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REQUIREMENT SPECIFICATIONS

Introduction

Hospital Management System is majorly to organise Patients, Employees and Services provided. Patients are the customers of the Hospital Management System, every data corresponding to the Patients must be stored and they must be provided with Services or Medication requested.

Working

The flow of Hospital Management System is as below
There are three categories of persons who enter the Hospital.
Patient, the person who is entering the Hospital for medical treatment.
Visitor, the person who is entering the Hospital for visiting other patients.
Emergency Patient, the person who is entering the Hospital with dire need of medical attention. In the case of an Emergency Patient the information collected need not be collected with the information, they are assigned with an id and rushed to the emergency ward. The patient can either avail the services which require no doctor prescription, provided by the hospital like Blood test, Urine test, Coronavirus test, ECG, X-Ray, Medicines etc or book an appointment to visit the doctor. The appointment booking will be for a doctor who is an expert in the area in which the patient requires consultation. The doctor then consults the patient either asking him to avail the services like MRI Scanning, CT Scanning, X-Ray, Blood test, medicines or in more serious situations perform surgery on the patient. The details regarding the surgeries are also stored. The surgeries are scheduled in operation theatres, so the assignment of an operation theatre to a patient is very crucial. After the surgery the patient is admitted into admit rooms and advised to stay in the admit rooms for a certain period of time before discharging from the hospital. Emergency patients and surgery undergoing patients are attended by the nurses. Who are the employees of the hospital like doctors? Employees are the backbone of the hospital.

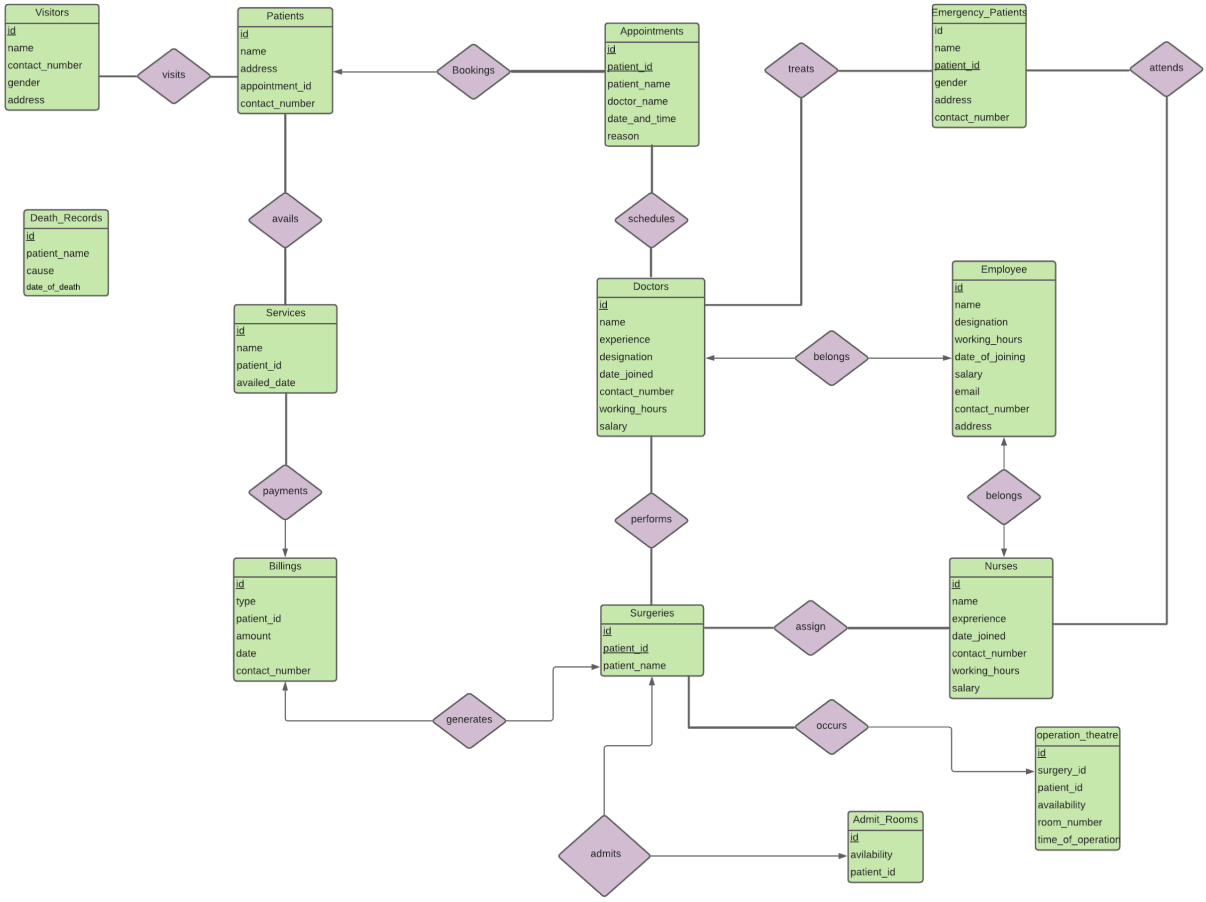
The commercial part of the Hospital Management System relies on three major commodities. Services availment, Surgery payments. After the patient avails the services provided by the hospital, he needs to make the payment. Also, bills generated from the surgery of the patient need to be paid. It is also the hospital's responsibility to store the records of patients who are deceased.

