CSE333s: Database Systems

Project Domain : Hospital

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Description:

Hospital database system serve as comprehensive repositories, storing details about healthcare professionals, including their roles, schedules, and credentials.

Simultaneously, they capture crucial data about patients, tracking their medical histories, treatments, and appointments.

This overview delves into the pivotal role of hospital databases in managing personnel and patient information, essential for efficient healthcare delivery and quality patient care.

Important data:

- Employee (Name,SSN,Gender,Birthdate,Salary,Employee_type)
- Medical_Staff(SSN,Degree,Medical_staff_type)
- Receptionist(SSN,Shift,language)
- Appointment(id,Date,R_SSN,National_id)
- Patient(Name,National_id,Gender,D_SSN,Room_id,Symptoms)
- Medicine(Name,Type,Expiry_Date,BarCode,P_SSN)
- Room(Room_id,location)
- Pharmacist(Experience,SSN)
- Nurse(NurseShift,SSN)
- Doctor(Specialization,SSN,Dep_NO)
- Department(Name,Dep_NO)

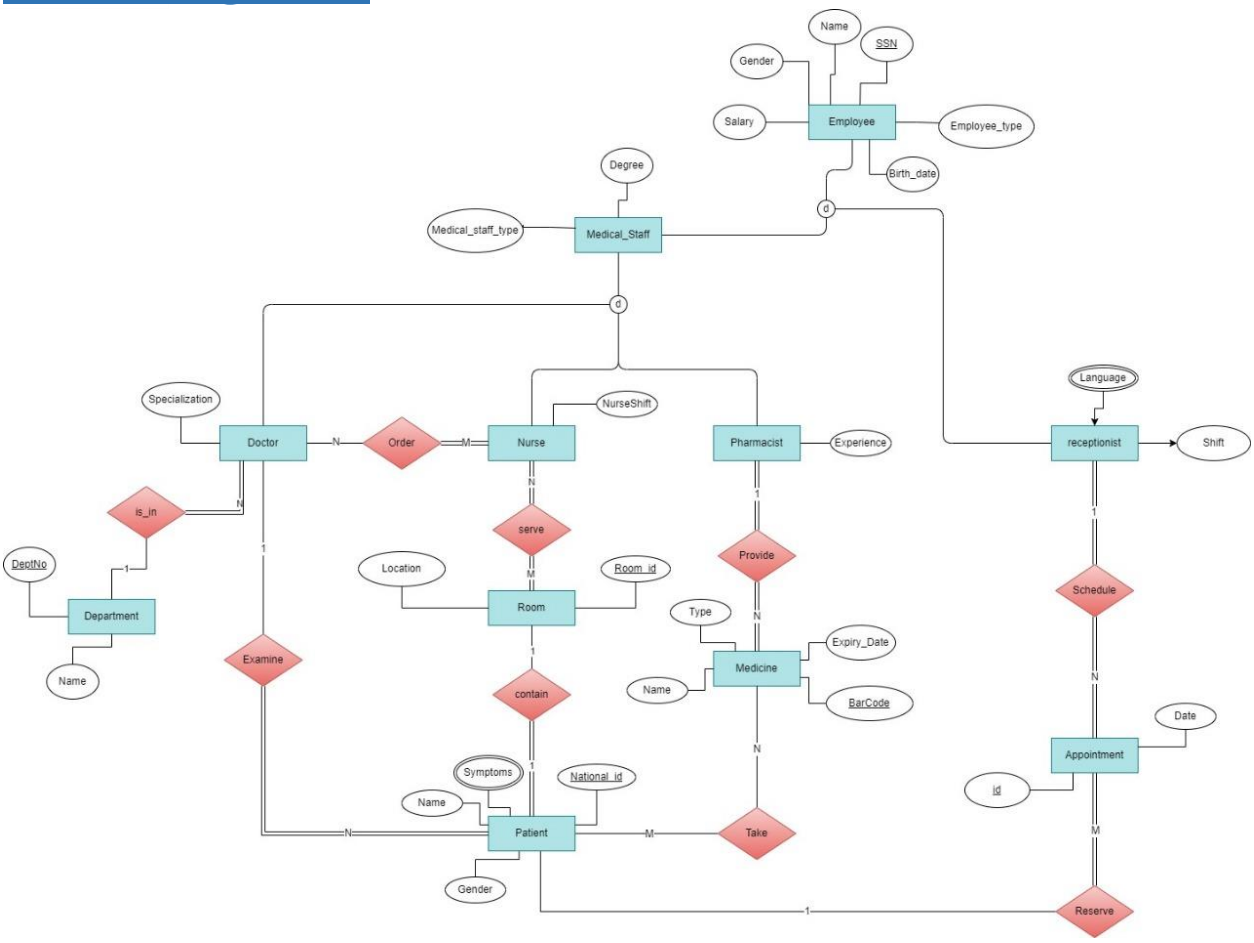
Reports:

- how many nurses working for each doctor:
- Patient is assigned to which doctor and what is the appointment :
- How many doctors in the department:
- Get count of all medical staff grouped by staff type:
- Pharmacist and medicine provided by each:
- Average salary of each medical staff:

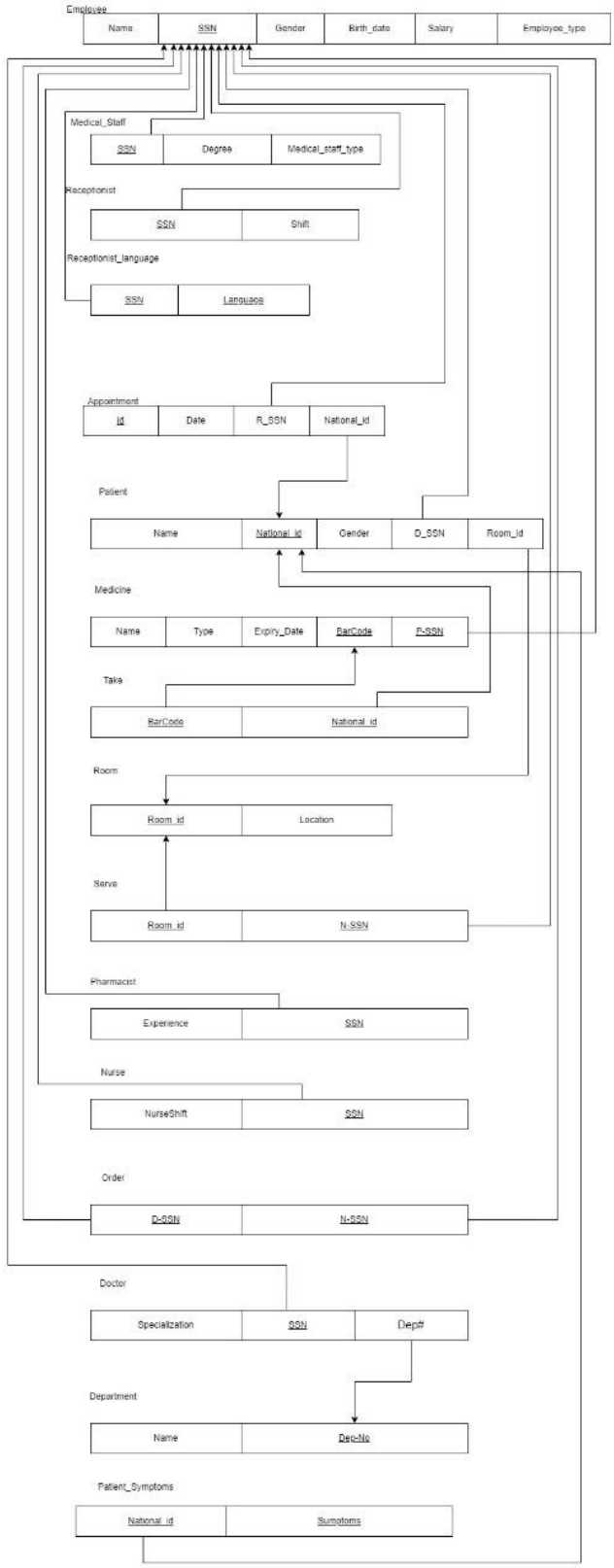
Assumptions:

- The employee may be medical staff or receptionist
- Receptionist must schedule many appointments
- Appointment must be scheduled by only one receptionist
- Appointment must be reserved by one patient
- Patient may reserve many appointments
- Patient may take many medicines
- Medicine may be taken by many patients
- Patient must be contained in only one room
- Room may contain only one patient
- Patient must be examined by only one doctor
- Doctor may examine many patients
- Doctor must be in only one department
- Department may be for many doctors
- Doctor may order many nurses
- Nurse must be ordered by many doctors
- Nurse must serve many rooms
- Room must be served by many nurses
- Pharmacist must provide many medicines
- Medicine must be provided by only one pharmacist
- Medical staff may be doctor or nurse or pharmacist

EER diagram:


Name
SSN
Gender
Salary
Employee
Employee_type
Birth_date
Degree
Medical_staff_type
Medical_Staff
d
Language
Specialization
NurseShift
Doctor
N
Order
M
Nurse
Pharmacist
Experience
receptionist
Shift
is_in
serve
Provide
Schedule
DeptNo
Location
Room_id
Department
Room
Type
Expiry_Date
Examine
Medicine
Name
BarCode
contain
Date
Appointment
Symptoms
National_id
Name
Id
Patient
Take
Gender
Reserve

Database Schema:



Sample of SQL:

- Create table:

```
CREATE TABLE EMPLOYEE(
name VARCHAR(25) NOT NULL,
        SSN int primary key ,
        gender VARCHAR(6) NOT NULL ,
        CONSTRAINT genderEmp check(gender in ('male','female')),
        Birthdate date ,
        salary double NOT NULL,
        Constraint salaryconstraint check(salary >= 0),
        Employee_type varchar(15) not null,
        constraint EmpConst check (Employee_type in ('Medical_staff','Receptionist'))
        );

CREATE TABLE MedicalStaff(
        SSN INT primary key NOT NULL,
        foreign key (SSN) REFERENCES EMPLOYEE(SSN) ON DELETE RESTRICT ON update
CASCADE,
        degree VARCHAR(30),
        medical_staff_type VARCHAR(10) NOT NULL,
        CONSTRAINT medicalConstraint check(medical_staff_type in
("doctor","nurse","pharmacist"))
        );


CREATE TABLE Receptionist(
        SSN INT primary key NOT NULL,
        foreign key (SSN) REFERENCES EMPLOYEE(SSN) ON DELETE RESTRICT ON update
CASCADE,
        shift VARCHAR(10) NOT NULL,
        CONSTRAINT shiftConstraint check(shift in ("night","midnight","morning","midday"))
        );

CREATE TABLE Rec_language(
        SSN INT NOT NULL,
```

```
        foreign key (SSN) REFERENCES EMPLOYEE(SSN) ON DELETE CASCADE ON update
CASCADE,
        language VARCHAR(12) NOT NULL,
        primary key (SSN,language)
        );
CREATE TABLE Room(
        Room_ID SMALLINT primary key NOT NULL,
        CONSTRAINT roomNoConstraint CHECK (Room_ID >= 1 AND Room_ID <= 230)
        );

CREATE TABLE Patient(
        name VARCHAR(30) NOT NULL,
        National_ID BIGINT primary key NOT NULL,
        gender varchar(6),
        CONSTRAINT genderpatient check(gender in ('male','female')),
        D_SSN int ,
        foreign key (D_SSN) REFERENCES EMPLOYEE(SSN) ON DELETE SET NULL ON update
CASCADE,
        Room_ID SMALLINT,
        foreign key (Room_ID) REFERENCES Room(Room_ID) ON DELETE SET NULL ON update
CASCADE
        );


CREATE TABLE Appointment(
        id SMALLINT primary key NOT NULL,
        Date date,
        R_SSN int  ,
        foreign key (R_SSN) REFERENCES EMPLOYEE(SSN) ON DELETE RESTRICT ON update
CASCADE,
        National_ID BIGINT,
        foreign key (National_ID) REFERENCES Patient(National_ID) ON DELETE RESTRICT ON
update CASCADE
        );
CREATE TABLE Medicine(
        name VARCHAR (40) NOT NULL,
        type VARCHAR(20) NOT NULL,
```

```
        Expire_date date NOT NULL,
        Bar_code int NOT NULL,
        P_SSN int NOT NULL,
        primary key(Bar_code,P_SSN),
        foreign key (P_SSN) REFERENCES Employee(SSN) ON DELETE CASCADE ON UPDATE
CASCADE
        );
CREATE TABLE Take(
        Bar_code int NOT NULL,
        National_ID BIGINT NOT NULL,
        primary key(Bar_code,National_ID),
        foreign key (Bar_code) REFERENCES Medicine(Bar_code) ON DELETE CASCADE ON
update CASCADE,
        foreign key (National_ID) REFERENCES Patient(National_ID) ON DELETE CASCADE ON
update CASCADE
        );

CREATE TABLE Serve(
        Room_ID SMALLINT NOT NULL,
        foreign key (Room_ID) REFERENCES Room(Room_ID) ON DELETE CASCADE ON update
CASCADE,
        N_SSN int NOT NULL,
        foreign key (N_SSN) REFERENCES EMPLOYEE(SSN) ON DELETE CASCADE ON update
CASCADE,
        primary key(Room_ID,N_SSN)
        );
Create table Pharmacist(
        Experience_years tinyint ,
        SSN int primary key,
        foreign key (SSN) REFERENCES EMPLOYEE(SSN) ON DELETE RESTRICT ON update
CASCADE
        );

Create table Nurse(
        NurseShift varchar(10) ,
        constraint shift check(NurseShift in ("night","midnight","morning","midday")),
        SSN int primary key,
```

```
        foreign key (SSN) REFERENCES EMPLOYEE(SSN) ON DELETE RESTRICT ON update
CASCADE
        );

Create table order_(
        D_SSN int ,
        N_SSN int ,
        Primary key (D_SSN,N_SSN),
        foreign key (D_SSN) REFERENCES EMPLOYEE(SSN) ON DELETE RESTRICT ON update
CASCADE,
        foreign key (N_SSN) REFERENCES EMPLOYEE(SSN) ON DELETE RESTRICT ON update
CASCADE
        );

create table Department(
        name varchar(25) not null,
        Dep_No tinyint primary key
        );

Create table Doctor(
        SSN int primary key ,
        DepNo tinyint ,
        Specialization varchar(20) not null,
        foreign key (SSN) REFERENCES EMPLOYEE(SSN) ON DELETE RESTRICT ON update
CASCADE,
        foreign key (DepNo) REFERENCES Department(Dep_No) ON DELETE RESTRICT ON update
CASCADE
        );
create table Patient_Symptoms(
        National_ID bigint ,
        Symptoms varchar(15),
        Primary key (National_id,Symptoms),
        Foreign key (National_ID) REFERENCES Patient(National_ID) ON DELETE RESTRICT ON
update CASCADE
        );
```

- # Insert:

1) Commands

```
INSERT INTO employee VALUES("Eva","1","female",NULL,6500,'Medical_staff');
INSERT INTO employee VALUES("Fady","2","male",NULL,7500,'Medical_staff');
INSERT INTO employee VALUES("Andrew","3","male",NULL,10000,'Medical_staff');
INSERT INTO employee VALUES("Ahmed","4","male",NULL,9000,'Medical_staff');
INSERT INTO employee VALUES("David","5","male",NULL,11000,'Medical_staff');
INSERT INTO employee VALUES("Emma","6","female",NULL,15000,'Medical_staff');

insert into employee values ("Mona",13,"female",'1980-2-12',6500,"Medical_staff");
insert into employee values ("Ahmed",20,"male",'1977-3-12',7500,"Medical_staff");

INSERT INTO employee VALUES('Alice', 100, 'female', NULL, 6500, 'Medical_staff');
INSERT INTO employee VALUES('Bob', 101, 'male', NULL, 7500, 'Medical_staff');

INSERT INTO employee VALUES("Mostafa",15,"male",'1990-2-24',5000,"receptionist");
INSERT INTO employee VALUES("Karim",16,"male",'1991-3-26',6000,"receptionist");
INSERT INTO employee VALUES("Nermin",17,"female",'1995-6-28',5000,"receptionist");
```

Output:

	name	SSN	gender	Birthdate	salary	Employee_type
Edit Copy Delete	Eva	1	female	NULL	6500	Medical_staff
Edit Copy Delete	Fady	2	male	NULL	7500	Medical_staff
Edit Copy Delete	Andrew	3	male	NULL	10000	Medical_staff
Edit Copy Delete	Ahmed	4	male	NULL	9000	Medical_staff
Edit Copy Delete	David	5	male	NULL	11000	Medical_staff
Edit Copy Delete	Emma	6	female	NULL	15000	Medical_staff
Edit Copy Delete	Mona	13	female	1980-02-12	6500	Medical_staff
Edit Copy Delete	Eva	14	female	NULL	5500	Medical_staff
Edit Copy Delete	Mostafa	15	male	1990-02-24	5000	receptionist
Edit Copy Delete	Karim	16	male	1991-03-26	6000	receptionist
Edit Copy Delete	Nermin	17	female	1995-06-28	5000	receptionist
Edit Copy Delete	Ahmed	20	male	1977-03-12	7500	Medical_staff
Edit Copy Delete	David	22	male	NULL	6000	receptionist
Edit Copy Delete	Alice	100	female	NULL	6500	Medical_staff
Edit Copy Delete	Bob	101	male	NULL	7500	Medical_staff

2) Commands

```
insert INTO medicalstaff values (1,'MBBS','doctor');
insert INTO medicalstaff values (2,'M.D','doctor');
insert INTO medicalstaff values (3,'M.D','doctor');
insert INTO medicalstaff values (4,'M.D','doctor');
insert INTO medicalstaff values (5,'MBBS','doctor');
insert INTO medicalstaff values (6,'M.D','doctor');
```

