UNIVERSITY OF KALYANI

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HOSPITAL DATABASE MANAGEMENT

DBMS PROJECT

DATA MUSKETEERS

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INTRODUCTION

Hospitals used to store their data in traditional file system like : Microsoft Excel (compatible with windows) , Open office (compatible with windows/MAC/Linux), Google docs spreadsheets (needs internet access any time).The main drawback of traditional file system is data definition which is a part of application program that works only with specific application. Files are design driven, they require change in design & Coding whenever new kind of data occurs.

Healthcare database differs from other database as it contains data records which include employees – doctors , nurses , ward persons and others, patients , their medical history and many more things.

Few data records are as below:

- Patients Personnel Information
- Medical history
- Details of the Doctors and the nurses working there
- Laboratory test results
- Medication prescribed
- Reports about result of operations and Medical Procedures
- Diseases and their treatments.etc

The database administrator is often called as Medical Record Administrator who has additional responsibility of managing patient related information, accreditation and re-imbursement information too.

The Entities used in this hospital management database are:

- Hospitals
- Employee
- Doctors
- Nurse
- Patients
- Report
- Outdoor Patients
- Indoor Patients
- Bill

This ER Diagram represents the model of a Hospital database management system. The entity -relationship diagram of Hospital database management system shows all the visiual instrument of database tables and the relationship between patients, Nurses, Doctors, Hospital etc . It is used to structure data and to define the relationship between structured data groups of Hospital database management system functionalities. The main entities of the Hospital Management System are Hospitals, Patients, Doctors,Nurses,Report and Bill.

Hospital database management system entities along with their attributes are :

- **Hospital** : Hospital_id (Primary key) ; city ; head_office ; name.
- **Employee:** Employee_ID(empid)(Primary key) ; hospital_id(Foreign key); category(Doctor/Nurse) ; name ; gender ; DOB(Date of Birth) ; phone_no.
- **Doctor :** d_id(Primary key)(doctors id) ; empid(Foreign key) ; name ; degree ; hospital_id(Foreign key).
- **Nurse :** n_id(Primary key)(Nurse id) ; empid(Foreign key) ; name ; hospital_id(Foreign key).
- **Patients :** p_id(Primary key)(Patient id) ; hospital_id(Foreign key) ; name ; gender ; DOB(Date of Birth) ; phone_no ; address.
- **Report :** Report_iD(Primary key) ; p_id(Foreign key) ; d_id(Foreign key) ; Date.
- **Out Patient(weak entity) :** Report_id (Foreign key) ; p_id(Foreign key) ; d_id(Foreign key) ; Disease.
- **IN Patient:** P_ID(Foreign key) ; d_id(Foreign key) ; n_id(Foreign key) ; report_id(Foreign key) ; Room_No ; Disease ; Date of admission ; Date of Discharge.
- **Bill :** Bill-ID(Primary key) ; Med_fees ; Doc_ fees ; Operational_fees ; Others ; Total..

This Hospital database management model consists relationship type of one to one , many to one , one to many , many to many and few tertiary relationships.

Entity Relationship (ER) Diagram

ER model stands for an Entity-Relationship model. It is a high-level data model. This model is used to define the data elements and relationship for a specified system. It develops a conceptual design for the database. It also develops a very simple and easy to design view of data. In ER modeling, the database structure is portrayed as a diagram called an entity-relationship diagram.

Entity : An entity may be any object, class, person or place. In the ER diagram, an entity can be represented as rectangles. Consider an organization as an example- manager, product, employee, department etc. can be taken as an entity. An entity that depends on another entity called a **weak entity**. The weak entity doesn't contain any key attribute of its own. The weak entity is represented by a double rectangle.

Attribute : The attribute is used to describe the property of an entity. Eclipse is used to represent an attribute. eg- empid, DOB , phone_no, name, etc. can be attributes of a employee. The key attribute is used to represent the main characteristics of an entity. It represents a **primary key**. The key attribute is represented by an ellipse with the text underlined. An attribute that can be derived from other attribute is known as a **derived attribute**. It can be represented by a dashed ellipse.

Relationship : A relationship is used to describe the relation between entities. Diamond or rhombus is used to represent the relationship. The types of entities are as follows :

a. One-to-One Relationship

When only one instance of an entity is associated with the relationship, then it is known as one to one relationship.

b. One-to-many relationship

When only one instance of the entity on the left, and more than one instance of an entity on the right associates with the relationship then this is known as a one-to-many relationship.

