HOSPITAL MANAGEMENT SYSTEM

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1. INTRODUCTION

This project is to computerize hospital data to manage details of all patients, doctors, appointments, diagnosis & prescriptions so that in case of any emergency details can be found out directly.

Database has four modules:

First module consists of all patient details.
Second modules consist of all details of doctors working in the hospital.
Third modules consist of the appointment dates & timings of patients with doctors.
The last module is diagnosis & prescriptions given by doctors.

The Hospital has allotted unique Patient IDs, Doctor IDs & Appointment IDs.

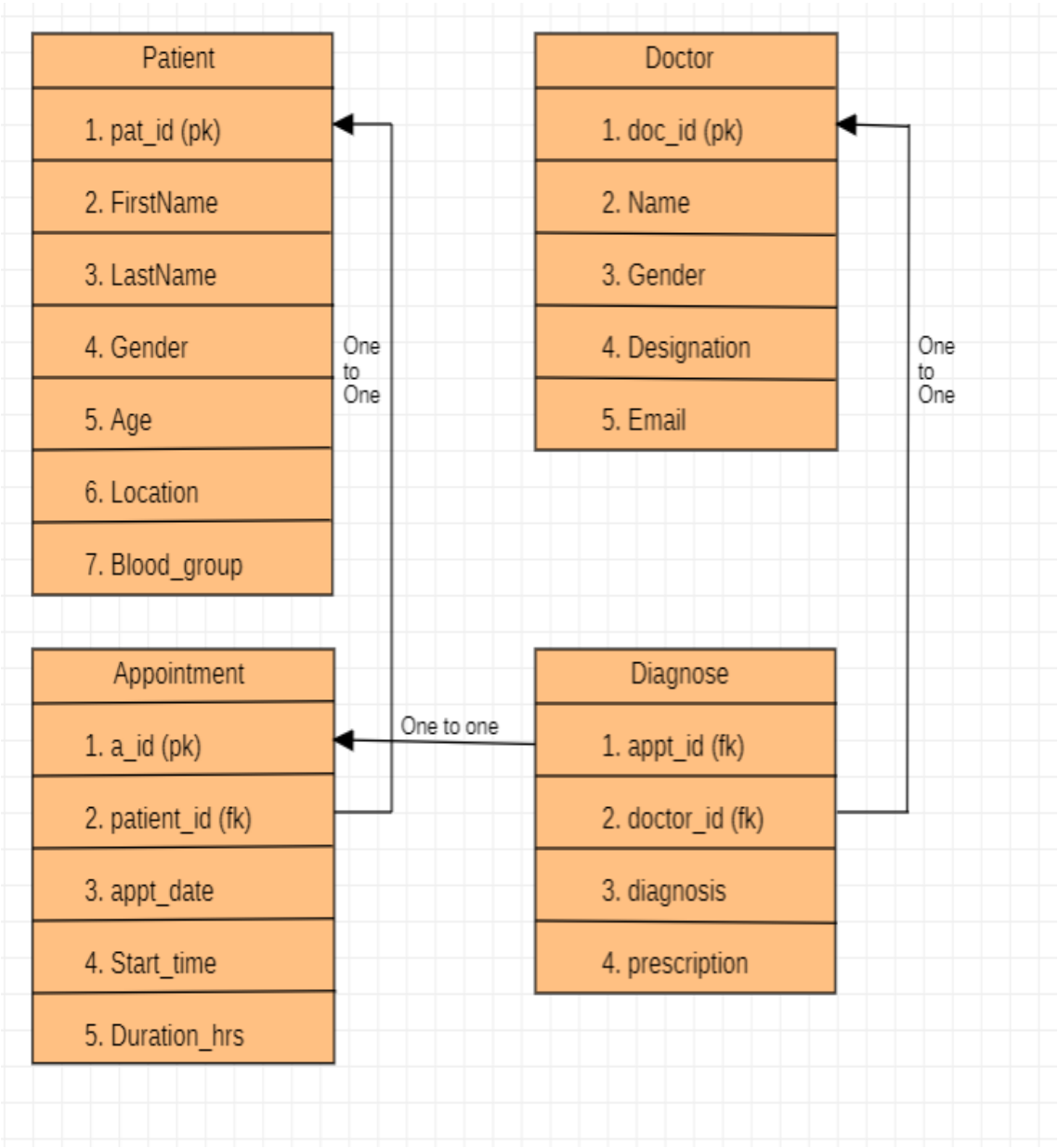
Patient details such as their Names, Age, Location, Gender & Blood group is available with the Hospital.

Doctor details such as their Names, Gender, Designation & Email ID is available with the Hospital. Every doctor as per its designation is assigned to the patients as per their health checkups.

Appointment details of patient such as Appt date, Time, Appt Duration is available. In case of any emergency last appointment date or upcoming appointment dates, duration can be found out.

According to Appointment ID, Diagnosis, Prescriptions given by doctors as per Doctor ID is noted. Through this history of the medicines or prescriptions given to patient is available with hospital.