Output:

	SSN	degree	medical_staff_type
Edit Copy Delete	1	MBBS	doctor
Edit Copy Delete	2	M.D	doctor
Edit Copy Delete	3	M.D	doctor
Edit Copy Delete	4	M.D	doctor
Edit Copy Delete	5	MBBS	doctor
Edit Copy Delete	6	M.D	doctor
Edit Copy Delete	14	MSN	nurse

3) Commands

```
insert into doctor values (1,1,'General Surgery');
insert into doctor values (5,1,'Vascular Surgery');
insert into doctor values (3,2,'Cardiology');
insert into doctor values (4,2,'Cardiology');
insert into doctor values (2,3,'Children');
insert into doctor values (6,3,'Children');
```

Output:

	SSN	DepNo	Specialization
Edit Copy Delete	1	1	General Surgery
Edit Copy Delete	2	3	Children
Edit Copy Delete	3	2	Cardiology
Edit Copy Delete	4	2	Cardiology
Edit Copy Delete	5	1	Vascular Surgery
Edit Copy Delete	6	3	Children

4) Commands

```
insert into medicine values('Telefast','tablet','2026-04-25',111111,100);
insert into medicine values('Amoxicillin', 'capsule', '2025-08-15',222222,100);
insert into medicine values('Ibuprofen', 'tablet', '2024-12-31',333333,100);
insert into medicine values('Ciprofloxacin', 'tablet', '2023-10-20',444444,100);
insert into medicine values('Paracetamol', 'tablet', '2023-11-30',555555,101);
insert into medicine values('Loratadine', 'tablet', '2024-09-15',666666,101);
insert into medicine values('Omeprazole', 'capsule', '2025-07-10',777777,101);
insert into medicine values('Aspirin', 'tablet', '2023-05-20',888888,101);
```

Output:

	name	type	Expire_date	Bar_code	P_SSN
Edit Copy Delete	Telefast	tablet	2026-04-25	111111	100
Edit Copy Delete	Amoxicillin	capsule	2025-08-15	222222	100
Edit Copy Delete	Ibuprofen	tablet	2024-12-31	333333	100
Edit Copy Delete	Ciprofloxacin	tablet	2023-10-20	444444	100
Edit Copy Delete	Paracetamol	tablet	2023-11-30	555555	101
Edit Copy Delete	Loratadine	tablet	2024-09-15	666666	101
Edit Copy Delete	Omeprazole	capsule	2025-07-10	777777	101
Edit Copy Delete	Aspirin	tablet	2023-05-20	888888	101

5) Commands

```
INSERT INTO serve VALUES(1,20);
INSERT INTO serve VALUES(2,20);
INSERT INTO serve VALUES(3,20);
INSERT INTO serve VALUES(4,13);
INSERT INTO serve VALUES(5,13);
INSERT INTO serve VALUES(6,20);
INSERT INTO serve VALUES(7,20);
INSERT INTO serve VALUES(8,20);
INSERT INTO serve VALUES(10,20);
```

Output:

	Room_ID	N_SSN
Edit Copy Delete	1	20
Edit Copy Delete	2	20
Edit Copy Delete	3	20
Edit Copy Delete	4	13
Edit Copy Delete	5	13
Edit Copy Delete	6	20
Edit Copy Delete	7	20
Edit Copy Delete	10	20

6) Commands

```
INSERT INTO rec_language VALUES(22,"Italian");
INSERT INTO rec_language VALUES(22,"English");
INSERT INTO rec_language VALUES(15,"Arabic");
INSERT INTO rec_language VALUES(15,"English");
INSERT INTO rec_language VALUES(15,"French");
INSERT INTO rec_language VALUES(16,"Arabic");
INSERT INTO rec_language VALUES(17,"Arabic");
INSERT INTO rec_language VALUES(17,"English");
INSERT INTO rec_language VALUES(17,"Spanish");
```

Output:

	SSN	language
Edit Copy Delete	15	Arabic
Edit Copy Delete	15	English
Edit Copy Delete	15	French
Edit Copy Delete	16	Arabic
Edit Copy Delete	17	Arabic
Edit Copy Delete	17	English
Edit Copy Delete	17	Spanish
Edit Copy Delete	22	English
Edit Copy Delete	22	Italian

7) Commands

```
INSERT INTO receptionist VALUES(15,"night");
INSERT INTO receptionist VALUES(16,"midday");
INSERT INTO receptionist VALUES(17,"morning");
```

Output:

	SSN	shift
Edit Copy Delete	15	night
Edit Copy Delete	16	midday
Edit Copy Delete	17	morning
Edit Copy Delete	22	midnight

8) Commands

```
INSERT INTO patient VALUES('Mohammed', 10000000, 'male', 3, 1);
INSERT INTO patient VALUES('Fatima', 10000001, 'female', 3, 2);
INSERT INTO patient VALUES('Ali', 10000002, 'male', 4, 3);
INSERT INTO patient VALUES('Lina', 10000003, 'female', 4, 4);
INSERT INTO patient VALUES('Ahmed', 10000004, 'male', 2, 5);
INSERT INTO patient VALUES('Sara', 10000005, 'female', 2, 6);
INSERT INTO patient VALUES('Omar', 10000006, 'male', 6, 7);
INSERT INTO patient VALUES('Aisha', 10000007, 'female', 6, 10);
```

Output:

	name	National_ID	gender	D_SSN	Room_ID
Edit Copy Delete	Mohammed	10000000	male	3	1
Edit Copy Delete	Fatima	10000001	female	3	2
Edit Copy Delete	Ali	10000002	male	4	3
Edit Copy Delete	Lina	10000003	female	4	4
Edit Copy Delete	Ahmed	10000004	male	2	5
Edit Copy Delete	Sara	10000005	female	2	6
Edit Copy Delete	Omar	10000006	male	6	7
Edit Copy Delete	Aisha	10000007	female	6	10