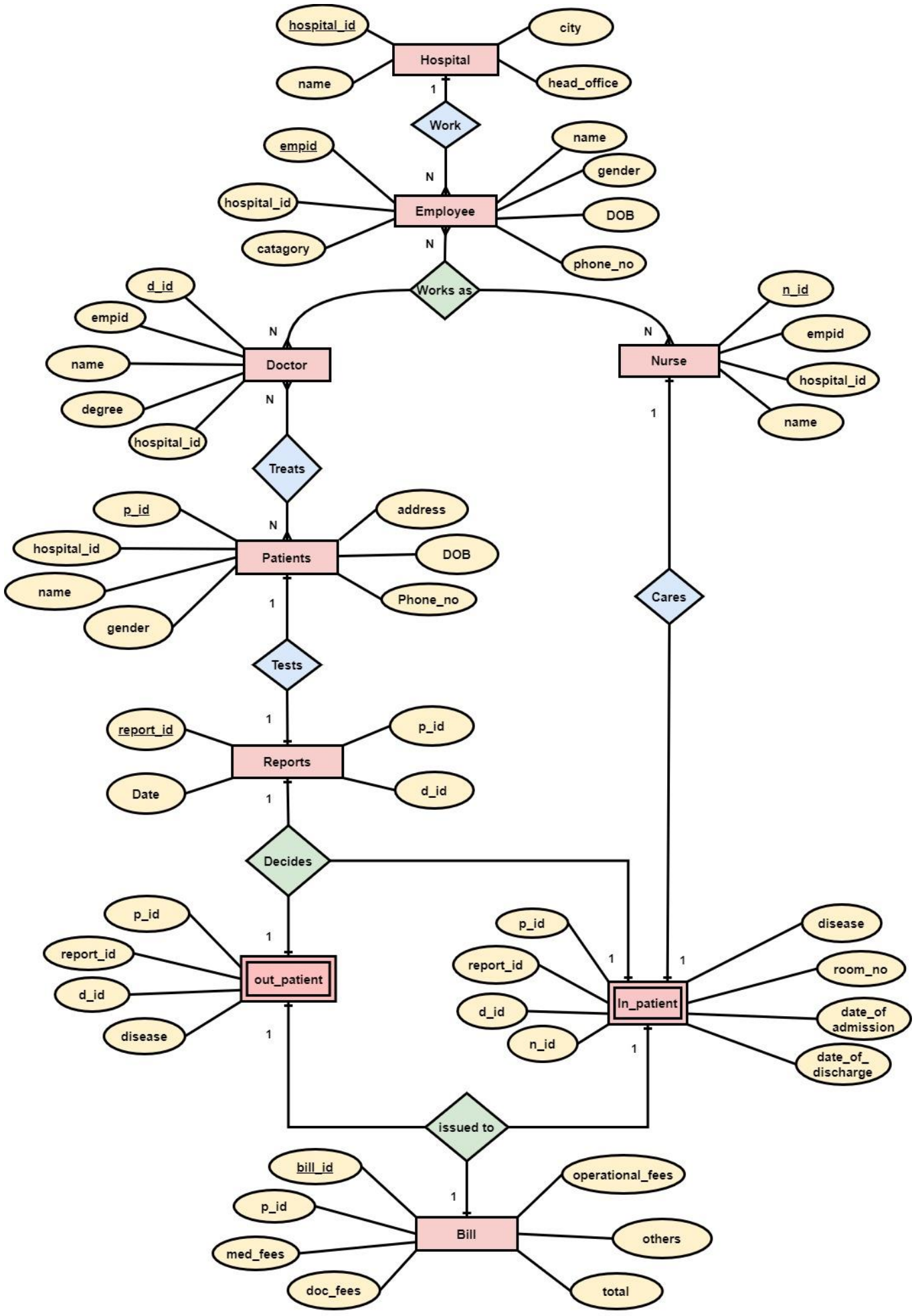
c. Many-to-one relationship

When more than one instance of the entity on the left, and only one instance of an entity on the right associates with the relationship then it is known as a many-to-one relationship.

d. Many-to-many relationship

When more than one instance of the entity on the left, and more than one instance of an entity on the right associates with the relationship then it is known as a many-to-many relationship.

Given below is the ER Diagram of the Hospital Database management system.



ER DIAGRAM OF HOSPITAL DATABASE MANAGEMENT

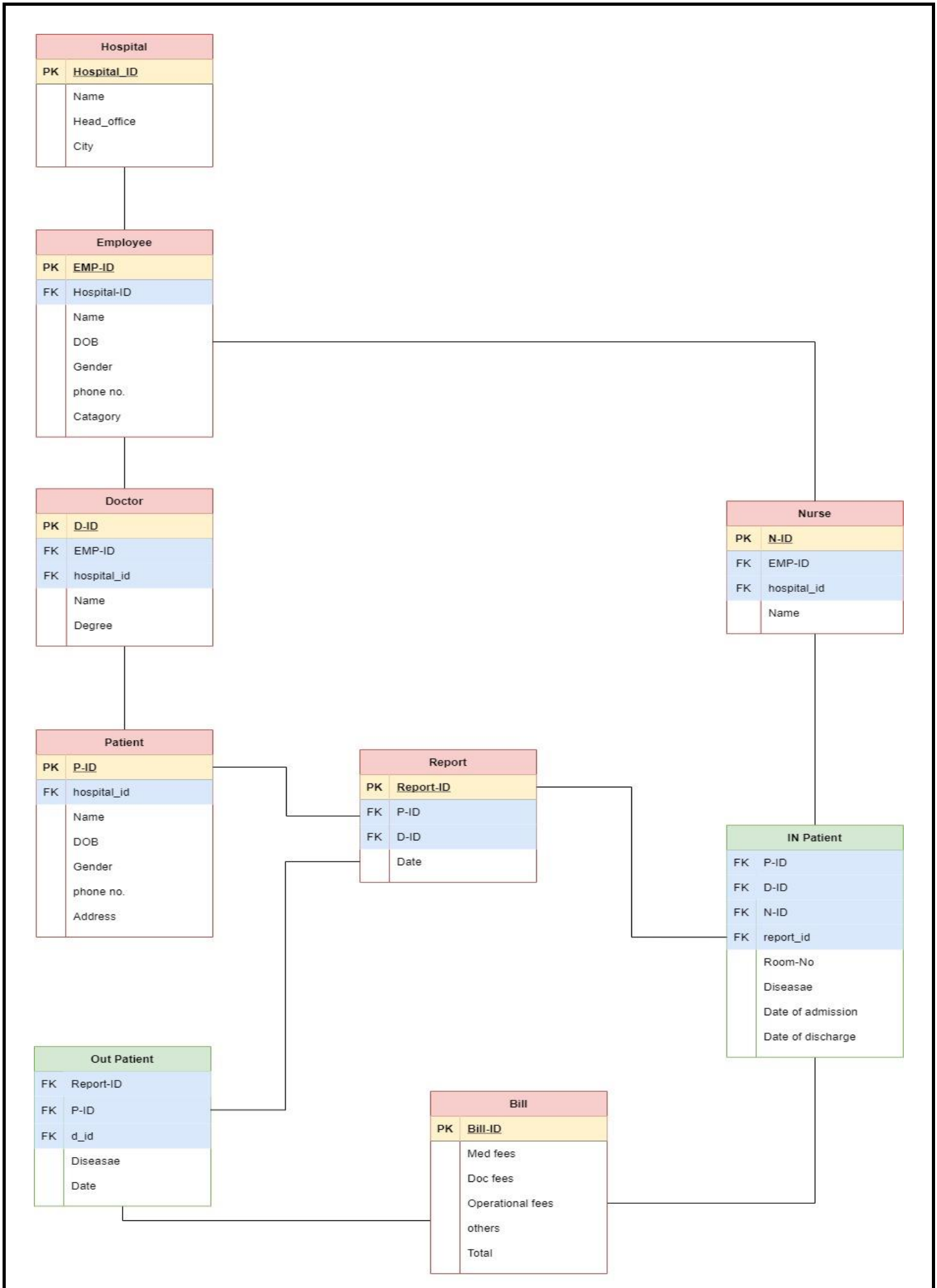
Relational Model

Relational Model (RM) represents the database as a collection of relations. A relation is nothing but a table of values. Every row in the table represents a collection of related data values. These rows in the table denote a real-world entity or relationship.

The table name and column names are helpful to interpret the meaning of values in each row. The data are represented as a set of relations. In the relational model, data are stored as tables. However, the physical storage of the data is independent of the way the data are logically organized.

After designing the ER diagram of system, we need to convert it to Relational models which can directly be implemented by any RDBMS like MySQL.

Given below is the Relational Model of the Hospital management database system.