2. ER Diagram


Patient
1. pat_id (pk)
2. FirstName
3. LastName
4. Gender
5. Age
6. Location
7. Blood_group
Doctor
1. doc_id (pk)
2. Name
3. Gender
4. Designation
5. Email
One to One
One to One
Appointment
1. a_id (pk)
2. patient_id (fk)
3. appt_date
4. Start_time
5. Duration_hrs
One to one
Diagnose
1. appt_id (fk)
2. doctor_id (fk)
3. diagnosis
4. prescription

3. Database Design

Databases: Hospital Management System

Tables:

a) Patient

b) Doctor

c) Appointment

d) Diagnose

4. Creating Tables

a. Patient Table

```
MariaDB [projecthms]> create table patient(
    -> pat_id int primary key,
    -> FirstName varchar(60) not null,
    -> LastName varchar(60) not null,
    -> Gender varchar(30),
    -> Age int,
    -> Contactno bigint,
    -> Location varchar(50));
Query OK, 0 rows affected (0.022 sec)
```

b. Doctor Table

```
MariaDB [projecthms]> create table doctor(
    -> doc_id int primary key,
    -> Name varchar(100) not null,
    -> Gender varchar(30),
    -> Designation varchar(60),
    -> Department varchar(60),
    -> Email varchar(100) default 'hospital@gmail.com');
Query OK, 0 rows affected (0.044 sec)
```

c. Appointment Table

```
MariaDB [projecthms]>  create table appt(
    -> a_id int primary key,
    -> patient_id int,
    -> Date varchar(100),
    -> Start_time varchar(100),
    -> Duration_hrs float,
    -> FOREIGN KEY (patient_id) REFERENCES patient(pat_id)
    -> );
Query OK, 0 rows affected (0.047 sec)
```

d. Diagnose Table

```
MariaDB [projecthms]> create table diag(
    -> appt_id int,
    -> doctor_id int,
    -> diagnosis varchar(100),
    -> prescription varchar(100),
    -> FOREIGN KEY (appt_id) REFERENCES appt(a_id),
    -> FOREIGN KEY (doctor_id) REFERENCES doctor(doc_id)
    -> );
Query OK, 0 rows affected (0.047 sec)
```

5. Tables in Database:

```
MariaDB [projecthms]> show tables;
+----------------------+
| Tables_in_projecthms |
+----------------------+
| appt                 |
| diag                 |
| doctor               |
| patient              |
+----------------------+
4 rows in set (0.001 sec)
```

6. Data Definition language (DDL)

a. Creating Tables:

1. Patient

```
MariaDB [projecthms]> desc patient;
+-----------+-------------+------+-----+---------+-------+
| Field     | Type        | Null | Key | Default | Extra |
+-----------+-------------+------+-----+---------+-------+
| pat_id    | int(11)     | NO   | PRI | NULL    |       |
| FirstName | varchar(60) | NO   |     | NULL    |       |
| LastName  | varchar(60) | NO   |     | NULL    |       |
| Gender    | varchar(30) | YES  |     | NULL    |       |
| Age       | int(11)     | YES  |     | NULL    |       |
| Contactno | bigint(20)  | YES  |     | NULL    |       |
| Location  | varchar(50) | YES  |     | NULL    |       |
+-----------+-------------+------+-----+---------+-------+
7 rows in set (0.012 sec)
```

2. Doctor

```
MariaDB [projecthms]> desc doctor;
+-------------+-------------+------+-----+--------------------+-------+
| Field       | Type        | Null | Key | Default            | Extra |
+-------------+-------------+------+-----+--------------------+-------+
| doc_id      | int(11)     | NO   | PRI | NULL               |       |
| Name        | varchar(100)| NO   |     | NULL               |       |
| Gender      | varchar(30) | YES  |     | NULL               |       |
| Designation | varchar(60) | YES  |     | NULL               |       |
| Department  | varchar(60) | YES  |     | NULL               |       |
| Email       | varchar(100)| YES  |     | hospital@gmail.com |       |
+-------------+-------------+------+-----+--------------------+-------+
6 rows in set (0.010 sec)
```

3. Appointment

```
MariaDB [projecthms]> desc appt;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| a_id         | int(11)     | NO   | PRI | NULL    |       |
| patient_id   | int(11)     | YES  | MUL | NULL    |       |
| Date         | varchar(100)| YES  |     | NULL    |       |
| Start_time   | varchar(100)| YES  |     | NULL    |       |
| Duration_hrs | float       | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
5 rows in set (0.009 sec)
```

4. Diagnose

```
MariaDB [projecthms]> desc diag;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| appt_id      | int(11)     | YES  | MUL | NULL    |       |
| doctor_id    | int(11)     | YES  | MUL | NULL    |       |
| diagnosis    | varchar(100)| YES  |     | NULL    |       |
| prescription | varchar(100)| YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
4 rows in set (0.010 sec)
```

b. Alter Table

1. Alter table add column:

```
MariaDB [projecthms]> alter table patient add Blood_Group varchar(30);
Query OK, 0 rows affected (0.012 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

2. Alter table modify column:

```
MariaDB [projecthms]> alter table doctor modify Name varchar(80);
Query OK, 0 rows affected (0.051 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

3. Alter table rename column:

```
MariaDB [projecthms]> alter table appt change date appt_date varchar(100);
Query OK, 0 rows affected (0.010 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

4. Alter table drop column:

```
MariaDB [projecthms]> alter table patient drop contactno;
Query OK, 0 rows affected (0.013 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

c. Rename table:

```
MariaDB [projecthms]> alter table diag rename to diagnose;
Query OK, 0 rows affected (0.006 sec)
```

d. Truncate table:

```
MariaDB [projecthms]> truncate test;
Query OK, 0 rows affected (0.031 sec)
```

e. Drop table:

```
MariaDB [projecthms]> drop table test;
Query OK, 0 rows affected (0.013 sec)
```

7. Data Manipulation language (DML)

a. Insert into table

```
insert into patient(pat_id,FirstName,LastName,Gender,Age,Location,Blood_Group) values(101,'John','Clinton','Male',40,'Washington','A+');
```

b. Update into table

```
MariaDB [projecthms]> update patient set Location="Pune" where pat_id=101;
Query OK, 1 row affected (0.015 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

c. Delete into table

```
MariaDB [projecthms]> delete from patient where LastName='Mohanty';
Query OK, 1 row affected (0.036 sec)
```

8. Data Query Language (DQL)

a. Select query

**Find all patient details

```
MariaDB [projecthms]> select * from patient;
+--------+-----------+----------+--------+------+----------+-------------+
| pat_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+--------+-----------+----------+--------+------+----------+-------------+
|    101 | John      | Clinton  | Male   |   40 | Pune     | A+          |
|    102 | Maggie    | Lincon   | Female |   25 | London   | B-          |
|    104 | Sia       | Sharma   | Female |   40 | Mumbai   | A+          |
|    105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
|    106 | Tushar    | Sharma   | Male   |   15 | Delhi    | O-          |
|    107 | Suwarna   | Jadhav   | Female |   62 | Pune     | B-          |
|    108 | Ram       | Kapoor   | Male   |   32 | Mumbai   | O+          |
|    109 | Gita      | Shah     | Female |   69 | Delhi    | A+          |
|    110 | Riya      | Jain     | Female |   51 | Mumbai   | AB+         |
+--------+-----------+----------+--------+------+----------+-------------+
9 rows in set (0.000 sec)
```

**Find details of Doctors

```
MariaDB [projecthms]> select * from doctor;
+--------+----------+--------+-------------------+--------------------+
| doc_id | Name     | Gender | Designation       | Email              |
+--------+----------+--------+-------------------+--------------------+
|      1 | Prashant | Male   | Anesthesiologists | pra@gmail.com      |
|      2 | Mitali   | Female | Cardiologists     | mitali@gmail.com   |
|      3 | John     | Male   | Dermatologists    | jo@gmail.com       |
|      4 | Nick     | Male   | Surgeon           | nick@gmail.com     |
|      5 | Riya     | Female | Family Physician  | riya@gmail.com     |
|      6 | Mahesh   | Male   | Surgeon           | hospital@gmail.com |
|      7 | Alex     | Male   | Cardiologists     | hospital@gmail.com |
+--------+----------+--------+-------------------+--------------------+
7 rows in set (0.001 sec)
```

**Find Appointment details

```
MariaDB [projecthms]> select * from appt;
+------+------------+------------+------------+--------------+
| a_id | patient_id | appt_date  | Start_time | Duration_hrs |
+------+------------+------------+------------+--------------+
| 1001 |        101 | 2015-04-25 | 9:00       |          1.5 |
| 1002 |        102 | 2015-04-25 | 13:00      |          2.5 |
| 1003 |        106 | 2015-04-26 | 10:30      |            1 |
| 1004 |        109 | 2015-04-26 | 15:45      |          2.5 |
| 1005 |        107 | 2015-04-27 | 8:00       |          1.5 |
| 1006 |        110 | 2015-04-28 | 12:00      |          0.5 |
| 1007 |        105 | 2015-04-29 | 7:00       |          1.5 |
+------+------------+------------+------------+--------------+
7 rows in set (0.000 sec)
```

**Find Diagnose details

```
MariaDB [projecthms]> select * from diagnose;
+---------+-----------+--------------+----------------------+
| appt_id | doctor_id | diagnosis    | prescription         |
+---------+-----------+--------------+----------------------+
|    1001 |         1 | Surgery pain | Medicinal Tablets    |
|    1002 |         2 | heart attack | Good Diet & Exercise |
|    1003 |         4 | stomach pain | Surgery              |
|    1006 |         5 | Flu          | Medicines            |
|    1007 |         3 | acne         | skin cream           |
+---------+-----------+--------------+----------------------+
5 rows in set (0.001 sec)
```

b. Order by query ASC

**Find details of all patients ordered by age in ascending order

