Analysis & Design Hospital Software System

➢ Step 1 - Identify entities

No.	Entity Set
1	Doctors
2	Patients
3	Appointments
4	Specialties
5	Diseases
6	Rooms
7	Work_Type
8	Allergies

➢ Remove duplicate entities

No.	Entity Set	Type
1	Doctors	Strong
2	Patients	Strong
3	Appointments	Strong
4	Specialties	Strong
5	Diseases	Strong
6	Rooms	Strong
7	Allergies	Strong

I can remove work type which I mean (part-time and full-time) and replace it with hours or number workdays in doctor table. In addition, add another attribute to the days active include the days name.
Why this information is important to avoid give an appointment for patients and a doctor doesn't work in this day if he/she works as part-time.

Attributes names	Type	Domain	Optional
Doctor_ID	Unique identifier	Text	No
First_name	Single valued attribute	Text	No
Last_name	Single valued attribute	Text	No
Phone	Single valued attribute	Text	No
Address	Composite attribute	Text	Yes
Email	Single valued attribute	Text	No
Specialty_ID	Single valued attribute	Text	No

Workdays_num	Single valued attribute	Numeric	No	
Salary	Single valued attribute	Numeric	No	

each entity set

Doctors entities

- ↓ Primary key is Doctor_ID.
- ↓ Unique constraint: Doctor_Id, phone and Email
- ↓ Null constraint: The Address attribute only accepts the null value.
- ↓ Referential integrity constraint: Specialty_ID.

In Future maybe add Active days and improve the workdays attribute.

Patients entities

Attributes names	Type	Domain	Optional
Patients_ID	Unique identifier	Text	No
First_name	Single valued attribute	Text	No
Last_name	Single valued attribute	Text	No
Phone	Single Value attribute	Text	No
Email	Single Value attribute	Text	Yes
Address	Composite attribute	Text	Yes
Diseases_ID	Single Value attribute	Text	No
Allergies_ID	Multi-valued attribute	Text	No
Doctor_ID	Single Value attribute	Text	may
Register_Date	Single valued attribute	Text	No

- ↓ Primary key is Partient_ID.
- ↓ Unique constraint: partient_Id, phone and Email.
- ↓ Null constraint: Address attribute and Email accept the null value.
- ↓ Referential integrity constraint: Diseases_ID and Allergies_ID.

I observe if patient is admitted by one doctor, I can add Doctor_ID in Patients_ID. But I think for more fixable and at the same time, maybe patient is admitted by multiple doctors. The best to put Doctor_ID only Appointment table. And make the patient table for information about it only and see can select information about what the previous doctors work with patient for appointment table.

Appointments entities

Attributes names	Type	Domain	Optional
Appintments_ID	Unique identifier	Text	No
Appointment_date	Derived attribute	Text	No
Doctor_ID	Single Value attribute	Text	No
Patients_ID	Single Value attribute	Text	No
Treatment _info	Composite attribute	Text	Yes
Treatment_notes	Composite attribute	Text	No
Medicines	Composite attribute	Text	Yes
Rooms_ID	Single Value attribute	Text	No
Appintments_nums	Single Value attribute	Numeric	Yes

- Primary key is Appintments_ID.
- Unique constraint: Appintments _ID.
- Null constraint: Appintments _nums, Medicines, and Treatment_info accept the null value.
- Referential integrity constraint: Rooms_ID, Paetient_ID and Doctor_ID.

Why add Appointments_nums and treatment_notes is not accepted null value?
Appointments numbers accept the number of Appointments probably the patitnet visit doctor again this information help predict a disease needs number of appointments.
Treatment_notes is not accepted null value in my opinion this is important for the future because we can relate between doctor said the patient suffer from the disease and have allergies you must take any medicines or convert to another department.

Specialties entities

Attributes names	Type	Domains	Optional
Specialties_ID	Unique identifier	Text	No
Specialties_name	Single valued attribute	Text	No

- Primary key is Specialties_ID.
- Unique constraint: Specialties_ID and Specialties_name.

Diseases entities

Attributes names	Type	Domains	Optional
Diseases _ID	Unique identifier	Text	No
Diseases _name	Single valued attribute	Text	No

- Primary key is Diseases_ID.
- Unique constraint: Diseases_ID and Diseases_name.

Rooms entities

Attributes names	Type	Domains	Optional
Rooms_ID	Unique identifier	Text	No
Room _num	Single valued attribute	Text	No
Floor_ID	Single Value attribute	Numeric	No

- Primary key is Rooms_ID.
- Unique constraint: Rooms_ID and Rooms_name.
- Non-null value: Floor_ID.
- Semantic integrity constraint: Floor_ID takes number from 1-n

Allergies entities

Attributes names	Type	Domains	Optional
Allergies_ID	Unique identifier	Text	No
Allergies _name	Single valued attribute	Text	No

- Primary key is Allergies_ID.
- Unique constraint: Allergies_ID and Specialties_name.