



Hospital Management System





Entities



- Department
- Sub_dept
- Patient
- Patient_satisfaction
- Nurse
- Wardrooms
- Doctor
- Staff
- Equipment
- Appointment



Entities



DOCTOR
doctor_id
full_name
job_title
department_name
sub_dept_name
gender
date_of_birth
nationality
experience
salary
email
phone_number

APPOINTMENT
Appointment_id
Patient_id
Department_name
Sub_dept_name
Wardroom_id
Doctor_id
Appointment_date
status

NURSE
Nurse_id
Full_name
Department_name
Sub_dept_name
Gender
Date_of_birth
Nationality
Experience
Salary
Email
Phone_Number

DEPARTMENT
Department_name
Budget

PATIENT_SATISFACTION
Survey_ID
Patient_ID
Doctor_ID
Nurse_ID
Rating_scale
Survey_Date

STAFF
Staff_id
Full_name
Job_Title
Department_name
Sub_dept_name
Gender
Date_Of_Birth
Nationality
Experience
Salary
Email
Phone_Number

SUB_DEPT
Sub_dept_name
Department_name

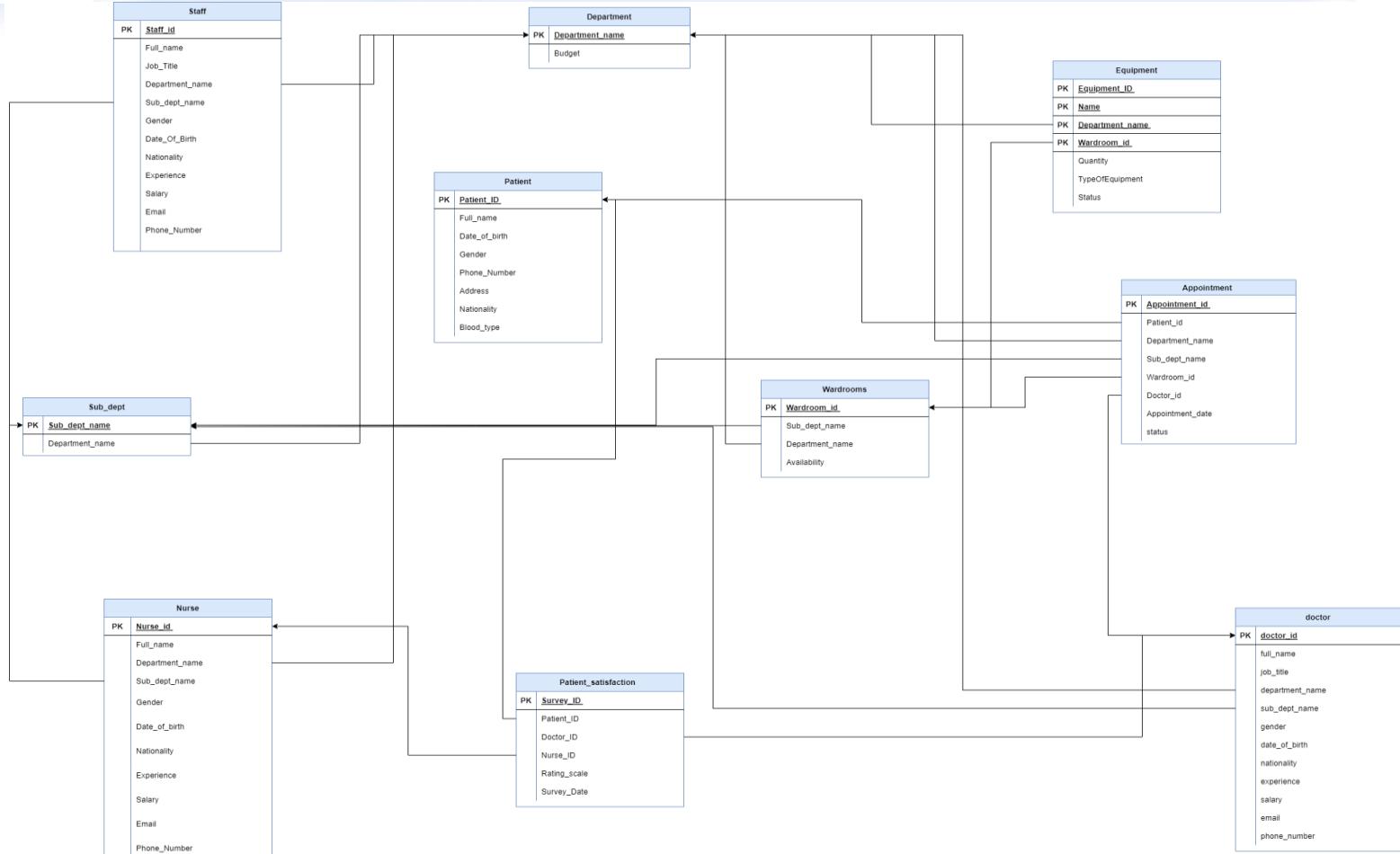
PATIENT
Patient_ID
Full_name
Date_of_birth
Gender
Phone_Number
Address
Nationality
Blood_type

EQUIPMENT
Equipment_ID
Name
Department_name
Wardroom_id
Quantity
TypeOfEquipment
Status

