IIT PALAKKAD

Indian Institute of Technology, Palakkad
Database Management System

Project: Hospital Management System

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Team - 1

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Describing entities and relationships

Hospital Management system involves taking care of multiple things. First of them is to recognize the various **entities** that we are going to introduce in the database and the **relation** among them.

We have identified the following entities to be included in the database:

1. **Employees**: contains the information of all the employees in the hospital.

Attribute	**Datatype**
ID	*CHAR*
Name	*VARCHAR*
Contact	*INT*
Designation	*VARCHAR*
Email	*VARCHAR*
Address	*VARCHAR*
Salary	*FLOAT*

2. **Doctors:** stores the necessary information of the doctors of the hospital.

Attribute	**Datatype**
ID	*CHAR*
Name	*VARCHAR*
Contact	*INT*
Specialisation	*VARCHAR*
Visiting_hours	*VARCHAR*
Office_no	*CHAR*

3. **Management_staff**: stores the basic information of the management staff

Attribute	**Datatype**

ID	*CHAR*
Name	*VARCHAR*
Contact	*INT*
Shift	*VARCHAR*

4. **Nurses:** stores the information of the nursing staff to facilitate seamless allotment.

Attribute	Datatype
ID	*CHAR*
Name	*VARCHAR*
Contact	*INT*
Shift	*VARCHAR*

5. **Departments:** contains information of various departments in the hospital

Attribute	Datatype
Dep_id	*CHAR*
Dep_name	*VARCHAR*
No_of_employees	*INT*

6. **Medicines:** serves as the inventory management table for the medicines

Attribute	Datatype
Med_id	*CHAR*
Med_name	*VARCHAR*
Price_per_unit	*FLOAT*
Units	*INT*
Med_type	*VARCHAR*

7. **Payments:** table to store information on the payments

Attribute	Datatype
Payment_id	*CHAR*
Payment_date	*VARCHAR*
Payment_time	*VARCHAR*

Amount	*FLOAT*
Payment_id	*CHAR*

8. **Appointments:** contains information on the various appointments

Attribute	Datatype
Payment_id	*CHAR*
Doctor_id	*CHR*
Time_slot	*VARCHAR*

9. **Rooms:** table to store information about the different rooms in the hospital premises

Attribute	Datatype
Room_id	*CHAR*
Dept_id	*CHAR*
Room_type	*VARCHAR*

10. **Patients:** table to store information of various patients

Attribute	Datatype
Patient_id	*CHAR*
Name	*VARCHAR*
Contact	*INT*
Address	*VARCHAR*
DOB	*VARCHAR*
Doctor	*CHAR*
Room	*CHAR*

11. **Users:** table to store credentials of the staff allowed access to the hospital portal

Attribute	Datatype
Login_id	*VARCHAR*
Password	*VARCHAR*
Name	*VARCHAR*

Phone	*INT*
Mail	*VARCHAR*
Access_level	*VARCHAR*

We have also identified the following relationships for our DBMS:

1. **Is a:** Relationship between entities for staff members(viz., *Doctors, Nurses*, *Management_staff*, *Users*) with *Employee* table

2. **Belongs:** Relationship connecting between *Doctors* and their respective *Departments*

3. **Treats:** Relationship to connect the *Doctors/Nurses* table with respective *Patients*

4. **Assigned to:** connects the *Patients* table with the *Rooms* table

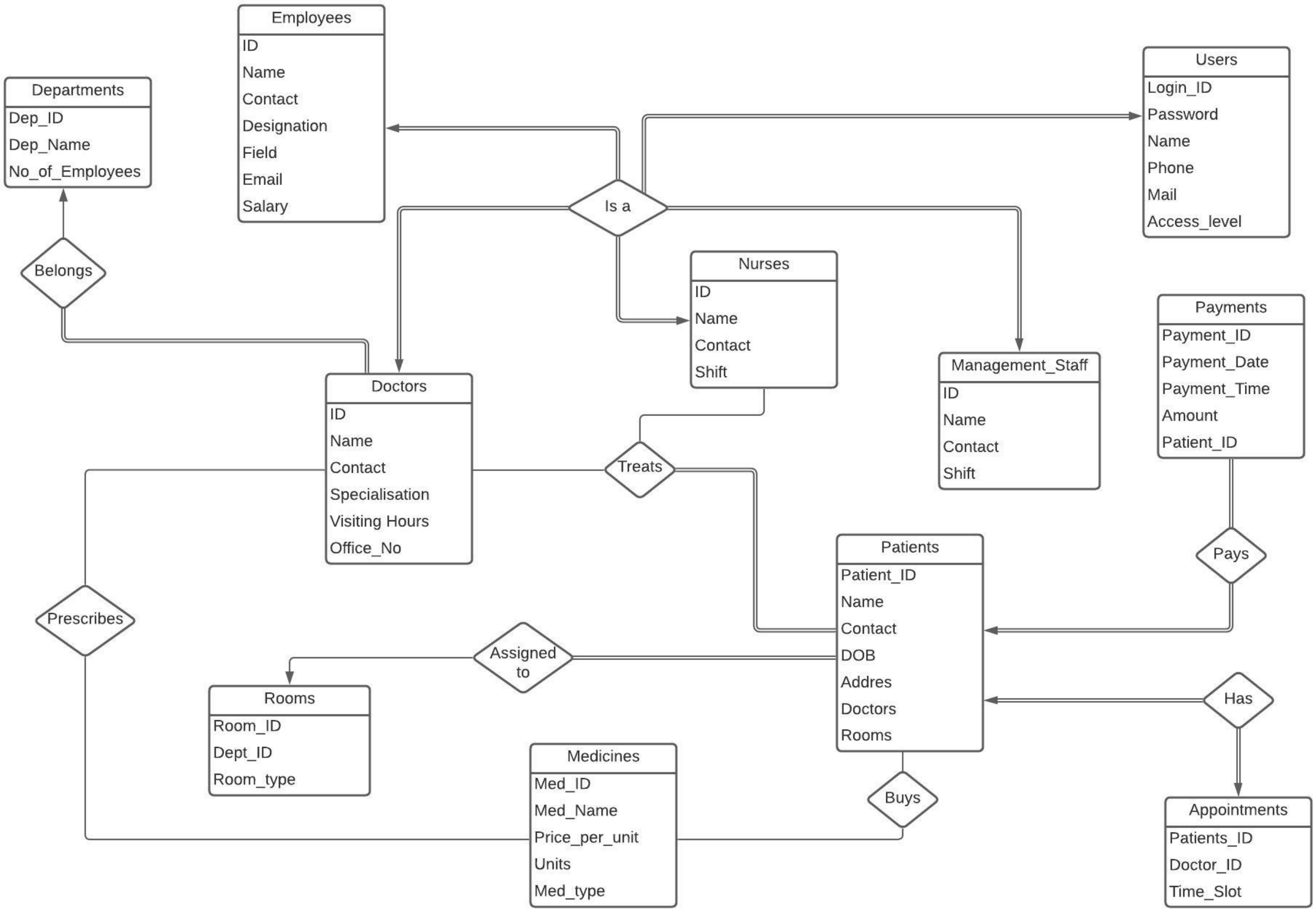
5. **Has:** Relates patients from *Patients* table to corresponding entry in the *Appointments* table

6. **Prescribes**: Relationship between *Doctors* table and *Medicines* table for the prescription for the patient.

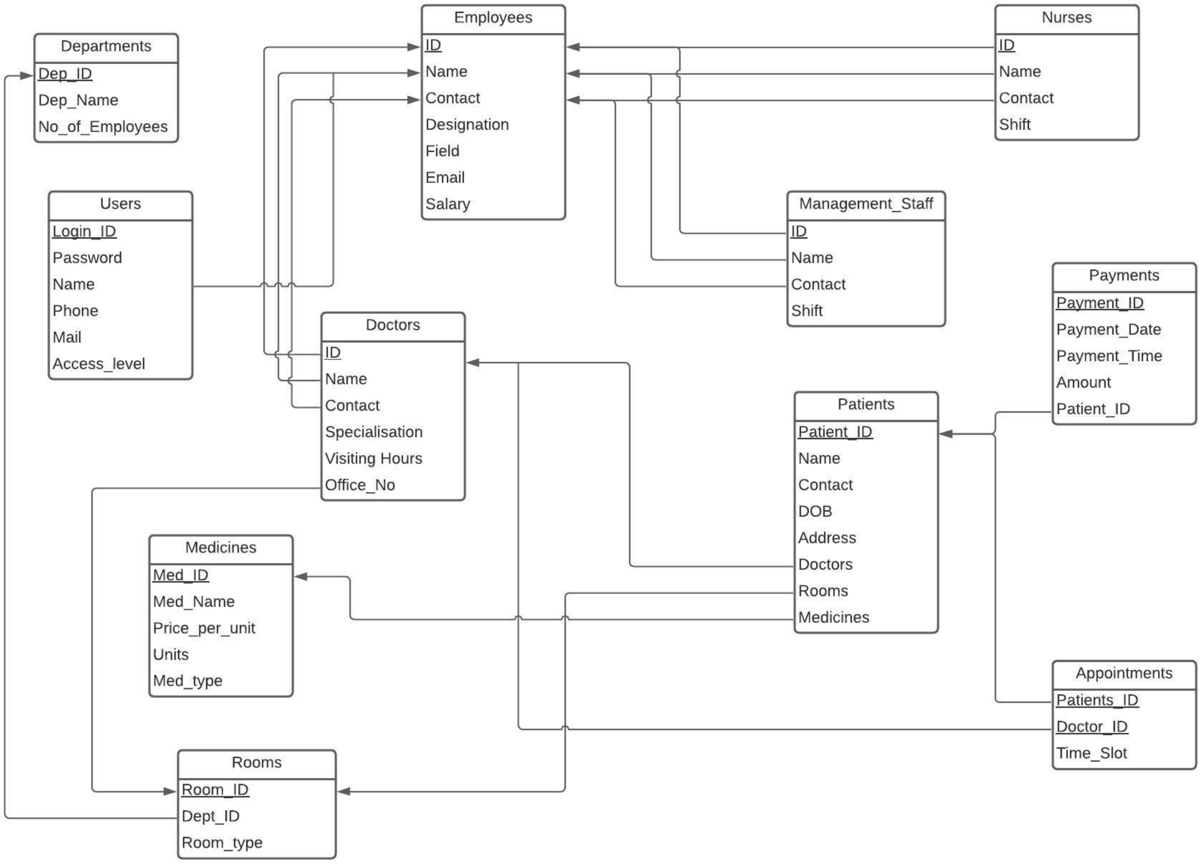
7. **Buys:** Relationship between *Patients* table and *Medicines* table

8. **Pays**: Relates patients from *Patients* table to their corresponding payment in the *Payments* table

Entity Relationship Diagram:



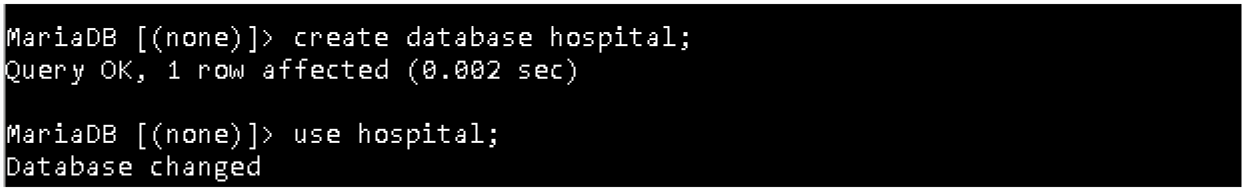
Schema Diagram



Code Snippets

Following are the screenshots taken while creating the required entities for the hospital database management system.

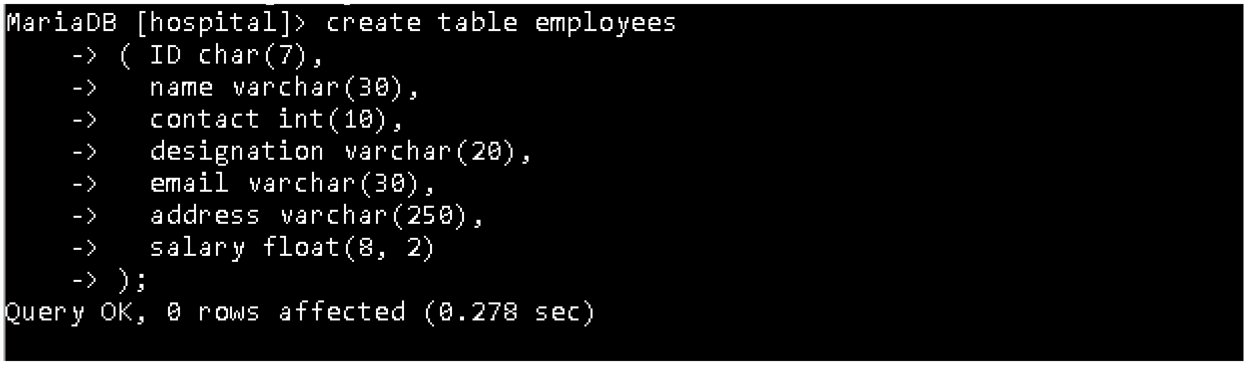
Creating Database:



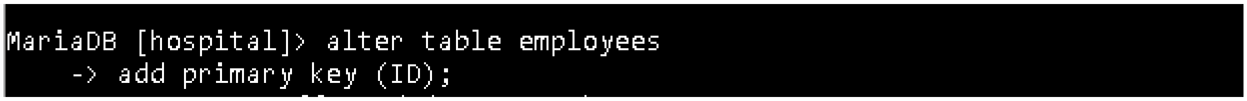
```
MariaDB [(none)]> create database hospital;
Query OK, 1 row affected (0.002 sec)

MariaDB [(none)]> use hospital;
Database changed
```

Creating tables:

- Employees:

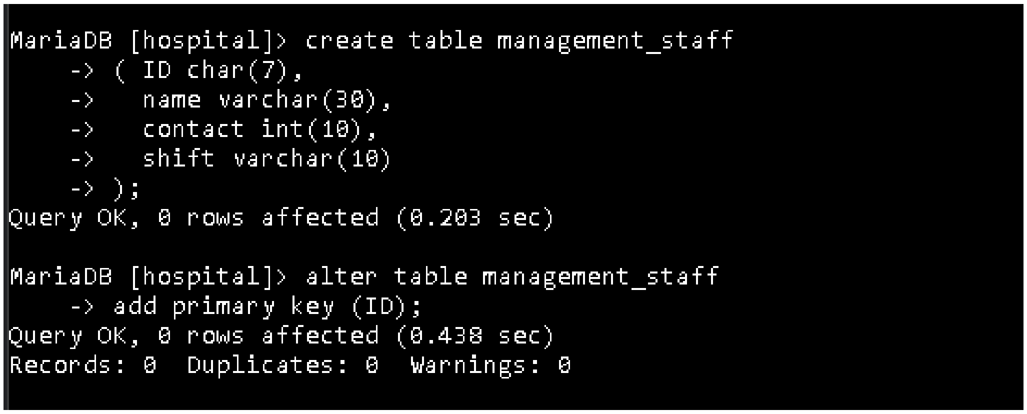


```
MariaDB [hospital]> create table employees
    -> ( ID char(7),
    ->   name varchar(30),
    ->   contact int(10),
    ->   designation varchar(20),
    ->   email varchar(30),
    ->   address varchar(250),
    ->   salary float(8, 2)
    -> );
Query OK, 0 rows affected (0.278 sec)
```



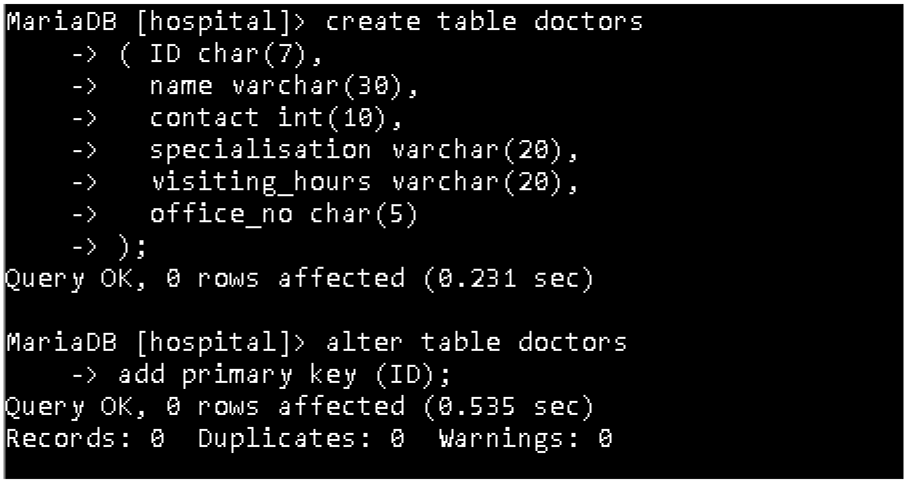
```
MariaDB [hospital]> alter table employees
    -> add primary key (ID);
```

- Management Staff:



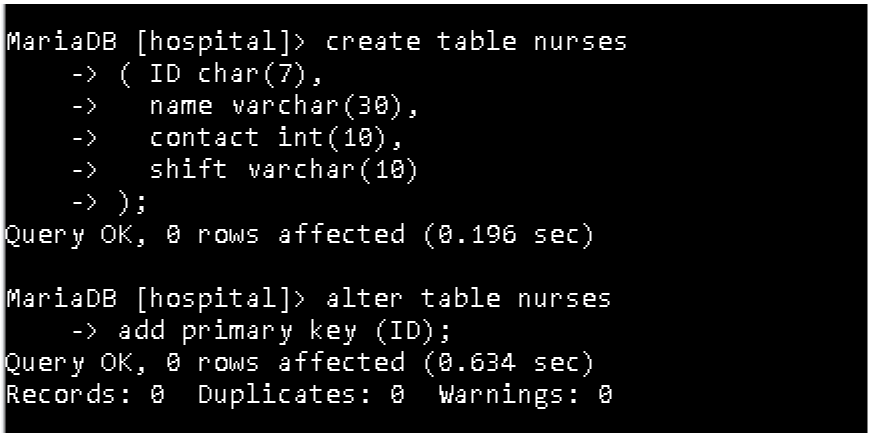
```
MariaDB [hospital]> create table management_staff
    -> ( ID char(7),
    ->   name varchar(30),
    ->   contact int(10),
    ->   shift varchar(10)
    -> );
Query OK, 0 rows affected (0.203 sec)

MariaDB [hospital]> alter table management_staff
    -> add primary key (ID);
Query OK, 0 rows affected (0.438 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

- Doctors:



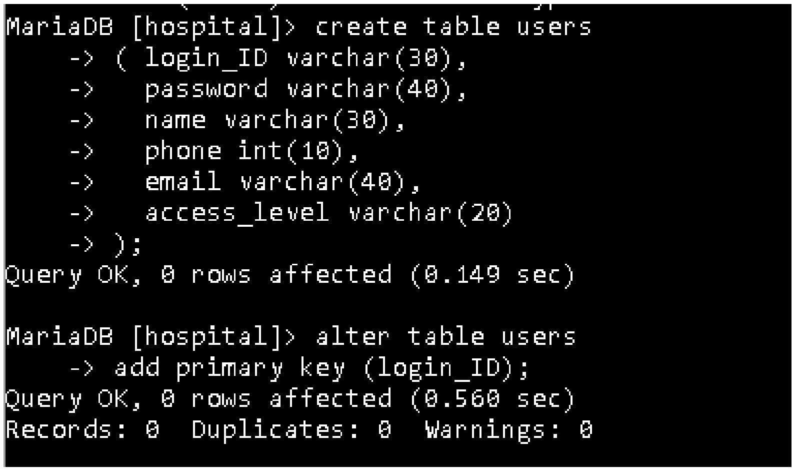
```
MariaDB [hospital]> create table doctors
    -> ( ID char(7),
    ->   name varchar(30),
    ->   contact int(10),
    ->   specialisation varchar(20),
    ->   visiting_hours varchar(20),
    ->   office_no char(5)
    -> );
Query OK, 0 rows affected (0.231 sec)

MariaDB [hospital]> alter table doctors
    -> add primary key (ID);
Query OK, 0 rows affected (0.535 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

- Nurses:



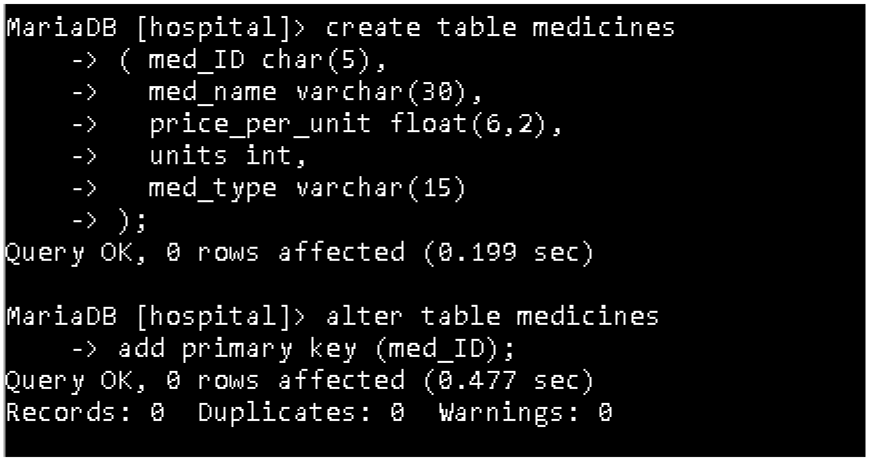
```
MariaDB [hospital]> create table nurses
    -> ( ID char(7),
    ->   name varchar(30),
    ->   contact int(10),
    ->   shift varchar(10)
    -> );
Query OK, 0 rows affected (0.196 sec)

MariaDB [hospital]> alter table nurses
    -> add primary key (ID);
Query OK, 0 rows affected (0.634 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

- Users:



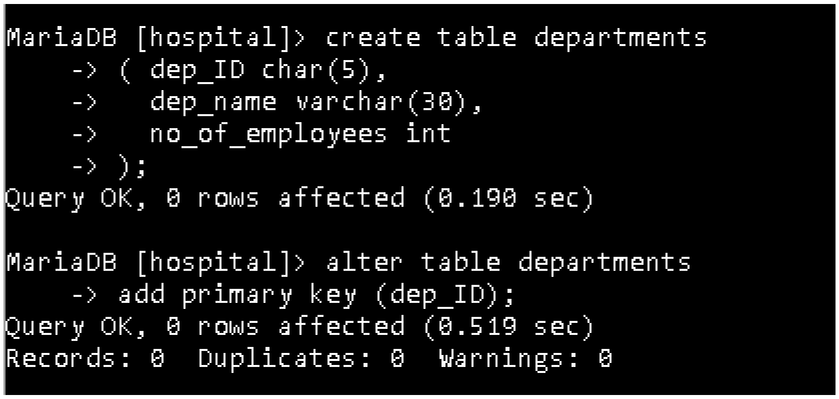
```
MariaDB [hospital]> create table users
    -> ( login_ID varchar(30),
    ->   password varchar(40),
    ->   name varchar(30),
    ->   phone int(10),
    ->   email varchar(40),
    ->   access_level varchar(20)
    -> );
Query OK, 0 rows affected (0.149 sec)

MariaDB [hospital]> alter table users
    -> add primary key (login_ID);
Query OK, 0 rows affected (0.560 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

- Medicines:



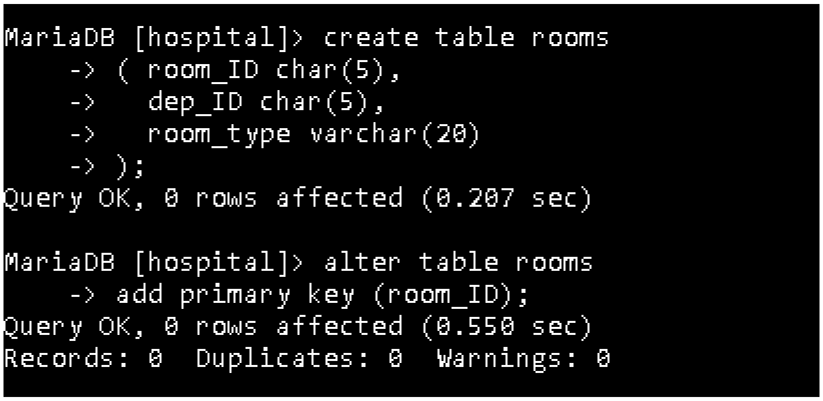
```
MariaDB [hospital]> create table medicines
    -> ( med_ID char(5),
    ->   med_name varchar(30),
    ->   price_per_unit float(6,2),
    ->   units int,
    ->   med_type varchar(15)
    -> );
Query OK, 0 rows affected (0.199 sec)

MariaDB [hospital]> alter table medicines
    -> add primary key (med_ID);
Query OK, 0 rows affected (0.477 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

- Departments:



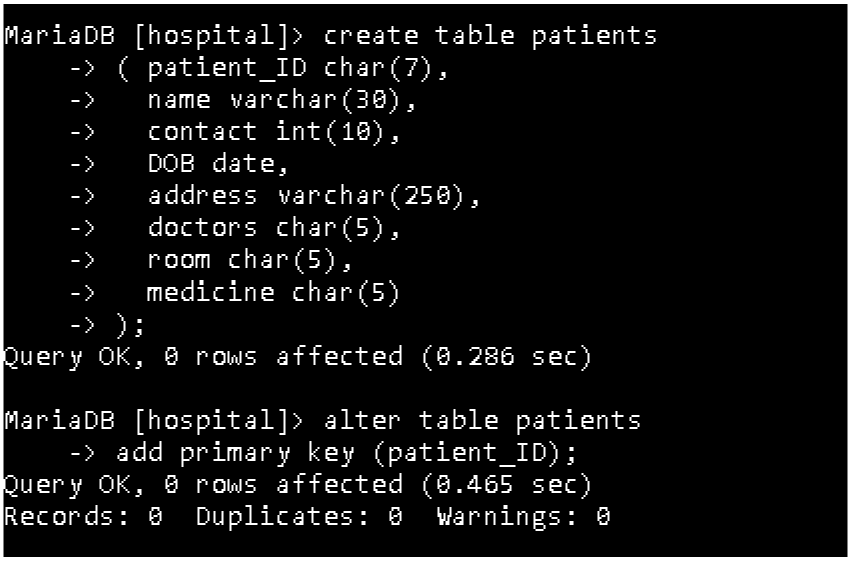
```
MariaDB [hospital]> create table departments
    -> ( dep_ID char(5),
    ->   dep_name varchar(30),
    ->   no_of_employees int
    -> );
Query OK, 0 rows affected (0.190 sec)