```
MariaDB [projecthms]> select * from patient order by age;
+--------+-----------+----------+--------+------+----------+-------------+
| pat_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+--------+-----------+----------+--------+------+----------+-------------+
|    106 | Tushar    | Sharma   | Male   |   15 | Delhi    | O-          |
|    102 | Maggie    | Lincon   | Female |   25 | London   | B-          |
|    108 | Ram       | Kapoor   | Male   |   32 | Mumbai   | O+          |
|    101 | John      | Clinton  | Male   |   40 | Pune     | A+          |
|    104 | Sia       | Sharma   | Female |   40 | Mumbai   | A+          |
|    110 | Riya      | Jain     | Female |   51 | Mumbai   | AB+         |
|    107 | Suwarna   | Jadhav   | Female |   62 | Pune     | B-          |
|    109 | Gita      | Shah     | Female |   69 | Delhi    | A+          |
|    105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
+--------+-----------+----------+--------+------+----------+-------------+
9 rows in set (0.005 sec)
```

c. Order by query DESC

**Find details of all patients ordered by age in descending order

```
MariaDB [projecthms]> select * from patient order by age desc;
+--------+-----------+----------+--------+------+----------+-------------+
| pat_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+--------+-----------+----------+--------+------+----------+-------------+
|    105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
|    109 | Gita      | Shah     | Female |   69 | Delhi    | A+          |
|    107 | Suwarna   | Jadhav   | Female |   62 | Pune     | B-          |
|    110 | Riya      | Jain     | Female |   51 | Mumbai   | AB+         |
|    101 | John      | Clinton  | Male   |   40 | Pune     | A+          |
|    104 | Sia       | Sharma   | Female |   40 | Mumbai   | A+          |
|    108 | Ram       | Kapoor   | Male   |   32 | Mumbai   | O+          |
|    102 | Maggie    | Lincon   | Female |   25 | London   | B-          |
|    106 | Tushar    | Sharma   | Male   |   15 | Delhi    | O-          |
+--------+-----------+----------+--------+------+----------+-------------+
9 rows in set (0.000 sec)
```

d. Order by column

**Find details of doctors ordered by their Names

```
MariaDB [projecthms]> select * from doctor order by Name;
+--------+----------+--------+-------------------+--------------------+
| doc_id | Name     | Gender | Designation       | Email              |
+--------+----------+--------+-------------------+--------------------+
|      7 | Alex     | Male   | Cardiologists     | hospital@gmail.com |
|      3 | John     | Male   | Dermatologists    | jo@gmail.com       |
|      6 | Mahesh   | Male   | Surgeon           | hospital@gmail.com |
|      2 | Mitali   | Female | Cardiologists     | mitali@gmail.com   |
|      4 | Nick     | Male   | Surgeon           | nick@gmail.com     |
|      1 | Prashant | Male   | Anesthesiologists | pra@gmail.com      |
|      5 | Riya     | Female | Family Physician  | riya@gmail.com     |
+--------+----------+--------+-------------------+--------------------+
7 rows in set (0.001 sec)
```

e. Limit Query

**Find the details of first 5 patients from the table

```
MariaDB [projecthms]> select * from patient limit 5;
+--------+-----------+----------+--------+------+----------+-------------+
| pat_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+--------+-----------+----------+--------+------+----------+-------------+
|    101 | John      | Clinton  | Male   |   40 | Pune     | A+          |
|    102 | Maggie    | Lincon   | Female |   25 | London   | B-          |
|    104 | Sia       | Sharma   | Female |   40 | Mumbai   | A+          |
|    105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
|    106 | Tushar    | Sharma   | Male   |   15 | Delhi    | O-          |
+--------+-----------+----------+--------+------+----------+-------------+
5 rows in set (0.001 sec)
```

f. Select query with specific column

**Find Name & Designation of all doctors

```
MariaDB [projecthms]> select Name,Designation from doctor;
+----------+--------------------+
| Name     | Designation        |
+----------+--------------------+
| Prashant | Anesthesiologists  |
| Mitali   | Cardiologists      |
| John     | Dermatologists     |
| Nick     | Surgeon            |
| Riya     | Family Physician   |
| Mahesh   | Surgeon            |
| Alex     | Cardiologists      |
+----------+--------------------+
7 rows in set (0.001 sec)
```

g. Select query with column name change

**Find Names of patients by changing Column name

```
MariaDB [projecthms]> select FirstName,LastName as Surname from patient;
+-----------+---------+
| FirstName | Surname |
+-----------+---------+
| John      | Clinton |
| Maggie    | Lincon  |
| Sia       | Sharma  |
| Georgia   | Dsouza  |
| Tushar    | Sharma  |
| Suwarna   | Jadhav  |
| Ram       | Kapoor  |
| Gita      | Shah    |
| Riya      | Jain    |
+-----------+---------+
9 rows in set (0.001 sec)
```

h. Distinct query

**Find all unique designations of doctors