RELATIONAL MODEL FOR HOSPITAL DATABASE MANAGEMEN

SYNTAX

```
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| project            |
| sakila             |
| sys                |
| world              |
+--------------------+
7 rows in set (0.10 sec)
```

```
mysql> use project;
Database changed
```

```
mysql> create table Hospital(
    ->      hospital_id char(10) PRIMARY KEY,
    ->      head_office char(30),
    ->      name char(40),
    ->      city char(15)
    ->      );
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> desc Hospital;
+-------------+----------+------+-----+---------+-------+
| Field       | Type     | Null | Key | Default | Extra |
+-------------+----------+------+-----+---------+-------+
| hospital_id | char(10) | NO   | PRI | NULL    |       |
| head_office | char(30) | YES  |     | NULL    |       |
| name        | char(40) | YES  |     | NULL    |       |
| city        | char(15) | YES  |     | NULL    |       |
+-------------+----------+------+-----+---------+-------+
4 rows in set (0.02 sec)
```

```
mysql> insert into hospital(hospital_id,head_office,name,city)
    -> values('H0501','Delhi','Narayana_Hospital','Barasat'),
    -> ('H0506','Delhi','CMR_Hospital ','Kolkata'),
    -> ('H0509','Kolkata','Amri_Hospital ','Saltlake_city'),
    -> ('H0926','Mumbai','Tata_Memorial_Hospital ','Newtown'),
    -> ('H1032','Bangaluru','NIMHANS ','Howrah');
Query OK, 5 rows affected (0.12 sec)
Records: 5  Duplicates: 0  Warnings: 0
```

```
mysql> select * from Hospital;
+-------------+-------------+------------------------+---------------+
| hospital_id | head_office | name                   | city          |
+-------------+-------------+------------------------+---------------+
| H0501       | Delhi       | Narayana_Hospital      | Barasat       |
| H0506       | Delhi       | CMR_Hospital           | Kolkata       |
| H0509       | Kolkata     | Amri_Hospital          | Saltlake_city |
| H0926       | Mumbai      | Tata_Memorial_Hospital | Newtown       |
| H1032       | Bangaluru   | NIMHANS                | Howrah        |
+-------------+-------------+------------------------+---------------+
5 rows in set (0.01 sec)



mysql> create table employee(
    ->        empid char(10) primary key,
    ->        name char(35),
    ->        gender char(15),
    ->        DOB DATE,
    ->        category char(15),
    ->        phone_no bigint(15),
    ->        hospital_id char(10),
    ->        foreign key(hospital_id)
    ->        references hospital(hospital_id));
Query OK, 0 rows affected, 2 warnings (0.05 sec)



mysql> desc employee;
+-------------+----------+------+-----+---------+-------+
| Field       | Type     | Null | Key | Default | Extra |
+-------------+----------+------+-----+---------+-------+
| empid       | char(10) | NO   | PRI | NULL    |       |
| name        | char(35) | YES  |     | NULL    |       |
| gender      | char(15) | YES  |     | NULL    |       |
| category    | char(15) | YES  |     | NULL    |       |
| phone_no    | bigint   | YES  |     | NULL    |       |
| hospital_id | char(10) | YES  | MUL | NULL    |       |
| DOB         | date     | YES  |     | NULL    |       |
+-------------+----------+------+-----+---------+-------+
7 rows in set (0.02 sec)



mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp01','Dr.S.Roy','M','42','Doctor','8965458562','H0501',' 1960-08-30');
Query OK, 1 row affected (0.00 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp02','Dr.P.Mondol','M','57','Doctor','9654120140','H0926','1969-07-10');
Query OK, 1 row affected (0.00 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp03','Susrita Roy','F','29','Nurse','9632004100','H0926','1995-12-19');
Query OK, 1 row affected (0.01 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp04','Pradipta Das','F','35','Nurse','8652227733','H1032','1985-10-07');
Query OK, 1 row affected (0.00 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp05','Manisha Mondol','F','32','Nurse','8232125203','H0506','1972-01-24');
Query OK, 1 row affected (0.01 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp06','Dr.M.Banerjee','M','41','Doctor','8250502003','H0501','1961-02-21');
Query OK, 1 row affected (0.01 sec)
```

```
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp07','Dr.C.Banerjee','F','39','Doctor','8253647003','H0509,','1966-12-25');
Query OK, 1 row affected (0.00 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp08','Aarati Das','F','51','Nurse','6525896311','H0926','1996-09-13');
Query OK, 1 row affected (0.00 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp09','Pritha Das','F','45','Nurse','7471213255','H0501','1979-06-23');
Query OK, 1 row affected (0.01 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp10','Nikita Banerjee','F','35','Nurse','7326566635','H1032','1997-04-12');
Query OK, 1 row affected (0.01 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp11','Dr.A.Dutta','M','38','Doctor','8322121212','H1032','1988-08-30');
Query OK, 1 row affected (0.00 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp12','Dr.S.Ghoshal','M','47','Doctor','8250502870','H0506','1983-04-13');
Query OK, 1 row affected (0.00 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp13','Apita Banerjee','F','25','Nurse','7328886635','H0506','1994-05-08');
Query OK, 1 row affected (0.00 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp14','Chandrani Paul','F','45','Nurse','9898947775','H1032','1996-05-30');
Query OK, 1 row affected (0.00 sec)
mysql> insert into employee(empid,name,gender,age,category,phone_no,hospital_id,DOB) values
('emp15','Puspita Dutta','F','31','Nurse','9845454885','H0509','1991-11-29');
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from employee;
+-------+-----------------+--------+----------+------------+-------------+------------+
| empid | name            | gender | category | phone_no   | hospital_id | DOB        |
+-------+-----------------+--------+----------+------------+-------------+------------+
| emp01 | Dr.S.Roy        | M      | Doctor   | 8965458562 | H0501       | 1960-08-30 |
| emp02 | Dr.P.Mondol     | M      | Doctor   | 9654120140 | H0926       | 1969-07-10 |
| emp03 | Susrita Roy     | F      | Nurse    | 9632004100 | H0926       | 1995-12-19 |
| emp04 | Pradipta Das    | F      | Nurse    | 8652227733 | H1032       | 1985-10-07 |
| emp05 | Manisha Mondol  | F      | Nurse    | 8232125203 | H0506       | 1972-01-24 |
| emp06 | Dr.M.Banerjee   | M      | Doctor   | 8250502003 | H0501       | 1961-02-21 |
| emp07 | Dr.C.Banerjee   | F      | Doctor   | 8253647003 | H0509       | 1966-12-25 |
| emp08 | Aarati Das      | F      | Nurse    | 6525896311 | H0926       | 1996-09-13 |
| emp09 | Pritha Das      | F      | Nurse    | 7471213255 | H0501       | 1979-06-23 |
| emp10 | Nikita Banerjee | F      | Nurse    | 7326566635 | H1032       | 1997-04-12 |
| emp11 | Dr.A.Dutta      | M      | Doctor   | 8322121212 | H1032       | 1988-08-30 |
| emp12 | Dr.S.Ghoshal    | M      | Doctor   | 8250502870 | H0506       | 1983-04-13 |
| emp13 | Apita Banerjee  | F      | Nurse    | 7328886635 | H0506       | 1994-05-08 |
| emp14 | Chandrani Paul  | F      | Nurse    | 9898947775 | H1032       | 1996-05-30 |
| emp15 | Puspita Dutta   | F      | Nurse    | 9845454885 | H0509       | 1991-11-29 |
+-------+-----------------+--------+----------+------------+-------------+------------+
15 rows in set (0.00 sec)
```

```
mysql> create table doctor(
    ->        d_id char(10) primary key,
    ->        empid char(10),
    ->        name char(30),
    ->        degree char(15),
    ->        hospital_id char(10),
    ->        foreign key(hospital_id) references hospital(hospital_id)),
    ->        foreign key(empid) references employee(empid));
Query OK, 0 rows affected (0.06 sec)
```

```
mysql> desc doctor;
+-------------+----------+------+-----+---------+-------+
| Field       | Type     | Null | Key | Default | Extra |
+-------------+----------+------+-----+---------+-------+
| d_id        | char(10) | NO   | PRI | NULL    |       |
| empid       | char(10) | YES  | MUL | NULL    |       |
| name        | char(30) | YES  |     | NULL    |       |
| degree      | char(15) | YES  |     | NULL    |       |
| hospital_id | char(10) | YES  | MUL | NULL    |       |
+-------------+----------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

