ER-Diagram (Hospital Management System)

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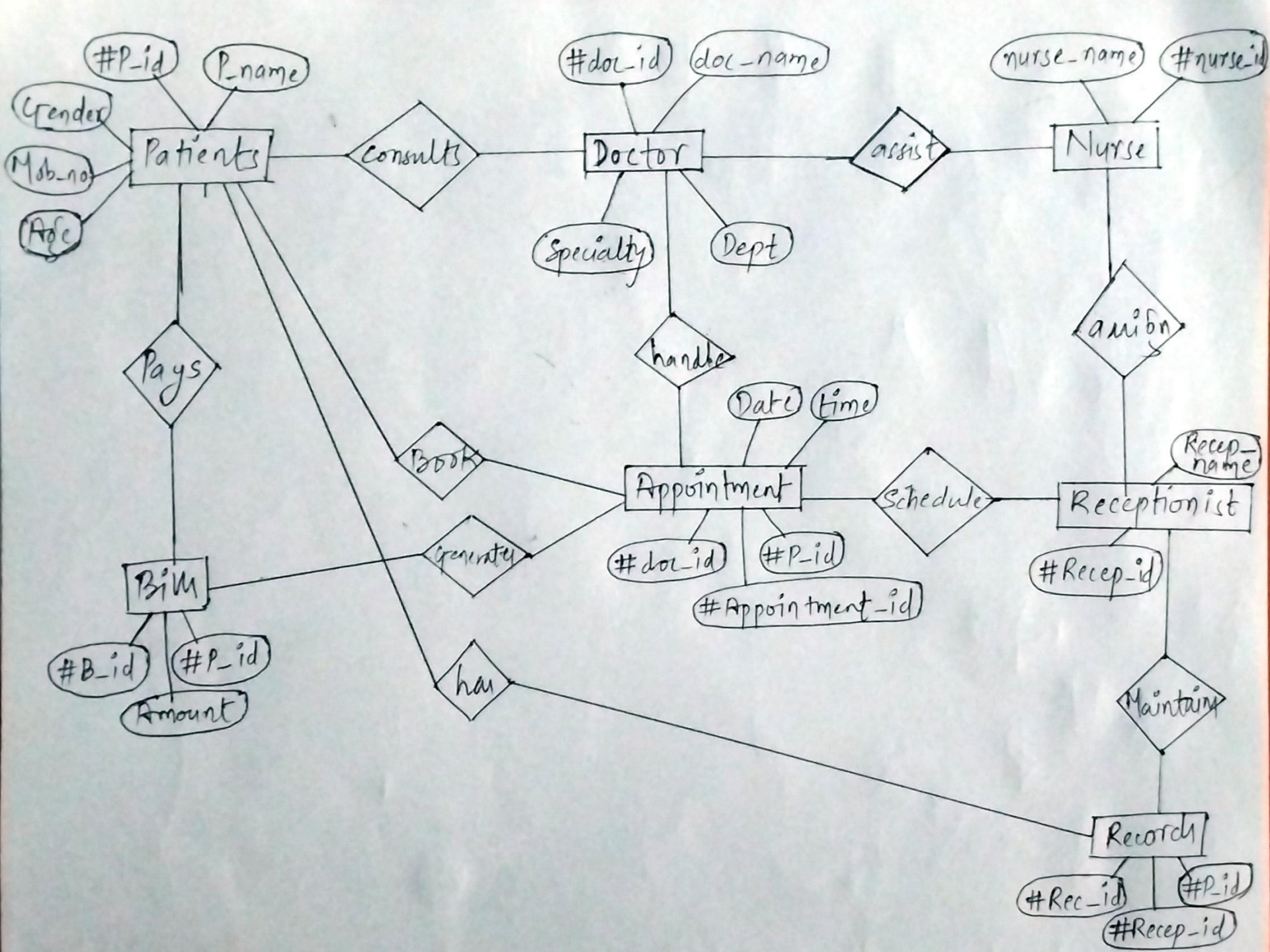
Q> Draw a basic ER diagram for the Hospital Management System that includes entities such as Patients, Doctors, Appointments, Medical Records, and Bills? Show the relationships between these entities with appropriate cardinalities