Requirement

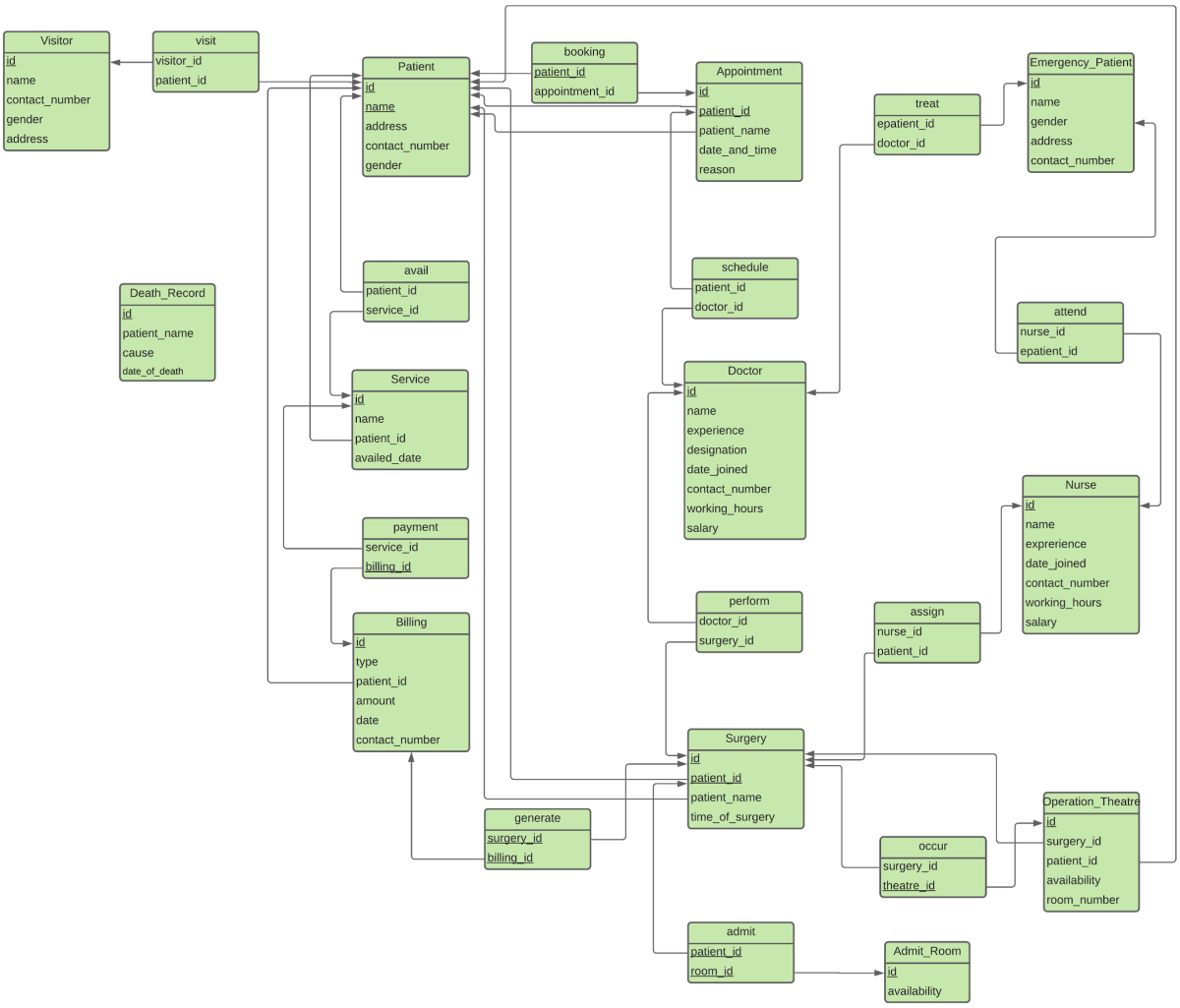
There is a requirement to store the data corresponding to
Patients, the persons who enter the hospital intending to get medical attention or avail any non-prescribed services. So, that the further procedures of the patient can be kept track of starting from here. Their details are to be stored.
Visitors, the persons who enter the hospital intending to visit patients in the hospital. Each visitor is given a visitor id, so that they are restricted to visit only the patient they are related to and only at certain periods of time. Their details such as contact number, address are collected for storing in case of any mishappening related to the visitor and the patient they visit.
Storing the details of emergency patients is another key requirement. But the patients need not provide the details prior to their admit into the hospital, they or their guardians can provide the hospital with the details post treatment.
Services like Blood test, Urine test, Coronavirus test, ECG, MRI scanning, CT scanning, X-Ray etc availed by each patient is to be stored. So, that each patient can be linked to the tests and find out the results corresponding to the test. The doctors can also prescribe any test which the patient then avails, and provides the doctor with reports. The doctor can make the diagnosis or perform any surgery based on the reports.
The surgery details are stored with the corresponding patient id, there may be a lot of doctors operating on a single patient. The complete data of the doctors operated on the patient in the surgery is to be stored.