MariaDB [hospital]> alter table departments
    -> add primary key (dep_ID);
Query OK, 0 rows affected (0.519 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

- Rooms:



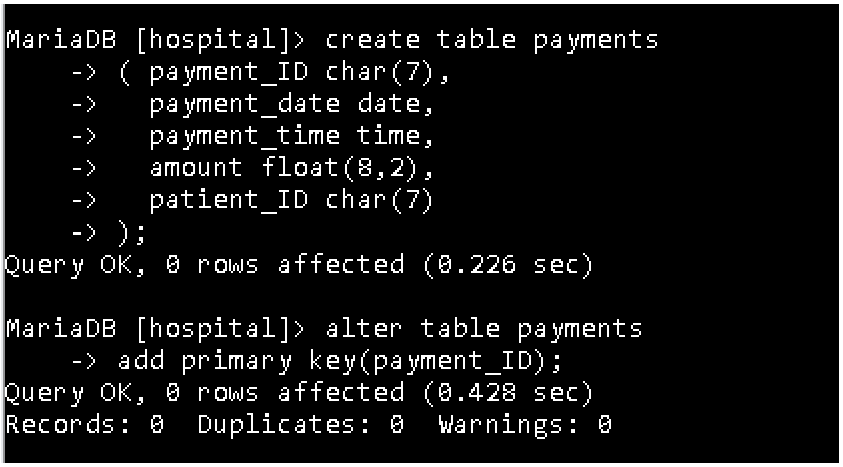
```
MariaDB [hospital]> create table rooms
    -> ( room_ID char(5),
    ->   dep_ID char(5),
    ->   room_type varchar(20)
    -> );
Query OK, 0 rows affected (0.207 sec)

MariaDB [hospital]> alter table rooms
    -> add primary key (room_ID);
Query OK, 0 rows affected (0.550 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

- Patients:



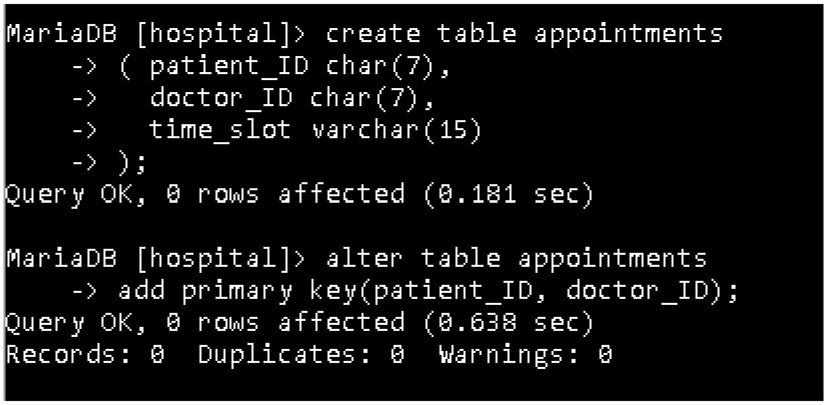
```
MariaDB [hospital]> create table patients
    -> ( patient_ID char(7),
    ->   name varchar(30),
    ->   contact int(10),
    ->   DOB date,
    ->   address varchar(250),
    ->   doctors char(5),
    ->   room char(5),
    ->   medicine char(5)
    -> );
Query OK, 0 rows affected (0.286 sec)

MariaDB [hospital]> alter table patients
    -> add primary key (patient_ID);
Query OK, 0 rows affected (0.465 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

- Payments:



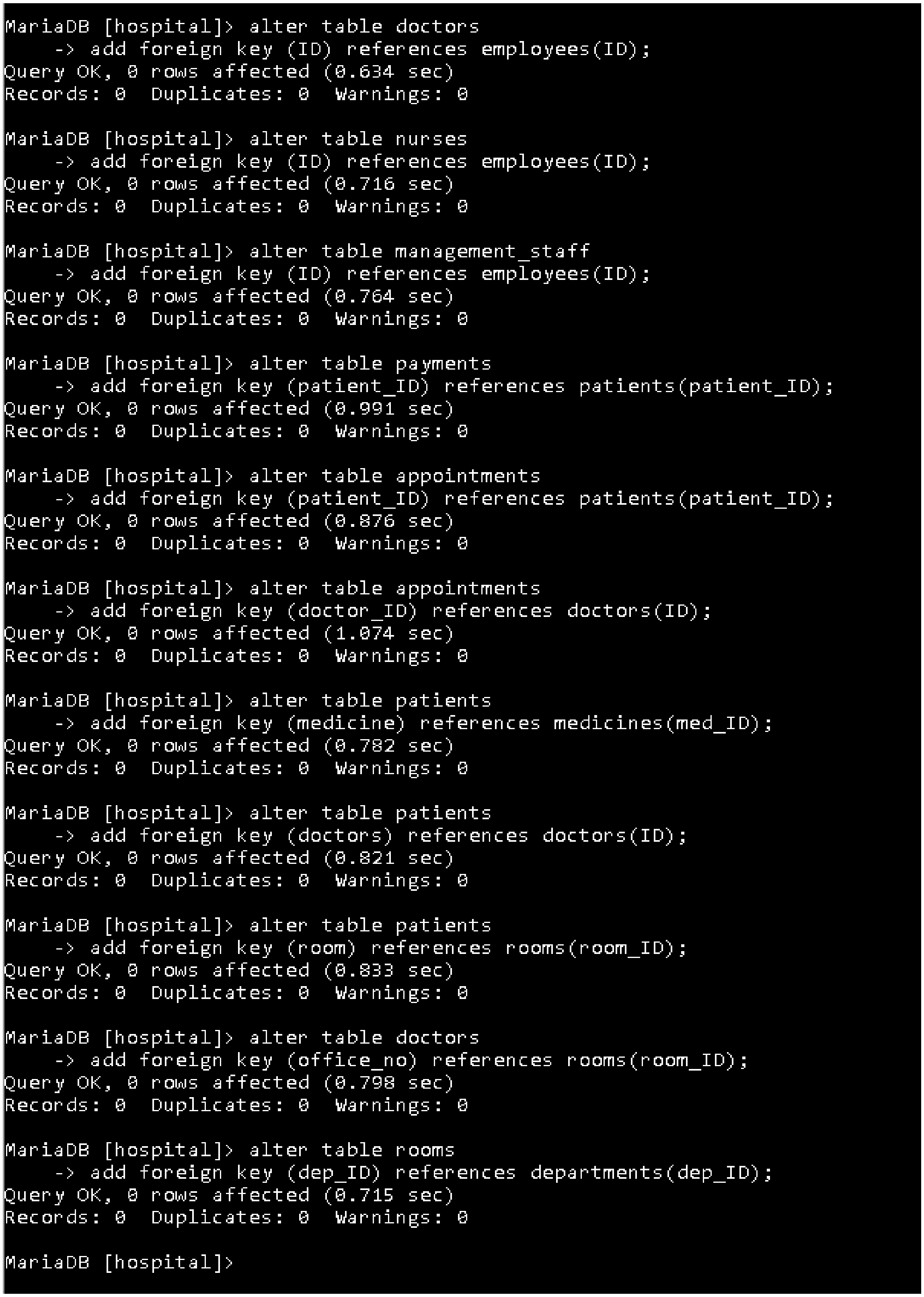
```
MariaDB [hospital]> create table payments
    -> ( payment_ID char(7),
    ->   payment_date date,
    ->   payment_time time,
    ->   amount float(8,2),
    ->   patient_ID char(7)
    -> );
Query OK, 0 rows affected (0.226 sec)

MariaDB [hospital]> alter table payments
    -> add primary key(payment_ID);
Query OK, 0 rows affected (0.428 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

- Appointments:



```
MariaDB [hospital]> create table appointments
    -> ( patient_ID char(7),
    ->   doctor_ID char(7),
    ->   time_slot varchar(15)
    -> );
Query OK, 0 rows affected (0.181 sec)

MariaDB [hospital]> alter table appointments
    -> add primary key(patient_ID, doctor_ID);
Query OK, 0 rows affected (0.638 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

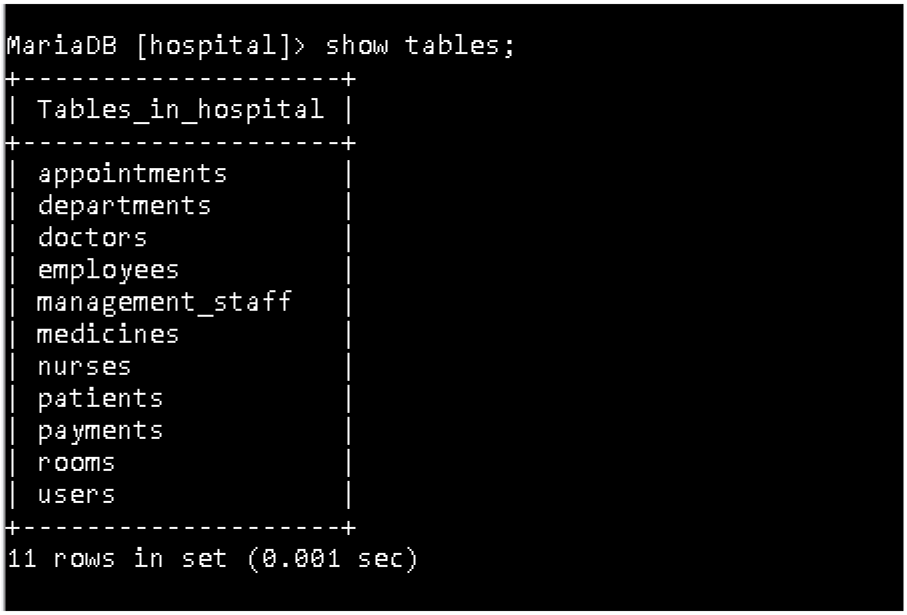
Applying the foreign key constraints on the interconnected tables:



```
MariaDB [hospital]> alter table doctors
    -> add foreign key (ID) references employees(ID);
Query OK, 0 rows affected (0.634 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table nurses
    -> add foreign key (ID) references employees(ID);
Query OK, 0 rows affected (0.716 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table management_staff
    -> add foreign key (ID) references employees(ID);
Query OK, 0 rows affected (0.764 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table payments
    -> add foreign key (patient_ID) references patients(patient_ID);
Query OK, 0 rows affected (0.991 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table appointments
    -> add foreign key (patient_ID) references patients(patient_ID);
Query OK, 0 rows affected (0.876 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table appointments
    -> add foreign key (doctor_ID) references doctors(ID);
Query OK, 0 rows affected (1.074 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table patients
    -> add foreign key (medicine) references medicines(med_ID);
Query OK, 0 rows affected (0.782 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table patients
    -> add foreign key (doctors) references doctors(ID);
Query OK, 0 rows affected (0.821 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table patients
    -> add foreign key (room) references rooms(room_ID);
Query OK, 0 rows affected (0.833 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table doctors
    -> add foreign key (office_no) references rooms(room_ID);
Query OK, 0 rows affected (0.798 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]> alter table rooms
    -> add foreign key (dep_ID) references departments(dep_ID);
Query OK, 0 rows affected (0.715 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [hospital]>
```

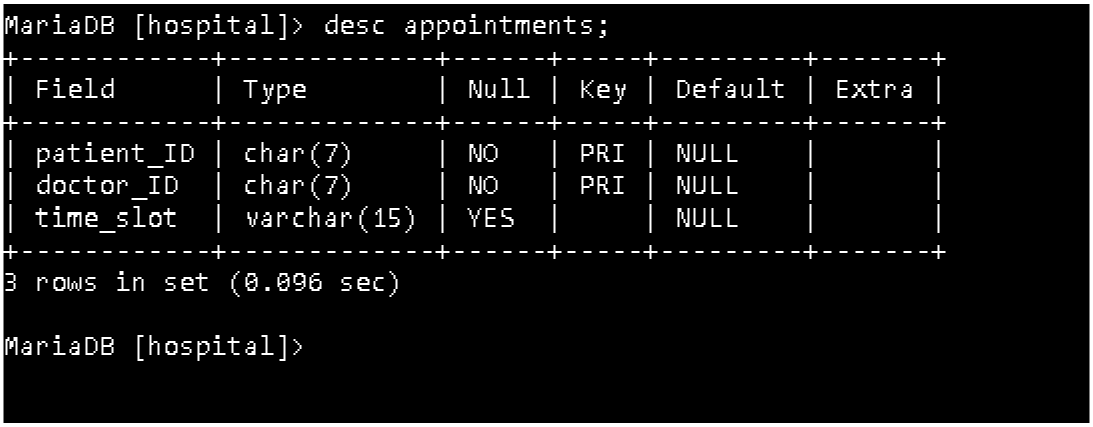
Detailed description of the tables:

All the tables of database:



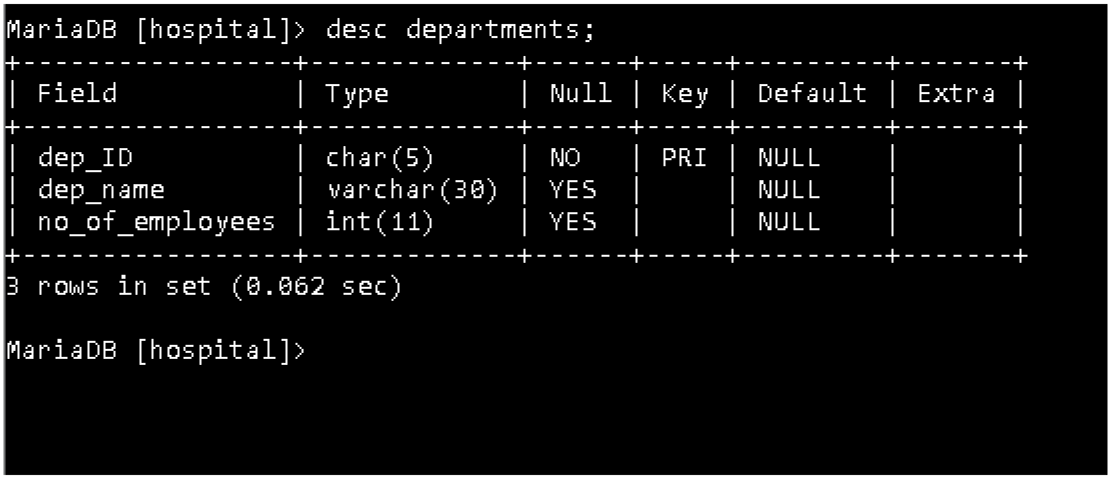
```
MariaDB [hospital]> show tables;
+--------------------+
| Tables_in_hospital |
+--------------------+
| appointments       |
| departments        |
| doctors            |
| employees          |
| management_staff   |
| medicines          |
| nurses             |
| patients           |
| payments           |
| rooms              |
| users              |
+--------------------+
11 rows in set (0.001 sec)
```

- Appointments:



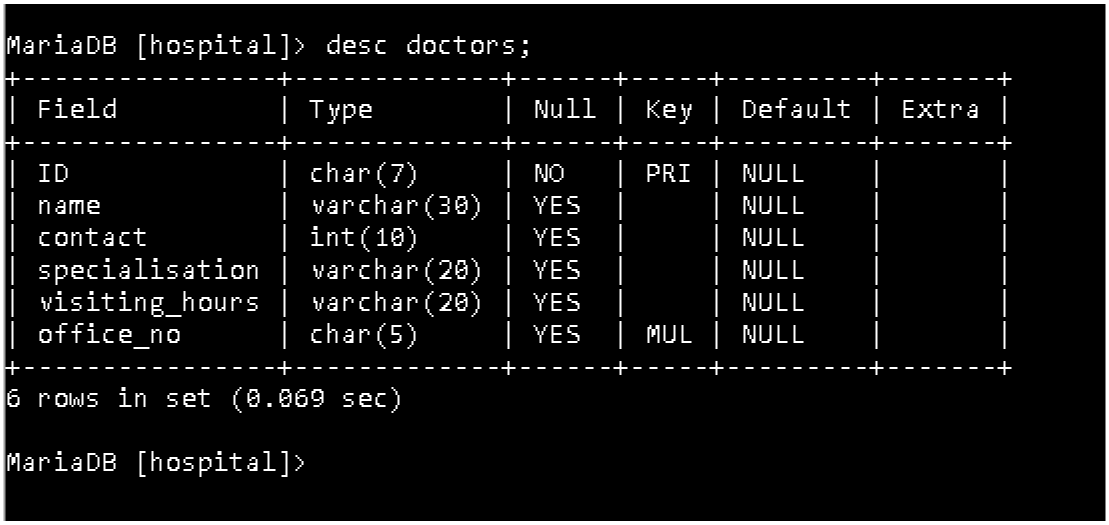
```
MariaDB [hospital]> desc appointments;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| patient_ID | char(7)     | NO   | PRI | NULL    |       |
| doctor_ID  | char(7)     | NO   | PRI | NULL    |       |
| time_slot  | varchar(15) | YES  |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
3 rows in set (0.096 sec)

MariaDB [hospital]>
```

- Departments:



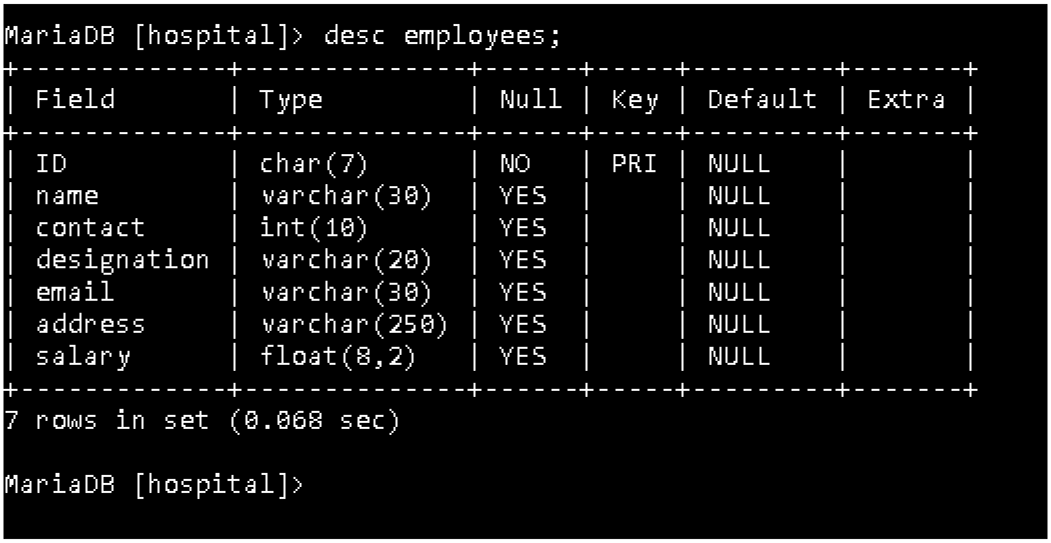
```
MariaDB [hospital]> desc departments;
+-----------------+-------------+------+-----+---------+-------+
| Field           | Type        | Null | Key | Default | Extra |
+-----------------+-------------+------+-----+---------+-------+
| dep_ID          | char(5)     | NO   | PRI | NULL    |       |
| dep_name        | varchar(30) | YES  |     | NULL    |       |
| no_of_employees | int(11)     | YES  |     | NULL    |       |
+-----------------+-------------+------+-----+---------+-------+
3 rows in set (0.062 sec)

MariaDB [hospital]>
```

- Doctors:



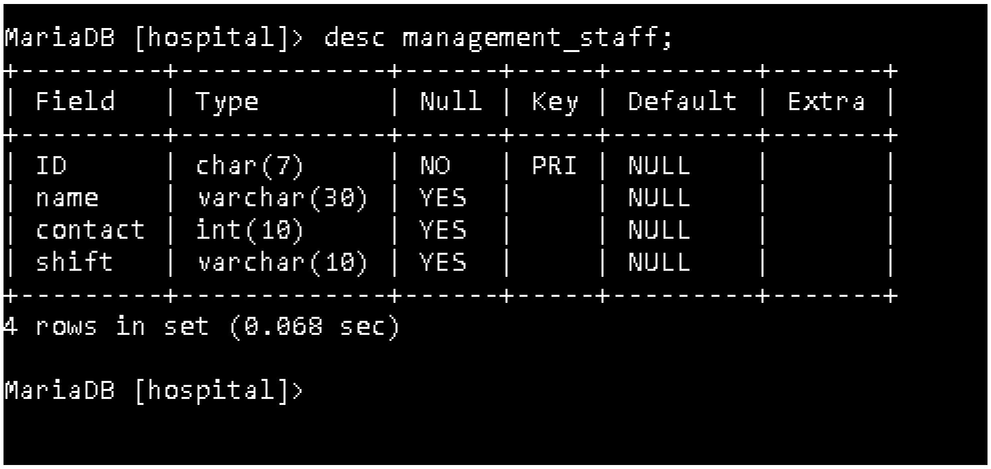
```
MariaDB [hospital]> desc doctors;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| ID             | char(7)     | NO   | PRI | NULL    |       |
| name           | varchar(30) | YES  |     | NULL    |       |
| contact        | int(10)     | YES  |     | NULL    |       |
| specialisation | varchar(20) | YES  |     | NULL    |       |
| visiting_hours | varchar(20) | YES  |     | NULL    |       |
| office_no      | char(5)     | YES  | MUL | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
6 rows in set (0.069 sec)

MariaDB [hospital]>
```

- Employees:



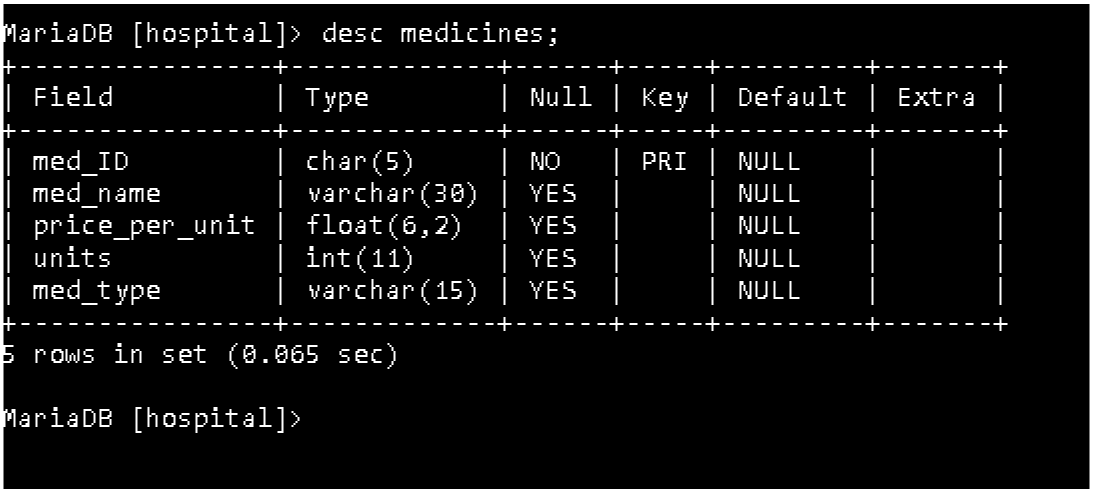
```
MariaDB [hospital]> desc employees;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| ID          | char(7)      | NO   | PRI | NULL    |       |
| name        | varchar(30)  | YES  |     | NULL    |       |
| contact     | int(10)      | YES  |     | NULL    |       |
| designation | varchar(20)  | YES  |     | NULL    |       |
| email       | varchar(30)  | YES  |     | NULL    |       |
| address     | varchar(250) | YES  |     | NULL    |       |
| salary      | float(8,2)   | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
7 rows in set (0.068 sec)

MariaDB [hospital]>
```

- Management Staff:



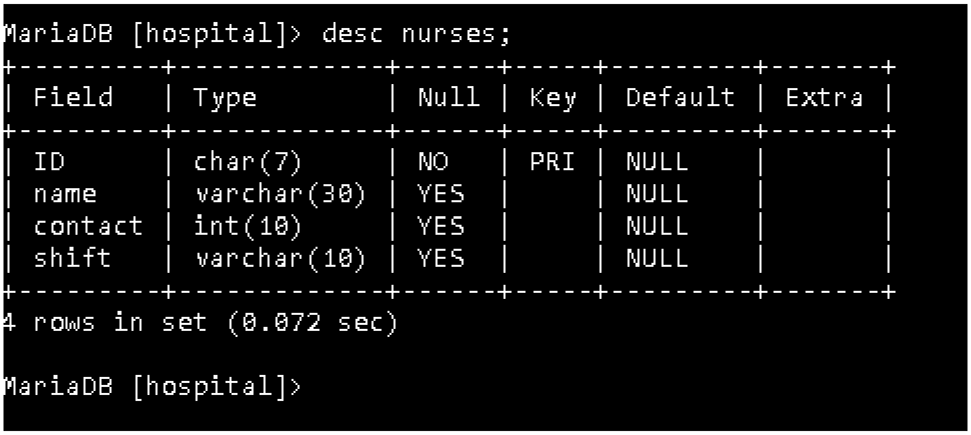
```
MariaDB [hospital]> desc management_staff;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| ID      | char(7)     | NO   | PRI | NULL    |       |
| name    | varchar(30) | YES  |     | NULL    |       |
| contact | int(10)     | YES  |     | NULL    |       |
| shift   | varchar(10) | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
4 rows in set (0.068 sec)

MariaDB [hospital]>
```

