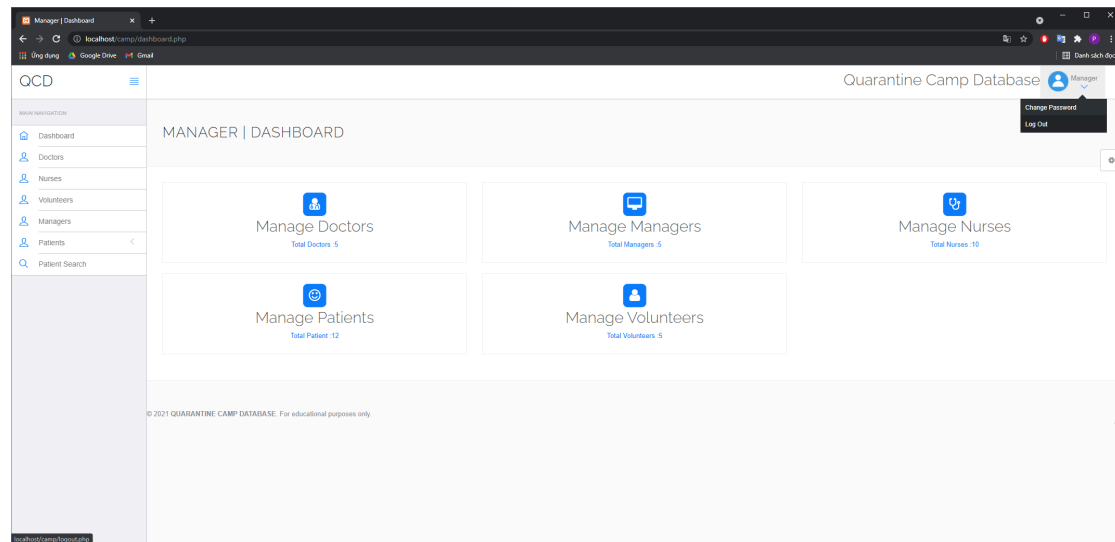
- Note that if the connection to the database is established successfully, there will be a message in the top center. And the same for the failed case. Here we login by using account **admin**:



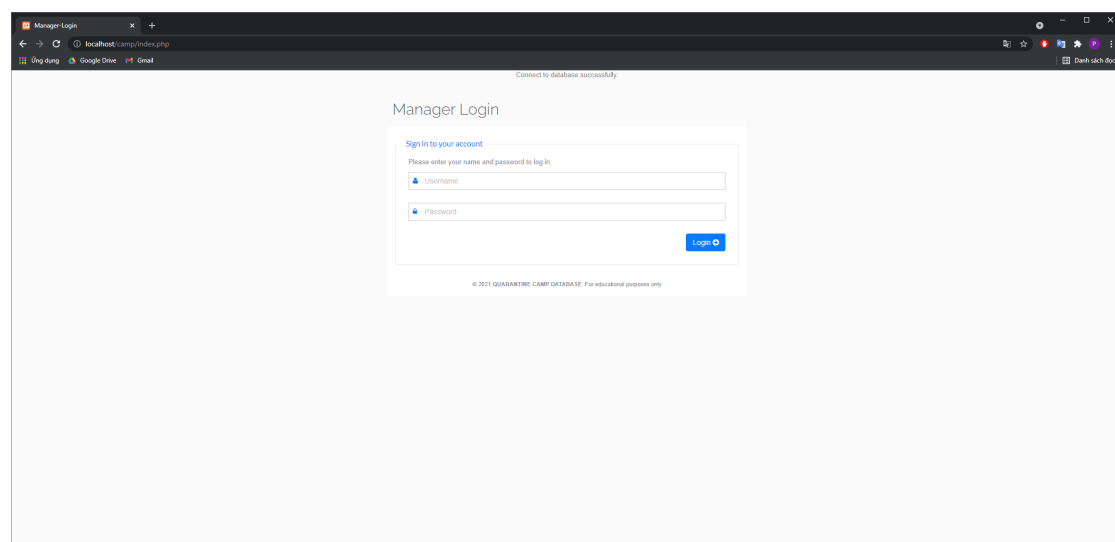
- Click on **Login** button, if the user is successfully logged in then we can see the dashboard. Otherwise, it will display **Invalid username or password**. Luckily we can see the dashboard as well in the figure below:



- To log out, the user clicks on the Manager icon in the upper left and then selects **Log Out**.



- Then we back to `index.php`:



### 2.3.2.b Search function

**Requirement:** Search patient information: Search results include the name, phone number and information about his/her comorbidities.

- First we choose **Patient Search** located at the last line in the toolbar on the left, and we will get the interface as shown in the image below.