Billing details are the commercial aspect of the hospital. Bill corresponding to each service, surgery is to be stored along with the patient id. This way total payment of each patient can be kept track of.
Employees data is also to be stored, to provide them their salary on time and keep track of their information for the times of any mishappening.
Rooms are intended to be of two types, operation theatres and admit rooms, the patient undergoing a surgery is related to the operation theatre in which their surgery takes place and the admit room where he is admitted after the surgery or in case of any mild medication. The details corresponding to the rooms are to be stored. Also, the details of patients who died due to unfortunate circumstances in the hospital are recorded and stored.

ENTITY RELATIONSHIP DIAGRAM



SCHEMA DIAGRAM



SCHEMA

```
MariaDB [hospital]> show tables;
+--------------------+
| Tables_in_hospital |
+--------------------+
| Admit_Room         |
| Appointment        |
| Billing            |
| Death_Record       |
| Doctor             |
| Emergency_Patient  |
| Nurse              |
| Operation_Theatre  |
| Patient            |
| Service            |
| Surgery            |
| Visitor            |
| admit              |
| assign             |
| attend             |
| avail              |
| booking            |
| generate           |
| occur              |
| payment            |
| perform            |
| schedule           |
| treat              |
| visit              |
+--------------------+
24 rows in set (0.003 sec)
```

```
MariaDB [hospital]> describe Admit_Room;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| id           | varchar(10) | NO   | PRI | NULL    |       |
| availability | tinyint(1)  | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
2 rows in set (0.007 sec)
```

```
MariaDB [hospital]> describe Appointment;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| id           | varchar(10) | NO   | PRI | NULL    |       |
| patient_id   | varchar(10) | NO   | PRI | NULL    |       |
| patient_name | varchar(50) | YES  |     | NULL    |       |
| date_and_time| datetime    | YES  |     | NULL    |       |
| reason       | varchar(80) | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
5 rows in set (0.007 sec)
```

```
MariaDB [hospital]> describe Billing;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| id           | varchar(10) | NO   | PRI | NULL    |       |
| type         | varchar(10) | YES  |     | NULL    |       |
| patient_id   | varchar(10) | YES  | MUL | NULL    |       |
| amount       | float       | YES  |     | NULL    |       |
| date         | datetime    | YES  |     | NULL    |       |
| contact_number | varchar(10) | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
6 rows in set (0.010 sec)
```

```
MariaDB [hospital]> describe Death_Record;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| id           | varchar(10) | NO   | PRI | NULL    |       |
| patient_name | varchar(50) | YES  |     | NULL    |       |
| cause        | varchar(50) | YES  |     | NULL    |       |
| date_of_death| datetime    | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
4 rows in set (0.009 sec)
```

```
MariaDB [hospital]> describe Doctor;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| id             | varchar(10) | NO   | PRI | NULL    |       |
| name           | varchar(50) | YES  |     | NULL    |       |
| experience     | float       | YES  |     | NULL    |       |
| designation    | varchar(20) | YES  |     | NULL    |       |
| date_joined    | date        | YES  |     | NULL    |       |
| contact_number | varchar(10) | YES  |     | NULL    |       |
| working_hours  | float       | YES  |     | NULL    |       |
| salary         | float       | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
8 rows in set (0.013 sec)
```

```
MariaDB [hospital]> describe Emergency_Patient;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| id             | varchar(10) | NO   | PRI | NULL    |       |
| name           | varchar(50) | YES  |     | NULL    |       |
| gender         | varchar(10) | YES  |     | NULL    |       |
| address        | varchar(80) | YES  |     | NULL    |       |
| contact_number | varchar(10) | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
5 rows in set (0.015 sec)
```

```
MariaDB [hospital]> describe Nurse;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| id             | varchar(10) | NO   | PRI | NULL    |       |
| name           | varchar(50) | YES  |     | NULL    |       |
| experience     | float       | YES  |     | NULL    |       |
| date_joined    | date        | YES  |     | NULL    |       |
| contact_number | varchar(10) | YES  |     | NULL    |       |
| working_hours  | float       | YES  |     | NULL    |       |
| salary         | float       | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
7 rows in set (0.011 sec)
```

```
MariaDB [hospital]> describe Operation_Theatre;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| id           | varchar(10) | NO   | PRI | NULL    |       |
| surgery_id   | varchar(10) | YES  | MUL | NULL    |       |
| patient_id   | varchar(10) | YES  | MUL | NULL    |       |
| availability | tinyint(1)  | YES  |     | NULL    |       |
| room_number  | int(10)     | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
5 rows in set (0.008 sec)
```

```
MariaDB [hospital]> describe Patient;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| id             | varchar(10) | NO   | PRI | NULL    |       |