- Medicines:



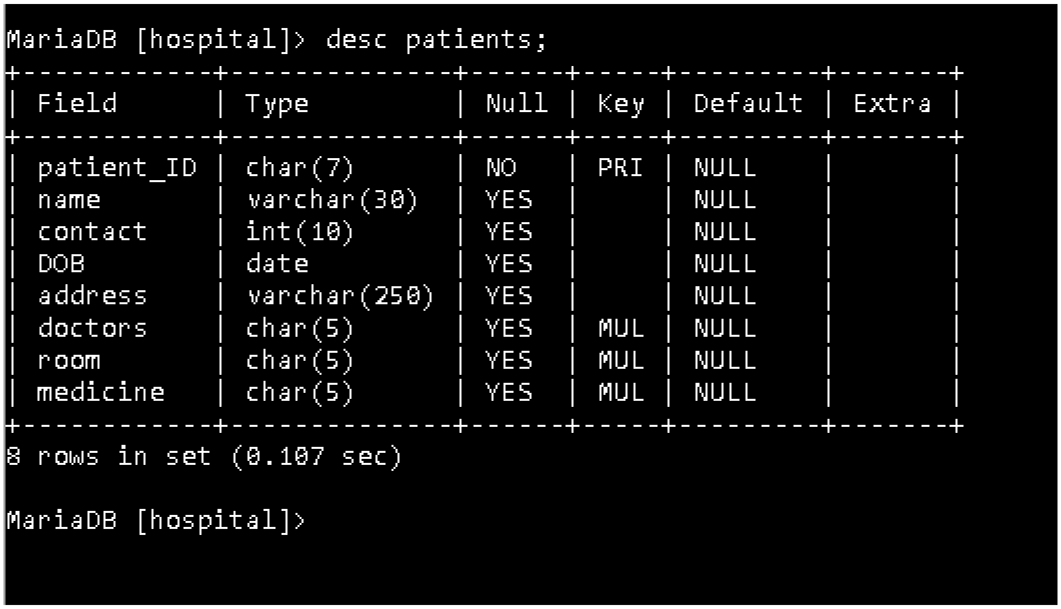
```
MariaDB [hospital]> desc medicines;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| med_ID         | char(5)     | NO   | PRI | NULL    |       |
| med_name       | varchar(30) | YES  |     | NULL    |       |
| price_per_unit | float(6,2)  | YES  |     | NULL    |       |
| units          | int(11)     | YES  |     | NULL    |       |
| med_type       | varchar(15) | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
5 rows in set (0.065 sec)

MariaDB [hospital]>
```

- Nurses:



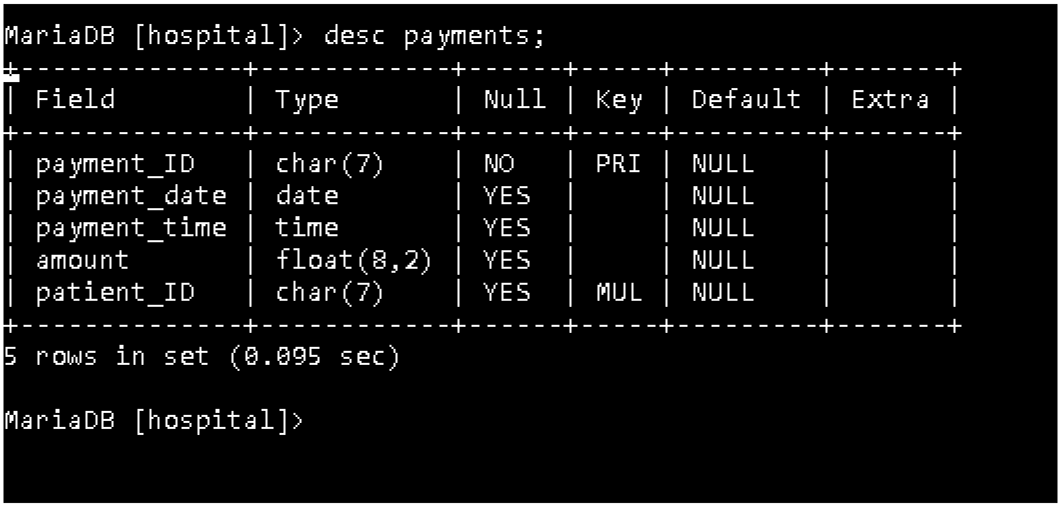
```
MariaDB [hospital]> desc nurses;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| ID      | char(7)     | NO   | PRI | NULL    |       |
| name    | varchar(30) | YES  |     | NULL    |       |
| contact | int(10)     | YES  |     | NULL    |       |
| shift   | varchar(10) | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
4 rows in set (0.072 sec)

MariaDB [hospital]>
```

- Patients:



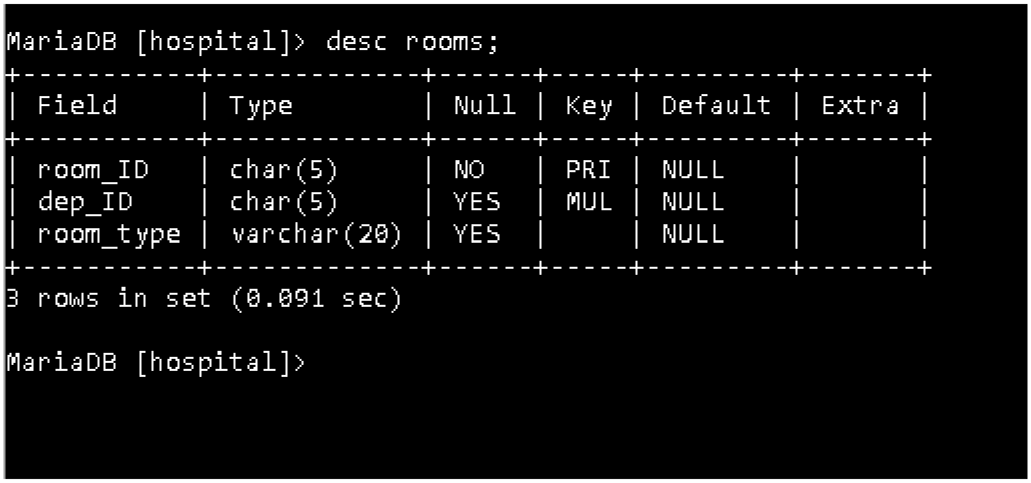
```
MariaDB [hospital]> desc patients;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| patient_ID | char(7)      | NO   | PRI | NULL    |       |
| name       | varchar(30)  | YES  |     | NULL    |       |
| contact    | int(10)      | YES  |     | NULL    |       |
| DOB        | date         | YES  |     | NULL    |       |
| address    | varchar(250) | YES  |     | NULL    |       |
| doctors    | char(5)      | YES  | MUL | NULL    |       |
| room       | char(5)      | YES  | MUL | NULL    |       |
| medicine   | char(5)      | YES  | MUL | NULL    |       |
+------------+--------------+------+-----+---------+-------+
8 rows in set (0.107 sec)

MariaDB [hospital]>
```

- Payments:



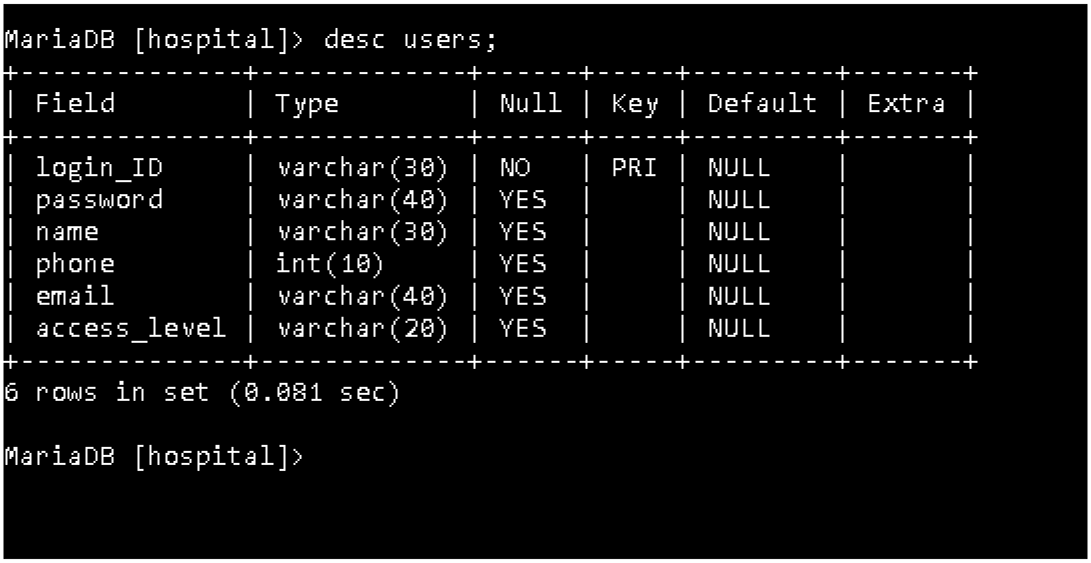
```
MariaDB [hospital]> desc payments;
+--------------+------------+------+-----+---------+-------+
| Field        | Type       | Null | Key | Default | Extra |
+--------------+------------+------+-----+---------+-------+
| payment_ID   | char(7)    | NO   | PRI | NULL    |       |
| payment_date | date       | YES  |     | NULL    |       |
| payment_time | time       | YES  |     | NULL    |       |
| amount       | float(8,2) | YES  |     | NULL    |       |
| patient_ID   | char(7)    | YES  | MUL | NULL    |       |
+--------------+------------+------+-----+---------+-------+
5 rows in set (0.095 sec)

MariaDB [hospital]>
```

- Rooms:



```
MariaDB [hospital]> desc rooms;
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| room_ID   | char(5)     | NO   | PRI | NULL    |       |
| dep_ID    | char(5)     | YES  | MUL | NULL    |       |
| room_type | varchar(20) | YES  |     | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
3 rows in set (0.091 sec)

MariaDB [hospital]>
```

- Users:



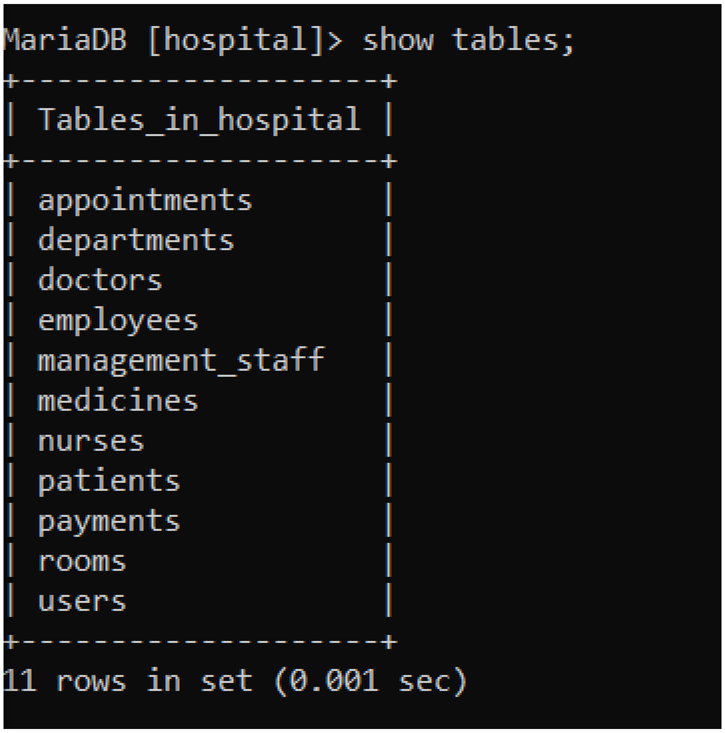
```
MariaDB [hospital]> desc users;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| login_ID     | varchar(30) | NO   | PRI | NULL    |       |
| password     | varchar(40) | YES  |     | NULL    |       |
| name         | varchar(30) | YES  |     | NULL    |       |
| phone        | int(10)     | YES  |     | NULL    |       |
| email        | varchar(40) | YES  |     | NULL    |       |
| access_level | varchar(20) | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
6 rows in set (0.081 sec)

MariaDB [hospital]>
```

Populating the Database

After creating the required tables for the hospital database, we start populating the database with entries. We wrote a sql script to fill up the tables in our database with entries. (The above mentioned script is linked in Appendix)

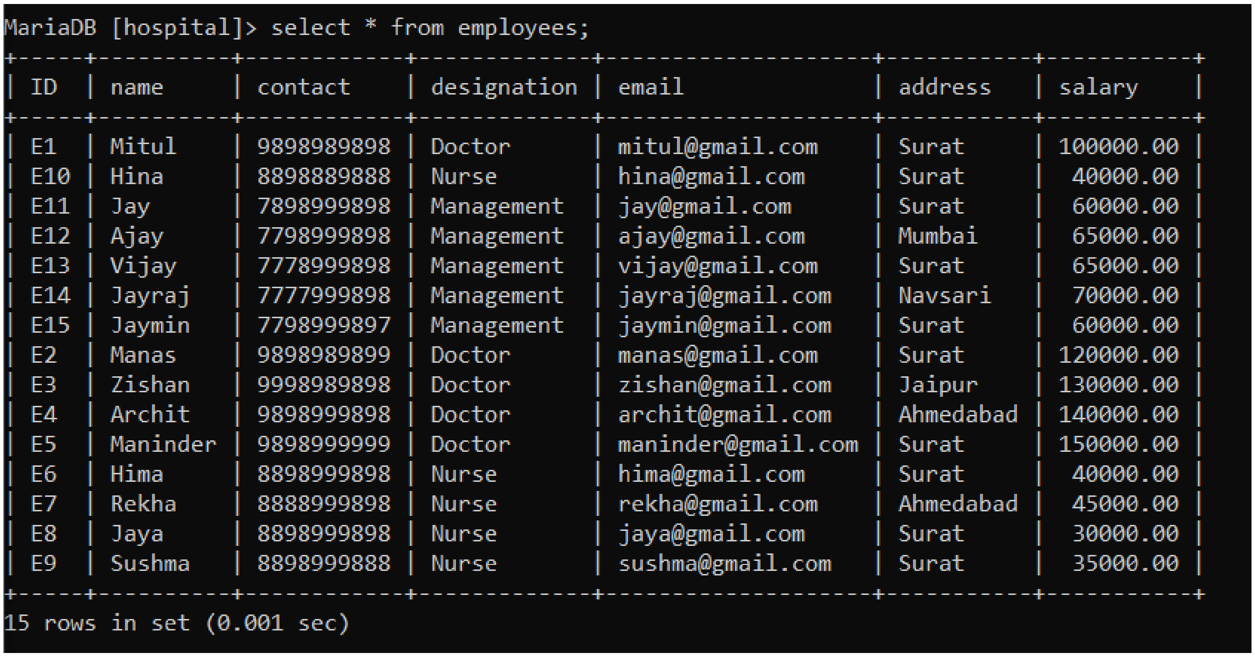
Following screenshots are taken after populating the database.

All the tables of the database:



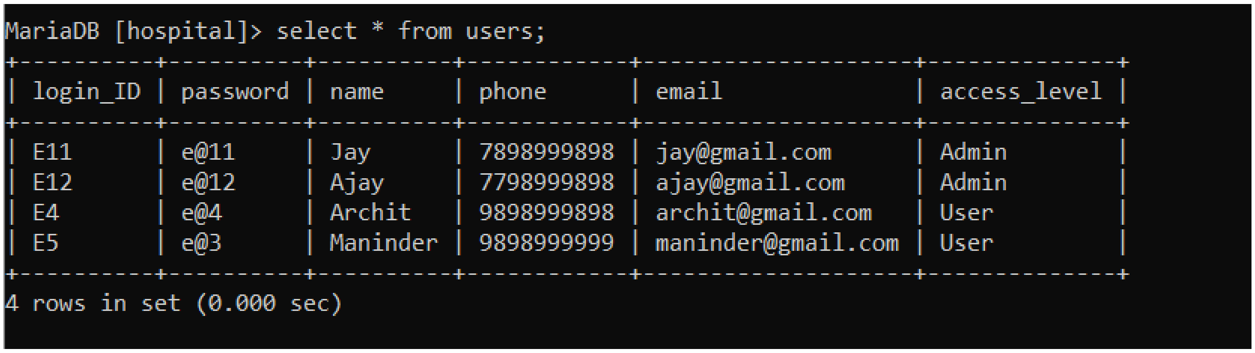
```
MariaDB [hospital]> show tables;
+--------------------+
| Tables_in_hospital |
+--------------------+
| appointments       |
| departments        |
| doctors            |
| employees          |
| management_staff   |
| medicines          |
| nurses             |
| patients           |
| payments           |
| rooms              |
| users              |
+--------------------+
11 rows in set (0.001 sec)
```

- Employees



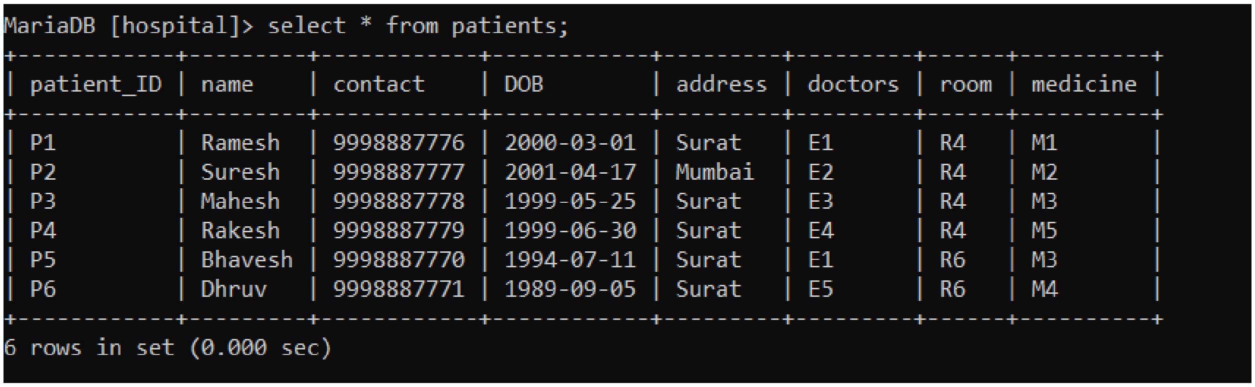
```
MariaDB [hospital]> select * from employees;
+-----+----------+------------+-------------+--------------------+-----------+-----------+
| ID  | name     | contact    | designation | email              | address   | salary    |
+-----+----------+------------+-------------+--------------------+-----------+-----------+
| E1  | Mitul    | 9898989898 | Doctor      | mitul@gmail.com    | Surat     | 100000.00 |
| E10 | Hina     | 8898889888 | Nurse       | hina@gmail.com     | Surat     |  40000.00 |
| E11 | Jay      | 7898999898 | Management  | jay@gmail.com      | Surat     |  60000.00 |
| E12 | Ajay     | 7798999898 | Management  | ajay@gmail.com     | Mumbai    |  65000.00 |
| E13 | Vijay    | 7778999898 | Management  | vijay@gmail.com    | Surat     |  65000.00 |
| E14 | Jayraj   | 7777999898 | Management  | jayraj@gmail.com   | Navsari   |  70000.00 |
| E15 | Jaymin   | 7798999897 | Management  | jaymin@gmail.com   | Surat     |  60000.00 |
| E2  | Manas    | 9898989899 | Doctor      | manas@gmail.com    | Surat     | 120000.00 |
| E3  | Zishan   | 9998989898 | Doctor      | zishan@gmail.com   | Jaipur    | 130000.00 |
| E4  | Archit   | 9898999898 | Doctor      | archit@gmail.com   | Ahmedabad | 140000.00 |
| E5  | Maninder | 9898999999 | Doctor      | maninder@gmail.com | Surat     | 150000.00 |
| E6  | Hima     | 8898999898 | Nurse       | hima@gmail.com     | Surat     |  40000.00 |
| E7  | Rekha    | 8888999898 | Nurse       | rekha@gmail.com    | Ahmedabad |  45000.00 |
| E8  | Jaya     | 8898999898 | Nurse       | jaya@gmail.com     | Surat     |  30000.00 |
| E9  | Sushma   | 8898999888 | Nurse       | sushma@gmail.com   | Surat     |  35000.00 |
+-----+----------+------------+-------------+--------------------+-----------+-----------+
15 rows in set (0.001 sec)
```

- Users



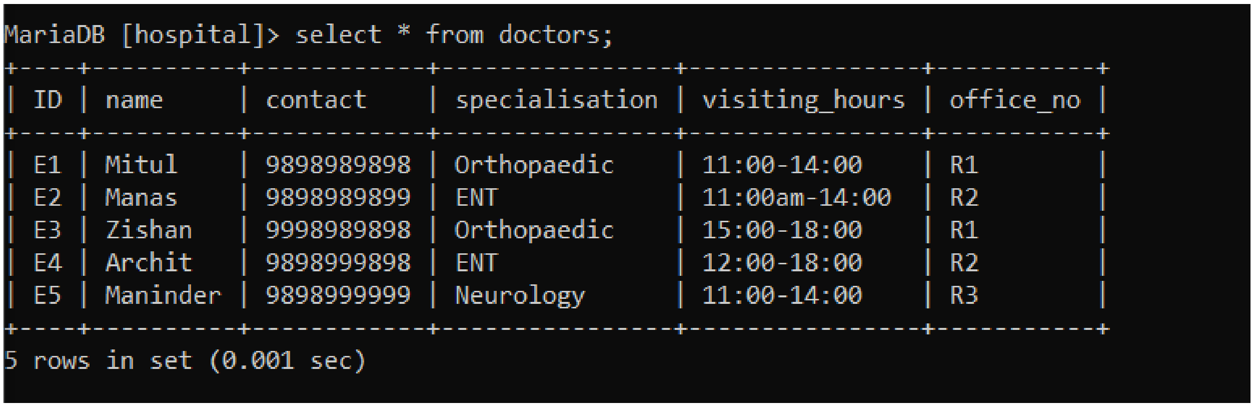
```
MariaDB [hospital]> select * from users;
+----------+----------+----------+------------+--------------------+--------------+
| login_ID | password | name     | phone      | email              | access_level |
+----------+----------+----------+------------+--------------------+--------------+
| E11      | e@11     | Jay      | 7898999898 | jay@gmail.com      | Admin        |
| E12      | e@12     | Ajay     | 7798999898 | ajay@gmail.com     | Admin        |
| E4       | e@4      | Archit   | 9898999898 | archit@gmail.com   | User         |
| E5       | e@3      | Maninder | 9898999999 | maninder@gmail.com | User         |
+----------+----------+----------+------------+--------------------+--------------+
4 rows in set (0.000 sec)
```

- Patients



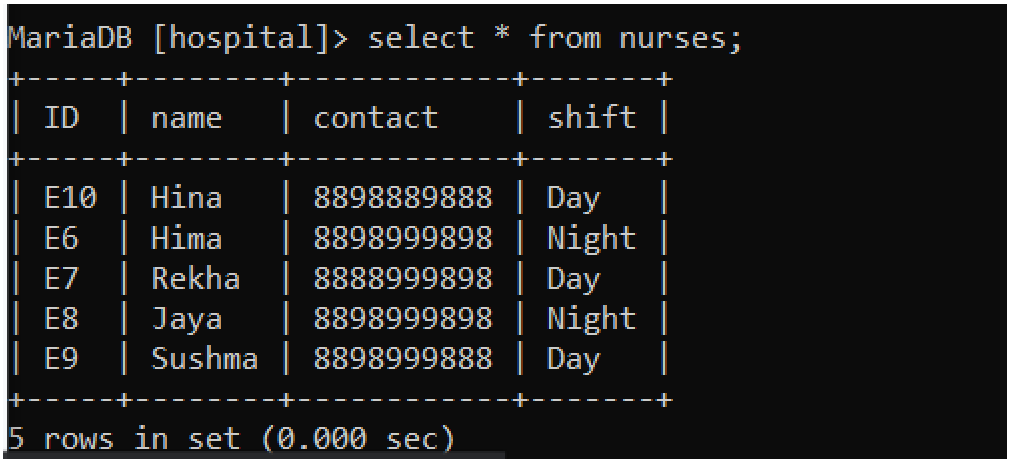
```
MariaDB [hospital]> select * from patients;
+------------+---------+------------+------------+---------+---------+------+----------+
| patient_ID | name    | contact    | DOB        | address | doctors | room | medicine |
+------------+---------+------------+------------+---------+---------+------+----------+
| P1         | Ramesh  | 9998887776 | 2000-03-01 | Surat   | E1      | R4   | M1       |
| P2         | Suresh  | 9998887777 | 2001-04-17 | Mumbai  | E2      | R4   | M2       |
| P3         | Mahesh  | 9998887778 | 1999-05-25 | Surat   | E3      | R4   | M3       |
| P4         | Rakesh  | 9998887779 | 1999-06-30 | Surat   | E4      | R4   | M5       |
| P5         | Bhavesh | 9998887770 | 1994-07-11 | Surat   | E1      | R6   | M3       |
| P6         | Dhruv   | 9998887771 | 1989-09-05 | Surat   | E5      | R6   | M4       |
+------------+---------+------------+------------+---------+---------+------+----------+
6 rows in set (0.000 sec)
```