The screenshot shows the 'Quarantine Camp Database' Manager interface. On the left is a 'MAIN NAVIGATION' sidebar with links to Dashboard, Doctors, Nurses, Volunteers, Managers, Patients, and Patient Search. The main content area is titled 'MANAGER | SEARCH PATIENTS'. It features a search bar labeled 'Search by Name/Mobile No.' with a 'Search' button below it. The interface is clean and modern, with a light blue and grey color scheme.

- Then select the blank line and enter information such as the patient's name or phone number to search. For example, if you want to find a patient with the full name **Nguyen Van A**, after entering the name, information about name, phone number and information about his/her comorbidities will be displayed as shown below.

This screenshot shows the same interface as the previous one, but with search results displayed. The search bar contains the text 'nguyen van a'. Below the search bar, a table titled 'Result against "nguyen van a" keyword' displays the following data:

#	Patient ID	Patient Name	Phone Number	Gender	Patient Comorbidity	Detail
1.	PAT006	Nguyen Van A	0781673811	F	immunocompromised state	
2.	PAT008	Nguyen Van A	0183981613	M	immunocompromised state	

- If you can not remember the full name but only remember the last name or 1 character, that is okay, just enter it and the system will find out who has that character in their name. For example, if you only remember the patient **Nguyen Van A** with the name **Van** in the name, just search for the word "**Van**" and you will get patients with "**Van**" in the name or you just remember each of the names. If that person has the letter A, when clicking on it,



the system will display all the names with the letter A in the name. If the search fails the system will output the text “No record found against this search”.

QCD

MAIN NAVIGATION

Dashboard

Doctors

Nurses

Volunteers

Managers

Patients

Patient Search

Quarantine Camp Database

Manager

MANAGER | SEARCH PATIENTS

Manager / Search Patients

Search by Name/Mobile No.

van

Search

Result against "van" keyword

#	Patient ID	Patient Name	Phone Number	Gender	Patient Comorbidity	Detail
1.	PAT011	Ly Van T	0185714617	F	cancer	<a href="#">Detail</a>
2.	PAT011	Ly Van T	0185714617	F	diabetes	<a href="#">Detail</a>
3.	PAT007	Tran Van B	0367481791	M	heart conditions	<a href="#">Detail</a>
4.	PAT006	Nguyen Van A	0781673811	F	immunocompromised state	<a href="#">Detail</a>
5.	PAT008	Nguyen Van A	0183981613	M	immunocompromised state	<a href="#">Detail</a>

QCD

MAIN NAVIGATION

Dashboard

Doctors

Nurses

Volunteers

Managers

Patients

Patient Search

Quarantine Camp Database

Manager

Search by Name/Mobile No.

A

Search

Result against "A" keyword

#	Patient ID	Patient Name	Phone Number	Gender	Patient Comorbidity	Detail
1.	PAT001	Peter Tran	0948297879	M	cancer	<a href="#">Detail</a>
2.	PAT005	Truong Quang Thai	0891731933	F	cancer	<a href="#">Detail</a>
3.	PAT011	Ly Van T	0185714617	F	cancer	<a href="#">Detail</a>
4.	PAT002	Ben Parker	0893797192	F	chronic lung diseases	<a href="#">Detail</a>
5.	PAT005	Truong Quang Thai	0891731933	F	chronic lung diseases	<a href="#">Detail</a>
6.	PAT003	Nguyen Bach Cuc	0997187933	F	diabetes	<a href="#">Detail</a>
7.	PAT011	Ly Van T	0185714617	F	diabetes	<a href="#">Detail</a>
8.	PAT007	Tran Van B	0367481791	M	heart conditions	<a href="#">Detail</a>
9.	PAT006	Nguyen Van A	0781673811	F	immunocompromised state	<a href="#">Detail</a>
10.	PAT008	Nguyen Van A	0183981613	M	immunocompromised state	<a href="#">Detail</a>



The screenshot shows the 'Quarantine Camp Database' Manager interface. On the left is a sidebar with 'MAIN NAVIGATION' including Dashboard, Doctors, Nurses, Volunteers, Managers, Patients, and Patient Search. The main area is titled 'MANAGER | SEARCH PATIENTS'. It features a search bar labeled 'Search by Name/Mobile No.' with the text 'Z' entered. Below the search bar is a 'Search' button. The results section is titled 'Result against "Z" keyword' and shows a table with columns: #, Patient ID, Patient Name, Phone Number, Gender, Patient Comorbidity, and Detail. The table contains one row: 'No record found against this search'.

- But for phones, you must enter it correctly and completely otherwise the system will output "No record found against this search".