```
mysql> insert into doctor (d_id,empid,name,degree,hospital_id) values
('D1003','emp01','Dr.S.Roy','MS',H0501);
Query OK, 1 row affected (0.01 sec)
mysql> insert into doctor (d_id,empid,name,degree,hospital_id) values
('D5200','emp02','Dr.P.Mondol','MD','H0926');
Query OK, 1 row affected (0.01 sec)
mysql> insert into doctor (d_id,empid,name,degree,hospital_id) values
('D5280','emp06','Dr.M.Banerjee','MBBS','H1032');
Query OK, 1 row affected (0.00 sec)
mysql> insert into doctor (d_id,empid,name,degree,hospital_id) values
('D9565','emp07','Dr.C.Banerjee','MBBS',NULL);
Query OK, 1 row affected (0.00 sec)
mysql> insert into doctor (d_id,empid,name,degree,hospital_id) values
('D2005','emp11','Dr.A.Dutta','DDS','H0506');
Query OK, 1 row affected (0.01 sec)
mysql> insert into doctor (d_id,empid,name,degree,hospital_id) values
('D2045','emp12','Dr.S.Ghoshal','MD','H0509');
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from doctor;
+-------+-------+---------------+--------+-------------+
| d_id  | empid | name          | degree | hospital_id |
+-------+-------+---------------+--------+-------------+
| D1003 | emp01 | Dr.S.Roy      | MS     | H0501       |
| D2005 | emp11 | Dr.A.Dutta    | DDS    | H0506       |
| D2045 | emp12 | Dr.S.Ghoshal  | MD     | H0509       |
| D5200 | emp02 | Dr.P.Mondol   | MD     | H0926       |
| D5280 | emp06 | Dr.M.Banerjee | MBBS   | H1032       |
| D9565 | emp07 | Dr.C.Banerjee | MBBS   | NULL        |
+-------+-------+---------------+--------+-------------+
6 rows in set (0.00 sec)
```

```
mysql> create table nurse(
    ->         n_id char(10) primary key,
    ->         empid char(10),
    ->         name char(20),
    ->         hospital_id char(10),
    ->         foreign key(hospital_id) references hospital(hospital_id)),
    ->         foreign key(empid) references employee(empid));
Query OK, 0 rows affected (0.06 sec)
```