- Doctors



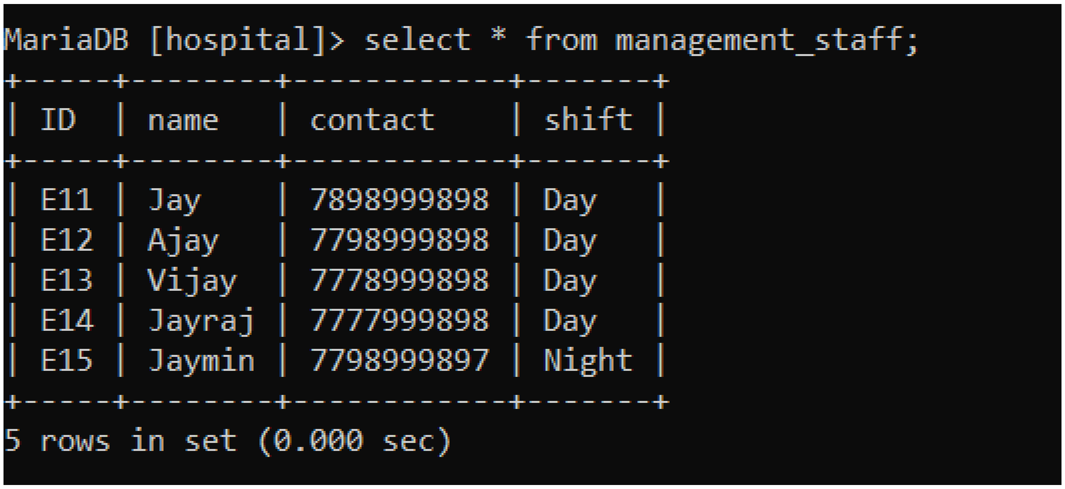
```
MariaDB [hospital]> select * from doctors;
+----+----------+------------+----------------+----------------+-----------+
| ID | name     | contact    | specialisation | visiting_hours | office_no |
+----+----------+------------+----------------+----------------+-----------+
| E1 | Mitul    | 9898989898 | Orthopaedic    | 11:00-14:00    | R1        |
| E2 | Manas    | 9898989899 | ENT            | 11:00am-14:00  | R2        |
| E3 | Zishan   | 9998989898 | Orthopaedic    | 15:00-18:00    | R1        |
| E4 | Archit   | 9898999898 | ENT            | 12:00-18:00    | R2        |
| E5 | Maninder | 9898999999 | Neurology      | 11:00-14:00    | R3        |
+----+----------+------------+----------------+----------------+-----------+
5 rows in set (0.001 sec)
```

- Nurses



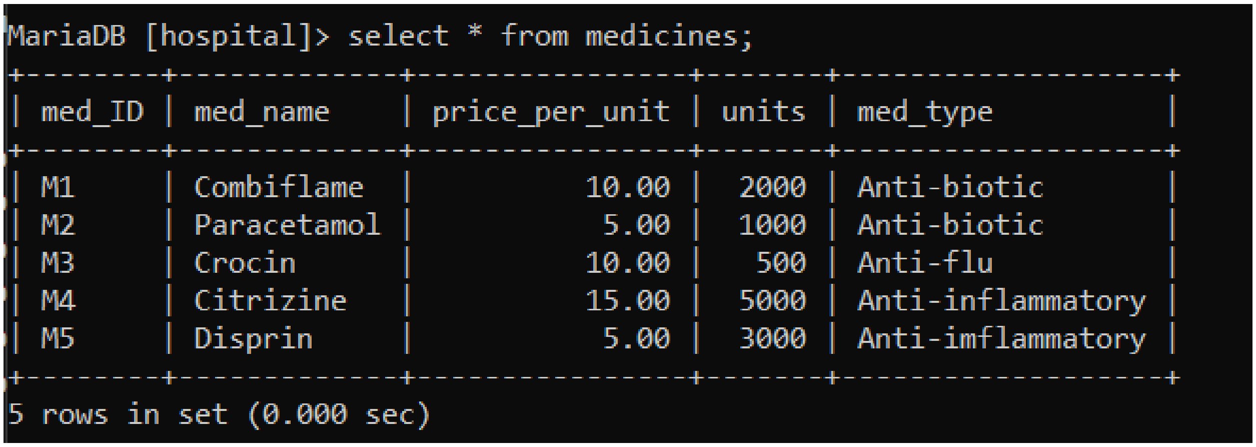
```
MariaDB [hospital]> select * from nurses;
+-----+--------+------------+-------+
| ID  | name   | contact    | shift |
+-----+--------+------------+-------+
| E10 | Hina   | 8898889888 | Day   |
| E6  | Hima   | 8898999898 | Night |
| E7  | Rekha  | 8888999898 | Day   |
| E8  | Jaya   | 8898999898 | Night |
| E9  | Sushma | 8898999888 | Day   |
+-----+--------+------------+-------+
5 rows in set (0.000 sec)
```

- Management_staff



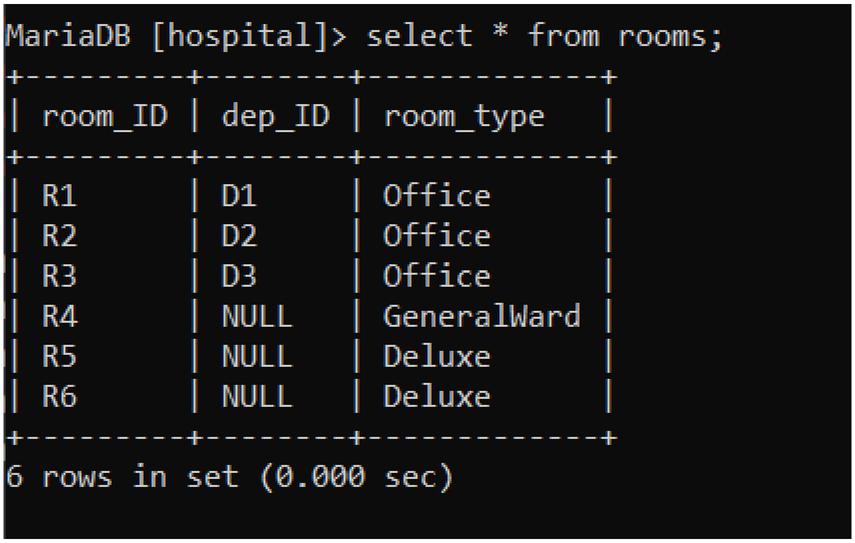
```
MariaDB [hospital]> select * from management_staff;
+-----+--------+------------+-------+
| ID  | name   | contact    | shift |
+-----+--------+------------+-------+
| E11 | Jay    | 7898999898 | Day   |
| E12 | Ajay   | 7798999898 | Day   |
| E13 | Vijay  | 7778999898 | Day   |
| E14 | Jayraj | 7777999898 | Day   |
| E15 | Jaymin | 7798999897 | Night |
+-----+--------+------------+-------+
5 rows in set (0.000 sec)
```

- Medicines



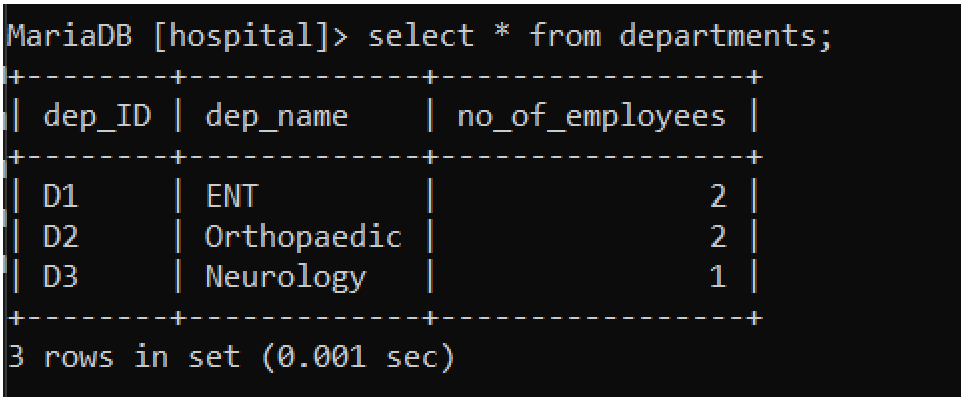
```
MariaDB [hospital]> select * from medicines;
+--------+------------+----------------+-------+-------------------+
| med_ID | med_name   | price_per_unit | units | med_type          |
+--------+------------+----------------+-------+-------------------+
| M1     | Combiflame |          10.00 |  2000 | Anti-biotic       |
| M2     | Paracetamol |          5.00 |  1000 | Anti-biotic       |
| M3     | Crocin     |          10.00 |   500 | Anti-flu          |
| M4     | Citrizine  |          15.00 |  5000 | Anti-inflammatory |
| M5     | Disprin    |           5.00 |  3000 | Anti-imflammatory |
+--------+------------+----------------+-------+-------------------+
5 rows in set (0.000 sec)
```

- Rooms



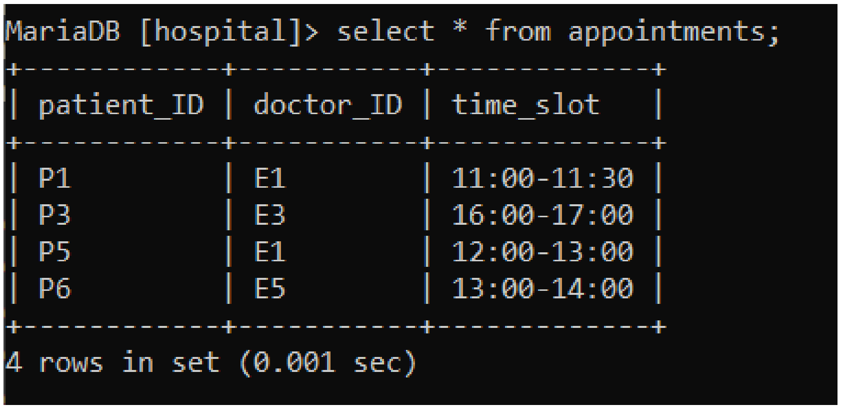
```
MariaDB [hospital]> select * from rooms;
+---------+--------+-------------+
| room_ID | dep_ID | room_type   |
+---------+--------+-------------+
| R1      | D1     | Office      |
| R2      | D2     | Office      |
| R3      | D3     | Office      |
| R4      | NULL   | GeneralWard |
| R5      | NULL   | Deluxe      |
| R6      | NULL   | Deluxe      |
+---------+--------+-------------+
6 rows in set (0.000 sec)
```

- Departments



```
MariaDB [hospital]> select * from departments;
+--------+-------------+-----------------+
| dep_ID | dep_name    | no_of_employees |
+--------+-------------+-----------------+
| D1     | ENT         |               2 |
| D2     | Orthopaedic |               2 |
| D3     | Neurology   |               1 |
+--------+-------------+-----------------+
3 rows in set (0.001 sec)
```

- Appointments

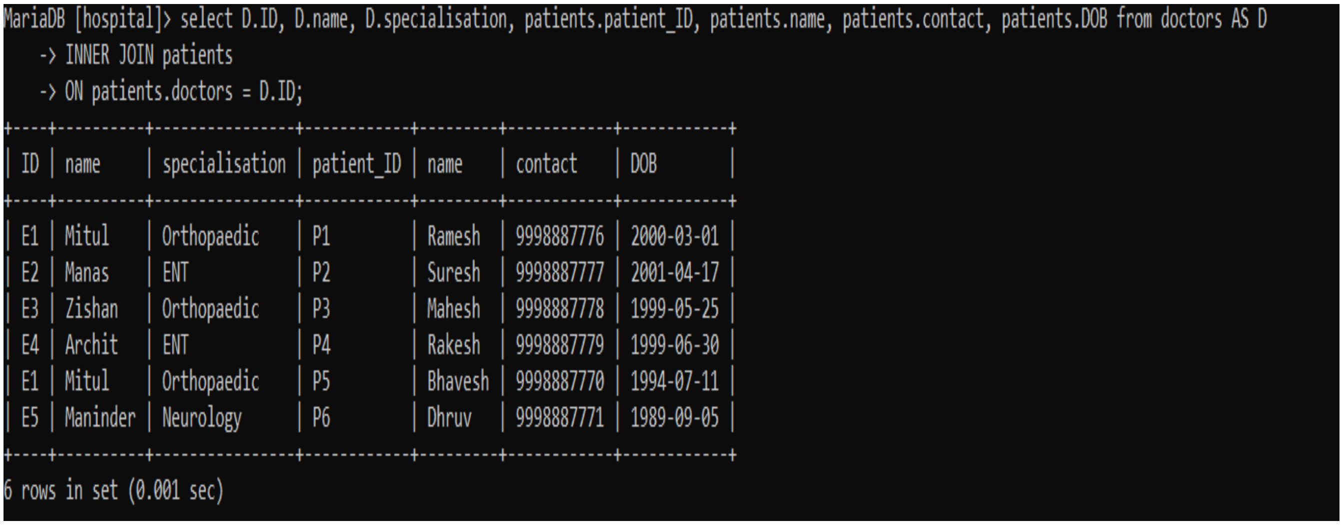


```
MariaDB [hospital]> select * from appointments;
+------------+-----------+-------------+
| patient_ID | doctor_ID | time_slot   |
+------------+-----------+-------------+
| P1         | E1        | 11:00-11:30 |
| P3         | E3        | 16:00-17:00 |
| P5         | E1        | 12:00-13:00 |
| P6         | E5        | 13:00-14:00 |
+------------+-----------+-------------+
4 rows in set (0.001 sec)
```

Key Points

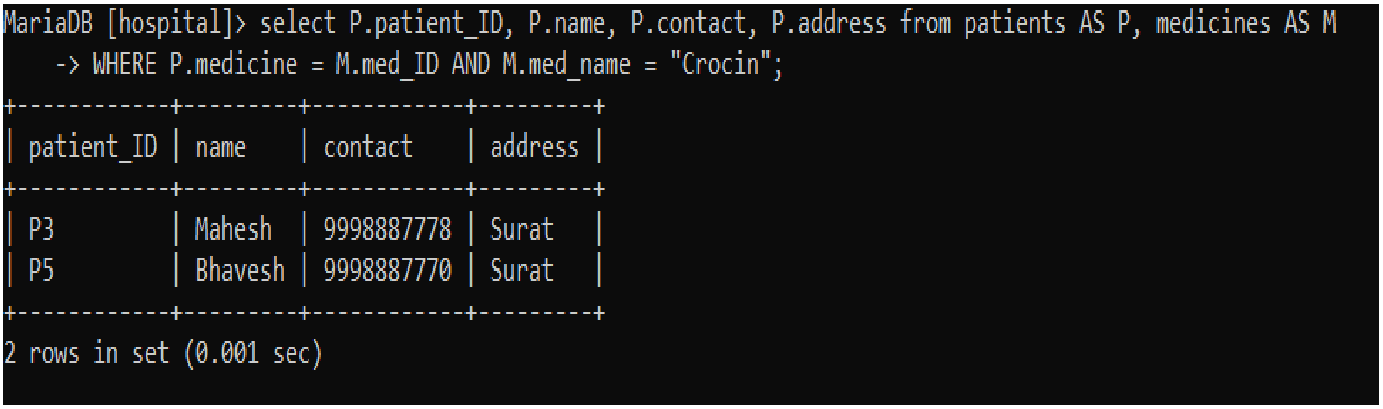
The above database can be manipulated in various manners so as to extract any particular information that can be achieved by performing join operations on the tables.

For example, suppose we want to find the information of all patients corresponding to a particular doctor. In such a case, we can do so as follows:



```
MariaDB [hospital]> select D.ID, D.name, D.specialisation, patients.patient_ID, patients.name, patients.contact, patients.DOB from doctors AS D
    -> INNER JOIN patients
    -> ON patients.doctors = D.ID;
+----+----------+----------------+------------+---------+------------+------------+
| ID | name     | specialisation | patient_ID | name    | contact    | DOB        |
+----+----------+----------------+------------+---------+------------+------------+
| E1 | Mitul    | Orthopaedic    | P1         | Ramesh  | 9998887776 | 2000-03-01 |
| E2 | Manas    | ENT            | P2         | Suresh  | 9998887777 | 2001-04-17 |
| E3 | Zishan   | Orthopaedic    | P3         | Mahesh  | 9998887778 | 1999-05-25 |
| E4 | Archit   | ENT            | P4         | Rakesh  | 9998887779 | 1999-06-30 |
| E1 | Mitul    | Orthopaedic    | P5         | Bhavesh | 9998887770 | 1994-07-11 |
| E5 | Maninder | Neurology      | P6         | Dhruv   | 9998887771 | 1989-09-05 |
+----+----------+----------------+------------+---------+------------+------------+
6 rows in set (0.001 sec)
```

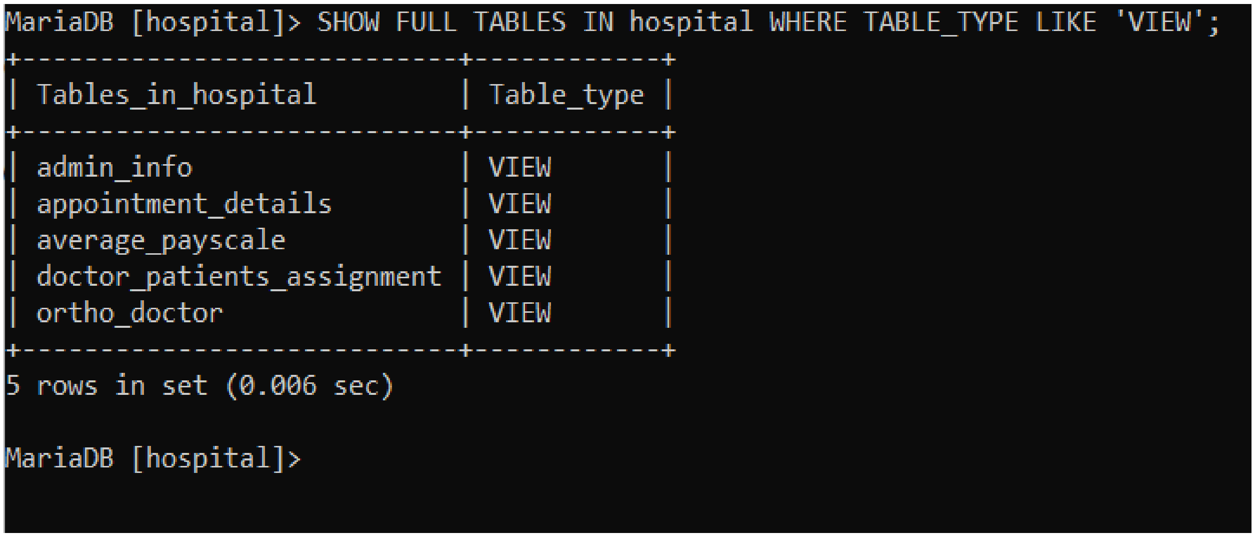
Similar to the above, suppose, it is brought to our notice that a certain medicine has expired and we want to know all the patients that were prescribed that medicine, we can search for all the patients who brought the medicine from the medical store.



```
MariaDB [hospital]> select P.patient_ID, P.name, P.contact, P.address from patients AS P, medicines AS M
    -> WHERE P.medicine = M.med_ID AND M.med_name = "Crocin";
+------------+---------+------------+---------+
| patient_ID | name    | contact    | address |
+------------+---------+------------+---------+
| P3         | Mahesh  | 9998887778 | Surat   |
| P5         | Bhavesh | 9998887770 | Surat   |
+------------+---------+------------+---------+
2 rows in set (0.001 sec)
```

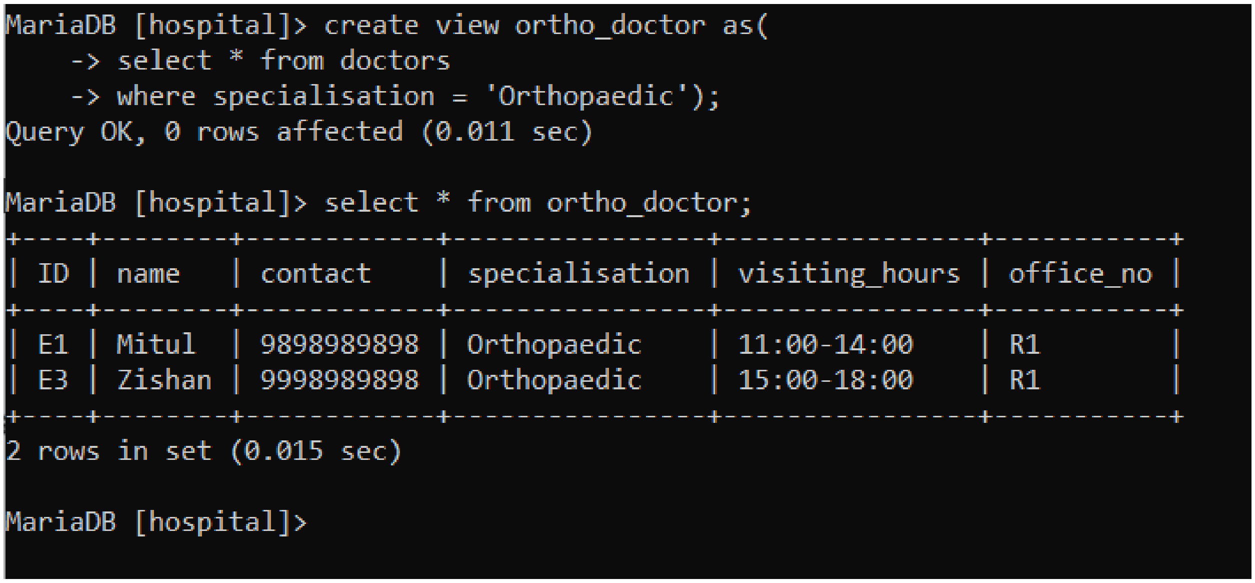
Views

We have created the following views which can be used anytime as per the requirement:



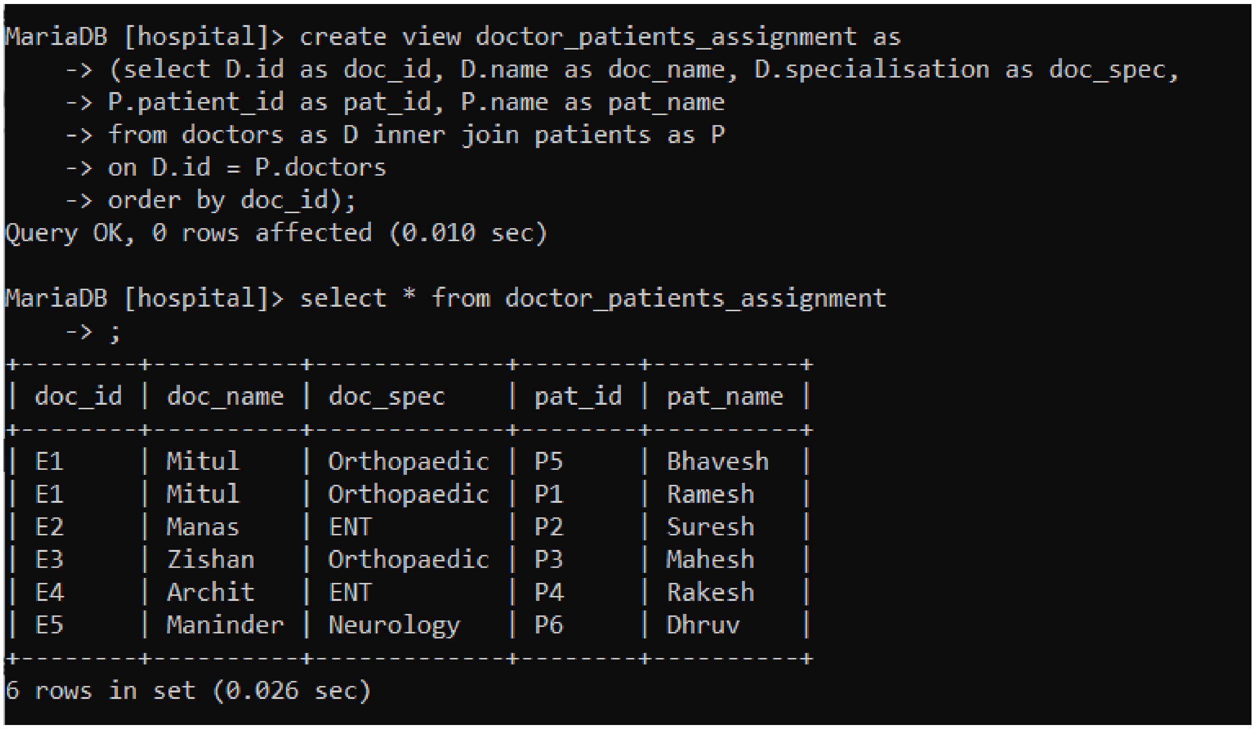
```
MariaDB [hospital]> SHOW FULL TABLES IN hospital WHERE TABLE_TYPE LIKE 'VIEW';
+----------------------------+------------+
| Tables_in_hospital         | Table_type |
+----------------------------+------------+
| admin_info                 | VIEW       |
| appointment_details        | VIEW       |
| average_payscale           | VIEW       |
| doctor_patients_assignment | VIEW       |
| ortho_doctor               | VIEW       |
+----------------------------+------------+
5 rows in set (0.006 sec)

MariaDB [hospital]>
```

- Ortho_doctor: For fetching doctors information in a particular department. Here we have created a view for only the orthopedic department. In the same way we can do it for the rest of the department.