```
MariaDB [projecthms]> select distinct designation from doctor;
+--------------------+
| designation        |
+--------------------+
| Anesthesiologists  |
| Cardiologists      |
| Dermatologists     |
| Surgeon            |
| Family Physician   |
+--------------------+
5 rows in set (0.028 sec)
```

9. Using where clause

a. With Comparison Operator

**Find patient details whose age is above 60

```
MariaDB [projecthms]> select * from patient where Age>60 ;
+--------+-----------+----------+--------+------+----------+-------------+
| pat_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+--------+-----------+----------+--------+------+----------+-------------+
|    105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
|    107 | Suwarna   | Jadhav   | Female |   62 | Pune     | B-          |
|    109 | Gita      | Shah     | Female |   69 | Delhi    | A+          |
+--------+-----------+----------+--------+------+----------+-------------+
3 rows in set (0.029 sec)
```

**Find patient details whose Blood group is A+

```
MariaDB [projecthms]> select FirstName,LastName,Gender,Age from patient where blood_group='A+';
+-----------+----------+--------+------+
| FirstName | LastName | Gender | Age  |
+-----------+----------+--------+------+
| John      | Clinton  | Male   |   40 |
| Sia       | Sharma   | Female |   40 |
| Gita      | Shah     | Female |   69 |
+-----------+----------+--------+------+
3 rows in set (0.001 sec)
```

10. Using Logical Operators

a. Using AND operator

**Find appointment details for specific date & duration

```
MariaDB [projecthms]> select * from appt where appt_date='2015-04-26' and duration_hrs=2.5;
+------+------------+------------+------------+--------------+
| a_id | patient_id | appt_date  | Start_time | Duration_hrs |
+------+------------+------------+------------+--------------+
| 1004 |        109 | 2015-04-26 | 15:45      |          2.5 |
+------+------------+------------+------------+--------------+
1 row in set (0.004 sec)
```

b. Using OR operator

**Find details of doctors who are either male or Surgeon

```
MariaDB [projecthms]> select * from doctor where gender='male' or designation='Surgeon';
+--------+----------+--------+-------------------+--------------------+
| doc_id | Name     | Gender | Designation       | Email              |
+--------+----------+--------+-------------------+--------------------+
|      1 | Prashant | Male   | Anesthesiologists | pra@gmail.com      |
|      3 | John     | Male   | Dermatologists    | jo@gmail.com       |
|      4 | Nick     | Male   | Surgeon           | nick@gmail.com     |
|      6 | Mahesh   | Male   | Surgeon           | hospital@gmail.com |
|      7 | Alex     | Male   | Cardiologists     | hospital@gmail.com |
+--------+----------+--------+-------------------+--------------------+
5 rows in set (0.001 sec)
```

c. Using NOT operator

**Find diagnosis details where prescription is not Surgery

```
MariaDB [projecthms]> select * from diagnose where not prescription='Surgery';
+---------+-----------+-------------+----------------------+
| appt_id | doctor_id | diagnosis   | prescription         |
+---------+-----------+-------------+----------------------+
|    1001 |         1 | Surgery pain | Medicinal Tablets    |
|    1002 |         2 | heart attack | Good Diet & Exercise |
|    1006 |         5 | Flu          | Medicines            |
|    1007 |         3 | acne         | skin cream           |
+---------+-----------+-------------+----------------------+
4 rows in set (0.001 sec)
```

d. Using between clause

**Find patient details whose age is between 20 to 60

```
MariaDB [projecthms]> select * from patient where Age between 20 and 60;
+--------+-----------+----------+--------+------+----------+-------------+
| pat_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+--------+-----------+----------+--------+------+----------+-------------+
|    101 | John      | Clinton  | Male   |   40 | Pune     | A+          |
|    102 | Maggie    | Lincon   | Female |   25 | London   | B-          |
|    104 | Sia       | Sharma   | Female |   40 | Mumbai   | A+          |
|    108 | Ram       | Kapoor   | Male   |   32 | Mumbai   | O+          |
|    110 | Riya      | Jain     | Female |   51 | Mumbai   | AB+         |
+--------+-----------+----------+--------+------+----------+-------------+
5 rows in set (0.027 sec)
```

e. Using IN clause

**Find patient details of Mumbai,Pune,Delhi

```
MariaDB [projecthms]> select * from patient where Location in ('Mumbai','Pune','Delhi');
+--------+-----------+----------+--------+------+----------+-------------+
| pat_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+--------+-----------+----------+--------+------+----------+-------------+
|    101 | John      | Clinton  | Male   |   40 | Pune     | A+          |
|    104 | Sia       | Sharma   | Female |   40 | Mumbai   | A+          |
|    106 | Tushar    | Sharma   | Male   |   15 | Delhi    | O-          |
|    107 | Suwarna   | Jadhav   | Female |   62 | Pune     | B-          |
|    108 | Ram       | Kapoor   | Male   |   32 | Mumbai   | O+          |
|    109 | Gita      | Shah     | Female |   69 | Delhi    | A+          |
|    110 | Riya      | Jain     | Female |   51 | Mumbai   | AB+         |
+--------+-----------+----------+--------+------+----------+-------------+
7 rows in set (0.001 sec)
```

11. Aggregate function

a. Count function

**Find number of doctors