```
mysql> desc nurse;
+-------------+----------+------+-----+---------+-------+
| Field       | Type     | Null | Key | Default | Extra |
+-------------+----------+------+-----+---------+-------+
| n_id        | char(10) | NO   | PRI | NULL    |       |
| empid       | char(10) | YES  | MUL | NULL    |       |
| name        | char(20) | YES  |     | NULL    |       |
| hospital_id | char(10) | YES  | MUL | NULL    |       |
+-------------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

```
mysql> insert into nurse(n_id,empid,name,hospital_id) values('N102','emp15','Puspita Dutta','H0501');
Query OK, 1 row affected (0.01 sec)
mysql> insert into nurse(n_id,empid,name,hospital_id) values('N199','emp13',' Apita Banerjee','H0509');
Query OK, 1 row affected (0.01 sec)
mysql> insert into nurse(n_id,empid,name,hospital_id) values('N109','emp14','Chandrani Paul','H0506');
Query OK, 1 row affected (0.00 sec)
mysql> insert into nurse(n_id,empid,name,hospital_id) values('N204','emp10','Nikita Banerjee','H0926');
Query OK, 1 row affected (0.01 sec)
mysql> insert into nurse(n_id,empid,name,hospital_id) values('N255','emp09','Pritha Das','H1032');
Query OK, 1 row affected (0.00 sec)
mysql> insert into nurse(n_id,empid,name,hospital_id) values('N324','emp08','Aarati Das','H0926');
Query OK, 1 row affected (0.00 sec)
mysql> insert into nurse(n_id,empid,name,hospital_id) values('N354','emp05','Manisha Mondol','H0506');
Query OK, 1 row affected (0.00 sec)
mysql> insert into nurse(n_id,empid,name,hospital_id) values('N274','emp04','Pradipta Das','H1032');
Query OK, 1 row affected (0.00 sec)
mysql> insert into nurse(n_id,empid,name,hospital_id) values('N105','emp03','Susrita Roy','H0501');
Query OK, 1 row affected (0.00 sec)
```

```
mysql> select * from nurse;
+------+-------+-----------------+-------------+
| n_id | empid | name            | hospital_id |
+------+-------+-----------------+-------------+
| N102 | emp15 | Puspita Dutta   | H0501       |
| N105 | emp03 | Susrita Roy     | H0501       |
| N109 | emp14 | Chandrani Paul  | H0506       |
| N199 | emp13 | Apita Banerjee  | H0509       |
| N204 | emp10 | Nikita Banerjee | H0926       |
| N255 | emp09 | Pritha Das      | H1032       |
| N274 | emp04 | Pradipta Das    | H1032       |
| N324 | emp08 | Aarati Das      | H0926       |
| N354 | emp05 | Manisha Mondol  | H0506       |
+------+-------+-----------------+-------------+
9 rows in set (0.00 sec)
```

```
mysql> create table patient(
    ->        p_id char(10) primary key,
    ->        name char(30),
    ->        gender char(10),
    ->        DOB DATE,
    ->        phone_no bigint(15),
    ->        address char(45),
    ->        hospital_id char(10),
    ->        foreign key(hospital_id) references hospital(hospital_id));
Query OK, 0 rows affected, 2 warnings (0.10 sec)
```

```
mysql> desc patient;
+-------------+----------+------+-----+---------+-------+
| Field       | Type     | Null | Key | Default | Extra |
+-------------+----------+------+-----+---------+-------+
| p_id        | char(10) | NO   | PRI | NULL    |       |
| name        | char(30) | YES  |     | NULL    |       |
| gender      | char(10) | YES  |     | NULL    |       |
| phone_no    | bigint   | YES  |     | NULL    |       |
| address     | char(45) | YES  |     | NULL    |       |
| hospital_id | char(10) | YES  | MUL | NULL    |       |
| DOB         | date     | YES  |     | NULL    |       |
+-------------+----------+------+-----+---------+-------+
7 rows in set (0.00 sec)
```

```
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P01','H0501','Rumpa Roy','F','19','9874787444','Behala',' 1969-12-15');
Query OK, 1 row affected (0.01 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P02','H0501','Nandita Das','F','36','9875212104','Kasba','2010-01-31');
Query OK, 1 row affected (0.01 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P03','H0506','Amal Kar','M','56','8987222000','Sonarpur','1957-02-09');
Query OK, 1 row affected (0.00 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P04','H0509','Tapas Roy','M','78','8932658940','Sodepur','1977-04-19');
Query OK, 1 row affected (0.01 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P05','H0926','Ritika Roy','F','29','6969584210','Howrah','1997-08-30');
Query OK, 1 row affected (0.00 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P06','H0509','Akash Das','M','84','8565844441','Sonarpur','1967-07-11');
Query OK, 1 row affected (0.01 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P07','H0926','Anup Biswas','M','42','7121000441','Shymbazar','1998-09-12');
Query OK, 1 row affected (0.00 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P08','H0509','Ritam Ghosh','M','21','7128987471','Shymbazar','1985-02-28');
Query OK, 1 row affected (0.00 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P09','H0926','Ridhhi Ghosh','F','35','6325521201','Kalyani','1995-04-21');
Query OK, 1 row affected (0.01 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P10','H1032','Amal Das','M','91','8587874561','Sonarpur','1955-06-05');
Query OK, 1 row affected (0.01 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P11','H0506','Rama Paul','F','65','6964522210','Naihati','2015-09-18');
Query OK, 1 row affected (0.01 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P12','H1032','Ram Modak','M','76','9893300125','shreerampore','2000-10-06');
Query OK, 1 row affected (0.00 sec)
mysql> insert into patient(p_id,hospital_id,name,gender,age,phone_no,address,DOB) values
('P13','H1032','Suraj Khan','M','42','9457400125','Dumdum','1945-07-08');
Query OK, 1 row affected (0.00 sec)
```

```
mysql> select * from patient;
+------+--------------+--------+------------+--------------+-------------+------------+
| p_id | name         | gender | phone_no   | address      | hospital_id | DOB        |
+------+--------------+--------+------------+--------------+-------------+------------+
| P01  | Rumpa Roy    | F      | 9874787444 | Behala       | H0501       | 1969-12-15 |
| P02  | Nandita Das  | F      | 9875212104 | Kasba        | H0501       | 2010-01-31 |
| P03  | Amal Kar     | M      | 8987222000 | Sonarpur     | H0506       | 1957-02-09 |
| P04  | Tapas Roy    | M      | 8932658940 | Sodepur      | H0509       | 1977-04-19 |
| P05  | Ritika Roy   | F      | 6969584210 | Howrah       | H0926       | 1997-08-30 |
| P06  | Akash Das    | M      | 8565844441 | Sonarpur     | H0509       | 1967-07-11 |
| P07  | Anup Biswas  | M      | 7121000441 | Shymbazar    | H0926       | 1998-09-12 |
| P08  | Ritam Ghosh  | M      | 7128987471 | Shymbazar    | H0509       | 1985-02-28 |
| P09  | Ridhhi Ghosh | F      | 6325521201 | Kalyani      | H0926       | 1995-04-21 |
| P10  | Amal Das     | M      | 8587874561 | Sonarpur     | H1032       | 1955-06-05 |
| P11  | Rama Paul    | F      | 6964522210 | Naihati      | H0506       | 2015-09-18 |
| P12  | Ram Modak    | M      | 9893300125 | shreerampore | H1032       | 2000-10-06 |
| P13  | Suraj Khan   | M      | 9457400125 | Dumdum       | H1032       | 1945-07-08 |
+------+--------------+--------+------------+--------------+-------------+------------+
13 rows in set (0.00 sec)



mysql> create table report(
    ->         report_id char(10) primary key,
    ->         p_id char(10),
    ->         d_id char(10),
    ->         Date date,
    ->         foreign key(p_id) references patient(p_id),
    ->         foreign key(d_id) references doctor(d_id));
Query OK, 0 rows affected (0.08 sec)



mysql> desc report;
+-----------+----------+------+-----+---------+-------+
| Field     | Type     | Null | Key | Default | Extra |
+-----------+----------+------+-----+---------+-------+
| report_id | char(10) | NO   | PRI | NULL    |       |
| p_id      | char(10) | YES  | MUL | NULL    |       |
| d_id      | char(10) | YES  | MUL | NULL    |       |
| Date      | date     | YES  |     | NULL    |       |
+-----------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)



mysql> insert into report(report_id,p_id,d_id,date) values ('R015','P01','D2045','2020-09-14');
Query OK, 1 row affected (0.00 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R055','P02','D2005','2020-08-24');
Query OK, 1 row affected (0.01 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R285','P03','D5200','2019-09-25');
Query OK, 1 row affected (0.00 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R042','P04','D5280','2020-04-22');
Query OK, 1 row affected (0.00 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R211','P05','D5200','2018-02-12');
Query OK, 1 row affected (0.00 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R133','P06','D9565','2019-02-02');
Query OK, 1 row affected (0.01 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R987','P07','D1003','2015-01-01');
Query OK, 1 row affected (0.00 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R560','P08','D2005','2011-11-11');
```

```
Query OK, 1 row affected (0.01 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R103','P09','D1003','2016-04-12');
Query OK, 1 row affected (0.00 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R665','P10','D2045','2006-03-27');
Query OK, 1 row affected (0.00 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R562','P11','D5280','2017-11-28');
Query OK, 1 row affected (0.01 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R971','P12','D9565','2018-07-09');
Query OK, 1 row affected (0.00 sec)
mysql> insert into report(report_id,p_id,d_id,date) values ('R111','P13','D9565','2021-06-05');
Query OK, 1 row affected (0.00 sec)
```

```
mysql> select * from report;
+-----------+------+-------+------------+
| report_id | p_id | d_id  | Date       |
+-----------+------+-------+------------+
| R015      | P01  | D2045 | 2020-09-14 |
| R042      | P04  | D5280 | 2020-04-22 |
| R055      | P02  | D2005 | 2020-08-24 |
| R103      | P09  | D1003 | 2016-04-12 |
| R111      | P13  | D9565 | 2021-06-05 |
| R133      | P06  | D9565 | 2019-02-02 |
| R211      | P05  | D5200 | 2018-02-12 |
| R285      | P03  | D5200 | 2019-09-25 |
| R560      | P08  | D2005 | 2011-11-11 |
| R562      | P11  | D5280 | 2017-11-28 |
| R665      | P10  | D2045 | 2006-03-27 |
| R971      | P12  | D9565 | 2018-07-09 |
| R987      | P07  | D1003 | 2015-01-01 |
+-----------+------+-------+------------+
13 rows in set (0.00 sec)
```

```
mysql> create table out_patient(
    ->         report_id char(10),
    ->         p_id char(12),
    ->         disease char(15),
    ->         foreign key(report_id) references report(report_id),
    ->         foreign key(p_id) references patient(p_id)
    ->         foreign key(d_id) references doctor(d_id));
Query OK, 0 rows affected (0.06 sec)
```

```
mysql> desc out_patient;
+-----------+----------+------+-----+---------+-------+
| Field     | Type     | Null | Key | Default | Extra |
+-----------+----------+------+-----+---------+-------+
| report_id | char(10) | YES  | MUL | NULL    |       |
| p_id      | char(12) | YES  | MUL | NULL    |       |
| disease   | char(15) | YES  |     | NULL    |       |
| d_id      | char(10) | YES  | MUL | NULL    |       |
+-----------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