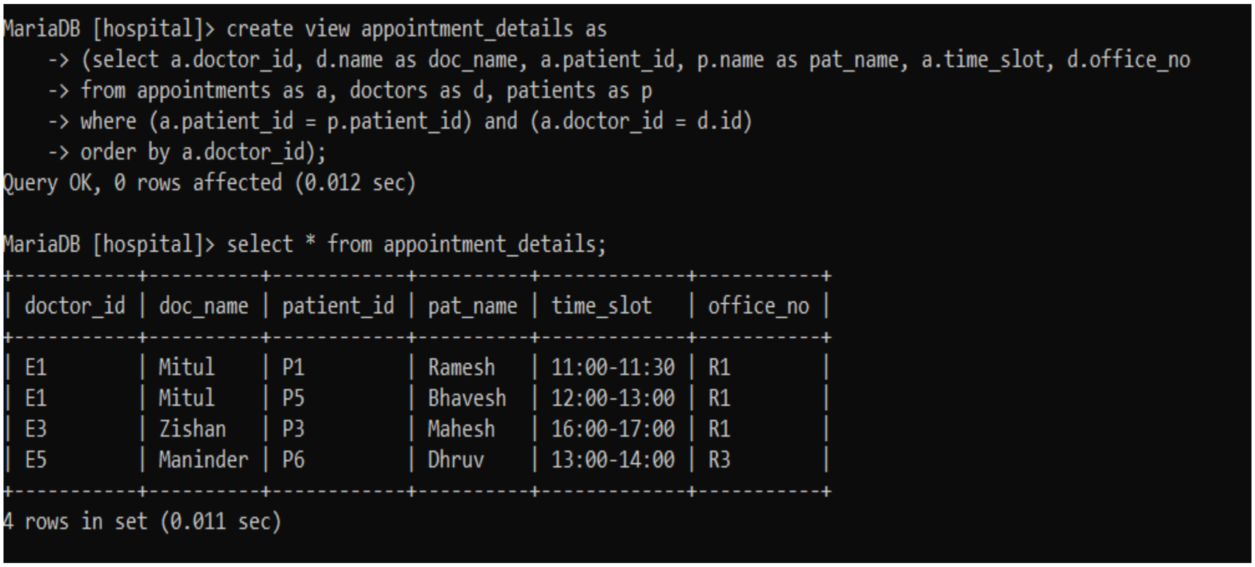
```
MariaDB [hospital]> create view ortho_doctor as(
    -> select * from doctors
    -> where specialisation = 'Orthopaedic');
Query OK, 0 rows affected (0.011 sec)

MariaDB [hospital]> select * from ortho_doctor;
+----+--------+------------+----------------+----------------+-----------+
| ID | name   | contact    | specialisation | visiting_hours | office_no |
+----+--------+------------+----------------+----------------+-----------+
| E1 | Mitul  | 9898989898 | Orthopaedic    | 11:00-14:00    | R1        |
| E3 | Zishan | 9998989898 | Orthopaedic    | 15:00-18:00    | R1        |
+----+--------+------------+----------------+----------------+-----------+
2 rows in set (0.015 sec)

MariaDB [hospital]>
```

- Doctors_patients_assignment: For getting insights about the patients assignments to a particular doctor



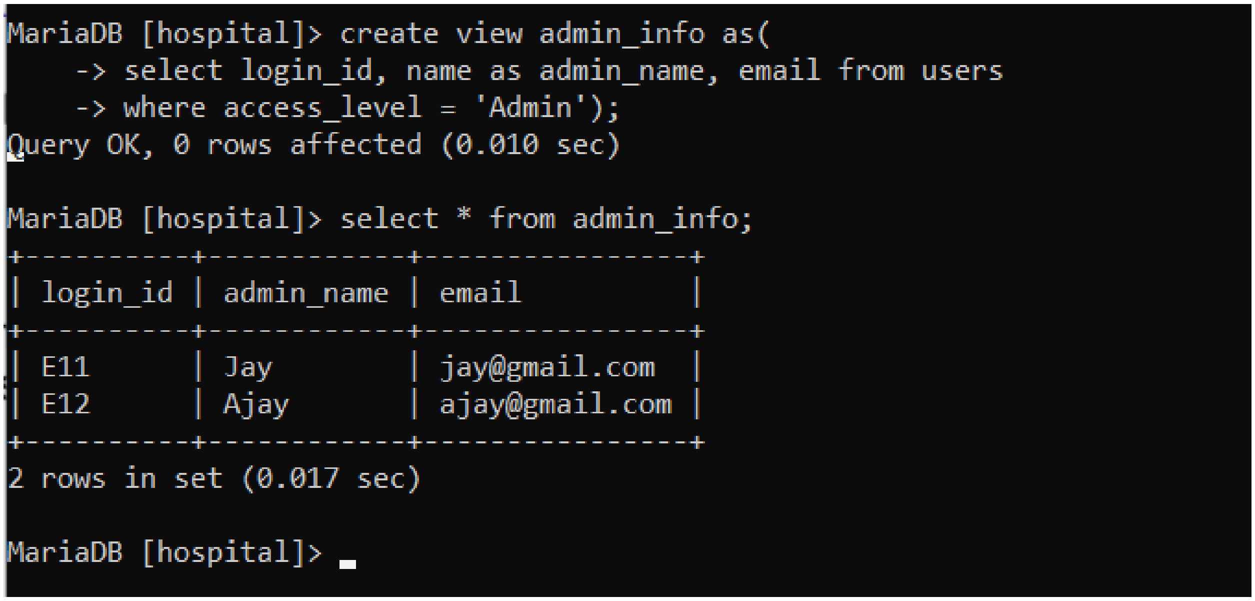
```
MariaDB [hospital]> create view doctor_patients_assignment as
    -> (select D.id as doc_id, D.name as doc_name, D.specialisation as doc_spec,
    -> P.patient_id as pat_id, P.name as pat_name
    -> from doctors as D inner join patients as P
    -> on D.id = P.doctors
    -> order by doc_id);
Query OK, 0 rows affected (0.010 sec)

MariaDB [hospital]> select * from doctor_patients_assignment
    -> ;
+--------+----------+-------------+--------+----------+
| doc_id | doc_name | doc_spec    | pat_id | pat_name |
+--------+----------+-------------+--------+----------+
| E1     | Mitul    | Orthopaedic | P5     | Bhavesh  |
| E1     | Mitul    | Orthopaedic | P1     | Ramesh   |
| E2     | Manas    | ENT         | P2     | Suresh   |
| E3     | Zishan   | Orthopaedic | P3     | Mahesh   |
| E4     | Archit   | ENT         | P4     | Rakesh   |
| E5     | Maninder | Neurology   | P6     | Dhruv    |
+--------+----------+-------------+--------+----------+
6 rows in set (0.026 sec)
```

- Appointment_details: For getting information on all current appointments in the hospital. Here we get all the required information coming from multiple tables regarding the appointment.



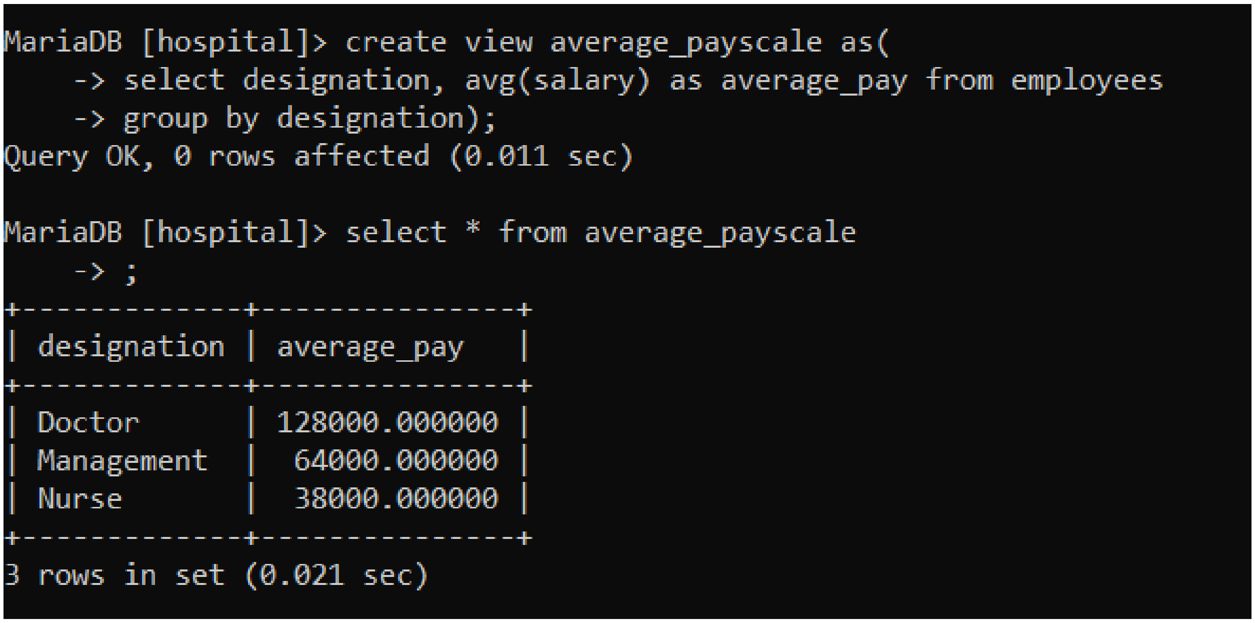
```
MariaDB [hospital]> create view appointment_details as
    -> (select a.doctor_id, d.name as doc_name, a.patient_id, p.name as pat_name, a.time_slot, d.office_no
    -> from appointments as a, doctors as d, patients as p
    -> where (a.patient_id = p.patient_id) and (a.doctor_id = d.id)
    -> order by a.doctor_id);
Query OK, 0 rows affected (0.012 sec)

MariaDB [hospital]> select * from appointment_details;
+-----------+----------+------------+----------+-------------+-----------+
| doctor_id | doc_name | patient_id | pat_name | time_slot   | office_no |
+-----------+----------+------------+----------+-------------+-----------+
| E1        | Mitul    | P1         | Ramesh   | 11:00-11:30 | R1        |
| E1        | Mitul    | P5         | Bhavesh  | 12:00-13:00 | R1        |
| E3        | Zishan   | P3         | Mahesh   | 16:00-17:00 | R1        |
| E5        | Maninder | P6         | Dhruv    | 13:00-14:00 | R3        |
+-----------+----------+------------+----------+-------------+-----------+
4 rows in set (0.011 sec)
```

- Admin_info: For getting admin information, which can be useful for anyone having difficulties in accessing the system. They can reach out to admins to get their issues rectified.



```
MariaDB [hospital]> create view admin_info as(
    -> select login_id, name as admin_name, email from users
    -> where access_level = 'Admin');
Query OK, 0 rows affected (0.010 sec)

MariaDB [hospital]> select * from admin_info;
+----------+------------+----------------+
| login_id | admin_name | email          |
+----------+------------+----------------+
| E11      | Jay        | jay@gmail.com  |
| E12      | Ajay       | ajay@gmail.com |
+----------+------------+----------------+
2 rows in set (0.017 sec)

MariaDB [hospital]>
```

- Average_payscale: Can be used by the Finance department for budget analysis and also for other financial purposes.

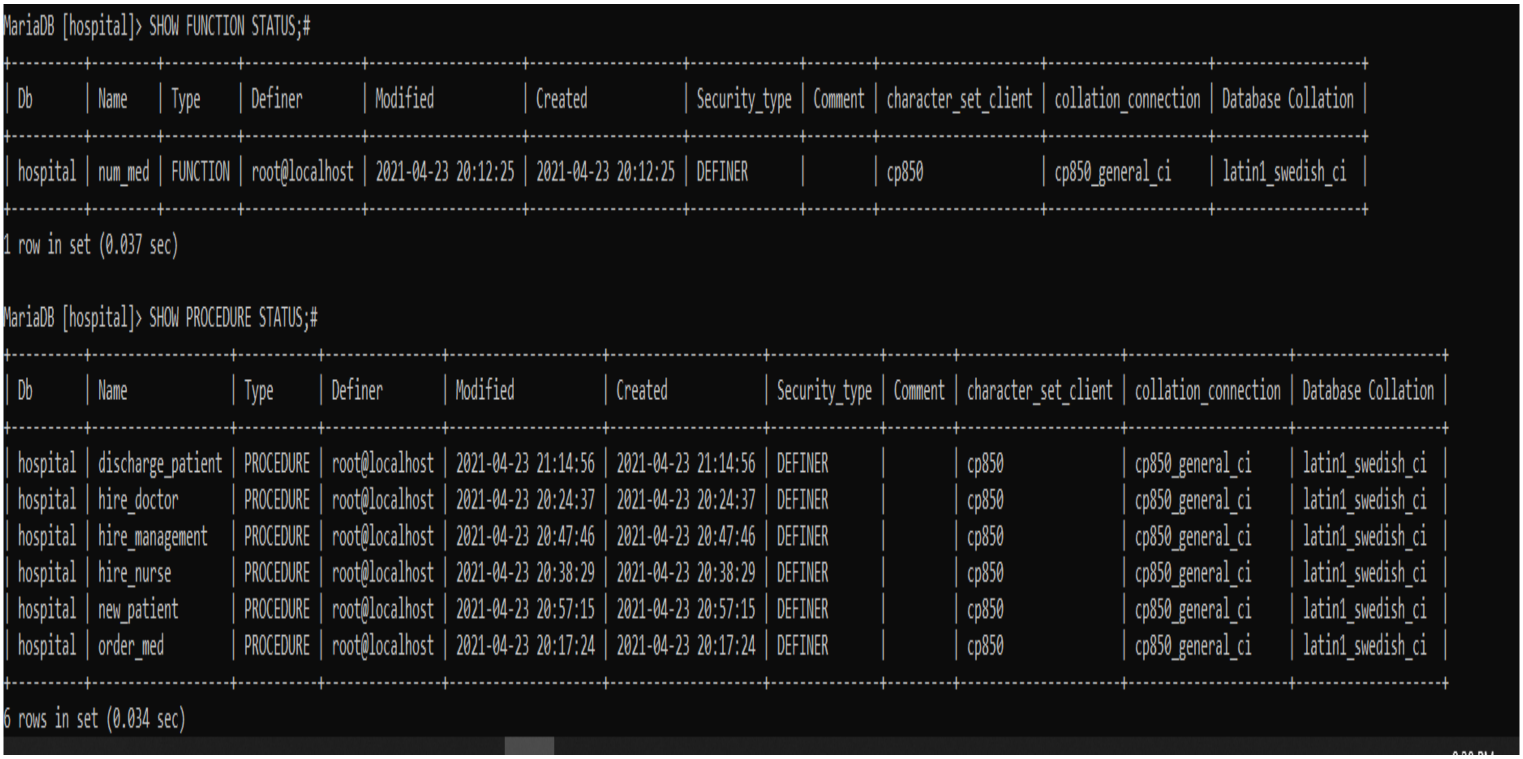


```
MariaDB [hospital]> create view average_payscale as(
    -> select designation, avg(salary) as average_pay from employees
    -> group by designation);
Query OK, 0 rows affected (0.011 sec)

MariaDB [hospital]> select * from average_payscale
    -> ;
+-------------+---------------+
| designation | average_pay   |
+-------------+---------------+
| Doctor      | 128000.000000 |
| Management  |  64000.000000 |
| Nurse       |  38000.000000 |
+-------------+---------------+
3 rows in set (0.021 sec)
```

Similarly, many other views can be created according to our requirements depending on the frequency with which the data is used.

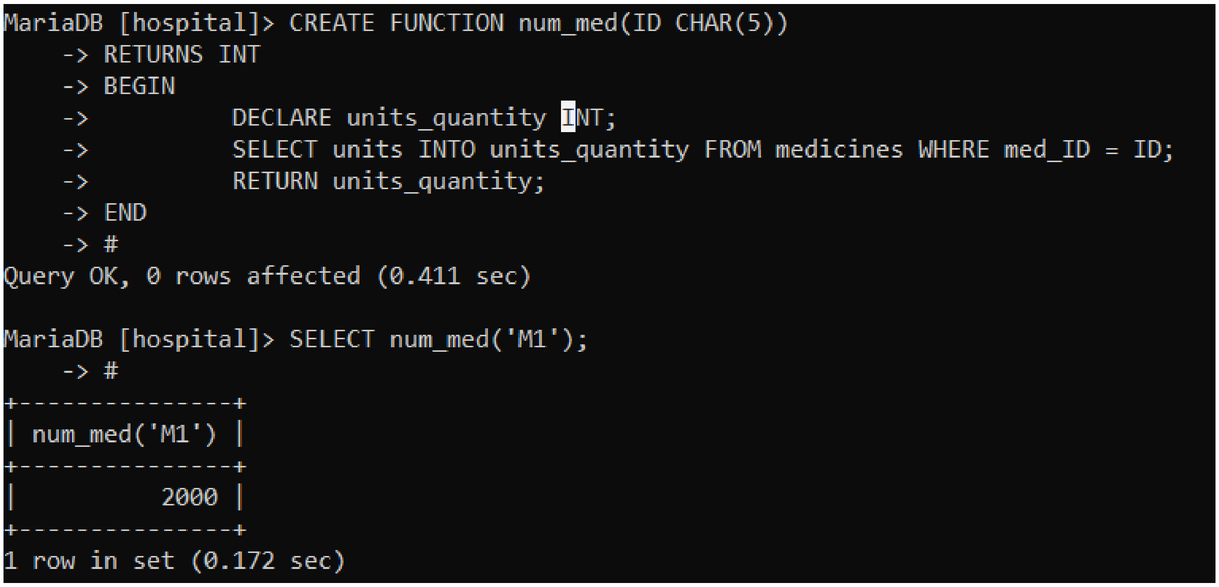
Functions and Procedures

We have created a few functions and procedures to make updates to our databases easier and more intuitive.



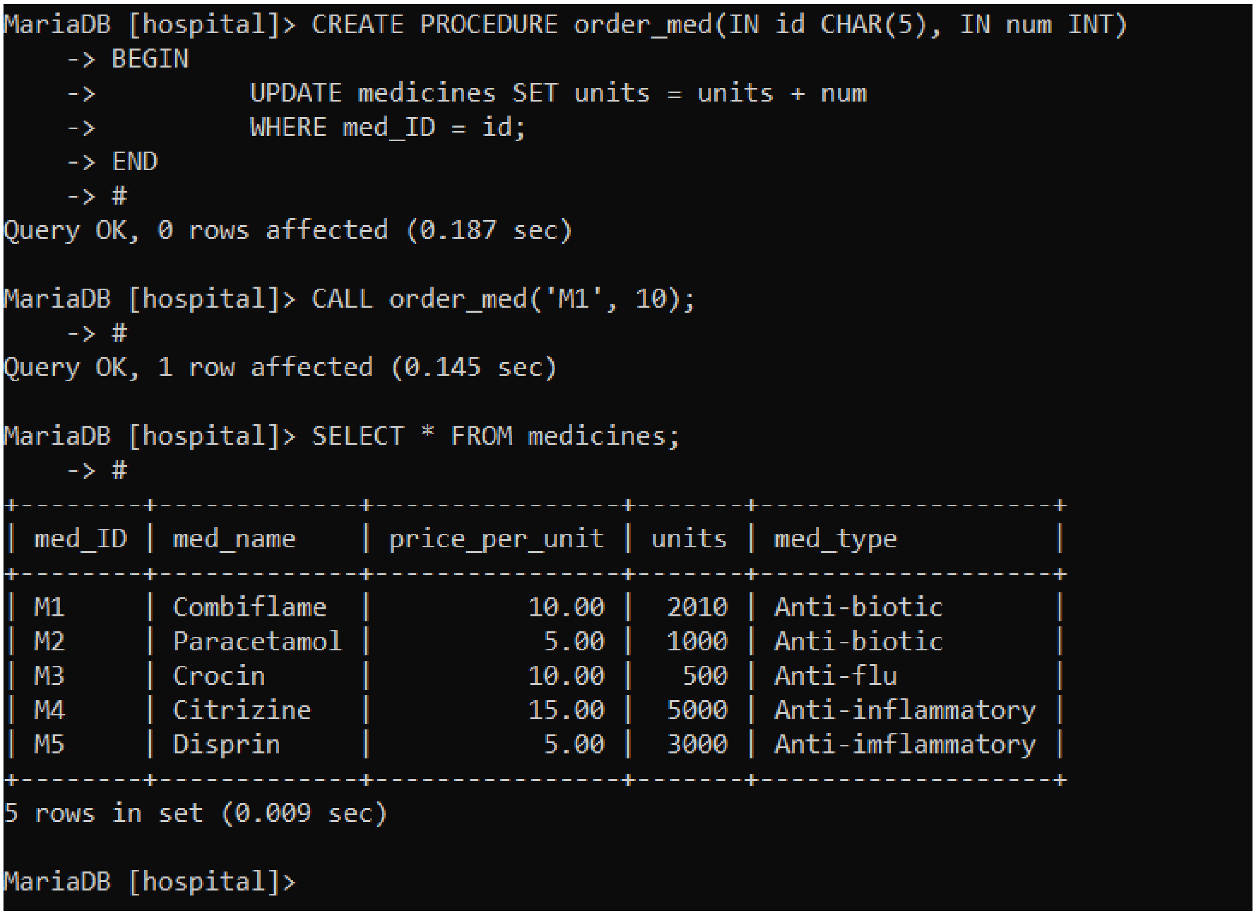
```
MariaDB [hospital]> SHOW FUNCTION STATUS;#
+----------+---------+----------+----------------+---------------------+---------------------+---------------+---------+----------------------+----------------------+--------------------+
| Db       | Name    | Type     | Definer        | Modified            | Created             | Security_type | Comment | character_set_client | collation_connection | Database Collation |
+----------+---------+----------+----------------+---------------------+---------------------+---------------+---------+----------------------+----------------------+--------------------+
| hospital | num_med | FUNCTION | root@localhost | 2021-04-23 20:12:25 | 2021-04-23 20:12:25 | DEFINER       |         | cp850                | cp850_general_ci     | latin1_swedish_ci  |
+----------+---------+----------+----------------+---------------------+---------------------+---------------+---------+----------------------+----------------------+--------------------+
1 row in set (0.037 sec)

MariaDB [hospital]> SHOW PROCEDURE STATUS;#
+----------+------------------+-----------+----------------+---------------------+---------------------+---------------+---------+----------------------+----------------------+--------------------+
| Db       | Name             | Type      | Definer        | Modified            | Created             | Security_type | Comment | character_set_client | collation_connection | Database Collation |
+----------+------------------+-----------+----------------+---------------------+---------------------+---------------+---------+----------------------+----------------------+--------------------+
| hospital | discharge_patient | PROCEDURE | root@localhost | 2021-04-23 21:14:56 | 2021-04-23 21:14:56 | DEFINER       |         | cp850                | cp850_general_ci     | latin1_swedish_ci  |
| hospital | hire_doctor      | PROCEDURE | root@localhost | 2021-04-23 20:24:37 | 2021-04-23 20:24:37 | DEFINER       |         | cp850                | cp850_general_ci     | latin1_swedish_ci  |
| hospital | hire_management  | PROCEDURE | root@localhost | 2021-04-23 20:47:46 | 2021-04-23 20:47:46 | DEFINER       |         | cp850                | cp850_general_ci     | latin1_swedish_ci  |
| hospital | hire_nurse       | PROCEDURE | root@localhost | 2021-04-23 20:38:29 | 2021-04-23 20:38:29 | DEFINER       |         | cp850                | cp850_general_ci     | latin1_swedish_ci  |
| hospital | new_patient      | PROCEDURE | root@localhost | 2021-04-23 20:57:15 | 2021-04-23 20:57:15 | DEFINER       |         | cp850                | cp850_general_ci     | latin1_swedish_ci  |
| hospital | order_med        | PROCEDURE | root@localhost | 2021-04-23 20:17:24 | 2021-04-23 20:17:24 | DEFINER       |         | cp850                | cp850_general_ci     | latin1_swedish_ci  |
+----------+------------------+-----------+----------------+---------------------+---------------------+---------------+---------+----------------------+----------------------+--------------------+
6 rows in set (0.034 sec)
```

- Num_med(function): This function will return to us the currently available number of medicine units in the inventory matching a certain ‘med_ID’. This function will be especially useful in triggers when we will need to check if the number of available medicines is below a certain threshold, in such a case, we will order more units of medicine.



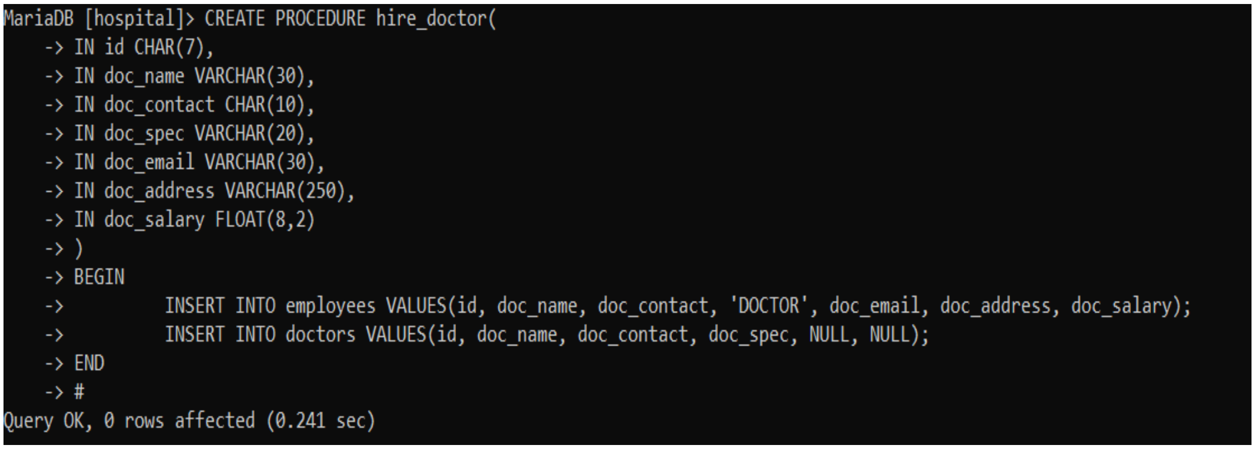
```
MariaDB [hospital]> CREATE FUNCTION num_med(ID CHAR(5))
    -> RETURNS INT
    -> BEGIN
    ->          DECLARE units_quantity INT;
    ->          SELECT units INTO units_quantity FROM medicines WHERE med_ID = ID;
    ->          RETURN units_quantity;
    -> END
    -> #
Query OK, 0 rows affected (0.411 sec)

MariaDB [hospital]> SELECT num_med('M1');
    -> #
+---------------+
| num_med('M1') |
+---------------+
|          2000 |
+---------------+
1 row in set (0.172 sec)
```

- Order_med (procedure): This procedure is used to order the medicine for the inventory and update the units' count.