| name           | varchar(50) | NO   | PRI | NULL    |       |
| address        | varchar(80) | YES  |     | NULL    |       |
| contact_number | varchar(10) | YES  |     | NULL    |       |
| gender         | varchar(10) | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
5 rows in set (0.010 sec)
```

```
MariaDB [hospital]> describe Service;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| id           | varchar(10) | NO   | PRI | NULL    |       |
| name         | varchar(50) | YES  |     | NULL    |       |
| patient_id   | varchar(10) | YES  | MUL | NULL    |       |
| availed_date | datetime    | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
4 rows in set (0.006 sec)
```

```
MariaDB [hospital]> describe Surgery;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| id             | varchar(10) | NO   | PRI | NULL    |       |
| patient_id     | varchar(10) | NO   | PRI | NULL    |       |
| patient_name   | varchar(50) | YES  |     | NULL    |       |
| time_of_surgery | datetime   | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
4 rows in set (0.008 sec)
```

```
MariaDB [hospital]> describe Visitor;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| id             | varchar(10) | NO   | PRI | NULL    |       |
| name           | varchar(50) | YES  |     | NULL    |       |
| contact_number | varchar(10) | YES  |     | NULL    |       |
| gender         | varchar(10) | YES  |     | NULL    |       |
| address        | varchar(80) | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
5 rows in set (0.010 sec)
```

```
MariaDB [hospital]> describe admit;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| patient_id | varchar(10) | NO   | PRI | NULL    |       |
| room_id    | varchar(10) | NO   | PRI | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.011 sec)
```

```
MariaDB [hospital]> describe assign;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| nurse_id   | varchar(10) | YES  | MUL | NULL    |       |
| patient_id | varchar(10) | YES  | MUL | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.008 sec)
```

```
MariaDB [hospital]> describe attend;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| nurse_id   | varchar(10) | YES  | MUL | NULL    |       |
| epatient_id | varchar(10) | YES  | MUL | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.007 sec)
```

```
MariaDB [hospital]> describe avail;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| patient_id | varchar(10) | YES  | MUL | NULL    |       |
| service_id | varchar(10) | YES  | MUL | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.008 sec)
```

```
MariaDB [hospital]> describe booking;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| patient_id     | varchar(10) | NO   | PRI | NULL    |       |
| appointment_id | varchar(10) | YES  | MUL | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
2 rows in set (0.008 sec)
```

```
MariaDB [hospital]> describe generate;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| surgery_id | varchar(10) | NO   | PRI | NULL    |       |
| billing_id | varchar(10) | NO   | PRI | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.007 sec)
```

```
MariaDB [hospital]> describe occur;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| surgery_id | varchar(10) | YES  | MUL | NULL    |       |
| theatre_id | varchar(10) | NO   | PRI | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.008 sec)
```

```
MariaDB [hospital]> describe payment;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| service_id | varchar(10) | YES  | MUL | NULL    |       |
| billing_id | varchar(10) | NO   | PRI | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.007 sec)
```

```
MariaDB [hospital]> describe perform;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| doctor_id  | varchar(10) | YES  | MUL | NULL    |       |
| surgery_id | varchar(10) | YES  | MUL | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.007 sec)
```

```
MariaDB [hospital]> describe schedule;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| patient_id | varchar(10) | YES  | MUL | NULL    |       |
| doctor_id  | varchar(10) | YES  | MUL | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.007 sec)
```

```
MariaDB [hospital]> describe treat;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| epatient_id | varchar(10) | YES  | MUL | NULL    |       |
| doctor_id   | varchar(10) | YES  | MUL | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
2 rows in set (0.013 sec)
```

```
MariaDB [hospital]> describe visit;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| visitor_id | varchar(10) | YES  | MUL | NULL    |       |
| patient_id | varchar(10) | YES  | MUL | NULL    |       |
+------------+-------------+------+-----+---------+-------+
2 rows in set (0.009 sec)
```

KEY AREAS OF SCHEMA

- Patients who have taken Doctor appointment

```
MariaDB [hospital]> SELECT id, name
    -> FROM Patient
    -> WHERE id IN (SELECT patient_id from Appointment);
+-----------+----------------------+
| id        | name                 |
+-----------+----------------------+
| 111801001 | Captain Jack Sparrow |
| 111801002 | Gellert Grindelwald  |
| 111801003 | Elizabeth Swann      |
| 111801004 | Harry Potter         |
| 111801005 | Ronald Weasley       |
| 111801006 | Hermione Granger     |
| 111801007 | Albus Dumbledore     |
| 111801029 | Tom Riddle           |
| 111801031 | Sirius Black         |
| 111801034 | Neville Longbottom   |
| 111801045 | Draco Malfoy         |
+-----------+----------------------+
11 rows in set (0.007 sec)
```