9) Commands

```
INSERT INTO appointment VALUES(1,'2024-7-1',17,10000000);
INSERT INTO appointment VALUES(2,'2024-8-1',16,10000001);
INSERT INTO appointment VALUES(3,'2024-4-22',16,10000002);
INSERT INTO appointment VALUES(4,'2024-3-2',17,10000003);
INSERT INTO appointment VALUES(5,'2024-3-15',15,10000004);
INSERT INTO appointment VALUES(6,'2024-6-12',15,10000005);
INSERT INTO appointment VALUES(7,'2024-6-18',22,10000006);
INSERT INTO appointment VALUES(8,'2024-7-1',22,10000007);
```

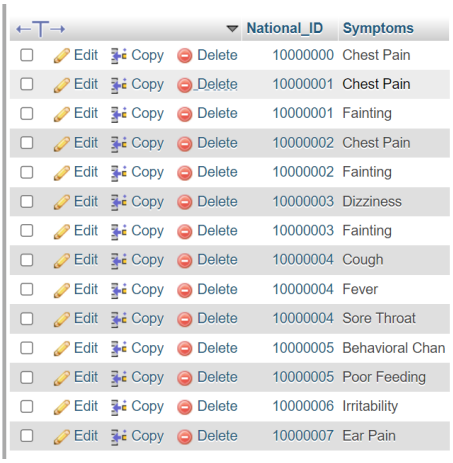
Output:

	id	Date	R_SSN	National_ID
Edit Copy Delete	1	2024-07-01	17	10000000
Edit Copy Delete	2	2024-08-01	16	10000001
Edit Copy Delete	3	2024-04-22	16	10000002
Edit Copy Delete	4	2024-03-02	17	10000003
Edit Copy Delete	5	2024-03-15	15	10000004
Edit Copy Delete	6	2024-06-12	15	10000005
Edit Copy Delete	7	2024-06-18	22	10000006
Edit Copy Delete	8	2024-07-01	22	10000007

10) Commands

```
INSERT INTO Patient_Symptoms (National_ID, Symptoms)VALUES (10000000, 'Chest Pain');
INSERT INTO Patient_Symptoms (National_ID, Symptoms)VALUES (10000001, 'Chest Pain'),(10000001,'Fainting');
INSERT INTO Patient_Symptoms (National_ID, Symptoms)VALUES (10000002, 'Chest Pain'),(10000002,'Fainting');
INSERT INTO Patient_Symptoms (National_ID, Symptoms)VALUES (10000003, 'Dizziness'),(10000003,'Fainting');
INSERT INTO Patient_Symptoms (National_ID, Symptoms)VALUES (10000004, 'Cough'),(10000004, 'Sore Throat'),(10000004, 'Fever');
INSERT INTO Patient_Symptoms (National_ID, Symptoms)VALUES (10000005, 'Poor Feeding'),(10000005, 'Behavioral Changes');
INSERT INTO Patient_Symptoms (National_ID, Symptoms)VALUES (10000006, 'Irritability');
INSERT INTO Patient_Symptoms (National_ID, Symptoms)VALUES (10000007, 'Ear Pain');
```

Output:

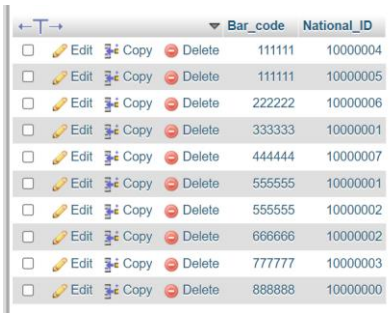


	National_ID	Symptoms
Edit Copy Delete	10000000	Chest Pain
Edit Copy Delete	10000001	Chest Pain
Edit Copy Delete	10000001	Fainting
Edit Copy Delete	10000002	Chest Pain
Edit Copy Delete	10000002	Fainting
Edit Copy Delete	10000003	Dizziness
Edit Copy Delete	10000003	Fainting
Edit Copy Delete	10000004	Cough
Edit Copy Delete	10000004	Fever
Edit Copy Delete	10000004	Sore Throat
Edit Copy Delete	10000005	Behavioral Chan
Edit Copy Delete	10000005	Poor Feeding
Edit Copy Delete	10000006	Irritability
Edit Copy Delete	10000007	Ear Pain

11) Commands

```
INSERT INTO take VALUES(555555,10000002);
INSERT INTO take VALUES(777777,10000003);
INSERT INTO take VALUES(222222,10000006);
INSERT INTO take VALUES(333333,10000001);
INSERT INTO take VALUES(111111,10000005);
INSERT INTO take VALUES(444444,10000007);
INSERT INTO take VALUES(111111,10000004);
INSERT INTO take VALUES(888888,10000000);
INSERT INTO take VALUES(666666,10000002);
INSERT INTO take VALUES(555555,10000001);
```

Output:

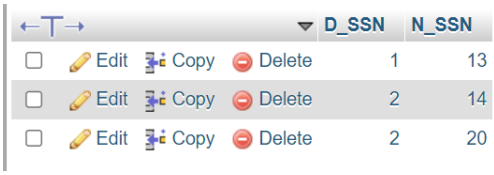


	Bar_code	National_ID
Edit Copy Delete	111111	10000004
Edit Copy Delete	111111	10000005
Edit Copy Delete	222222	10000006
Edit Copy Delete	333333	10000001
Edit Copy Delete	444444	10000007
Edit Copy Delete	555555	10000001
Edit Copy Delete	555555	10000002
Edit Copy Delete	666666	10000002
Edit Copy Delete	777777	10000003
Edit Copy Delete	888888	10000000

12) Commands

```
INSERT INTO order_ VALUES (1,13);
INSERT INTO order_ VALUES (2,14);
INSERT INTO order_ VALUES (2,20);
```

Output:



	D_SSN	N_SSN
Edit Copy Delete	1	13
Edit Copy Delete	2	14
Edit Copy Delete	2	20

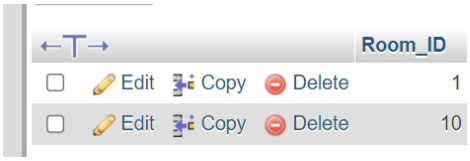
- ALTER:

1)

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0118 seconds.)