```
mysql> insert into out_patient(report_id,p_id,disease,d_id) values ('RO55','PO2','Diarrhea','D9565');
Query OK, 1 row affected (0.01 sec)
mysql> insert into out_patient(report_id,p_id,disease,d_id) values ('R562','P11','Allergies','D2045');
Query OK, 1 row affected (0.01 sec)
mysql> insert into out_patient(report_id,p_id,disease,d_id) values ('R971','P12','Fever','D52OO');
Query OK, 1 row affected (0.00 sec)
mysql> insert into out_patient(report_id,p_id,disease,d_id) values
('R1O3','PO9','Conjunctivitis','D9565');
Query OK, 1 row affected (0.00 sec)
mysql> insert into out_patient(report_id,p_id,disease,d_id) values ('RO15','PO1','Fever','D9565');
Query OK, 1 row affected (0.00 sec)
```

```
mysql> select * from out_patient;
+-----------+------+----------------+-------+
| report_id | p_id | disease        | d_id  |
+-----------+------+----------------+-------+
| RO55      | PO2  | Diarrhea       | D9565 |
| R562      | P11  | Allergies      | D2045 |
| R971      | P12  | Fever          | D52OO |
| R1O3      | PO9  | Conjunctivitis | D9565 |
| RO15      | PO1  | Fever          | D9565 |
+-----------+------+----------------+-------+
5 rows in set (0.00 sec)
```

```
mysql> create table in_patient(
    ->        p_id char(10),
    ->        d_id char(10),
    ->        n_id char(10), room_no char(20),
    ->        disease char(15),
    ->        date_of_admission date,
    ->        date_of_discharge date,
    ->        foreign key(p_id) references patient(p_id),
    ->        foreign key(d_id) references doctor(d_id),
    ->        foreign key(n_id) references nurse(n_id)
    ->         foreign key(report_id) references report(report_id),);
Query OK, 0 rows affected (0.06 sec)
```

```
mysql> desc in_patient;
+-------------------+----------+------+-----+---------+-------+
| Field             | Type     | Null | Key | Default | Extra |
+-------------------+----------+------+-----+---------+-------+
| p_id              | char(10) | YES  | MUL | NULL    |       |
| d_id              | char(10) | YES  | MUL | NULL    |       |
| n_id              | char(10) | YES  | MUL | NULL    |       |
| room_no           | char(20) | YES  |     | NULL    |       |
| disease           | char(15) | YES  |     | NULL    |       |
| date_of_admission | date     | YES  |     | NULL    |       |
| date_of_discharge | date     | YES  |     | NULL    |       |
| report_id         | char(10) | YES  | MUL | NULL    |       |
+-------------------+----------+------+-----+---------+-------+
8 rows in set (0.00 sec)
```

```
mysql> insert into
in_patient(p_id,d_id,n_id,room_no,disease,date_of_admission,date_of_discharge,report_id)
    ->        values('P03','D1003','N102','ICU 5','Cancer','2021-03-12','2021-04-21','R285'),
    ->        ('P04','D2005','N105','General-1','Thrush','2018-07-16','2018-08-01','R042'),
    ->        ('P05','D2045','N199','General-3','Covid','2020-08-02','2020-08-06','R211'),
    ->        ('P06','D5200','N324','General-4','Covid','2021-04-04','2021-04-18','R133'),
    ->        ('P07','D5280','N255','ICU 5','Dengue','2014-09-07','2014-09-23','R987'),
    ->        ('P08','D1003','N204','CCU-1','Blood Cancer','2010-12-03','2011-01-19','R560'),
    ->        ('P10','D1003','N109','CCU-2','Kidney failure','2016-12-05','2016-12-25','R665'),
    ->        ('P13','D9565','N354','ICU 4','Bypass surgery','2019-11-14','2019-11-28','R111');
Query OK, 8 rows affected (0.02 sec)
Records: 8  Duplicates: 0  Warnings: 0
```

```
mysql> select * from in_patient;
+------+-------+------+-----------+----------------+-------------------+-------------------+-----------+
| p_id | d_id  | n_id | room_no   | disease        | date_of_admission | date_of_discharge | report_id |
+------+-------+------+-----------+----------------+-------------------+-------------------+-----------+
| P03  | D1003 | N102 | ICU 5     | Cancer         | 2021-03-12        | 2021-04-21        | R285      |
| P04  | D2005 | N105 | General-1 | Thrush         | 2018-07-16        | 2018-08-01        | R042      |
| P05  | D2045 | N199 | General-3 | Covid          | 2020-08-02        | 2020-08-06        | R211      |
| P06  | D5200 | N324 | General-4 | Covid          | 2021-04-04        | 2021-04-18        | R133      |
| P07  | D5280 | N255 | ICU 5     | Dengue         | 2014-09-07        | 2014-09-23        | R987      |
| P08  | D1003 | N204 | CCU-1     | cancer         | 2010-12-03        | 2011-01-19        | R560      |
| P10  | D1003 | N109 | CCU-2     | Kidney failure | 2016-12-05        | 2016-12-25        | R665      |
| P13  | D9565 | N354 | ICU 4     | Bypass surgery | 2019-11-14        | 2019-11-28        | R111      |
+------+-------+------+-----------+----------------+-------------------+-------------------+-----------+
```