```
MariaDB [projecthms]> select count(name) from doctor;
+--------------+
| count(name) |
+--------------+
|            7 |
+--------------+
1 row in set (0.006 sec)
```

b. Average function

**Find average age of the patients

```
MariaDB [projecthms]> select avg(age) from patient;
+----------+
| avg(age) |
+----------+
|  45.4444 |
+----------+
1 row in set (0.001 sec)
```

c. Sum function

**Find total sum of patient age

```
MariaDB [projecthms]> select sum(age) from patient;
+----------+
| sum(age) |
+----------+
|      409 |
+----------+
1 row in set (0.005 sec)
```

d. Min function

**Find minimum age from patient details

```
MariaDB [projecthms]> select min(age) from patient;
+----------+
| min(age) |
+----------+
|       15 |
+----------+
1 row in set (0.000 sec)
```

e. Max function

**Find maximum age from patient details

```
MariaDB [projecthms]> select max(age) from patient;
+----------+
| max(age) |
+----------+
|       75 |
+----------+
1 row in set (0.001 sec)
```

12. String function

a. Concat function

**Display Full Names of Patients

```
MariaDB [projecthms]> select concat(firstname,' ',lastname) as FullName from patient;
+----------------+
| FullName       |
+----------------+
| John Clinton   |
| Maggie Lincon  |
| Sia Sharma     |
| Georgia Dsouza |
| Tushar Sharma  |
| Suwarna Jadhav |
| Ram Kapoor     |
| Gita Shah      |
| Riya Jain      |
+----------------+
9 rows in set (0.006 sec)
```

b. Replace function

**Replace name of doctor

```
MariaDB [projecthms]> select replace(Name,'John','Mike') as UpdatedNames from doctor;
+--------------+
| UpdatedNames |
+--------------+
| Prashant     |
| Mitali       |
| Mike         |
| Nick         |
| Riya         |
| Mahesh       |
| Alex         |
+--------------+
7 rows in set (0.001 sec)
```

c. Reverse function

**Reverse contents of a column

```
MariaDB [projecthms]> select reverse (Gender) as rev_name from doctor;
+----------+
| rev_name |
+----------+
| elaM     |
| elameF   |
| elaM     |
| elaM     |
| elameF   |
| elaM     |
| elaM     |
+----------+
7 rows in set (0.000 sec)
```

d. Length function

**Find length of characters of a column

```
MariaDB [projecthms]> select length (FirstName) from patient;
+---------------------+
| length (FirstName) |
+---------------------+
|                   4 |
|                   6 |
|                   3 |
|                   7 |
|                   6 |
|                   7 |
|                   3 |
|                   4 |
|                   4 |
+---------------------+
9 rows in set (0.000 sec)
```

13. Group By Clause

**Find count of patients by their Blood group

```
MariaDB [projecthms]> select count(Blood_group),Blood_group from patient group by Blood_group;
+-------------------+-------------+
| count(Blood_group) | Blood_group |
+-------------------+-------------+
|                 3 | A+          |
|                 1 | A-          |
|                 1 | AB+         |
|                 2 | B-          |
|                 1 | O+          |
|                 1 | O-          |
+-------------------+-------------+
6 rows in set (0.001 sec)
```

**Find Maximum Age of patient as per their Gender

```
MariaDB [projecthms]> select gender,max(age) from patient group by gender;
+--------+----------+
| gender | max(age) |
+--------+----------+
| Female |       75 |
| Male   |       40 |
+--------+----------+
2 rows in set (0.001 sec)
```

**Find minimum appointment duration hours Date wise

```
MariaDB [projecthms]> select appt_date,min(duration_hrs) from appt group by appt_date;
+------------+-------------------+
| appt_date  | min(duration_hrs) |
+------------+-------------------+
| 2015-04-25 |               1.5 |
| 2015-04-26 |                 1 |
| 2015-04-27 |               1.5 |
| 2015-04-28 |               0.5 |
| 2015-04-29 |               1.5 |
+------------+-------------------+
5 rows in set (0.001 sec)
```

14. Like Operator

**Find details of doctor with ‘logists’ as suffix in their designation

```
MariaDB [projecthms]> select * from doctor where designation like '%_____logists%';
+--------+----------+--------+-------------------+--------------------+
| doc_id | Name     | Gender | Designation       | Email              |
+--------+----------+--------+-------------------+--------------------+
|      1 | Prashant | Male   | Anesthesiologists | pra@gmail.com      |
|      2 | Mitali   | Female | Cardiologists     | mitali@gmail.com   |
|      3 | John     | Male   | Dermatologists    | jo@gmail.com       |
|      7 | Alex     | Male   | Cardiologists     | hospital@gmail.com |
+--------+----------+--------+-------------------+--------------------+
4 rows in set (0.001 sec)
```

**Find diagnose details where only medicines/tablets are given as prescription