- Visitors who came to visit Patients

```
MariaDB [hospital]> SELECT Visitor.name, Patient.name
    -> FROM Visitor, Patient, visit
    -> WHERE visit.visitor_id = Visitor.id AND visit.patient_id = Patient.id;
+-------------+----------------------+
| name        | name                 |
+-------------+----------------------+
| Will Turner | Captain Jack Sparrow |
| Will Turner | Gellert Grindelwald  |
| James Norry | Captain Jack Sparrow |
| Hector      | Elizabeth Swann      |
| Hector      | Harry Potter         |
| Ragetti     | Elizabeth Swann      |
| Ana Maria   | Ronald Weasley       |
| Ana Maria   | Hermione Granger     |
| Joshamee    | Ronald Weasley       |
| Marty       | Tom Riddle           |
| Mull roy    | Sirius Black         |
| Murtogg     | Neville Longbottom   |
| Lieutenant  | Draco Malfoy         |
+-------------+----------------------+
13 rows in set (0.001 sec)
```

- Patients who received surgery along with the doctor who performed surgery and time of surgery arranged in chronological order

```
MariaDB [hospital]> SELECT patient_id, patient_name, Doctor.name AS Doctor_name, time_of_surgery
    -> FROM Surgery, perform, Doctor
    -> WHERE Surgery.id = perform.surgery_id AND perform.doctor_id = Doctor.id
    -> ORDER BY time_of_surgery ASC;
+------------+--------------------+---------------------+---------------------+
| patient_id | patient_name       | Doctor_name         | time_of_surgery     |
+------------+--------------------+---------------------+---------------------+
| 111801031  | Sirius Black       | Charles Richard Drew | 1980-04-15 13:44:00 |
| 111801045  | Draco Malfoy       | Charles Richard Drew | 1990-05-28 19:36:28 |
| 111801034  | Neville Longbottom | Georges Mathe       | 1999-05-14 10:17:02 |
| 111801029  | Tom Riddle         | Elizabeth Blackwell | 2004-09-23 23:37:27 |
| 111801004  | Harry Potter       | Helene D.Gayle      | 2017-05-24 14:35:42 |
| 111801002  | Gellert Grindelwald | Helene D.Gayle      | 2017-11-02 21:18:31 |
| 111801005  | Ronald Weasley     | Edward Jenner       | 2017-11-20 00:14:34 |
+------------+--------------------+---------------------+---------------------+
7 rows in set (0.001 sec)
```

- Patients who availed any service, the type of the service availed and the amount of bill generated corresponding to the service ordered descendingly according to the amount(highest bill comes on top).

```
MariaDB [hospital]> SELECT Patient.name, Service.name, Billing.amount
    -> FROM Patient, Service, Billing, avail, payment
    -> WHERE Patient.id = avail.patient_id AND avail.service_id = Service.id
    ->                                    AND Service.id = payment.service_id
    ->                                    AND payment.billing_id = Billing.id;
+----------------------+------------------+---------+
| name                 | name             | amount  |
+----------------------+------------------+---------+
| Captain Jack Sparrow | Blood test       | 2480.02 |
| Elizabeth Swann      | X-Ray test       |    5480 |
| Gellert Grindelwald  | HRCT test        |    2000 |
| Albus Dumbledore     | Medical Checkup  | 17845.5 |
| Ronald Weasley       | ENT              |   15480 |
| Tom Riddle           | Blood test       | 2480.02 |
| Sirius Black         | Medical Checkup  | 17845.5 |
+----------------------+------------------+---------+
7 rows in set (0.002 sec)
```

- Nurses assigned to surgery undergone patients

```
MariaDB [hospital]> SELECT Nurse.name, Surgery.patient_name
    -> FROM Nurse, Surgery, assign
    -> WHERE Surgery.patient_id = assign.patient_id AND assign.nurse_id = Nurse.id;
+-----------------+--------------------+
| name            | patient_name       |
+-----------------+--------------------+
| Julie Watson    | Harry Potter       |
| Emily Parker    | Ronald Weasley     |
| Jamie Rose      | Tom Riddle         |
| Tiffany Morrison | Sirius Black      |
| Sophie Jane     | Neville Longbottom |
+-----------------+--------------------+
5 rows in set (0.002 sec)
```

- Name, bill amount and bill type generated by surgery undergone by patients.

```
MariaDB [hospital]> SELECT patient_name, amount, type
    -> FROM Surgery, Billing, generate
    -> WHERE Surgery.id = generate.surgery_id AND generate.billing_id = Billing.id;
+--------------------+---------+------------+
| patient_name       | amount  | type       |
+--------------------+---------+------------+
| Gellert Grindelwald | 17845.5 | UPI        |
| Harry Potter       | 2480.02 | Cash       |
| Ronald Weasley     |    5480 | UPI        |
| Tom Riddle         |    2000 | Debit Card |
| Sirius Black       | 17845.5 | Cash       |
| Neville Longbottom |   15480 | Debit Card |
| Draco Malfoy       | 2480.02 | Cash       |
+--------------------+---------+------------+
7 rows in set (0.003 sec)
```