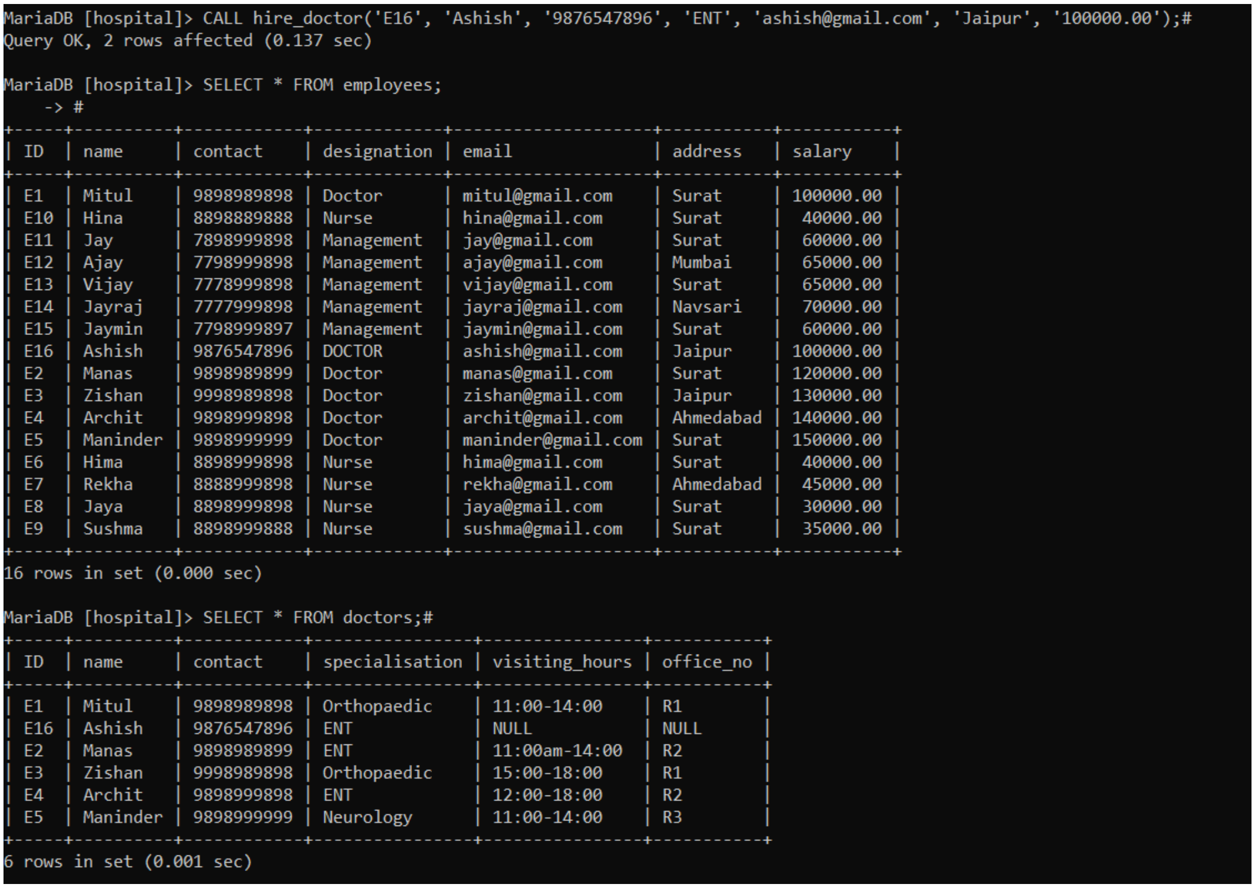


```
MariaDB [hospital]> CREATE PROCEDURE order_med(IN id CHAR(5), IN num INT)
    -> BEGIN
    ->          UPDATE medicines SET units = units + num
    ->          WHERE med_ID = id;
    -> END
    -> #
Query OK, 0 rows affected (0.187 sec)

MariaDB [hospital]> CALL order_med('M1', 10);
    -> #
Query OK, 1 row affected (0.145 sec)

MariaDB [hospital]> SELECT * FROM medicines;
    -> #
+--------+-------------+----------------+-------+-------------------+
| med_ID | med_name    | price_per_unit | units | med_type          |
+--------+-------------+----------------+-------+-------------------+
| M1     | Combiflame  |          10.00 |  2010 | Anti-biotic       |
| M2     | Paracetamol |           5.00 |  1000 | Anti-biotic       |
| M3     | Crocin      |          10.00 |   500 | Anti-flu          |
| M4     | Citrizine   |          15.00 |  5000 | Anti-inflammatory |
| M5     | Disprin     |           5.00 |  3000 | Anti-imflammatory |
+--------+-------------+----------------+-------+-------------------+
5 rows in set (0.009 sec)

MariaDB [hospital]>
```

- hire_doctor(procedure): This procedure will insert details in both employee and doctors table when a new doctor is hired.

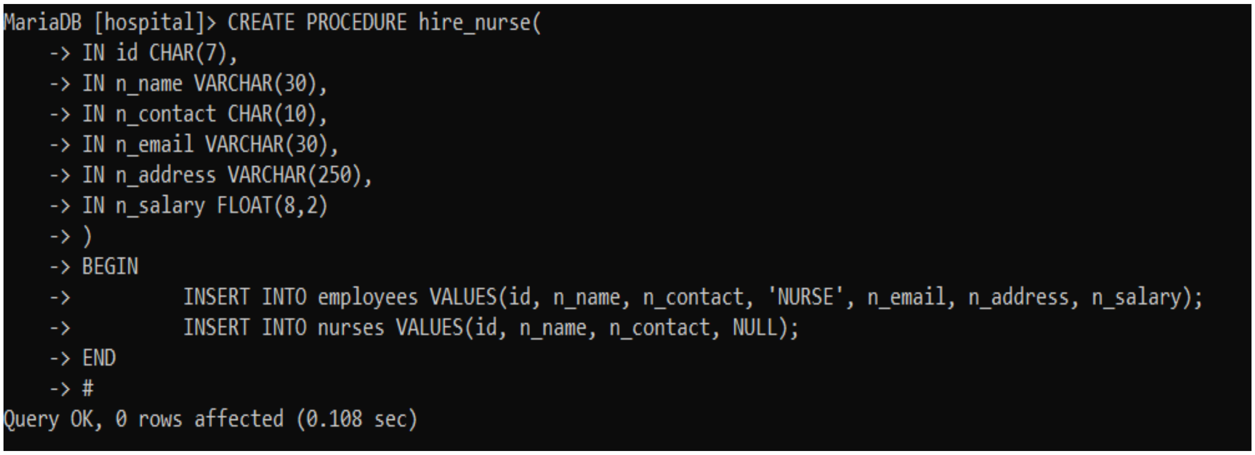


```
MariaDB [hospital]> CREATE PROCEDURE hire_doctor(
    -> IN id CHAR(7),
    -> IN doc_name VARCHAR(30),
    -> IN doc_contact CHAR(10),
    -> IN doc_spec VARCHAR(20),
    -> IN doc_email VARCHAR(30),
    -> IN doc_address VARCHAR(250),
    -> IN doc_salary FLOAT(8,2)
    -> )
    -> BEGIN
    ->          INSERT INTO employees VALUES(id, doc_name, doc_contact, 'DOCTOR', doc_email, doc_address, doc_salary);
    ->          INSERT INTO doctors VALUES(id, doc_name, doc_contact, doc_spec, NULL, NULL);
    -> END
    -> #
Query OK, 0 rows affected (0.241 sec)
```

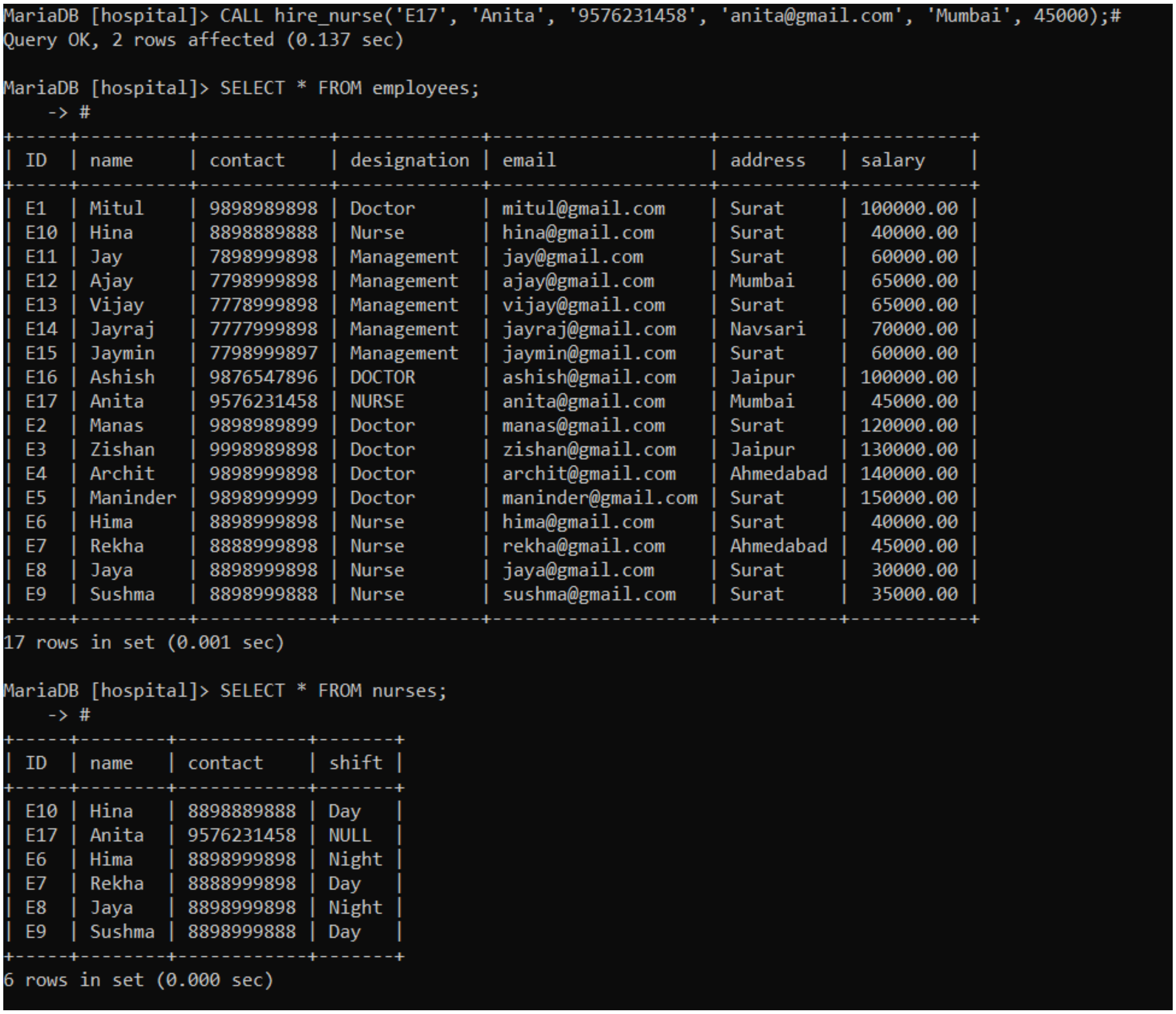


```
MariaDB [hospital]> CALL hire_doctor('E16', 'Ashish', '9876547896', 'ENT', 'ashish@gmail.com', 'Jaipur', '100000.00');#
Query OK, 2 rows affected (0.137 sec)

MariaDB [hospital]> SELECT * FROM employees;
    -> #
+-----+----------+------------+-------------+--------------------+-----------+-----------+
| ID  | name     | contact    | designation | email              | address   | salary    |
+-----+----------+------------+-------------+--------------------+-----------+-----------+
| E1  | Mitul    | 9898989898 | Doctor      | mitul@gmail.com    | Surat     | 100000.00 |
| E10 | Hina     | 8898889888 | Nurse       | hina@gmail.com     | Surat     |  40000.00 |
| E11 | Jay      | 7898999898 | Management  | jay@gmail.com      | Surat     |  60000.00 |
| E12 | Ajay     | 7798999898 | Management  | ajay@gmail.com     | Mumbai    |  65000.00 |
| E13 | Vijay    | 7778999898 | Management  | vijay@gmail.com    | Surat     |  65000.00 |
| E14 | Jayraj   | 7777999898 | Management  | jayraj@gmail.com   | Navsari   |  70000.00 |
| E15 | Jaymin   | 7798999897 | Management  | jaymin@gmail.com   | Surat     |  60000.00 |
| E16 | Ashish   | 9876547896 | DOCTOR      | ashish@gmail.com   | Jaipur    | 100000.00 |
| E2  | Manas    | 9898989899 | Doctor      | manas@gmail.com    | Surat     | 120000.00 |
| E3  | Zishan   | 9998989898 | Doctor      | zishan@gmail.com   | Jaipur    | 130000.00 |
| E4  | Archit   | 9898999898 | Doctor      | archit@gmail.com   | Ahmedabad | 140000.00 |
| E5  | Maninder | 9898999999 | Doctor      | maninder@gmail.com | Surat     | 150000.00 |
| E6  | Hima     | 8898999898 | Nurse       | hima@gmail.com     | Surat     |  40000.00 |
| E7  | Rekha    | 8888999898 | Nurse       | rekha@gmail.com    | Ahmedabad |  45000.00 |
| E8  | Jaya     | 8898999898 | Nurse       | jaya@gmail.com     | Surat     |  30000.00 |
| E9  | Sushma   | 8898999888 | Nurse       | sushma@gmail.com   | Surat     |  35000.00 |
+-----+----------+------------+-------------+--------------------+-----------+-----------+
16 rows in set (0.000 sec)

MariaDB [hospital]> SELECT * FROM doctors;#
+-----+----------+------------+----------------+----------------+-----------+
| ID  | name     | contact    | specialisation | visiting_hours | office_no |
+-----+----------+------------+----------------+----------------+-----------+
| E1  | Mitul    | 9898989898 | Orthopaedic    | 11:00-14:00    | R1        |
| E16 | Ashish   | 9876547896 | ENT            | NULL           | NULL      |
| E2  | Manas    | 9898989899 | ENT            | 11:00am-14:00  | R2        |
| E3  | Zishan   | 9998989898 | Orthopaedic    | 15:00-18:00    | R1        |
| E4  | Archit   | 9898999898 | ENT            | 12:00-18:00    | R2        |
| E5  | Maninder | 9898999999 | Neurology      | 11:00-14:00    | R3        |
+-----+----------+------------+----------------+----------------+-----------+
6 rows in set (0.001 sec)
```

- Hire_nurse (procedure): This procedure will insert details in both employee and nurse tables when a new nurse is hired.

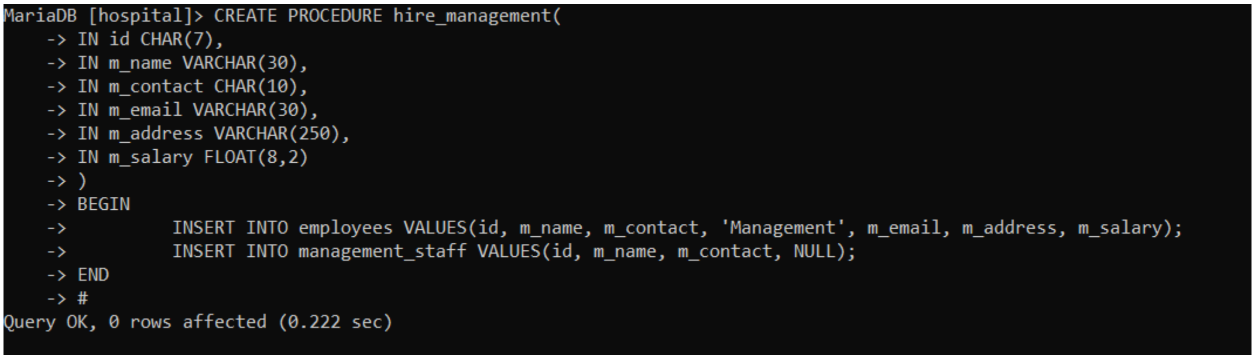


```
MariaDB [hospital]> CREATE PROCEDURE hire_nurse(
    -> IN id CHAR(7),
    -> IN n_name VARCHAR(30),
    -> IN n_contact CHAR(10),
    -> IN n_email VARCHAR(30),
    -> IN n_address VARCHAR(250),
    -> IN n_salary FLOAT(8,2)
    -> )
    -> BEGIN
    ->          INSERT INTO employees VALUES(id, n_name, n_contact, 'NURSE', n_email, n_address, n_salary);
    ->          INSERT INTO nurses VALUES(id, n_name, n_contact, NULL);
    -> END
    -> #
Query OK, 0 rows affected (0.108 sec)
```

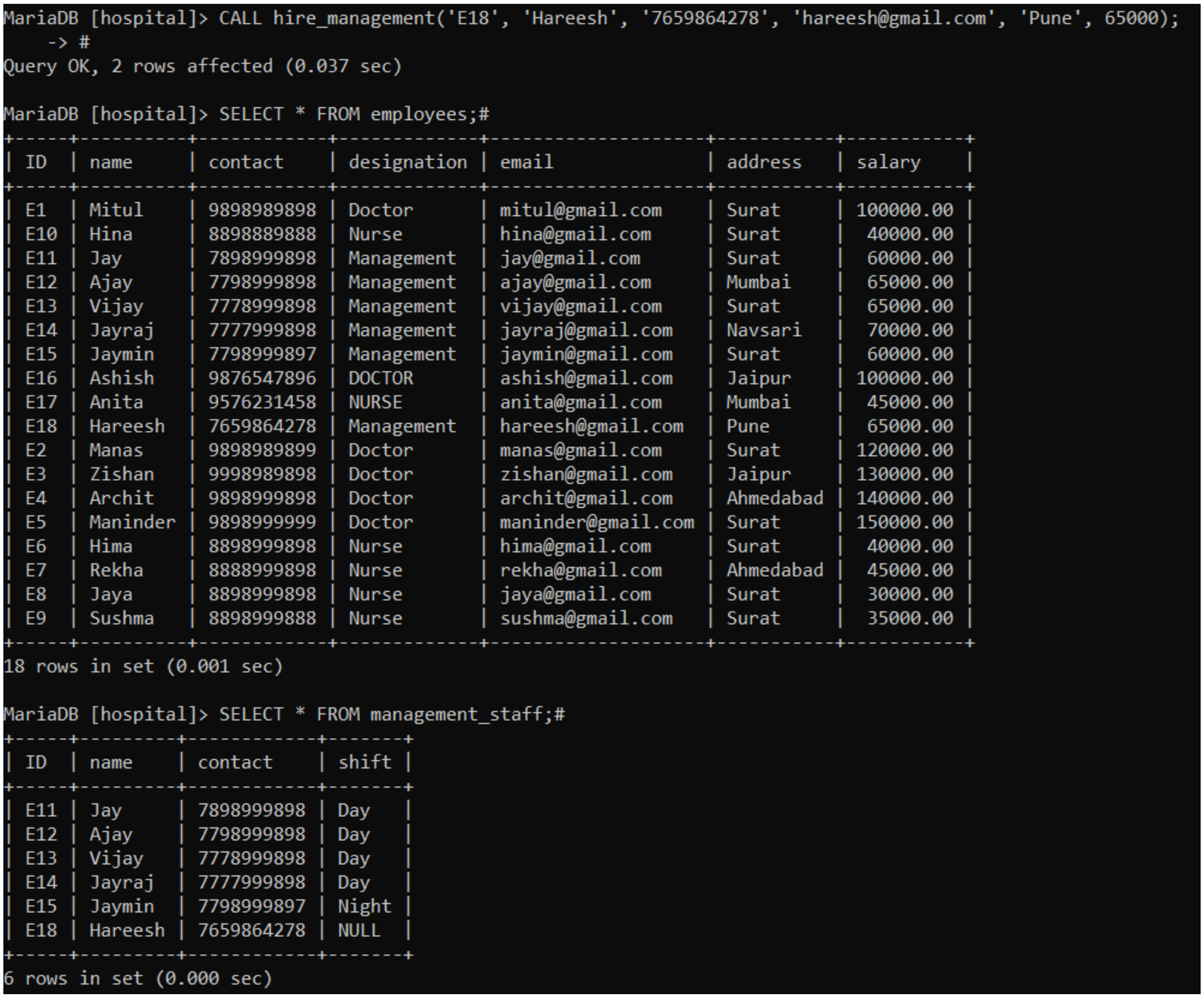


```
MariaDB [hospital]> CALL hire_nurse('E17', 'Anita', '9576231458', 'anita@gmail.com', 'Mumbai', 45000);#
Query OK, 2 rows affected (0.137 sec)

MariaDB [hospital]> SELECT * FROM employees;
    -> #
+-----+----------+------------+-------------+--------------------+-----------+-----------+
| ID  | name     | contact    | designation | email              | address   | salary    |
+-----+----------+------------+-------------+--------------------+-----------+-----------+
| E1  | Mitul    | 9898989898 | Doctor      | mitul@gmail.com    | Surat     | 100000.00 |
| E10 | Hina     | 8898889888 | Nurse       | hina@gmail.com     | Surat     |  40000.00 |
| E11 | Jay      | 7898999898 | Management  | jay@gmail.com      | Surat     |  60000.00 |
| E12 | Ajay     | 7798999898 | Management  | ajay@gmail.com     | Mumbai    |  65000.00 |
| E13 | Vijay    | 7778999898 | Management  | vijay@gmail.com    | Surat     |  65000.00 |
| E14 | Jayraj   | 7777999898 | Management  | jayraj@gmail.com   | Navsari   |  70000.00 |
| E15 | Jaymin   | 7798999897 | Management  | jaymin@gmail.com   | Surat     |  60000.00 |
| E16 | Ashish   | 9876547896 | DOCTOR      | ashish@gmail.com   | Jaipur    | 100000.00 |
| E17 | Anita    | 9576231458 | NURSE       | anita@gmail.com    | Mumbai    |  45000.00 |
| E2  | Manas    | 9898989899 | Doctor      | manas@gmail.com    | Surat     | 120000.00 |
| E3  | Zishan   | 9998989898 | Doctor      | zishan@gmail.com   | Jaipur    | 130000.00 |
| E4  | Archit   | 9898999898 | Doctor      | archit@gmail.com   | Ahmedabad | 140000.00 |
| E5  | Maninder | 9898999999 | Doctor      | maninder@gmail.com | Surat     | 150000.00 |
| E6  | Hima     | 8898999898 | Nurse       | hima@gmail.com     | Surat     |  40000.00 |
| E7  | Rekha    | 8888999898 | Nurse       | rekha@gmail.com    | Ahmedabad |  45000.00 |
| E8  | Jaya     | 8898999898 | Nurse       | jaya@gmail.com     | Surat     |  30000.00 |
| E9  | Sushma   | 8898999888 | Nurse       | sushma@gmail.com   | Surat     |  35000.00 |
+-----+----------+------------+-------------+--------------------+-----------+-----------+
17 rows in set (0.001 sec)

MariaDB [hospital]> SELECT * FROM nurses;
    -> #
+-----+--------+------------+-------+
| ID  | name   | contact    | shift |
+-----+--------+------------+-------+
| E10 | Hina   | 8898889888 | Day   |
| E17 | Anita  | 9576231458 | NULL  |
| E6  | Hima   | 8898999898 | Night |
| E7  | Rekha  | 8888999898 | Day   |
| E8  | Jaya   | 8898999898 | Night |
| E9  | Sushma | 8898999888 | Day   |
+-----+--------+------------+-------+
6 rows in set (0.000 sec)
```

- Hire_management(procedure): This procedure will insert details in both employee and management_staff tables when a new employee for management is hired.