```
MariaDB [projecthms]> select * from diagnose where prescription like '%Medici%';
+---------+-----------+-------------+-------------------+
| appt_id | doctor_id | diagnosis   | prescription      |
+---------+-----------+-------------+-------------------+
|    1001 |         1 | Surgery pain | Medicinal Tablets |
|    1006 |         5 | Flu          | Medicines         |
+---------+-----------+-------------+-------------------+
2 rows in set (0.001 sec)
```

**Find appointment details for date 2015-04-26

```
MariaDB [projecthms]> select * from appt where appt_date like '________26';
+------+------------+------------+------------+--------------+
| a_id | patient_id | appt_date  | Start_time | Duration_hrs |
+------+------------+------------+------------+--------------+
| 1003 |        106 | 2015-04-26 | 10:30      |            1 |
| 1004 |        109 | 2015-04-26 | 15:45      |          2.5 |
+------+------------+------------+------------+--------------+
2 rows in set (0.001 sec)
```

15. Union

**Find list of all patients and doctor with their genders

```
MariaDB [projecthms]> select firstname,gender from patient union select name,gender from doctor;
+-----------+--------+
| firstname | gender |
+-----------+--------+
| John      | Male   |
| Maggie    | Female |
| Sia       | Female |
| Georgia   | Female |
| Tushar    | Male   |
| Suwarna   | Female |
| Ram       | Male   |
| Gita      | Female |
| Riya      | Female |
| Prashant  | Male   |
| Mitali    | Female |
| Nick      | Male   |
| Mahesh    | Male   |
| Alex      | Male   |
+-----------+--------+
14 rows in set (0.001 sec)
```

**Find patient details with minimum and maximum age

```
MariaDB [projecthms]> select * from patient where age in(select min(age) from patient union select max(age) from patient);
+--------+-----------+----------+--------+------+----------+-------------+
| pat_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+--------+-----------+----------+--------+------+----------+-------------+
|    105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
|    106 | Tushar    | Sharma   | Male   |   15 | Delhi    | O-          |
+--------+-----------+----------+--------+------+----------+-------------+
2 rows in set (0.012 sec)
```

16. Joins

a. Inner join

**Find Name, Designation of Doctor as per Diagnosis

```
MariaDB [projecthms]> select doctor.name,doctor.designation,diagnose.diagnosis from doctor inner join diagnose on doctor.doctor_id=diagnose.doctor_id;
+----------+------------------+-------------+
| name     | designation      | diagnosis   |
+----------+------------------+-------------+
| Prashant | Anesthesiologists | Surgery pain |
| Mitali   | Cardiologists    | heart attack |
| Nick     | Surgeon          | stomach pain |
| Riya     | Family Physician | Flu         |
| John     | Dermatologists   | acne        |
+----------+------------------+-------------+
5 rows in set (0.001 sec)
```

b. Left join

**Find patient's Appointment date as per their FirstName & Age

```
MariaDB [projecthms]> select patient.pat_id,patient.firstname,patient.age,appt.appt_date from patient left join appt on patient.pat_id=appt.patient_id;
+--------+-----------+------+------------+
| pat_id | firstname | age  | appt_date  |
+--------+-----------+------+------------+
|    101 | John      |   40 | 2015-04-25 |
|    102 | Maggie    |   25 | 2015-04-25 |
|    104 | Sia       |   40 | NULL       |
|    105 | Georgia   |   75 | 2015-04-29 |
|    106 | Tushar    |   15 | 2015-04-26 |
|    107 | Suwarna   |   62 | 2015-04-27 |
|    108 | Ram       |   32 | NULL       |
|    109 | Gita      |   69 | 2015-04-26 |
|    110 | Riya      |   51 | 2015-04-28 |
+--------+-----------+------+------------+
9 rows in set (0.006 sec)
```

c. Right join

**Find Patient, Doctor & Diagnosis as per Appointment ID

```
MariaDB [projecthms]> select appt.patient_id,diagnose.doctor_id,appt.appt_date,diagnose.diagnosis from appt right join diagnose on diagnose.appt_id=appt.a_id;
+------------+-----------+------------+-------------+
| patient_id | doctor_id | appt_date  | diagnosis   |
+------------+-----------+------------+-------------+
|        101 |         1 | 2015-04-25 | Surgery pain |
|        102 |         2 | 2015-04-25 | heart attack |
|        106 |         4 | 2015-04-26 | stomach pain |
|        110 |         5 | 2015-04-28 | Flu         |
|        105 |         3 | 2015-04-29 | acne        |
+------------+-----------+------------+-------------+
5 rows in set (0.027 sec)
```

17. Subquery

a. Single Row Subquery

**Find patient details whose age is greater than maximum age of patient in Mumbai

```
MariaDB [projecthms]> select * from patient where Age>(select max(age) from patient where location='Mumbai');
+------------+-----------+----------+--------+------+----------+-------------+
| patient_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+------------+-----------+----------+--------+------+----------+-------------+
|        105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
|        107 | Suwarna   | Jadhav   | Female |   62 | Pune     | B-          |
|        109 | Gita      | Shah     | Female |   69 | Delhi    | A+          |
+------------+-----------+----------+--------+------+----------+-------------+
3 rows in set (0.010 sec)
```

b. Multiple Rows

**Find appointment details for minimum and maximum duration

