Hospital Management System

Hospital Management System is used to manage all the hospital operations. We can perform operations such as we can add patients, assign doctor to patient, view patient details, view doctor details, add staff, view staff, assign bed to patients, view bill and payments.

The Hospital Management include 5 entites :-

- Patients
- Doctors
- Staff
- Bills
- Payments

<u>Patients</u>

- **Attribues**
    1. p_id (Primary Key)
    2. fname
    3. lname
    4. gender
    5. disease
    6. admitstatus
    7. age
    8. phone_no
- **Relationship**
    1. Each patient can have only one billing record, and each billing record is associated with exactly one patient. (One-to-One)
    2. Each patient can have multiple payment records, but each payment record is associated with exactly one patient.(One-to-Many)

```
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| p_id        | int          | NO   | PRI | NULL    |       |
| fname       | varchar(255) | YES  |     | NULL    |       |
| lname       | varchar(255) | YES  |     | NULL    |       |
| gender      | varchar(10)  | YES  |     | NULL    |       |
| disease     | varchar(255) | YES  |     | NULL    |       |
| admitstatus | varchar(3)   | YES  |     | NULL    |       |
| age         | int          | YES  |     | NULL    |       |
| phone_no    | bigint       | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
```

Doctors

- **Attribues**
    1. d_id (Primary Key)
    2. d_name
    3. qualification
    4. specilization
    5. availability
- **Relationship**
    1. A doctor can be assigned to multiple patients, and a patient can be attended by multiple doctors. This relationship is represented by the doctors and patients tables.(Many-to-Many)

```
+---------------+--------------+------+-----+---------+-------+
| Field         | Type         | Null | Key | Default | Extra |
+---------------+--------------+------+-----+---------+-------+
| d_id          | int          | NO   | PRI | NULL    |       |
| d_name        | varchar(255) | YES  |     | NULL    |       |
| qualification | varchar(255) | YES  |     | NULL    |       |
| specilization | varchar(255) | YES  |     | NULL    |       |
| availability  | varchar(3)   | YES  |     | NULL    |       |
+---------------+--------------+------+-----+---------+-------+
```

Staff

- **Attribues**
    1. s_id (Primary Key)
    2. fname
    3. lname
    4. gender
    5. designation
    6. age
    7. salary
- **Relationship**
    1. Staff members (like nurses or administrators) can be associated with multiple patients, and a patient can interact with multiple staff members. This relationship is represented by the staff and patients tables.(Many-to-Many)
    2. A staff member can work with multiple doctors, and a doctor can have interactions with multiple staff members.(Many-to-Many)

```
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| s_id        | int          | NO   | PRI | NULL    |       |
| fname       | varchar(255) | YES  |     | NULL    |       |
| lname       | varchar(255) | YES  |     | NULL    |       |
| gender      | varchar(1)   | YES  |     | NULL    |       |
| designation | varchar(255) | YES  |     | NULL    |       |
| age         | int          | YES  |     | NULL    |       |
| salary      | int          | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
```

Bills

- **Attribues**
    1. b_id(Primary Key)
    2. basicCharges
    3. additionalCharges
    4. medicationCharges
    5. roomCharges
    6. doctorFees
    7. totalCharges
    8. patient_id(Foreign Key)
- **Relationship**
    1. Each billing record is associated with a staff member who handles the billing process. This relationship ensures that a billing record has a responsible staff member.(One-to-One)

```
+-------------------+--------+------+-----+---------+-------+
| Field             | Type   | Null | Key | Default | Extra |
+-------------------+--------+------+-----+---------+-------+
| b_id              | int    | NO   | PRI | NULL    |       |
| basicCharges      | double | YES  |     | NULL    |       |
| additionalCharges | double | YES  |     | NULL    |       |
| medicationCharges | double | YES  |     | NULL    |       |
| roomCharges       | double | YES  |     | NULL    |       |
| doctorFees        | double | YES  |     | NULL    |       |
| totalCharges      | double | YES  |     | NULL    |       |
| patient_id        | int    | YES  | MUL | NULL    |       |
+-------------------+--------+------+-----+---------+-------+
```

Payments

- **Attributes**
    1. p_id (Primary Key)
    2. bill_id (Foreign Key)
    3. paymentMethod
    4. amount

- **Relationship**
    a. many payment records is tied with one record in the Billis table.(Many- to-One)

```
mysql> desc payments;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| pay_id        | int         | NO   | PRI | NULL    |       |
| paymentMethod | varchar(20) | YES  |     | NULL    |       |
| amount        | double      | YES  |     | NULL    |       |
| bill_id       | int         | YES  | MUL | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
```

ER Diagram

Entity-Relationship Diagram for Hospital Management System

Doctor (entity)
- qualification
- specialization
- availability
- d_name
- d_id

Patients (entity)
- fname
- lname
- name
- p_id
- gender
- age
- Phone no.
- disease
- admitstatus

Staff (entity)
- gender
- age
- S_id
- name
- fname
- lname
- availability

Payments (entity)
- bill_id
- pay_id
- amount
- paymentMethod

Bills (entity)
- bill_id
- patient_id
- Total_charges
- Basic_charges
- Additional_charges
- Room_charges
- Doctor_fees
- Medication_charges

Relationships:
- Doctor **M** — Assigned to — **M** Patients
- Doctor **M** — Works with — **M** Staff
- Staff **M** — Interacts with
- Patients **M** — is associated — **1**
- Patients **1** — Can Have — **M** Payments
- Staff **1** — Handles — **1** Bills
- Bills **1** — is associated — **1**
- Bills **1** — Tied to — **M** Payments