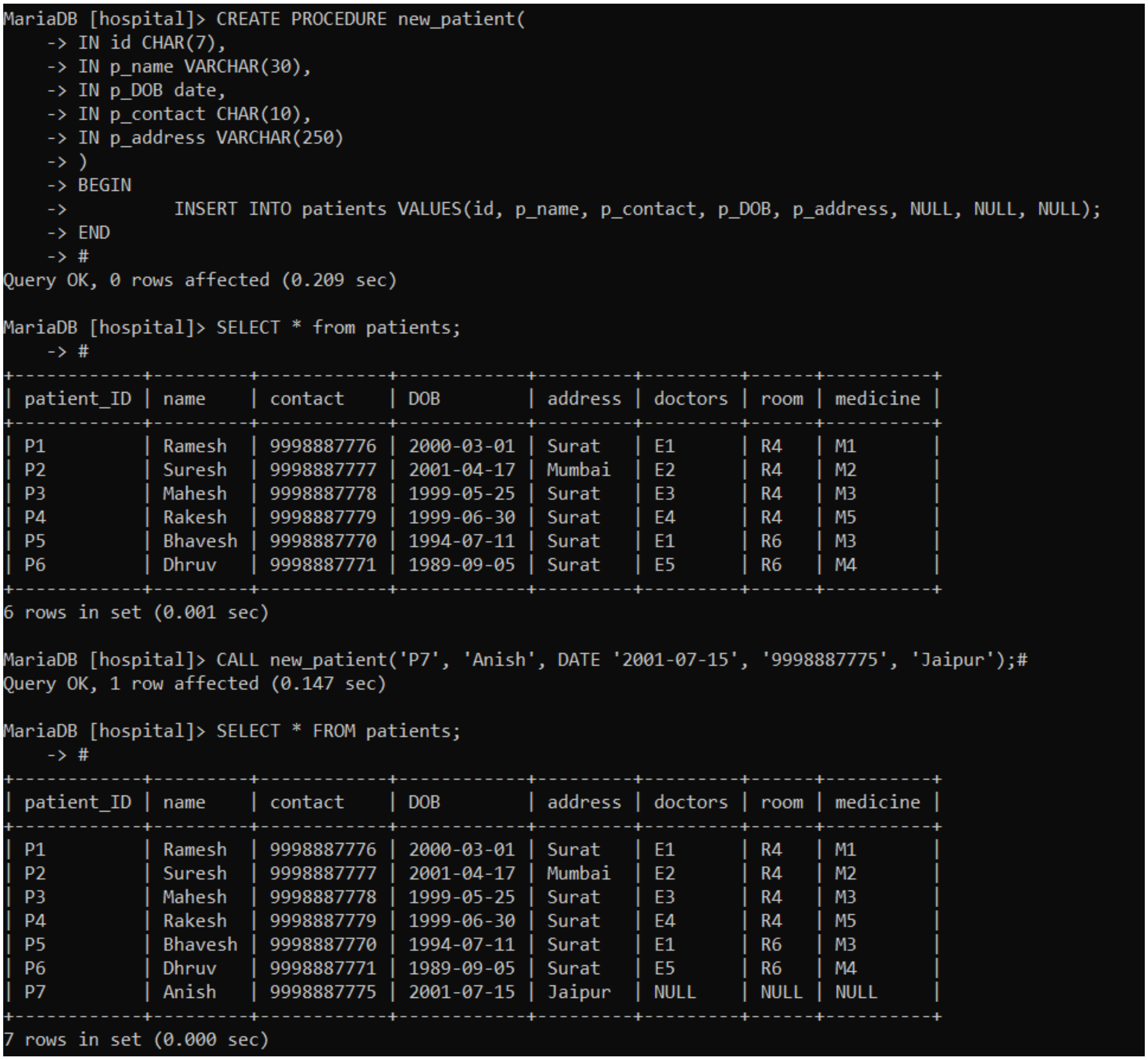


```
MariaDB [hospital]> CREATE PROCEDURE hire_management(
    -> IN id CHAR(7),
    -> IN m_name VARCHAR(30),
    -> IN m_contact CHAR(10),
    -> IN m_email VARCHAR(30),
    -> IN m_address VARCHAR(250),
    -> IN m_salary FLOAT(8,2)
    -> )
    -> BEGIN
    ->          INSERT INTO employees VALUES(id, m_name, m_contact, 'Management', m_email, m_address, m_salary);
    ->          INSERT INTO management_staff VALUES(id, m_name, m_contact, NULL);
    -> END
    -> #
Query OK, 0 rows affected (0.222 sec)
```



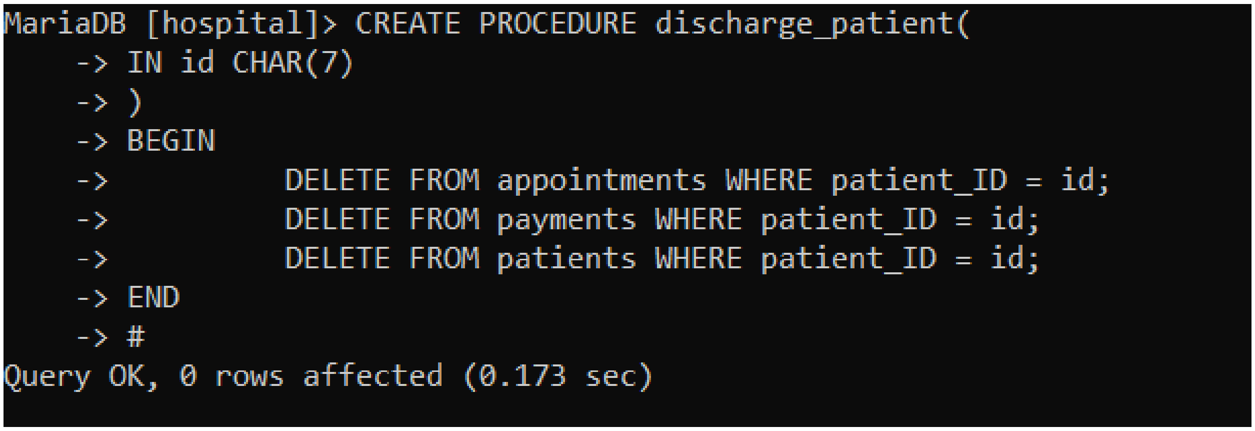
```
MariaDB [hospital]> CALL hire_management('E18', 'Hareesh', '7659864278', 'hareesh@gmail.com', 'Pune', 65000);
    -> #
Query OK, 2 rows affected (0.037 sec)

MariaDB [hospital]> SELECT * FROM employees;#
+-----+----------+------------+-------------+--------------------+-----------+-----------+
| ID  | name     | contact    | designation | email              | address   | salary    |
+-----+----------+------------+-------------+--------------------+-----------+-----------+
| E1  | Mitul    | 9898989898 | Doctor      | mitul@gmail.com    | Surat     | 100000.00 |
| E10 | Hina     | 8898889888 | Nurse       | hina@gmail.com     | Surat     |  40000.00 |
| E11 | Jay      | 7898999898 | Management  | jay@gmail.com      | Surat     |  60000.00 |
| E12 | Ajay     | 7798999898 | Management  | ajay@gmail.com     | Mumbai    |  65000.00 |
| E13 | Vijay    | 7778999898 | Management  | vijay@gmail.com    | Surat     |  65000.00 |
| E14 | Jayraj   | 7777999898 | Management  | jayraj@gmail.com   | Navsari   |  70000.00 |
| E15 | Jaymin   | 7798999897 | Management  | jaymin@gmail.com   | Surat     |  60000.00 |
| E16 | Ashish   | 9876547896 | DOCTOR      | ashish@gmail.com   | Jaipur    | 100000.00 |
| E17 | Anita    | 9576231458 | NURSE       | anita@gmail.com    | Mumbai    |  45000.00 |
| E18 | Hareesh  | 7659864278 | Management  | hareesh@gmail.com  | Pune      |  65000.00 |
| E2  | Manas    | 9898989899 | Doctor      | manas@gmail.com    | Surat     | 120000.00 |
| E3  | Zishan   | 9998989898 | Doctor      | zishan@gmail.com   | Jaipur    | 130000.00 |
| E4  | Archit   | 9898999898 | Doctor      | archit@gmail.com   | Ahmedabad | 140000.00 |
| E5  | Maninder | 9898999999 | Doctor      | maninder@gmail.com | Surat     | 150000.00 |
| E6  | Hima     | 8898999898 | Nurse       | hima@gmail.com     | Surat     |  40000.00 |
| E7  | Rekha    | 8888999898 | Nurse       | rekha@gmail.com    | Ahmedabad |  45000.00 |
| E8  | Jaya     | 8898999898 | Nurse       | jaya@gmail.com     | Surat     |  30000.00 |
| E9  | Sushma   | 8898999888 | Nurse       | sushma@gmail.com   | Surat     |  35000.00 |
+-----+----------+------------+-------------+--------------------+-----------+-----------+
18 rows in set (0.001 sec)

MariaDB [hospital]> SELECT * FROM management_staff;#
+-----+---------+------------+-------+
| ID  | name    | contact    | shift |
+-----+---------+------------+-------+
| E11 | Jay     | 7898999898 | Day   |
| E12 | Ajay    | 7798999898 | Day   |
| E13 | Vijay   | 7778999898 | Day   |
| E14 | Jayraj  | 7777999898 | Day   |
| E15 | Jaymin  | 7798999897 | Night |
| E18 | Hareesh | 7659864278 | NULL  |
+-----+---------+------------+-------+
6 rows in set (0.000 sec)
```

- new_patient(procedure): This procedure is used to fill the details of a new patient in all the required tables whenever a new patient is admitted.

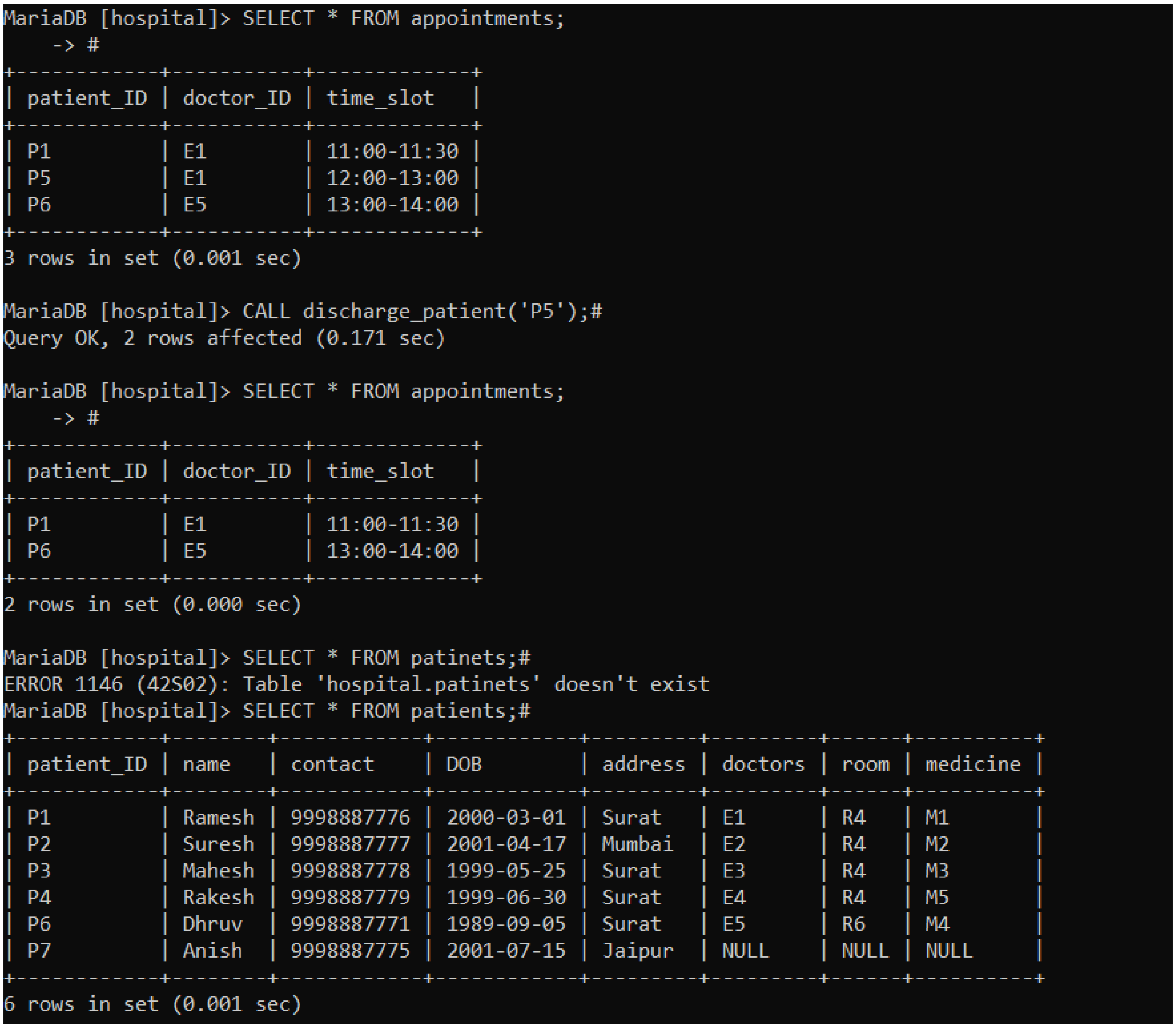


```
MariaDB [hospital]> CREATE PROCEDURE new_patient(
    -> IN id CHAR(7),
    -> IN p_name VARCHAR(30),
    -> IN p_DOB date,
    -> IN p_contact CHAR(10),
    -> IN p_address VARCHAR(250)
    -> )
    -> BEGIN
    ->          INSERT INTO patients VALUES(id, p_name, p_contact, p_DOB, p_address, NULL, NULL, NULL);
    -> END
    -> #
Query OK, 0 rows affected (0.209 sec)

MariaDB [hospital]> SELECT * from patients;
    -> #
+------------+---------+------------+------------+---------+---------+------+----------+
| patient_ID | name    | contact    | DOB        | address | doctors | room | medicine |
+------------+---------+------------+------------+---------+---------+------+----------+
| P1         | Ramesh  | 9998887776 | 2000-03-01 | Surat   | E1      | R4   | M1       |
| P2         | Suresh  | 9998887777 | 2001-04-17 | Mumbai  | E2      | R4   | M2       |
| P3         | Mahesh  | 9998887778 | 1999-05-25 | Surat   | E3      | R4   | M3       |
| P4         | Rakesh  | 9998887779 | 1999-06-30 | Surat   | E4      | R4   | M5       |
| P5         | Bhavesh | 9998887770 | 1994-07-11 | Surat   | E1      | R6   | M3       |
| P6         | Dhruv   | 9998887771 | 1989-09-05 | Surat   | E5      | R6   | M4       |
+------------+---------+------------+------------+---------+---------+------+----------+
6 rows in set (0.001 sec)

MariaDB [hospital]> CALL new_patient('P7', 'Anish', DATE '2001-07-15', '9998887775', 'Jaipur');#
Query OK, 1 row affected (0.147 sec)

MariaDB [hospital]> SELECT * FROM patients;
    -> #
+------------+---------+------------+------------+---------+---------+------+----------+
| patient_ID | name    | contact    | DOB        | address | doctors | room | medicine |
+------------+---------+------------+------------+---------+---------+------+----------+
| P1         | Ramesh  | 9998887776 | 2000-03-01 | Surat   | E1      | R4   | M1       |
| P2         | Suresh  | 9998887777 | 2001-04-17 | Mumbai  | E2      | R4   | M2       |
| P3         | Mahesh  | 9998887778 | 1999-05-25 | Surat   | E3      | R4   | M3       |
| P4         | Rakesh  | 9998887779 | 1999-06-30 | Surat   | E4      | R4   | M5       |
| P5         | Bhavesh | 9998887770 | 1994-07-11 | Surat   | E1      | R6   | M3       |
| P6         | Dhruv   | 9998887771 | 1989-09-05 | Surat   | E5      | R6   | M4       |
| P7         | Anish   | 9998887775 | 2001-07-15 | Jaipur  | NULL    | NULL | NULL     |
+------------+---------+------------+------------+---------+---------+------+----------+
7 rows in set (0.000 sec)
```

- discharge_patient(procedure): This procedure is used to remove the details of patients after a patient is discharged.



```
MariaDB [hospital]> CREATE PROCEDURE discharge_patient(
    -> IN id CHAR(7)
    -> )
    -> BEGIN
    ->          DELETE FROM appointments WHERE patient_ID = id;
    ->          DELETE FROM payments WHERE patient_ID = id;
    ->          DELETE FROM patients WHERE patient_ID = id;
    -> END
    -> #
Query OK, 0 rows affected (0.173 sec)
```



```
MariaDB [hospital]> SELECT * FROM appointments;
    -> #
+------------+-----------+-------------+
| patient_ID | doctor_ID | time_slot   |
+------------+-----------+-------------+
| P1         | E1        | 11:00-11:30 |
| P5         | E1        | 12:00-13:00 |
| P6         | E5        | 13:00-14:00 |
+------------+-----------+-------------+
3 rows in set (0.001 sec)

MariaDB [hospital]> CALL discharge_patient('P5');#
Query OK, 2 rows affected (0.171 sec)

MariaDB [hospital]> SELECT * FROM appointments;
    -> #
+------------+-----------+-------------+
| patient_ID | doctor_ID | time_slot   |
+------------+-----------+-------------+
| P1         | E1        | 11:00-11:30 |
| P6         | E5        | 13:00-14:00 |
+------------+-----------+-------------+
2 rows in set (0.000 sec)

MariaDB [hospital]> SELECT * FROM patinets;#
ERROR 1146 (42S02): Table 'hospital.patinets' doesn't exist
MariaDB [hospital]> SELECT * FROM patients;#
+------------+--------+------------+------------+---------+---------+------+----------+
| patient_ID | name   | contact    | DOB        | address | doctors | room | medicine |
+------------+--------+------------+------------+---------+---------+------+----------+
| P1         | Ramesh | 9998887776 | 2000-03-01 | Surat   | E1      | R4   | M1       |
| P2         | Suresh | 9998887777 | 2001-04-17 | Mumbai  | E2      | R4   | M2       |
| P3         | Mahesh | 9998887778 | 1999-05-25 | Surat   | E3      | R4   | M3       |
| P4         | Rakesh | 9998887779 | 1999-06-30 | Surat   | E4      | R4   | M5       |
| P6         | Dhruv  | 9998887771 | 1989-09-05 | Surat   | E5      | R6   | M4       |
| P7         | Anish  | 9998887775 | 2001-07-15 | Jaipur  | NULL    | NULL | NULL     |
+------------+--------+------------+------------+---------+---------+------+----------+
6 rows in set (0.001 sec)
```

Web Application

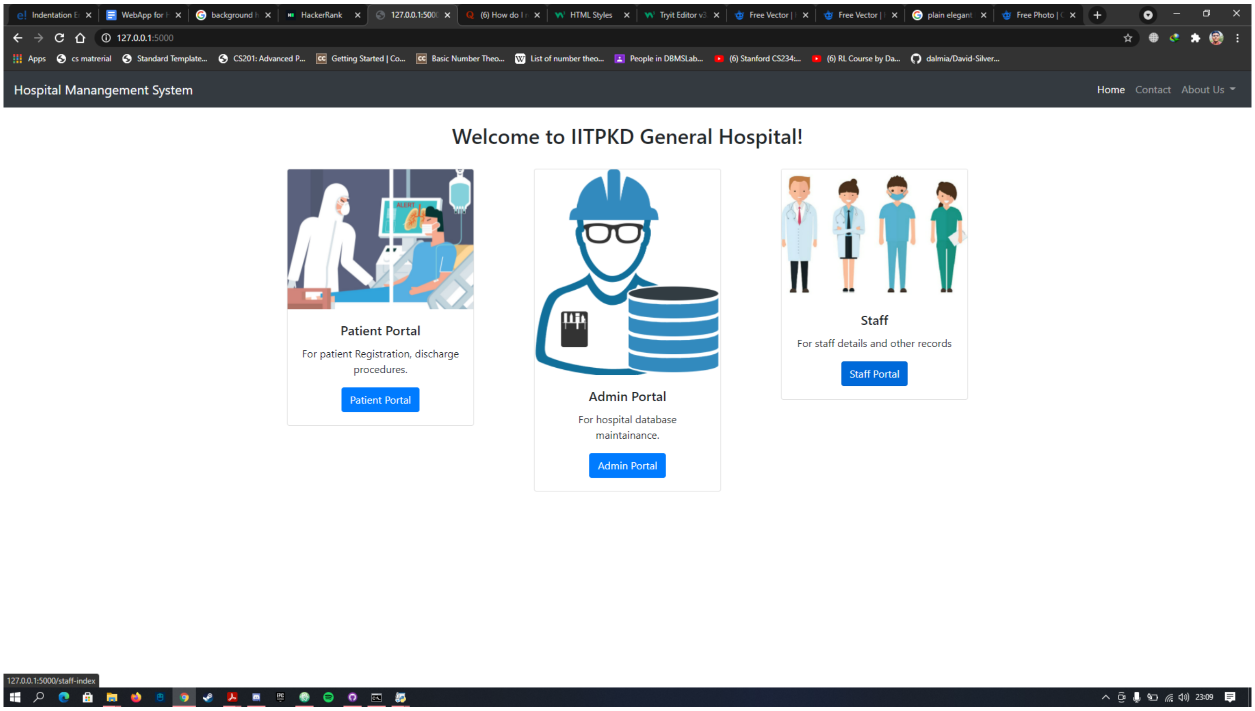
Technologies used:

- MariaDB 10.5
- Python 3.9
- Flask 1.1 (Web-application framework)
- MaterialDesign Bootstrap 4.6.0

In this project, we decided to use the Flask framework to integrate the backend of our application with the ‘Hospital’ database which is based on MariaDB. Flask is a micro-framework developed in Python that provides only the essential components - things like routing, request handling, sessions, and for a beginner’s project, it seemed apt. Also, it provides us with libraries, tools, and modules to develop web applications like a blog, wiki, or even a commercial website. HTML (Hypertext Markup Language) and Bootstrap are basic elements of web pages we see everyday and for the sake of simplicity of this project, it was more feasible to use prebuilt templates for different elements of web pages for adding appreciable aesthetics to the web-application.

We faced some challenges during the initial phase of development as we were not well acquainted with the technology stack and were facing some difficulties with learning the new technologies. However, we figured out some of the intricacies of the project through team effort and were able to complete the first phase of development of the web application.

1. Main Home Screen



Welcome to IITPKD General Hospital!

Patient Portal

For patient Registration, discharge procedures.

Patient Portal

Admin Portal

For hospital database maintainance.

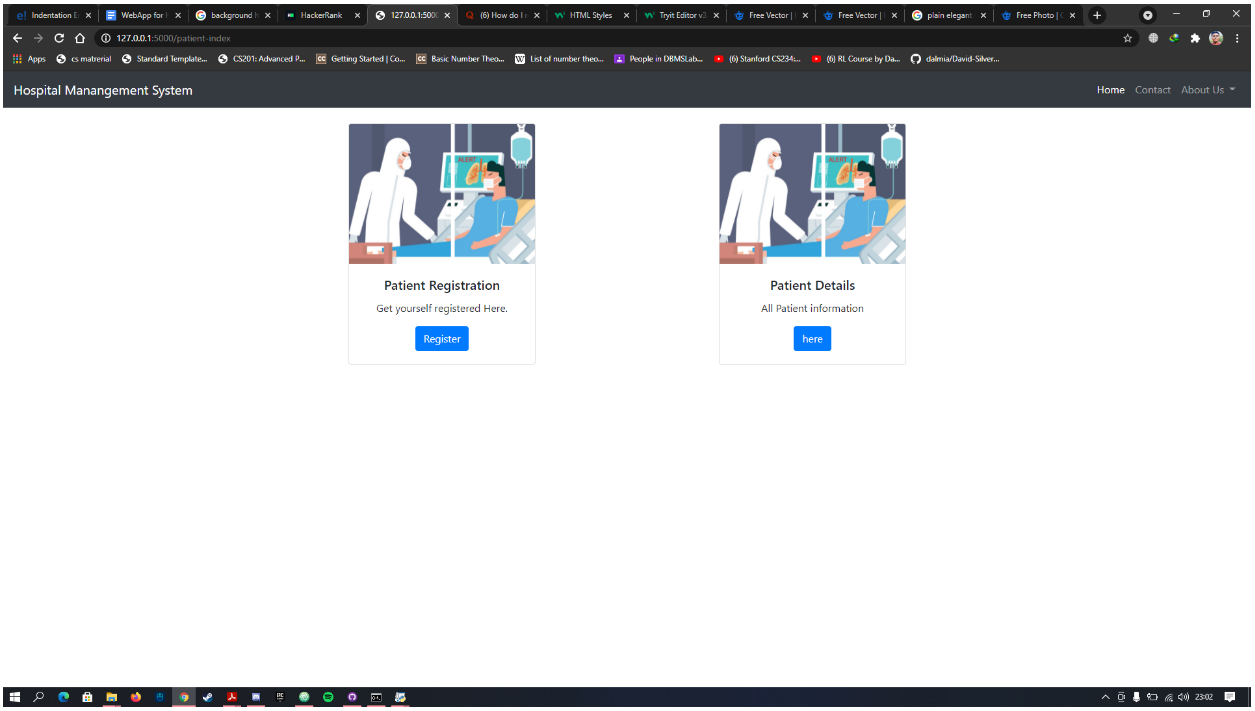
Admin Portal

Staff

For staff details and other records

Staff Portal

2. Patient Portal Screen



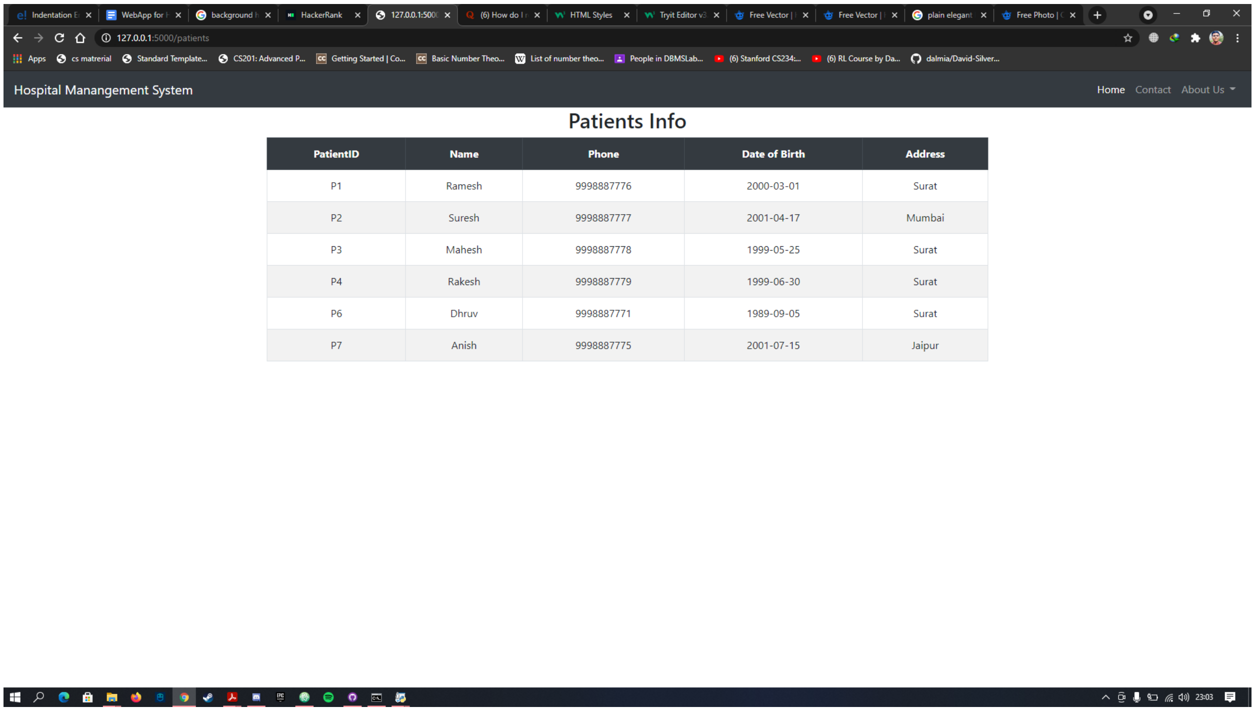
Patient Registration

Get yourself registered Here.