```
mysql> create table bill(
    ->        bill_id char(10),
    ->        p_id char(20),
    ->        med_fees float(15),
    ->        doc_fees float(15),
    ->        operational_fees float(15),
    ->        others float (15),
    ->        total float (20),
    ->        foreign key(p_id) references patient(p_id));
Query OK, 0 rows affected (0.05 sec)
```

```
mysql> desc bill;
+------------------+----------+------+-----+-------------------------------+-------------------+
| Field            | Type     | Null | Key | Default                       | Extra             |
+------------------+----------+------+-----+-------------------------------+-------------------+
| bill_id          | char(10) | YES  | PRI | NULL                          |                   |
| p_id             | char(20) | YES  | MUL | NULL                          |                   |
| med_fees         | float    | YES  |     | NULL                          |                   |
| doc_fees         | float    | YES  |     | NULL                          |                   |
| operational_fees | float    | YES  |     | NULL                          |                   |
| others           | float    | YES  |     | NULL                          |                   |
| total            | float    | YES  |     | NULL                          |                   |
| Amount_Payable   | int      | YES  |     | ((0.18 * `total`) + `total`) | DEFAULT_GENERATED |
+------------------+----------+------+-----+-------------------------------+-------------------+
8 rows in set (0.02 sec)
```

```
mysql> insert into bill(bill_id,p_id,med_fees,doc_fees,operational_fees,others,total)
    ->         values ('B956','P01','450.00','900.00','0','100.00','1450.00'),
    ->         ('B987','P02','832.00','500.00','0','100.00','1432.00'),
    ->         ('B135','P03','4325.00','1690.00','10000.00','7856.00','23871.00'),
    ->         ('B365','P04','2003.00','1900.00','5000.00','2216.00','11119.00'),
    ->         ('B365','P05','16000.00','4000.00','8000.00','7032.00','35032.00'),
    ->         ('B984','P06','98500.00','12600.00','56950.00','32032.00','200082.00'),
    ->         ('B522','P07','6023.00','4500.00','9058.00','5210.00','24791.00'),
    ->         ('B666','P08','54032.00','14056.00','58324.25','28561.08','154973.33'),
    ->         ('B216','P09','1242.00','680.00','0','2010.12','3932.12'),
    ->         ('B254','P10','55692.00','4566.00','75424.85','4585.32','140268.17'),
    ->         ('B742','P11','3242.00','400.00','0','100.00','3742.00'),
    ->         ('B122','P12','942.00','200.00','0','100.00','1242.00'),
    ->         ('B321','P13','12541.96','5014.00','45214.65','8269.98','71040.59');
Query OK, 13 rows affected (0.01 sec)
Records: 13  Duplicates: 0  Warnings: 0



mysql> select * from bill;
+---------+------+----------+----------+------------------+---------+---------+
| bill_id | p_id | med_fees | doc_fees | operational_fees | others  | total   |
+---------+------+----------+----------+------------------+---------+---------+
| B956    | P01  |      450 |      900 |                0 |     100 |    1450 |
| B987    | P02  |      832 |      500 |                0 |     100 |    1432 |
| B135    | P03  |     4325 |     1690 |            10000 |    7856 |   23871 |
| B365    | P04  |     2003 |     1900 |             5000 |    2216 |   11119 |
| B365    | P05  |    16000 |     4000 |             8000 |    7032 |   35032 |
| B984    | P06  |    98500 |    12600 |            56950 |   32032 |  200082 |
| B522    | P07  |     6023 |     4500 |             9058 |    5210 |   24791 |
| B666    | P08  |    54032 |    14056 |          58324.2 | 28561.1 |  154973 |
| B216    | P09  |     1242 |      680 |                0 | 2010.12 | 3932.12 |
| B254    | P10  |    55692 |     4566 |          75424.9 | 4585.32 |  140268 |
| B742    | P11  |     3242 |      400 |                0 |     100 |    3742 |
| B122    | P12  |      942 |      200 |                0 |     100 |    1242 |
| B321    | P13  |    12542 |     5014 |          45214.6 | 8269.98 | 71040.6 |
+---------+------+----------+----------+------------------+---------+---------+
13 rows in set (0.00 sec)



mysql> show tables;
+-------------------+
| Tables_in_project |
+-------------------+
| bill              |
| doctor            |
| employee          |
| hospital          |
| in_patient        |
| nurse             |
| out_patient       |
| patient           |
| report            |
+-------------------+
9 rows in set (0.06 sec)
```

QUERIES

Q 1 > Show the column of total payable amount after adding 18% GST on total amount per bill.

SYNTAX >

```
mysql> alter table bill add Amount_Payable int Default(0.18*total+total);
Query OK, 13 rows affected (0.11 sec)
Records: 13  Duplicates: 0  Warnings: 0

mysql> select * from bill;
+---------+------+----------+----------+------------------+---------+---------+----------------+
| bill_id | p_id | med_fees | doc_fees | operational_fees | others  | total   | Amount_Payable |
+---------+------+----------+----------+------------------+---------+---------+----------------+
| B956    | P01  |      450 |      900 |                0 |     100 |    1450 |           1711 |
| B987    | P02  |      832 |      500 |                0 |     100 |    1432 |           1690 |
| B135    | P03  |     4325 |     1690 |            10000 |    7856 |   23871 |          28168 |
| B365    | P04  |     2003 |     1900 |             5000 |    2216 |   11119 |          13120 |
| B365    | P05  |    16000 |     4000 |             8000 |    7032 |   35032 |          41338 |
| B984    | P06  |    98500 |    12600 |            56950 |   32032 |  200082 |         236097 |
| B522    | P07  |     6023 |     4500 |             9058 |    5210 |   24791 |          29253 |
| B666    | P08  |    54032 |    14056 |          58324.2 | 28561.1 |  154973 |         182869 |
| B216    | P09  |     1242 |      680 |                0 | 2010.12 | 3932.12 |           4640 |
| B254    | P10  |    55692 |     4566 |          75424.9 | 4585.32 |  140268 |         165516 |
| B742    | P11  |     3242 |      400 |                0 |     100 |    3742 |           4416 |
| B122    | P12  |      942 |      200 |                0 |     100 |    1242 |           1466 |
| B321    | P13  |    12542 |     5014 |          45214.6 | 8269.98 | 71040.6 |          83828 |
+---------+------+----------+----------+------------------+---------+---------+----------------+
13 rows in set (0.00 sec)
```

Q 2 > Show empid,name,age,DOB of those patients whose age is above 30years from current date.

SYNTAX >