```
MariaDB [projecthms]> select * from appt where duration_hrs in(select min(duration_hrs) from appt union select max(duration_hrs) from appt);
+------+------------+------------+------------+-------------+
| a_id | patient_id | appt_date  | Start_time | Duration_hrs |
+------+------------+------------+------------+-------------+
| 1002 |        102 | 2015-04-25 | 13:00      |         2.5 |
| 1004 |        109 | 2015-04-26 | 15:45      |         2.5 |
| 1006 |        110 | 2015-04-28 | 12:00      |         0.5 |
+------+------------+------------+------------+-------------+
3 rows in set (0.007 sec)
```

c. Multiple Columns

**Find doctor details whose gender, designation is same as gender, designation of 'Nick'

```
MariaDB [projecthms]> select * from doctor where (gender,designation) in (select gender,designation from doctor where Name='Nick');
+-----------+--------+--------+-------------+-------------------+
| doctor_id | Name   | Gender | Designation | Email             |
+-----------+--------+--------+-------------+-------------------+
|         4 | Nick   | Male   | Surgeon     | nick@gmail.com    |
|         6 | Mahesh | Male   | Surgeon     | hospital@gmail.com |
+-----------+--------+--------+-------------+-------------------+
2 rows in set (0.001 sec)
```

18. Views

**Create View of Patient Table

```
MariaDB [projecthms]> create view patient_view as select * from patient;
Query OK, 0 rows affected (0.032 sec)

MariaDB [projecthms]> select * from patient_view;
+------------+-----------+----------+--------+------+----------+-------------+
| patient_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+------------+-----------+----------+--------+------+----------+-------------+
|        101 | John      | Clinton  | Male   |   40 | Pune     | A+          |
|        102 | Maggie    | Lincon   | Female |   25 | London   | B-          |
|        104 | Sia       | Sharma   | Female |   40 | Mumbai   | A+          |
|        105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
|        106 | Tushar    | Sharma   | Male   |   15 | Delhi    | O-          |
|        107 | Suwarna   | Jadhav   | Female |   62 | Pune     | B-          |
|        108 | Ram       | Kapoor   | Male   |   32 | Mumbai   | O+          |
|        109 | Gita      | Shah     | Female |   69 | Delhi    | A+          |
|        110 | Riya      | Jain     | Female |   51 | Mumbai   | AB+         |
+------------+-----------+----------+--------+------+----------+-------------+
9 rows in set (0.028 sec)
```

** Update the View

```
MariaDB [projecthms]> update patient_view set FirstName='Priya',LastName='Verma' where Blood_group='O-';
Query OK, 1 row affected (0.033 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [projecthms]> select * from patient_view;
+------------+-----------+----------+--------+------+----------+-------------+
| patient_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+------------+-----------+----------+--------+------+----------+-------------+
|        101 | John      | Clinton  | Male   |   40 | Pune     | A+          |
|        102 | Maggie    | Lincon   | Female |   25 | London   | B-          |
|        104 | Sia       | Sharma   | Female |   40 | Mumbai   | A+          |
|        105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
|        106 | Priya     | Verma    | Male   |   15 | Delhi    | O-          |
|        107 | Suwarna   | Jadhav   | Female |   62 | Pune     | B-          |
|        108 | Ram       | Kapoor   | Male   |   32 | Mumbai   | O+          |
|        109 | Gita      | Shah     | Female |   69 | Delhi    | A+          |
|        110 | Riya      | Jain     | Female |   51 | Mumbai   | AB+         |
+------------+-----------+----------+--------+------+----------+-------------+
9 rows in set (0.000 sec)
```

**Delete from View

```
MariaDB [projecthms]> delete from patient_view where Age=32;
Query OK, 1 row affected (0.007 sec)

MariaDB [projecthms]> select * from patient_view;
+------------+-----------+----------+--------+------+----------+-------------+
| patient_id | FirstName | LastName | Gender | Age  | Location | Blood_Group |
+------------+-----------+----------+--------+------+----------+-------------+
|        101 | John      | Clinton  | Male   |   40 | Pune     | A+          |
|        102 | Maggie    | Lincon   | Female |   25 | London   | B-          |
|        104 | Sia       | Sharma   | Female |   40 | Mumbai   | A+          |
|        105 | Georgia   | Dsouza   | Female |   75 | London   | A-          |
|        106 | Priya     | Verma    | Male   |   15 | Delhi    | O-          |
|        107 | Suwarna   | Jadhav   | Female |   62 | Pune     | B-          |
|        109 | Gita      | Shah     | Female |   69 | Delhi    | A+          |
|        110 | Riya      | Jain     | Female |   51 | Mumbai   | AB+         |
+------------+-----------+----------+--------+------+----------+-------------+
8 rows in set (0.000 sec)
```