The screenshot shows the same 'Quarantine Camp Database' Manager interface. The search bar now contains the phone number '0781673812'. The results section is titled 'Result against "0781673812" keyword' and shows a table with the same columns as the previous screenshot. The table contains one row: 'No record found against this search'.

### 2.3.2.c Add function

**Requirement:** Add information for a new patient.

- Select **Patient** on the last line in the left toolbar, after appearing 2 command lines, select **Add Patient** in the first line. We get the following interface.



The screenshot shows a web application interface for the 'Quarantine Camp Database'. On the left is a sidebar with a 'MAIN NAVIGATION' menu containing links for Dashboard, Doctors, Nurses, Volunteers, Managers, Patients (selected), Add Patient, View Patient List, and Patient Search. The main content area is a form titled 'Patient Name' with the following fields: Patient Name (placeholder: Enter Patient Name, e.g. Pet), Patient ID (placeholder: Enter Patient ID, e.g. 1234), Patient Phone (placeholder: Enter Patient Phone, e.g. 1234), Patient Gender (placeholder: Enter Patient Gender, e.g. M), Patient Address (placeholder: Enter Patient Address, e.g. 268 Ly Thuong Kiet Str), Admission Date (placeholder: dd/mm/yyyy), Discharge Date (placeholder: dd/mm/yyyy), Location Before (placeholder: e.g. HCMUT), Staff ID (placeholder: e.g. STA000), and Nurse ID (placeholder: e.g. NUR000). A 'Submit' button is at the bottom of the form. The top right of the page shows 'Quarantine Camp Database' and a user profile icon labeled 'Manager'.

### 2.3.2.d List function

**Requirement:** List details of all testing which belong to a patient.

- Select the **Patient** line on the left toolbar, after appearing 2 command lines (**Add Patient** and **View Patient List**), you click on the **View Patient List** line, then we get the following interface.

The screenshot shows the 'MANAGER | DASHBOARD' interface. The sidebar is identical to the previous screenshot, with 'Patients' selected. The main content area displays five management cards: 'Manage Doctors' (Total Doctors: 5), 'Manage Managers' (Total Managers: 5), 'Manage Nurses' (Total Nurses: 10), 'Manage Patients' (Total Patient: 12), and 'Manage Volunteers' (Total Volunteers: 5). Each card has a corresponding icon. The top right of the dashboard shows 'Manager / Dashboard'. At the bottom, there is a copyright notice: '© 2021 QUARANTINE CAMP DATABASE. For educational purposes only.'



QCD

MAIN NAVIGATION

Dashboard

Doctors

Nurses

Volunteers

Managers

Patients

Patient Search

Quarantine Camp Database

Manager

MANAGER | VIEW PATIENT LIST

Manager / View Patient List

List Patients

#	Patient No.	Patient Name	Phone Number	Gender	Admission Date	Action
1.	PAT001	Peter Tran	0948297879	M	2020-10-20	
2.	PAT002	Ben Parker	0893797192	F	2020-09-25	
3.	PAT003	Nguyen Bach Cuc	0997187933	F	2021-11-01	
4.	PAT004	Le The Duy	0917936782	M	2021-03-25	
5.	PAT005	Truong Quang Thai	0891731933	F	2021-06-23	
6.	PAT006	Nguyen Van A	0781673811	F	2021-10-10	
7.	PAT007	Tran Van B	0367481791	M	2021-03-30	
8.	PAT008	Nguyen Van A	0183981613	M	2021-08-07	
9.	PAT009	Le Thi C	0819738618	F	2021-10-15	
10.	PAT010	Bui Trong D	0891379613	M	2021-05-01	
11.	PAT011	Ly Van T	0185714617	F	2021-04-20	
12.	PAT012	Tran Van V	0312412879	M	2021-12-25	

### 2.3.2.e Full detailed-report function

**Requirement:** Make a report that provides full information about the patient including demographic information, comorbidities, symptoms, testing, and treatment.

- To see the details of all testing of a patient, click on the “eye symbol” which is below the **Action** column on the right side. Then, you can see the result as pictures below which are the details of a patient whose name is “Ben Parker”.