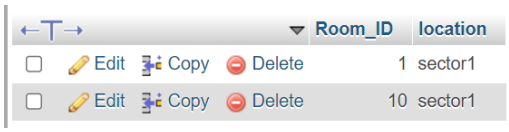
```
alter table room add column location varchar(20) DEFAULT "sector1" not null;
```

Before command:



	Room_ID
Edit Copy Delete	1
Edit Copy Delete	10

After command:

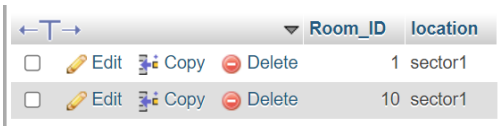


	Room_ID	location
Edit Copy Delete	1	sector1
Edit Copy Delete	10	sector1

2)

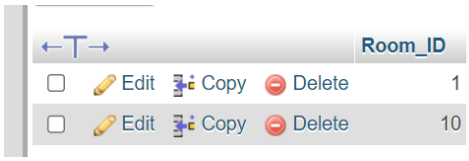
```
alter table room drop location;
```

Before command:



	Room_ID	location
Edit Copy Delete	1	sector1
Edit Copy Delete	10	sector1

After command:

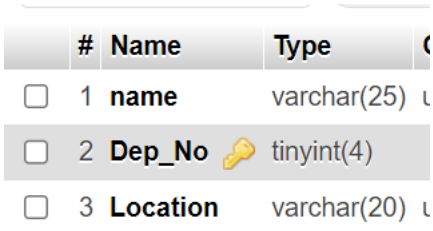


	Room_ID
Edit Copy Delete	1
Edit Copy Delete	10

3)

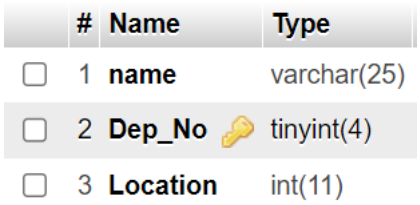
```
alter table department modify column Location int;
```

Before command:



	#	Name	Type
	1	name	varchar(25)
	2	Dep_No	tinyint(4)
	3	Location	varchar(20)

After command:



	#	Name	Type
	1	name	varchar(25)
	2	Dep_No	tinyint(4)
	3	Location	int(11)

- Update:

1)
```
UPDATE department set name = "Breza" WHERE Dep_No = 1;
```

Before command:

	name	Dep_No	Location
Edit Copy Delete	surgery	1	NULL
Edit Copy Delete	Emergency	2	NULL
Edit Copy Delete	Children	3	NULL

After command:

	name	Dep_No	Location
Edit Copy Delete	Breza	1	NULL
Edit Copy Delete	Emergency	2	NULL
Edit Copy Delete	Children	3	NULL

2)
```
UPDATE department set Dep_No = 100 where Dep_No = 1;
```

Before command:

Doctor table

	SSN	DepNo	Specialization
Edit Copy Delete	1	1	General Surgery
Edit Copy Delete	2	3	Children
Edit Copy Delete	3	2	Cardiology
Edit Copy Delete	4	2	Cardiology
Edit Copy Delete	5	1	Vascular Surgery
Edit Copy Delete	6	3	Children

Department table

	name	Dep_No	Location
Edit Copy Delete	Breza	1	NULL
Edit Copy Delete	Emergency	2	NULL
Edit Copy Delete	Children	3	NULL

After command:

Doctor table

	SSN	DepNo	Specialization
Edit Copy Delete	1	100	General Surgery
Edit Copy Delete	2	3	Children
Edit Copy Delete	3	2	Cardiology
Edit Copy Delete	4	2	Cardiology
Edit Copy Delete	5	100	Vascular Surgery
Edit Copy Delete	6	3	Children

Department table

	name	Dep_No	Location
Edit Copy Delete	Emergency	2	NULL
Edit Copy Delete	Children	3	NULL
Edit Copy Delete	Breza	100	NULL

3)
```
UPDATE employee set Birthdate='2000-1-1' where Birthdate is null;
```

Before command:

	name	SSN	gender	Birthdate	salary	Employee_type
Edit Copy Delete	Eva	1	female	NULL	6500	Medical_staff
Edit Copy Delete	Fady	2	male	NULL	7500	Medical_staff
Edit Copy Delete	Andrew	3	male	NULL	10000	Medical_staff
Edit Copy Delete	Ahmed	4	male	NULL	9000	Medical_staff
Edit Copy Delete	David	5	male	NULL	11000	Medical_staff
Edit Copy Delete	Emma	6	female	NULL	15000	Medical_staff
Edit Copy Delete	Mona	13	female	1980-02-12	6500	Medical_staff
Edit Copy Delete	Eva	14	female	NULL	5500	Medical_staff
Edit Copy Delete	Mostafa	15	male	1990-02-24	5000	receptionist
Edit Copy Delete	Karim	16	male	1991-03-26	6000	receptionist
Edit Copy Delete	Nermin	17	female	1995-06-28	5000	receptionist
Edit Copy Delete	Ahmed	20	male	1977-03-12	7500	Medical_staff
Edit Copy Delete	David	22	male	NULL	6000	receptionist
Edit Copy Delete	Alice	100	female	NULL	6500	Medical_staff
Edit Copy Delete	Bob	101	male	NULL	7500	Medical_staff

After command:

	name	SSN	gender	Birthdate	salary	Employee_type
Edit Copy Delete	Eva	1	female	2000-01-01	6500	Medical_staff
Edit Copy Delete	Fady	2	male	2000-01-01	7500	Medical_staff
Edit Copy Delete	Andrew	3	male	2000-01-01	10000	Medical_staff
Edit Copy Delete	Ahmed	4	male	2000-01-01	9000	Medical_staff
Edit Copy Delete	David	5	male	2000-01-01	11000	Medical_staff
Edit Copy Delete	Emma	6	female	2000-01-01	15000	Medical_staff
Edit Copy Delete	Mona	13	female	1980-02-12	6500	Medical_staff
Edit Copy Delete	Eva	14	female	2000-01-01	5500	Medical_staff
Edit Copy Delete	Mostafa	15	male	1990-02-24	5000	receptionist
Edit Copy Delete	Karim	16	male	1991-03-26	6000	receptionist
Edit Copy Delete	Nermin	17	female	1995-06-28	5000	receptionist
Edit Copy Delete	Ahmed	20	male	1977-03-12	7500	Medical_staff
Edit Copy Delete	David	22	male	2000-01-01	6000	receptionist
Edit Copy Delete	Alice	100	female	2000-01-01	6500	Medical_staff
Edit Copy Delete	Bob	101	male	2000-01-01	7500	Medical_staff