- Name of the patient who undergone surgery, the room in which operation took place, the time of operation and the room in which the patient was admitted after the surgery

```
MariaDB [hospital]> SELECT Patient.name, room_number AS operation_room_number,
    ->                    time_of_surgery, Admit_Room.id AS admit_room_number
    -> FROM Operation_Theatre, Surgery, admit, Admit_Room, Patient
    -> WHERE Operation_Theatre.patient_id = Patient.id AND Operation_Theatre.surgery_id = Surgery.id
    ->  AND  Surgery.patient_id = admit.patient_id AND admit.room_id = Admit_Room.id;
+--------------------+----------------------+---------------------+-------------------+
| name               | operation_room_number | time_of_surgery     | admit_room_number |
+--------------------+----------------------+---------------------+-------------------+
| Harry Potter       |                  108 | 2017-05-24 14:35:42 | 101               |
| Ronald Weasley     |                  109 | 2017-11-20 00:14:34 | 102               |
| Tom Riddle         |                  208 | 2004-09-23 23:37:27 | 103               |
| Sirius Black       |                  209 | 1980-04-15 13:44:00 | 104               |
| Draco Malfoy       |                  210 | 1990-05-28 19:36:28 | 105               |
| Gellert Grindelwald |                 208 | 2017-11-02 21:18:31 | 106               |
+--------------------+----------------------+---------------------+-------------------+
6 rows in set (0.001 sec)
```

- Death records is an independent table which has no foreign key references to any other table in the database

```
MariaDB [hospital]> SELECT * FROM Death_Record;
+------+----------------+-----------------+---------------------+
| id   | patient_name   | cause           | date_of_death       |
+------+----------------+-----------------+---------------------+
| 1032 | Adalberto Dray | Heart Attack    | 1995-05-21 00:00:00 |
| 1045 | Hilda Flanery  | Accident        | 1990-04-12 00:00:00 |
| 1154 | Eve Rampton    | Kidneys Failure | 1985-12-14 00:00:00 |
| 1561 | June Terhune   | Accident        | 1997-09-05 00:00:00 |
| 1847 | Nguyet Dutra   | Blood Cancer    | 1983-11-25 00:00:00 |
+------+----------------+-----------------+---------------------+
5 rows in set (0.000 sec)
```

- Doctors who treated the emergency patients and nurses attended them

```
MariaDB [hospital]> SELECT Emergency_Patient.name AS patient_name, Doctor.name as doctor_name,
    ->                     Nurse.name AS nurse_name
    -> FROM Emergency_Patient, Doctor, treat, Nurse, attend
    -> WHERE Emergency_Patient.id = treat.epatient_id AND treat.doctor_id = Doctor.id
    ->  AND  Emergency_Patient.id = attend.epatient_id AND attend.nurse_id = Nurse.id;
+-----------------+----------------------+-----------------+
| patient_name    | doctor_name          | nurse_name      |
+-----------------+----------------------+-----------------+
| Johnson Bravo   | Edward Jenner        | Tiffany Morrison |
| Olivia          | Helene D.Gayle       | Julie Watson    |
| George Smith    | Virginia Apgar       | Stephany Johnson |
| Olivia Morris   | Edward Jenner        | Emily Parker    |
| Jenson Nicolson | Charles Richard Drew | Tiffany Morrison |
| Jimmy williams  | Virginia Apgar       | Julie Watson    |
| Mitchell Santner | Edward Jenner       | Marie Phillips  |
+-----------------+----------------------+-----------------+
7 rows in set (0.008 sec)
```

- Revenue generated by the hospital so far, rounded to the nearest integer.

```
MariaDB [hospital]> SELECT ROUND(SUM(amount), 0) AS revenue
    -> FROM Billing;
+---------+
| revenue |
+---------+
|  127222 |
+---------+
1 row in set (0.001 sec)
```

VIEWS

- patient_appointment_service

```
MariaDB [hospital]> DESCRIBE patient_appointment_service;
+---------------------------+-------------+------+-----+---------+-------+
| Field                     | Type        | Null | Key | Default | Extra |
+---------------------------+-------------+------+-----+---------+-------+
| patient_id                | varchar(10) | NO   |     | NULL    |       |
| patient_name              | varchar(50) | NO   |     | NULL    |       |
| appointment_reason        | varchar(80) | YES  |     | NULL    |       |
| appointment_date_and_time | datetime    | YES  |     | NULL    |       |
| service_name              | varchar(50) | YES  |     | NULL    |       |
| service_availed_date      | datetime    | YES  |     | NULL    |       |
+---------------------------+-------------+------+-----+---------+-------+
6 rows in set (0.012 sec)
```

Justification:
If a patient enters hospital, then his motive can be to book an appointment or avail a service.
This view captures the motive of all the patients entering the hospital.
Statistics can be calculated according to the view about the number of people availing service or appointment or both.
Later these statistics can be used for the further development of hospital system.
Also, doctors can look at the past medical tests availed by a patient as a service, and recommend any future tests.