Patient Details

All Patient information

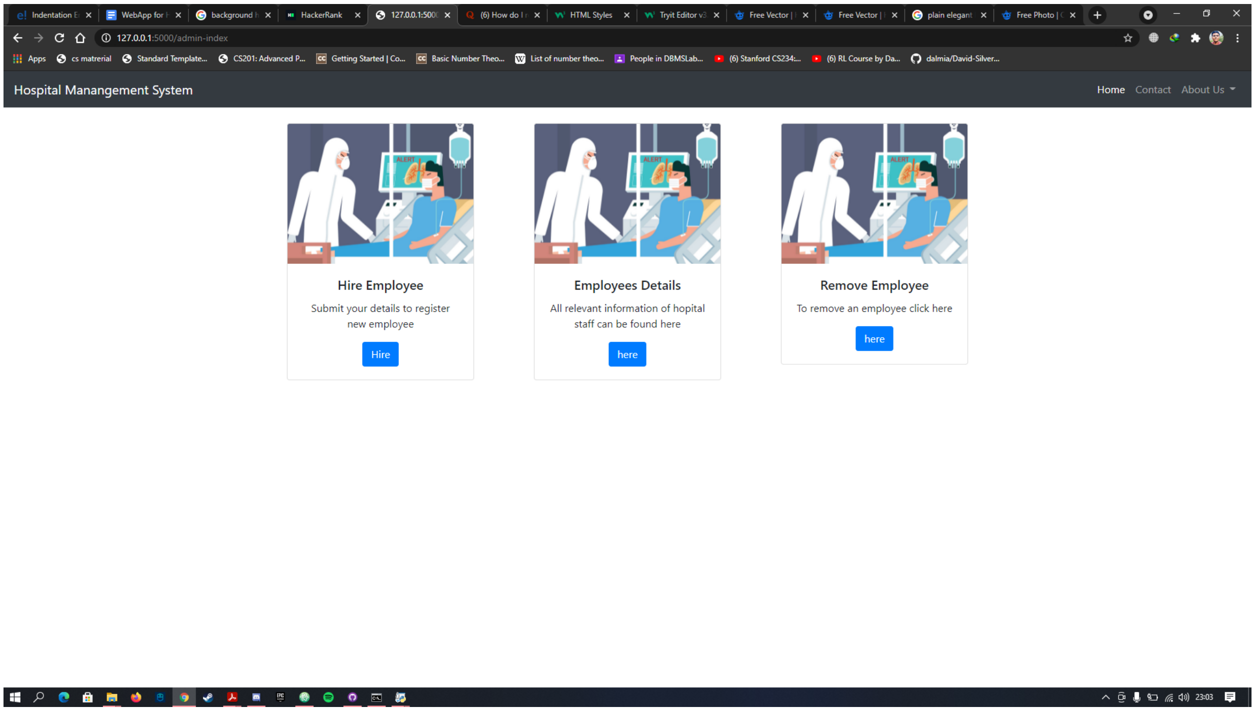
3. Patient Details Page



Patients Info

PatientID	Name	Phone	Date of Birth	Address
P1	Ramesh	9998887776	2000-03-01	Surat
P2	Suresh	9998887777	2001-04-17	Mumbai
P3	Mahesh	9998887778	1999-05-25	Surat
P4	Rakesh	9998887779	1999-06-30	Surat
P6	Dhruv	9998887771	1989-09-05	Surat
P7	Anish	9998887775	2001-07-15	Jaipur

4. Admin Portal



Hospital Manangement System

Hire Employee

Submit your details to register new employee

Hire

Employees Details

All relevant information of hopital staff can be found here

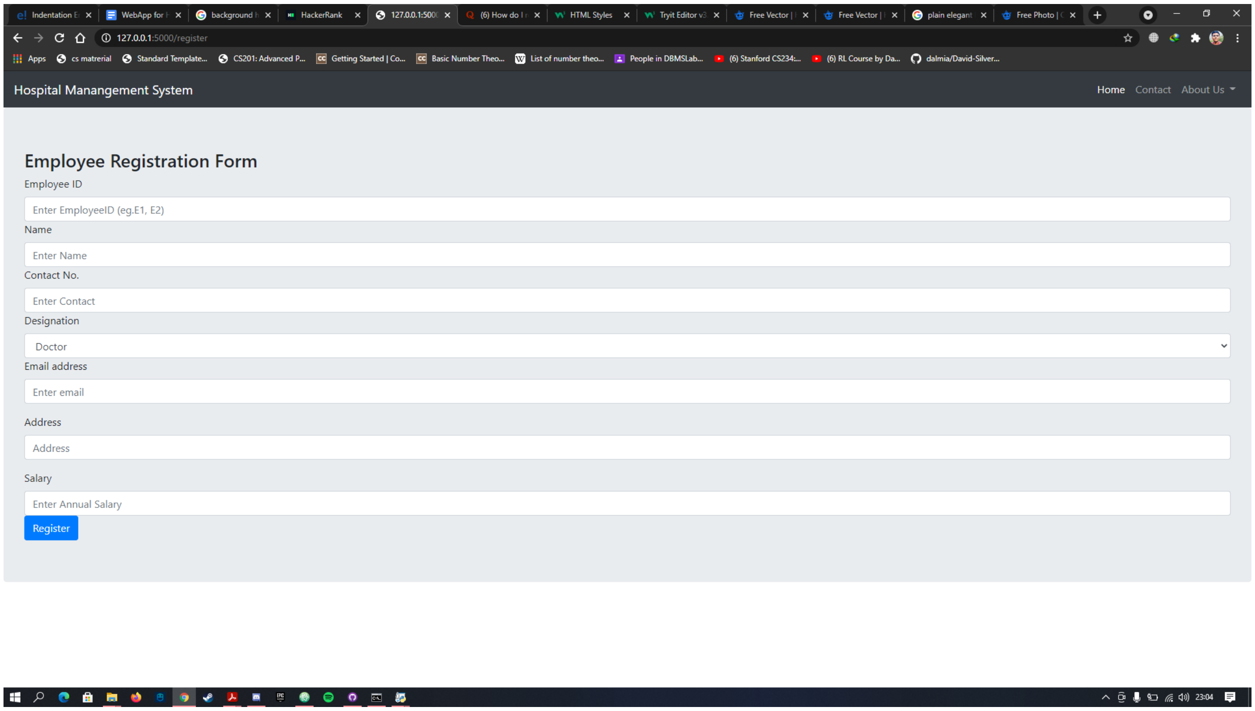
here

Remove Employee

To remove an employee click here

here

5. Employee Registration Page



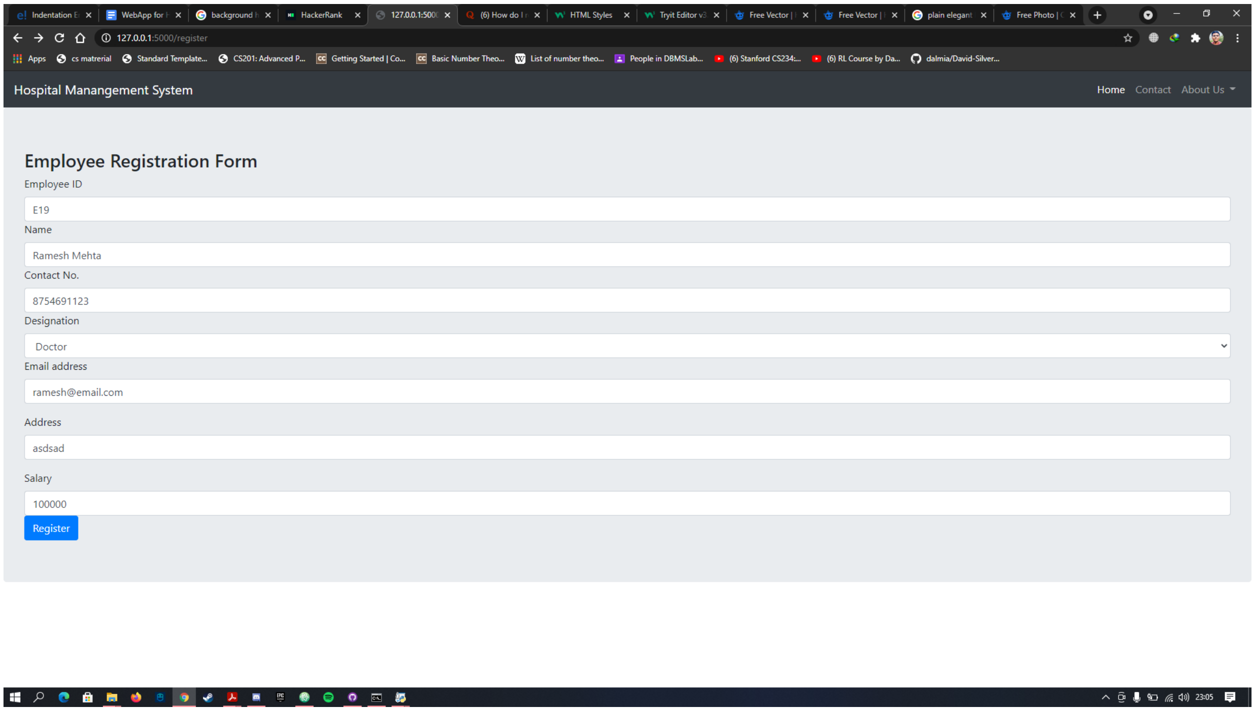
Hospital Manangement System

Employee Registration Form

Employee ID	Enter EmployeeID (eg.E1, E2)
Name	Enter Name
Contact No.	Enter Contact
Designation	Doctor
Email address	Enter email
Address	Address
Salary	Enter Annual Salary

Register

6. Filling Employee Details



Employee Registration Form

Employee ID

E19

Name

Ramesh Mehta

Contact No.

8754691123

Designation

Doctor

Email address

ramesh@email.com

Address

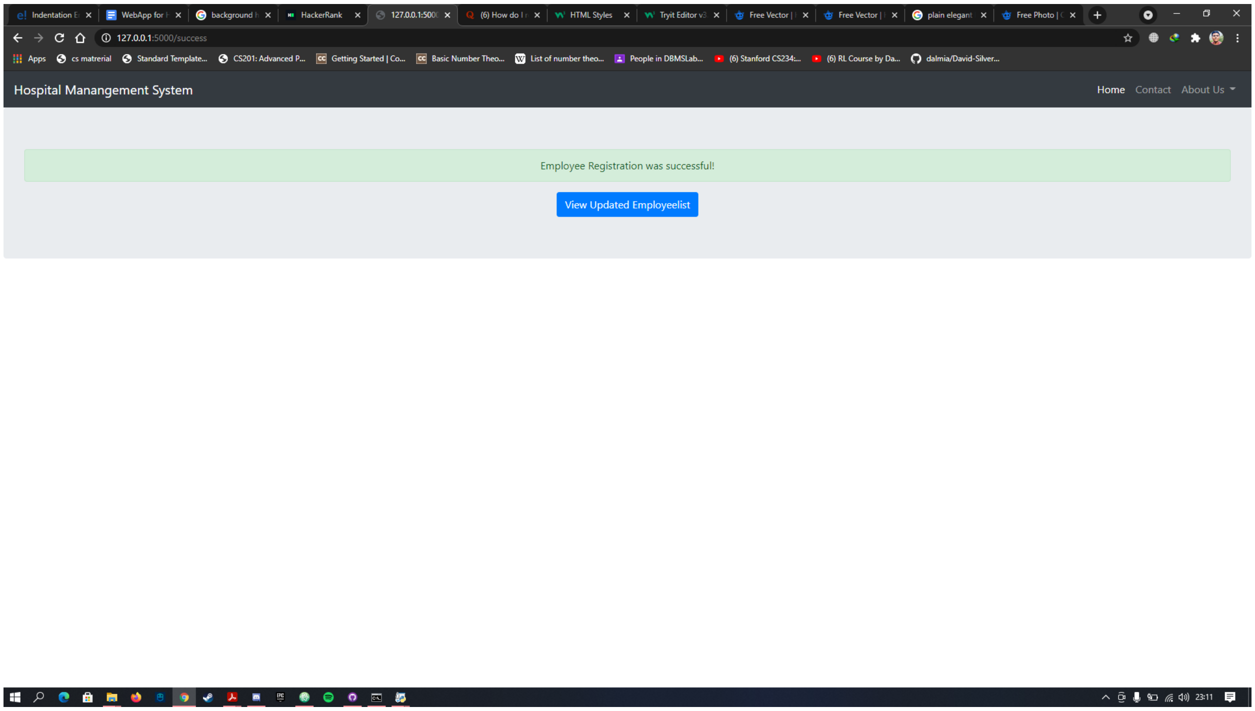
asdsad

Salary

100000

Register

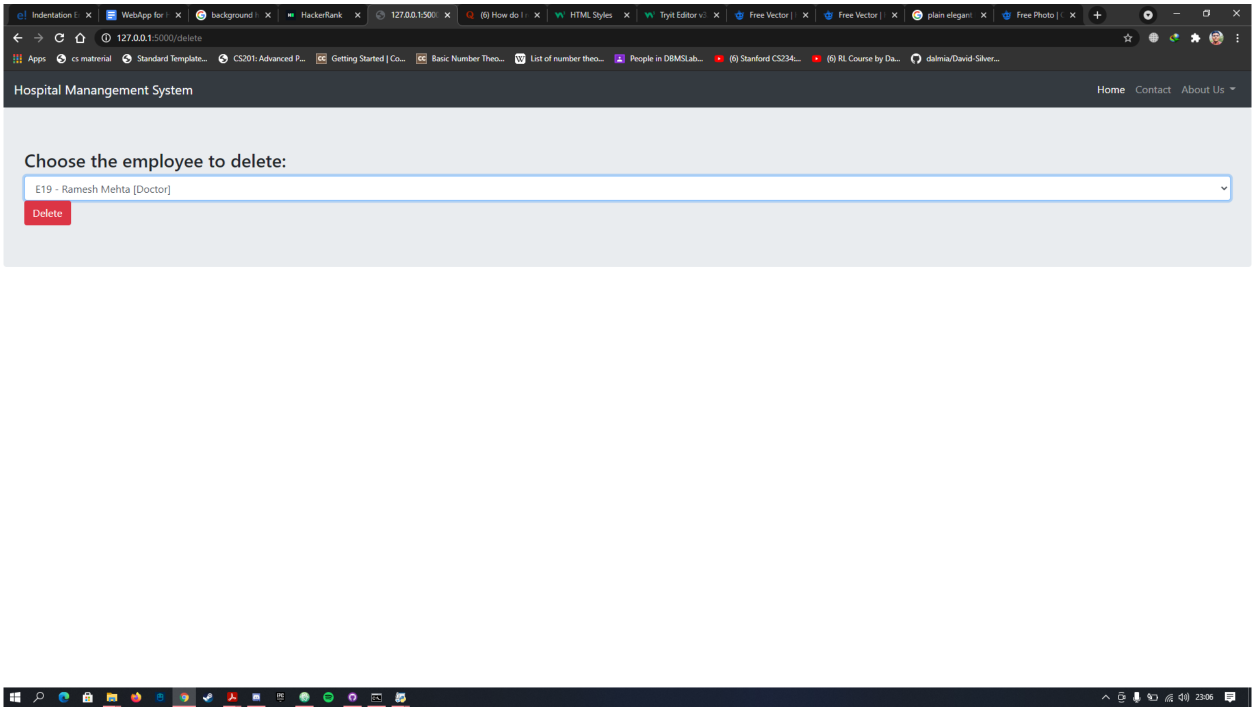
7. Successful Employee Registration



Employee Registration was successful!

View Updated Employeelist

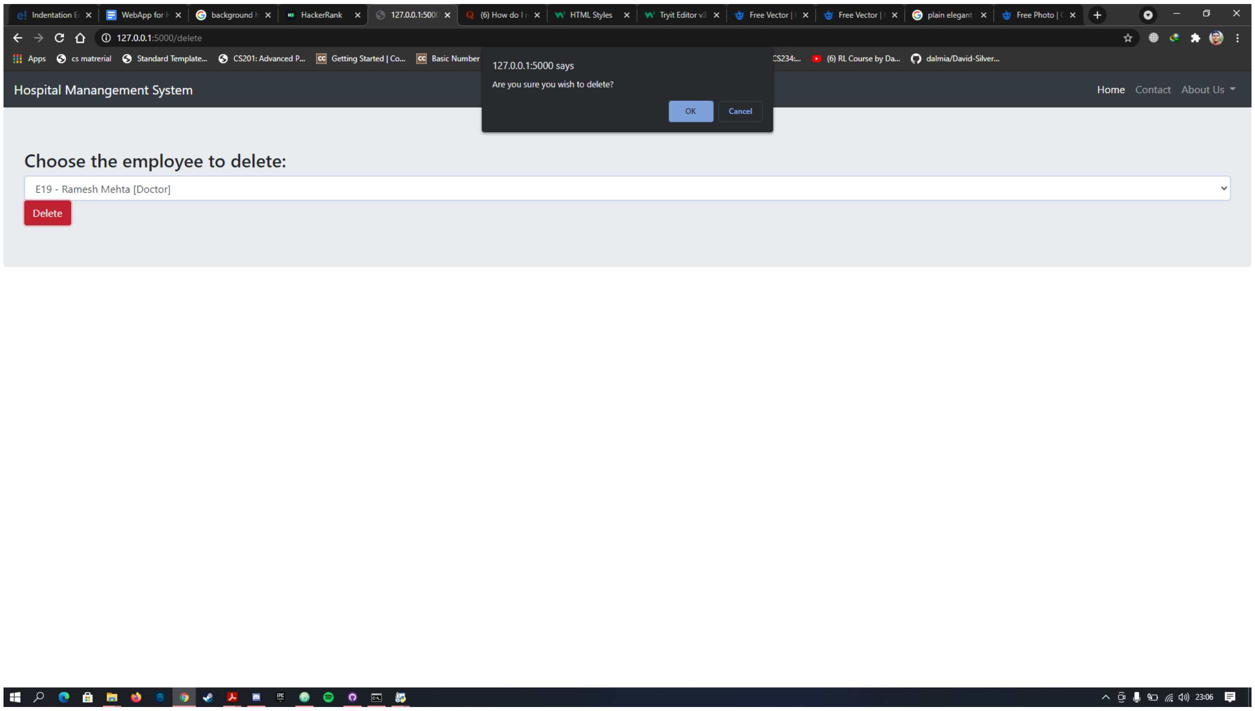
8. Employee Deletion Page



Choose the employee to delete:

E19 - Ramesh Mehta [Doctor]

9. Employee selection drop-down



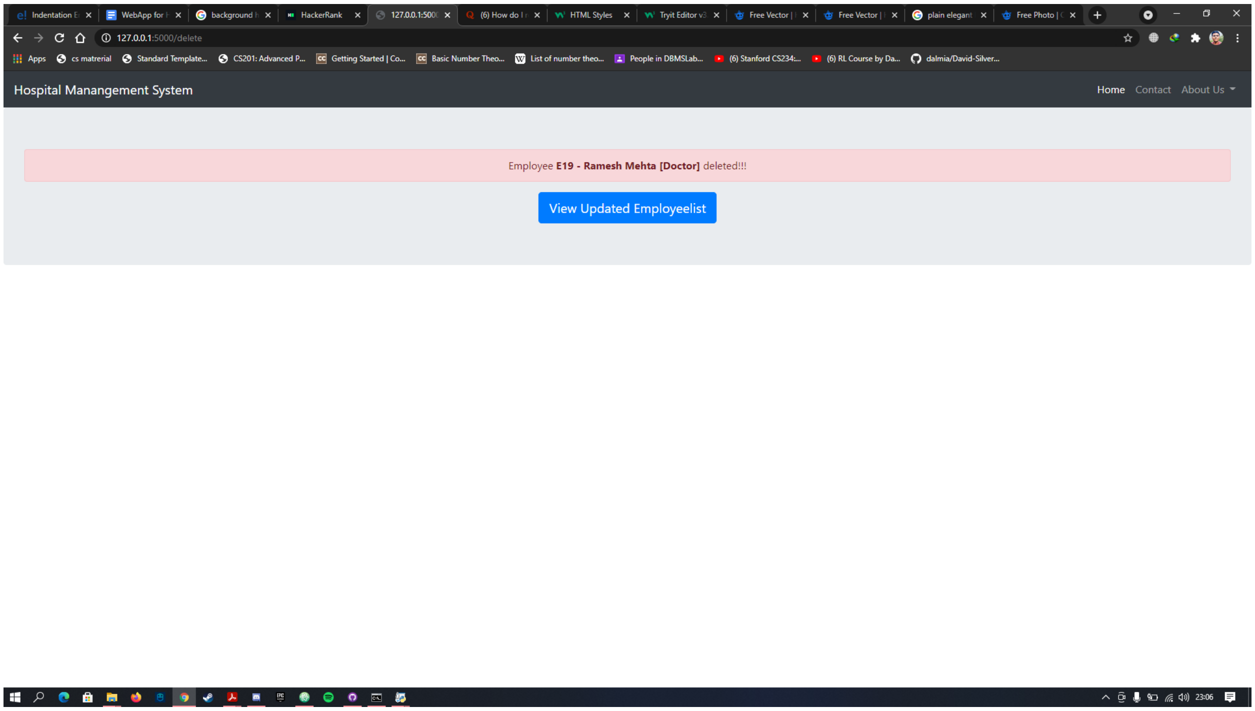
127.0.0.1:5000 says

Are you sure you wish to delete?

Choose the employee to delete:

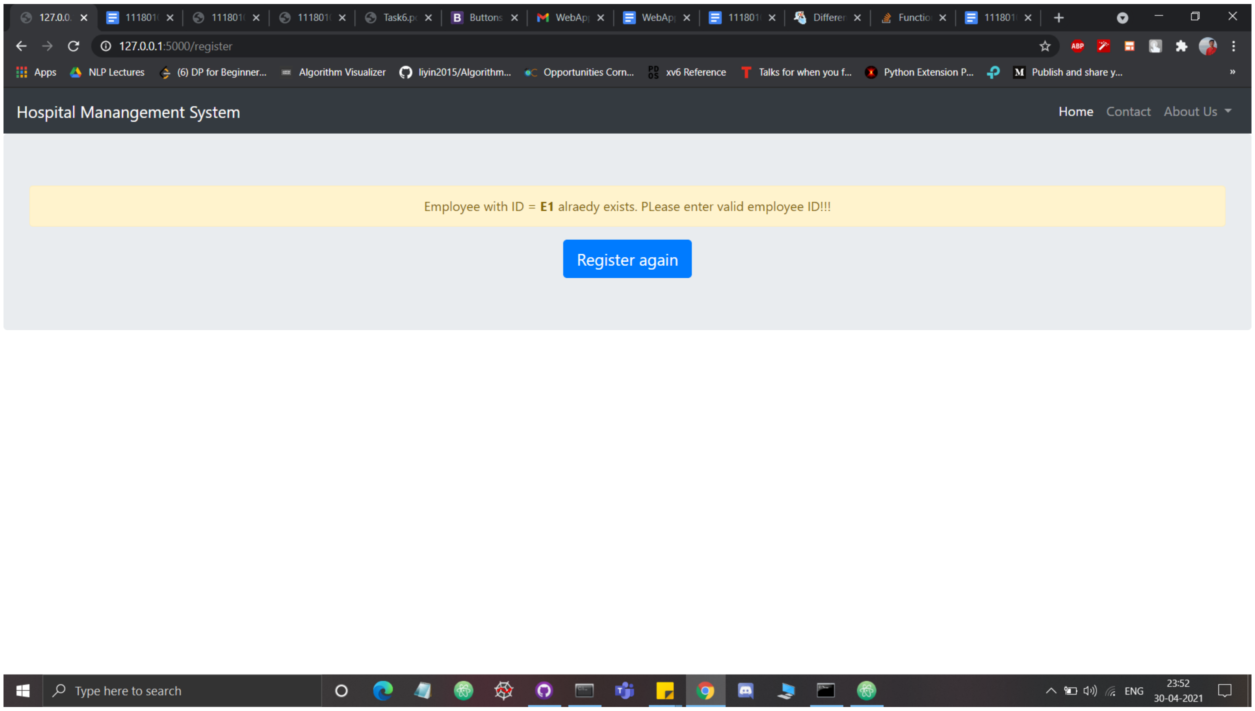
E19 - Ramesh Mehta [Doctor]

10. Successful employee deletion



Employee **E19 - Ramesh Mehta [Doctor]** deleted!!!

11. Registration with existing employee ID:



Employee with ID = **E1** alraedy exists. PLease enter valid employee ID!!!

Appendix

1. Full backup file for the database (https://drive.google.com/file/d/1m7fTa0b9e8NZvOUuK7QHR0LSVFgqu-oF/view?usp=sharing)
2. Web Application Demo Video (https://drive.google.com/drive/folders/1PNwbfSYTgIYpWgky1zdsWZfSsUedt2K2?usp=sharing)