```
mysql> SELECT
    ->     empid,
    ->     name,
    ->     DOB,
    ->     (DATE_FORMAT(NOW(), '%Y') - DATE_FORMAT(DOB, '%Y')) AS Age
    ->     FROM
    ->     employee
    ->     WHERE
    ->     TIMESTAMPDIFF(YEAR, DOB, NOW()) > 30
    ->     ORDER BY Age DESC;
+-------+---------------+------------+------+
| empid | name          | DOB        | Age  |
+-------+---------------+------------+------+
| emp01 | Dr.S.Roy      | 1960-08-30 |   61 |
| emp06 | Dr.M.Banerjee | 1961-02-21 |   60 |
| emp07 | Dr.C.Banerjee | 1966-12-25 |   55 |
| emp02 | Dr.P.Mondol   | 1969-07-10 |   52 |
| emp05 | Manisha Mondol | 1972-01-24 |   49 |
| emp09 | Pritha Das    | 1979-06-23 |   42 |
| emp12 | Dr.S.Ghoshal  | 1983-04-13 |   38 |
| emp04 | Pradipta Das  | 1985-10-07 |   36 |
| emp11 | Dr.A.Dutta    | 1988-08-30 |   33 |
+-------+---------------+------------+------+
9 rows in set (0.01 sec)
```

Q 3 > Find average payable amount from bill table

SYNTAX >

```
mysql> select avg(Amount_Payable) as Average_Payable_amount from bill;
+------------------------+
| Average_Payable_amount |
+------------------------+
|             61085.5385 |
+------------------------+
1 row in set (0.00 sec)
```

Q 4 > show inner join between patient and bill table.

SYNTAX >

```
mysql> select
    ->      b.bill_id,
    ->     p.hospital_id,
    ->     p.p_id,
    ->     p.name,
    ->     p.gender,
    ->     p.phone_no,
    ->     p.address,
    ->     b.amount_payable
    ->     from
    ->     bill b INNER JOIN patient p ON p.p_id=b.p_id;
```

bill_id	hospital_id	p_id	name	gender	phone_no	address	amount_payable
B956	H0501	P01	Rumpa Roy	F	9874787444	Behala	1711
B987	H0501	P02	Nandita Das	F	9875212104	Kasba	1690
B135	H0506	P03	Amal Kar	M	8987222000	Sonarpur	28168
B365	H0509	P04	Tapas Roy	M	8932658940	Sodepur	13120
B365	H0926	P05	Ritika Roy	F	6969584210	Howrah	41338
B984	H0509	P06	Akash Das	M	8565844441	Sonarpur	236097
B522	H0926	P07	Anup Biswas	M	7121000441	Shymbazar	29253
B666	H0509	P08	Ritam Ghosh	M	7128987471	Shymbazar	182869
B216	H0926	P09	Ridhhi Ghosh	F	6325521201	Kalyani	4640
B254	H1032	P10	Amal Das	M	8587874561	Sonarpur	165516
B742	H0506	P11	Rama Paul	F	6964522210	Naihati	4416
B122	H1032	P12	Ram Modak	M	9893300125	shreerampore	1466
B321	H1032	P13	Suraj Khan	M	9457400125	Dumdum	83828

```
13 rows in set (0.00 sec)
```

Q 5 > Show report_id, p_ id,date of report which are older than 6 years.

SYNTAX >

```
mysql> select
    ->     report_id,
    ->     p_id,
    ->     date
    ->     from
    ->     report
    ->     where (curdate()-date)>60000;
```

```
+-----------+------+------------+
| report_id | p_id | date       |
+-----------+------+------------+
| R560      | P08  | 2011-11-11 |
| R665      | P10  | 2006-03-27 |
| R987      | P07  | 2015-01-01 |
+-----------+------+------------+
3 rows in set (0.00 sec)
```

Q 6 > Show p_id,name,hospital_id,DOB,phone_no,report_id of those whose name starts with 'R' or ends in 'Y'.

SYNTAX >

```
mysql> select
    ->     p.p_id,
    ->     p.name,
    ->     p.phone_no,
    ->     p.hospital_id,
    ->     p.DOB,
    ->     r.report_id
    ->     from
    ->     patient p, report r
    ->     where p.p_id=r.p_id and (p.name like 'R%' or p.name like '%y');
```

```
+------+--------------+------------+-------------+------------+-----------+
| p_id | name         | phone_no   | hospital_id | DOB        | report_id |
+------+--------------+------------+-------------+------------+-----------+
| P01  | Rumpa Roy    | 9874787444 | H0501       | 1969-12-15 | R015      |
| P04  | Tapas Roy    | 8932658940 | H0509       | 1977-04-19 | R042      |
| P05  | Ritika Roy   | 6969584210 | H0926       | 1997-08-30 | R211      |
| P08  | Ritam Ghosh  | 7128987471 | H0509       | 1985-02-28 | R560      |
| P09  | Ridhhi Ghosh | 6325521201 | H0926       | 1995-04-21 | R103      |
| P11  | Rama Paul    | 6964522210 | H0506       | 2015-09-18 | R562      |
| P12  | Ram Modak    | 9893300125 | H1032       | 2000-10-06 | R971      |
+------+--------------+------------+-------------+------------+-----------+
7 rows in set (0.00 sec)
```

Q 7 > Show how many patients are there from each city.

SYNTAX >

```
mysql> select Address,COUNT(name)AS no_of_patients FROM patient GROUP BY address ORDER BY COUNT(name)
DESC;

+--------------+----------------+
| Address      | no_of_patients |
+--------------+----------------+
| Sonarpur     |              3 |
| Shymbazar    |              2 |
| Behala       |              1 |
| Kasba        |              1 |
| Sodepur      |              1 |
| Howrah       |              1 |
| Kalyani      |              1 |
| Naihati      |              1 |
| shreerampore |              1 |
| Dumdum       |              1 |
+--------------+----------------+
10 rows in set (0.08 sec)
```

Q 8 >)show p_id,name, report_id,date_of_admission,date_of_discharge,disease,age of those patients who have suffered from covid.

SYNTAX >

```
mysql> select
    ->      p.p_id,
    ->      p.name,
    ->      i.report_id,
    ->      i.date_of_admission,
    ->      i.date_of_discharge,
    ->      i.disease,
    ->      (YEAR(CURDATE())-YEAR(DOB)) AS age
    ->      from
    ->      patient p,
    ->      in_patient i
    ->      where
    ->      p.p_id=i.p_id
    -> and i.disease = 'covid';

+------+------------+-----------+-------------------+-------------------+---------+------+
| p_id | name       | report_id | date_of_admission | date_of_discharge | disease | age  |
+------+------------+-----------+-------------------+-------------------+---------+------+
| P05  | Ritika Roy | R211      | 2020-08-02        | 2020-08-06        | Covid   |   24 |
| P06  | Akash Das  | R133      | 2021-04-04        | 2021-04-18        | Covid   |   54 |
+------+------------+-----------+-------------------+-------------------+---------+------+
2 rows in set (0.00 sec)
```

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