- Billing_Service_Surgery

```
MariaDB [hospital]> DESCRIBE Billing_Service_Surgery;
+---------------------+-------------+------+-----+---------+-------+
| Field               | Type        | Null | Key | Default | Extra |
+---------------------+-------------+------+-----+---------+-------+
| billing_id          | varchar(10) | NO   |     | NULL    |       |
| patient_id          | varchar(10) | YES  |     | NULL    |       |
| billing_amount      | float       | YES  |     | NULL    |       |
| billing_date        | datetime    | YES  |     | NULL    |       |
| service_id          | varchar(10) | YES  |     | NULL    |       |
| service_name        | varchar(50) | YES  |     | NULL    |       |
| service_availed_date | datetime    | YES  |     | NULL    |       |
| surgery_id          | varchar(10) | YES  |     | NULL    |       |
| time_of_surgery     | datetime    | YES  |     | NULL    |       |
+---------------------+-------------+------+-----+---------+-------+
9 rows in set (0.006 sec)
```

Justification:
Revenue is very important for a hospital management system. Also, the statistics involved in the revenue generation.
This view helps to know from where the majority of the revenue is generated, from services offered or from surgeries performed.
At the same time an entire statistics of the revenue from service and surgery, provides insights to the hospital about the expenditure.
Every billing is made under patient id, so a patient can know the amount of money spent by him, split into categories.

- patient_epatient

```
MariaDB [hospital]> DESCRIBE patient_epatient;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| patient_id   | varchar(10) | NO   |     |         |       |
| patient_name | varchar(50) | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
2 rows in set (0.006 sec)
```

Justification:
There are two types of patients in the hospital, normal patients and emergency patients.
The management needs to know the entire list of patients who are getting served, or treated in the hospital.

This view will help to provide statistics of the total people who are treated in the hospital.
Take any action, if the count of patients is decreasing and increase capacity of the hospital, if the count of patients is increasing.

- employee

```
MariaDB [hospital]> DESCRIBE employee;
+-----------------+-------------+------+-----+---------+-------+
| Field           | Type        | Null | Key | Default | Extra |
+-----------------+-------------+------+-----+---------+-------+
| employee_id     | varchar(10) | NO   |     |         |       |
| employee_name   | varchar(50) | YES  |     | NULL    |       |
| working_hours   | float       | YES  |     | NULL    |       |
| employee_salary | float       | YES  |     | NULL    |       |
+-----------------+-------------+------+-----+---------+-------+
4 rows in set (0.007 sec)
```

Justification:
Management needs to keep track of all the employees, to provide them salaries.
This view helps to give salary to employees, and keep track of the employees working in the hospital.

- nurse_assign_surgery

```
MariaDB [hospital]> DESCRIBE nurse_assign_surgery;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| id           | varchar(10) | NO   |     | NULL    |       |
| patient_id   | varchar(10) | NO   |     | NULL    |       |
| patient_name | varchar(50) | YES  |     | NULL    |       |
| nurse_name   | varchar(50) | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
4 rows in set (0.006 sec)
```

Justification:
To backtrack to nurses in case of any mishappening in the surgery period
Also to keep track of the working period of nurses

- surgery_admit_admitRoom

```
MariaDB [hospital]> DESCRIBE surgery_admit_admitRoom;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| id           | varchar(10) | YES  |     | NULL    |       |
| patient_id   | varchar(10) | YES  |     | NULL    |       |
| patient_name | varchar(50) | YES  |     | NULL    |       |
| room_id      | varchar(10) | NO   |     | NULL    |       |
| availability | tinyint(1)  | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
5 rows in set (0.005 sec)
```

Justification:
To know which patients are assigned to which rooms and to know the rooms which are empty so that it will helpful to assign new surgery patients

- surgery_occur_operationTheatre

```
MariaDB [hospital]> DESCRIBE surgery_occur_operationTheatre;
+---------------------+-------------+------+-----+---------+-------+
| Field               | Type        | Null | Key | Default | Extra |
+---------------------+-------------+------+-----+---------+-------+
| id                  | varchar(10) | YES  |     | NULL    |       |
| patient_id          | varchar(10) | YES  |     | NULL    |       |
| patient_name        | varchar(50) | YES  |     | NULL    |       |
| operation_theatre_id | varchar(10) | NO   |     | NULL    |       |
| availability        | tinyint(1)  | YES  |     | NULL    |       |
+---------------------+-------------+------+-----+---------+-------+
5 rows in set (0.007 sec)
```

Justification:
To know which patients are assigned to which operation theatres and to know the theatre rooms which are empty so that it will helpful to assign new surgery patients to do the operation

- nurse_assign_patient

```
MariaDB [hospital]> DESCRIBE nurse_assign_patient;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| nurse_id     | varchar(10) | NO   |     | NULL    |       |
| nurse_name   | varchar(50) | YES  |     | NULL    |       |
| patient_Id   | varchar(10) | NO   |     | NULL    |       |
| patient_name | varchar(50) | NO   |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
4 rows in set (0.005 sec)
```

Justification:
This will be a very frequently used query to find the nurses assigned to different persons.
If we want to know the nurses assigned to a particular patient we can perform queries in this view.