#P_id
P_name
Gender
Mob_no
Age
Patients
consults
#doc_id
doc_name
Doctor
Specialty
Dept
assist
nurse_name
#nurse_id
Nurse
assign
Pays
handle
Date
Time
BOOK
Appointment
schedule
Recep_name
Receptionist
Bill
generate
#doc_id
#P_id
#Appointment_id
#Recep_id
#B_id
#P_id
Amount
has
Maintain
Records
#Rec_id
#P_id
#Recep_id

Entities and their attributes

1. Doctors

- Represents medical professionals responsible for diagnosing and treating patients.
- Attributes:
  - Doc_ID (Primary Key), Name, Specialty, Department

2. Nurses

- Represents healthcare professionals who assist doctors and care for patients in various departments of a hospital.
- Attributes:
  - Nurse_ID (Primary Key), Name

3. Patients

- Represents individuals receiving medical care or consultations in the hospital.
- Attributes:
  - P_ID (Primary Key), Name, Age, Gender, Address, Phone

4. Receptionist

- The receptionist handles administrative tasks, including scheduling appointments, managing patient records, and coordinating between patients and healthcare staff.
- Attributes:
  - Recep_ID (Primary Key), Name

5. Medical Records

- Medical records store detailed information about a patient's medical history, diagnoses, treatments, and prescriptions.
- Attributes:
  - Record_ID (Primary Key)
  - P_ID (Foreign Key, linked to Patients)
  - Recep_ID (Foreign Key, linked to Receptionist)

6. Appointments

- Records the scheduling of a patient's visit with a doctor for consultation or treatment.
- Attributes:
  - Appointment_ID (Primary Key), Date, Time
  - P_ID (Foreign Key, linked to Patients)
  - Doc_ID (Foreign Key, linked to Doctors)

6. Bills

- Contains information related to payments for medical services or treatments.
- Attributes:
  - Bill_ID (Primary Key)
  - Amount
  - Date
  - P_ID (Foreign Key, linked to Patients)

Relationships between entities

1. Patients and Appointments

- Relationship: A Patient can have multiple Appointments, but each Appointment is for one Patient only.
- Cardinality: One-to-Many (1:N)
- Example: A patient may schedule multiple appointments with different doctors.

2. Doctors and Appointments

- Relationship: A Doctor can have multiple appointments
- Cardinality: One-to-Many (1:N)
- Example: A doctor may have several appointments scheduled on the same day.

3. Patients and Medical Records

- Relationship: A Patient can have multiple Medical Records, but each Medical Record is associated with one Patient only.
- Cardinality: One-to-Many (1:N)
- Example: A patient might have separate medical records for different treatments or visits.

4. Patients and Bills

- Relationship: Each Patient is associated with one or more Bills, but each Bill corresponds to one Patient only.
- Cardinality: One-to-Many (1:N)
- Example: A patient might have multiple bills for different services or visits.

5. Doctor and Nurse

- Relationship: A Doctor can collaborate with multiple Nurses, and a Nurse can assist multiple Doctors.
- Cardinality: Many-to-Many (M:N)
- Example :

A nurse might assist a surgeon in the operating room and later assist another doctor in the general ward.

Similarly, a doctor working in different shifts or departments might collaborate with multiple nurses.

6. Receptionist and Medical Records

- Relationship: A Receptionist is responsible for managing or accessing multiple Medical Records, but each Medical Record is managed by only one Receptionist during its creation or update.
- Cardinality: One-to-Many (1:N)

One Receptionist can manage many Medical Records.

Each Medical Record is managed or created by one Receptionist.

7. Nurse and Receptionist

- Relationship: Nurses and receptionists interact to coordinate patient care and administrative tasks.
- Cardinality : Many-to-One (M:1)
- Example: Nurses updates to receptionists for follow-up scheduling.

8. Doctor and Patient

- Relationship:

  i. A Doctor can treat multiple Patients. For example, a general physician or specialist may have many patients under their care.

  ii. A Patient may consult multiple Doctors. For instance, a patient might visit a cardiologist and a dermatologist.

- Cardinality: Many-to-Many (M:N)

  One Doctor can treat many Patients.

  One Patient can be treated by many Doctors.

9. Appointments and Bills

- Relationship: Each Appointment can generate one Bill, and each Bill corresponds to one Appointment.
- Cardinality: One-to-One (1:1)
- Example: A patient’s bill is generated based on the services provided during an appointment.