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MAIN NAVIGATION

Dashboard

Doctors

Nurses

Volunteers

Managers

Patients

Add Patient

View Patient List

Patient Search

Quarantine Camp Database

Manager

Details Patients

Medical Record

Patient Number	PAT002	Phone Number	0893797192
Patient Name	Ben Parker	Admission Date	2020-09-25
Patient ID	573723683	Discharge ID	2020-10-20
Patient Gender	F	Staff ID	STA002
Patient Address	268 Ly Thuong Kiet Str, HCM City	Location Before	Bach Khoa University

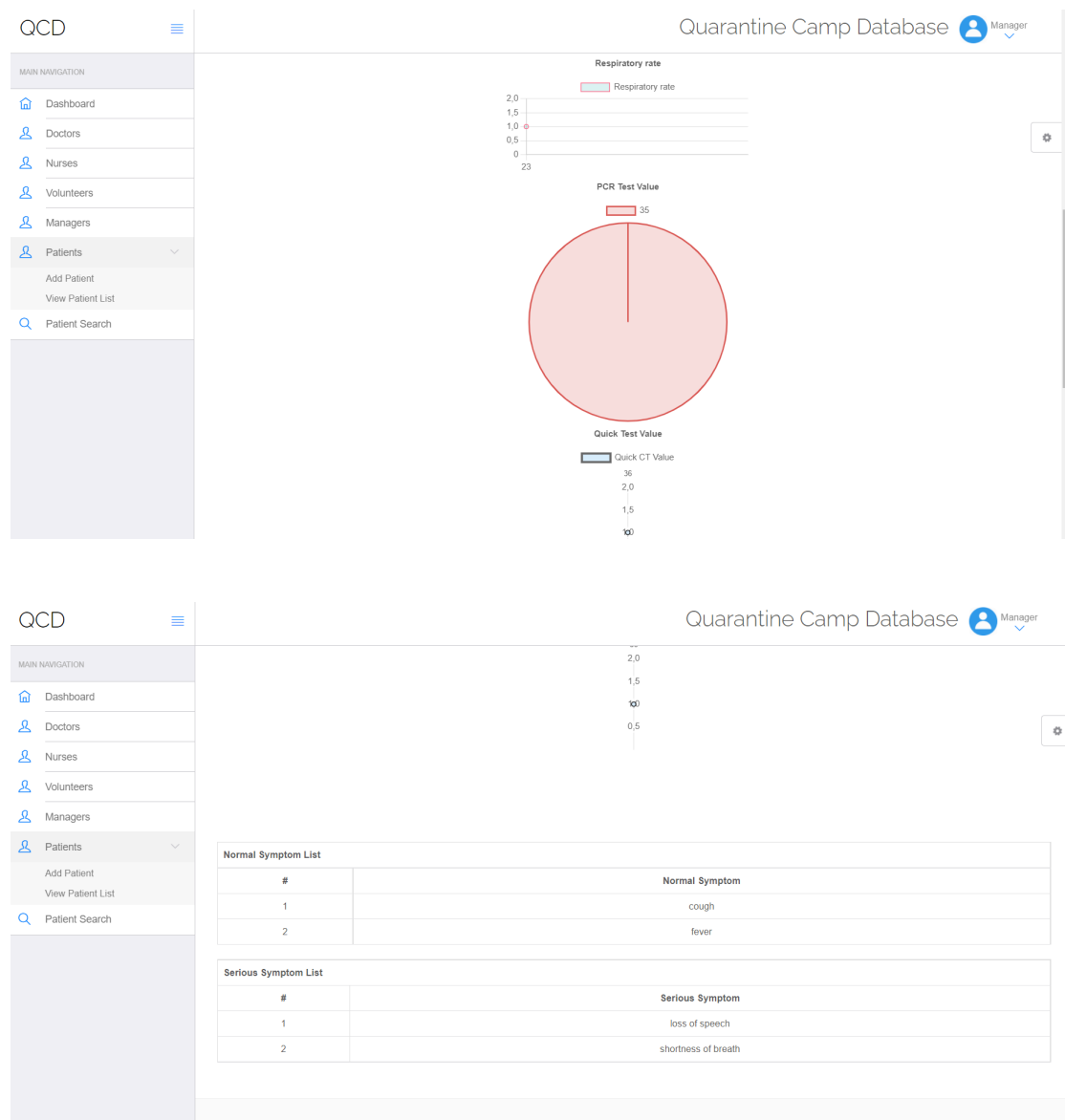
Medical Testing History

#	SPO2	Respiratory Rate	PCR Test	PCR CT Value	Quick Test	Quick CT Value	Warning Mark
1	99.12	23	T	35	T	36	F

\*Note: If the PCR Test (or the Quick Test) is F (False) the two corresponding value columns will be left blank.

Medical Treameant History

#	Doctor ID	Medication Code	Start Date	End Date	Result
1	DOC002	MED0001	2021-10-11	2021-11-01	Normal
2	DOC002	MED0004	2020-09-25	2020-10-02	Normal
3	DOC002	MED0005	2021-10-03	2021-10-10	Normal



## References

- [1] Elmasri, Navathe (2015), Fundamentals of Database Systems, 7th ed.