4)

```
UPDATE employee set salary = salary * 1.1 where Employee_type="Medical_staff";
```

Before command:

name	SSN	gender	Birthdate	salary	Employee_type
Eva	1	female	2000-01-01	6500	Medical_staff
Fady	2	male	2000-01-01	7500	Medical_staff
Andrew	3	male	2000-01-01	10000	Medical_staff
Ahmed	4	male	2000-01-01	9000	Medical_staff
David	5	male	2000-01-01	11000	Medical_staff
Emma	6	female	2000-01-01	15000	Medical_staff
Mona	13	female	1980-02-12	6500	Medical_staff
Eva	14	female	2000-01-01	5500	Medical_staff
Mostafa	15	male	1990-02-24	5000	receptionist
Karim	16	male	1991-03-26	6000	receptionist
Nermin	17	female	1995-06-28	5000	receptionist
Ahmed	20	male	1977-03-12	7500	Medical_staff
David	22	male	2000-01-01	6000	receptionist
Alice	100	female	2000-01-01	6500	Medical_staff
Bob	101	male	2000-01-01	7500	Medical_staff

After command:

name	SSN	gender	Birthdate	salary	Employee_type
Eva	1	female	2000-01-01	7150.000000000001	Medical_staff
Fady	2	male	2000-01-01	8250	Medical_staff
Andrew	3	male	2000-01-01	11000	Medical_staff
Ahmed	4	male	2000-01-01	9900	Medical_staff
David	5	male	2000-01-01	12100.000000000002	Medical_staff
Emma	6	female	2000-01-01	16500	Medical_staff
Mona	13	female	1980-02-12	7150.000000000001	Medical_staff
Eva	14	female	2000-01-01	6050.000000000001	Medical_staff
Mostafa	15	male	1990-02-24	5000	receptionist
Karim	16	male	1991-03-26	6000	receptionist
Nermin	17	female	1995-06-28	5000	receptionist
Ahmed	20	male	1977-03-12	8250	Medical_staff
David	22	male	2000-01-01	6000	receptionist
Alice	100	female	2000-01-01	7150.000000000001	Medical_staff
Bob	101	male	2000-01-01	8250	Medical_staff

5)

```
UPDATE doctor set DepNo = 50 where SSN =1;
```

Before command:

Doctor table

SSN	DepNo	Specialization
1	100	General Surgery
2	3	Children
3	2	Cardiology
4	2	Cardiology
5	100	Vascular Surgery
6	3	Children

Department table

name	Dep_No	Location
Emergency	2	NULL
Children	3	NULL
Breza	100	NULL

After command:

```
#1452 - Cannot add or update a child row: a foreign key constraint fails (`hospital`.`doctor`, CONSTRAINT `doctor_ibfk_2` FOREIGN KEY (`DepNo`) REFERENCES `department` (`Dep_No`) ON UPDATE CASCADE)
```

- Delete:

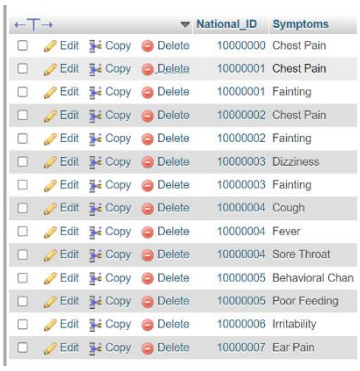
1)
```
DELETE FROM department WHERE Dep_No=1;
```

After command:

```
#1451 - Cannot delete or update a parent row: a foreign key constraint fails (`hospital`.`doctor`, CONSTRAINT `doctor_ibfk_2` FOREIGN KEY (`DepNo`) REFERENCES `department` (`Dep_No`) ON UPDATE CASCADE)
```

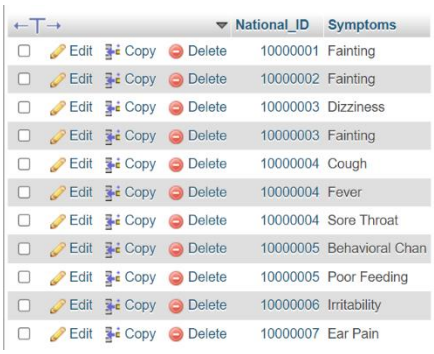
2)
```
DELETE FROM patient_symptoms WHERE Symptoms = "Chest Pain";
```

Before command:



	National_ID	Symptoms
Edit Copy Delete	10000000	Chest Pain
Edit Copy Delete	10000001	Chest Pain
Edit Copy Delete	10000001	Fainting
Edit Copy Delete	10000002	Chest Pain
Edit Copy Delete	10000002	Fainting
Edit Copy Delete	10000003	Dizziness
Edit Copy Delete	10000003	Fainting
Edit Copy Delete	10000004	Cough
Edit Copy Delete	10000004	Fever
Edit Copy Delete	10000004	Sore Throat
Edit Copy Delete	10000005	Behavioral Chan
Edit Copy Delete	10000005	Poor Feeding
Edit Copy Delete	10000006	Irritability
Edit Copy Delete	10000007	Ear Pain

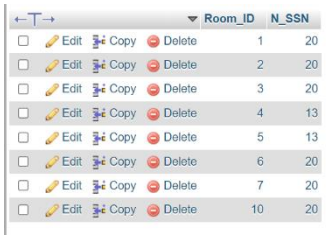
After command:



	National_ID	Symptoms
Edit Copy Delete	10000001	Fainting
Edit Copy Delete	10000002	Fainting
Edit Copy Delete	10000003	Dizziness
Edit Copy Delete	10000003	Fainting
Edit Copy Delete	10000004	Cough
Edit Copy Delete	10000004	Fever
Edit Copy Delete	10000004	Sore Throat
Edit Copy Delete	10000005	Behavioral Chan
Edit Copy Delete	10000005	Poor Feeding
Edit Copy Delete	10000006	Irritability
Edit Copy Delete	10000007	Ear Pain

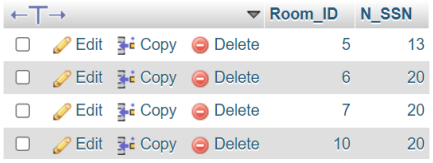
3)
```
DELETE FROM serve WHERE Room_ID<5;
```

Before command:



	Room_ID	N_SSN
Edit Copy Delete	1	20
Edit Copy Delete	2	20
Edit Copy Delete	3	20
Edit Copy Delete	4	13
Edit Copy Delete	5	13
Edit Copy Delete	6	20
Edit Copy Delete	7	20
Edit Copy Delete	10	20

After command:



	Room_ID	N_SSN
Edit Copy Delete	5	13
Edit Copy Delete	6	20
Edit Copy Delete	7	20
Edit Copy Delete	10	20

4)
```
DELETE FROM employee WHERE SSN =1;
```

After command:

```
#1451 - Cannot delete or update a parent row: a foreign key constraint fails (`hospital`.`doctor`, CONSTRAINT `doctor_ibfk_1` FOREIGN KEY (`SSN`) REFERENCES `employee` (`SSN`) ON UPDATE CASCADE)
```

5)
```
DELETE FROM employee WHERE Birthdate is null;
```

- Reports:

➢ how many nurses working for each doctor:

Commands

```
SELECT e.name as "Doctor", count(*) as "No Of Nurses"
FROM employee e join order_ o on e.SSN=o.D_SSN
GROUP BY o.D_SSN;
```

Output:

Doctor	No Of Nurses
Eva	1
Fady	2

➢ Patient is assigned to which doctor and what is the appointment :

Commands

```
SELECT p.name as "Patient" , e.name as "Doctor", a.Date
FROM employee e join patient p on e.SSN = p.D_SSN join appointment a on p.National_ID = a.National_ID
ORDER By a.Date;
```

Output:

Patient	Doctor	Date ▲ 1
Lina	Ahmed	2024-03-02
Ahmed	Fady	2024-03-15
Ali	Ahmed	2024-04-22
Sara	Fady	2024-06-12
Omar	Emma	2024-06-18
Mohammed	Andrew	2024-07-01
Aisha	Emma	2024-07-01
Fatima	Andrew	2024-08-01

➢ How many doctors in the department:

Commands

```
SELECT dep.name as "Department Name" , COUNT(*) as "No Of Doctors"
FROM department dep join doctor doc on dep.Dep_No = doc.DepNo
GROUP BY dep.name;
```

Output:

Department Name	No Of Doctors
Children	2
Emergency	2
surgery	2

➢ Get count of all medical staff grouped by staff type:

Commands

```
SELECT medical_staff_type , count(*) as "Total"
FROM medicalstaff
GROUP BY medical_staff_type
```

Output:

←T→				medical_staff_type	Total
☐	Edit	Copy	Delete	doctor	6
☐	Edit	Copy	Delete	nurse	1
☐	Edit	Copy	Delete	pharmacist	2

➢ Pharmacist and medicine provided by each:

Commands

```
SELECT employee.name as "Pharmacist" , medicine.name as "Medicine"
FROM employee join medicine on employee.SSN = medicine.P_SSN
```

Output:

Pharmacist	Medicine
Alice	Telefast
Alice	Amoxicillin
Alice	Ibuprofen
Alice	Ciprofloxacin
Bob	Paracetamol
Bob	Loratadine
Bob	Omeprazole
Bob	Aspirin

- Average salary of each medical staff:

Commands

```
SELECT medical_staff_type as "Medical Staff",avg(salary) as "Average Salary"
FROM employee join medicalstaff on employee.SSN = medicalstaff.SSN
GROUP BY medical_staff_type;
```

Output:

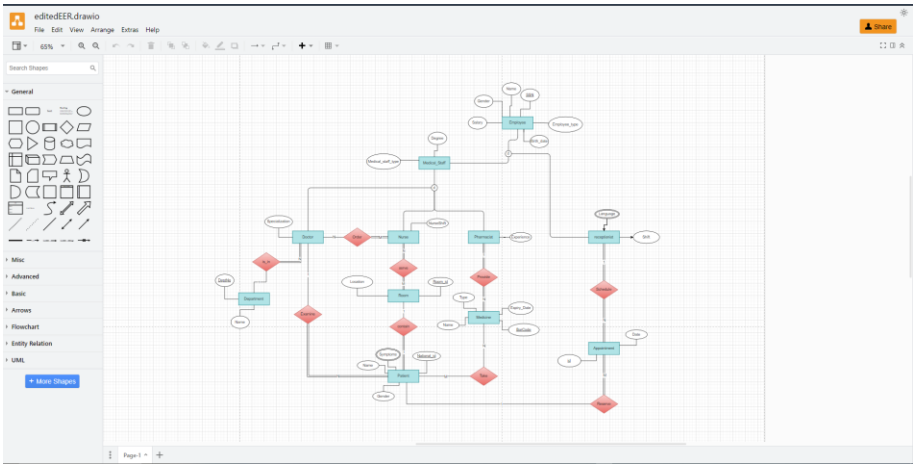
Medical Staff	Average Salary
doctor	9833.333333333334
nurse	5500
pharmacist	7000

Tools used:

DrawIO: (link)

Draw.io is a web-based diagramming tool that allows users to create a wide variety of diagrams, flowcharts, and visual representations.

We used this tool to draw EER and Relational schemas



Phpmyadmin: (link)

phpMyAdmin is a free software tool written in PHP, intended to handle the administration of MySQL over the Web.