- doctor_schedule_patient

```
MariaDB [hospital]> DESCRIBE doctor_schedule_patient;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| Doctor_id    | varchar(10) | NO   |     | NULL    |       |
| Doctor_name  | varchar(50) | YES  |     | NULL    |       |
| designation  | varchar(20) | YES  |     | NULL    |       |
| patient_id   | varchar(10) | NO   |     | NULL    |       |
| patient_name | varchar(50) | NO   |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
5 rows in set (0.005 sec)
```

Justification:
This view shows the list of all the doctors treating the patients.
If we want to know the patients which are treated by a particular doctor.
We can perform queries in this view.

- visitor_visit_patient

```
MariaDB [hospital]> DESCRIBE visitor_visit_patient;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| vistor_id     | varchar(10) | NO   |     | NULL    |       |
| visitor_name  | varchar(50) | YES  |     | NULL    |       |
| vistor_number | varchar(10) | YES  |     | NULL    |       |
| patient_id    | varchar(10) | NO   |     | NULL    |       |
| patient_name  | varchar(50) | NO   |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
5 rows in set (0.011 sec)
```

Justification:
This view shows the list of visitors visiting the patients admitted in the hospital.
It will be easier to know the visitor who visited a particular patient by performing queries in this view.

There are various cases where we may need to look up into the list of visitors to a particular patient, in which case we can use pateint_id in this view to access the list of viewers directly in a simple query

- doctor_epatient_nurse

```
MariaDB [hospital]> DESCRIBE doctor_epatient_nurse;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| doctor_name   | varchar(50) | YES  |     | NULL    |       |
| doctor_id     | varchar(10) | NO   |     | NULL    |       |
| e_patient_id  | varchar(10) | NO   |     | NULL    |       |
| e_patient_name| varchar(50) | YES  |     | NULL    |       |
| nurse_id      | varchar(10) | NO   |     | NULL    |       |
| nurse_name    | varchar(50) | YES  |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
6 rows in set (0.008 sec)
```

Justification:
This is a useful view, just in case we wanna have a page landing at all the emergency patients list who have been admitted to the hospital along with the nurses and doctors who have taken up the case

- doctor_surgery_nurse

```
MariaDB [hospital]> DESCRIBE doctor_surgery_nurse;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| doctor_id   | varchar(10) | NO   |     | NULL    |       |
| doctor_name | varchar(50) | YES  |     | NULL    |       |
| surgery_id  | varchar(10) | NO   |     | NULL    |       |
| patient_id  | varchar(10) | NO   |     | NULL    |       |
| patient_name| varchar(50) | YES  |     | NULL    |       |
| nurse_id    | varchar(10) | NO   |     | NULL    |       |
| nurse_name  | varchar(50) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
7 rows in set (0.007 sec)
```

Justification:
Just like the previous case, we might need to look up on all the surgeries along with the doctors and nurses who were involved in the surgery as well. Thus in that case a doctor_surgery_nurse view can be helpful.

- doctor_appointments

```
MariaDB [hospital]> DESCRIBE doctor_appointments;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| doctor_id      | varchar(10) | NO   |     | NULL    |       |
| doctor_name    | varchar(50) | YES  |     | NULL    |       |
| appointment_id | varchar(10) | NO   |     | NULL    |       |
| patient_name   | varchar(50) | YES  |     | NULL    |       |
| patient_id     | varchar(10) | NO   |     | NULL    |       |
| reason         | varchar(80) | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
6 rows in set (0.006 sec)
```

Justification:
Suppose we want to display what are all the appointments scheduled to a particular doctor, life becomes easy with this view in such a case

- patient_service

```
MariaDB [hospital]> DESCRIBE patient_service;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| patient_id   | varchar(10) | NO   |     | NULL    |       |
| patient_name | varchar(50) | NO   |     | NULL    |       |
| service_id   | varchar(10) | NO   |     | NULL    |       |
| service_name | varchar(50) | YES  |     | NULL    |       |
| date_availed | datetime    | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
5 rows in set (0.007 sec)
```

Justification:
There are chances that we may need to look up all the services availed by some patient or data a particular service available by patient, in such a case, the patient_service view helps a lot to retrieve info in simple queries

APPENDIX

Schema Files

Database Structure Creation file
Database Data Insertion file
Database Structure without data Backup file
Database Structure with data Backup file

Backup Creation

```
mysqldump -u root -p --no-data hospital > backup_hospital_structure.sql
mysqldump -u root -p hospital > backup_hospital_data.sql
```

Backup Loading

```
mysql -u root -p hospital < backup_hospital_structure.sql
mysql -u root -p hospital < backup_hospital_data.sql
```

Views Files

Views in Database along with justifications of the view