WARDROOMS
Wardroom_id
Sub_dept_name
Department_name
availability



Schema diagram





Data Definition Language (DDL)





Tables Creation



```
create table Department(
    Department_name varchar(50) primary key,
    Budget varchar(6) check(budget between 50000 and 500000)
)
```

Table created.

```
create table Sub_dept(
    Sub_dept_name varchar(50) primary key,
    Department_name varchar(50) not null,
    CONSTRAINT Department_name_fk foreign key(Department_name)references department on delete cascade
)
```

Table created.

```
create table Wardrooms(
    Wardroom_id varchar(5) primary key ,
    Sub_dept_name varchar(50) not null ,
    Department_name varchar(50) not null ,
    Availability varchar(30) ,
    foreign key (Sub_dept_name) references Sub_dept on delete cascade ,
    foreign key (Department_name) references Department on delete cascade ,
    check(Availability in ('Available','Non Available'))
)
```

Table created.



```
CREATE TABLE doctor (
    doctor_id VARCHAR(5) PRIMARY KEY,
    full_name VARCHAR(100) NOT NULL,
    job_title VARCHAR(50) NOT NULL,
    department_name VARCHAR(50) NOT NULL REFERENCES department (department_name) ON DELETE CASCADE,
    sub_dept_name VARCHAR(50) NOT NULL REFERENCES sub_dept (sub_dept_name) ON DELETE CASCADE,
    gender VARCHAR(10) NOT NULL CHECK (gender IN ('Male', 'Female')),
    date_of_birth DATE NOT NULL,
    nationality VARCHAR(30) NOT NULL,
    experience VARCHAR(30) NOT NULL,
    salary NUMERIC(7, 2) NOT NULL CHECK (salary BETWEEN 10000 AND 50000),
    email VARCHAR(50) NOT NULL,
    phone_number CHAR(15) NOT NULL,
    CONSTRAINT uk_doctor UNIQUE (email, phone_number)
)
```

Table created.

```
create table Patient (
    Patient_ID varchar(5) primary key,
    Full_name varchar(50) not null,
    Date_of_birth date not null ,
    Gender varchar(6)not null,
    Phone_Number char(15) unique not null,
    Address varchar(50),
    Nationality varchar(30),
    Blood_type varchar(3),
    check(Gender in ('Female', 'Male'))
)
```

Table created.

```
create table Nurse(
Nurse_id varchar(5) primary key,
Full_name varchar(50) not null,
Department_name varchar(50) not null,
Sub_dept_name varchar(50) not null,
Gender varchar(10)not null,
Date_of_birth date ,
Nationality varchar (30) not null,
Experience varchar(30) not null,
Salary numeric (7,2) not null,
Email varchar (50) not null,
Phone_Number char (15) not null,
check (gender IN('Male', 'Female')),
check (salary BETWEEN 10000 AND 50000),
constraints uk_Nurse UNIQUE (Email, Phone_Number),
foreign key (Department_name) references Department on delete cascade,
foreign key (Sub_dept_name) references Sub_dept on delete cascade
)
```

Table created.

```
Create table Staff(
Staff_id varchar(5) primary key,
Full_name varchar(50) not null,
Job_Title varchar(50) not null,
Department_name varchar(50) not null,
Sub_dept_name varchar(50) not null ,
Gender varchar(10) not null,
Date_Of_Birth date ,
Nationality varchar(30) not null,
Experience varchar(30) not null,
Salary numeric(7,2) not null,
Email varchar(50) unique not null,
Phone_Number char(15) unique not null,
Foreign key(Department_name) references Department(Department_name) on delete cascade ,
Foreign key(Sub_dept_name) references Sub_dept(Sub_dept_name) on delete cascade ,
Check (Salary Between 1500 and 90000),
Check (Gender in ('Female','Male'))
)
```

Table created.

```
CREATE TABLE Appointment (
    Appointment_id VARCHAR(5) PRIMARY KEY,
    Patient_id VARCHAR(5) NOT NULL REFERENCES patient (patient_id) ON DELETE CASCADE,
    Department_name VARCHAR(50) NOT NULL REFERENCES department (department_name) ON DELETE CASCADE,
    Sub_dept_name VARCHAR(50) NOT NULL REFERENCES sub_dept (sub_dept_name) ON DELETE CASCADE,
    Wardroom_id VARCHAR(5) NOT NULL REFERENCES wardrooms (Wardroom_id) ON DELETE CASCADE,
    Doctor_id VARCHAR(5) NOT NULL REFERENCES doctor (doctor_id) ON DELETE CASCADE,
    Appointment_date DATE NOT NULL,
    status VARCHAR(50) CHECK (status IN ('scheduled', 'completed', 'canceled'))
)
```

Table created.

```
create table Patient_satisfaction (
    Survey_ID varchar(5) primary key,
    Patient_ID varchar(5) references Patient(Patient_ID) on delete cascade not null ,
    Doctor_ID varchar(5) references Doctor(Doctor_ID) on delete cascade not null ,
    Nurse_ID varchar(5) references Nurse(Nurse_ID) on delete set NULL ,
    Rating_scale int not null check(Rating_scale between 1 and 5),
    Survey_Date date not null
)
```

Table created.

```
create table Equipment(
    Equipment_ID varchar(5) not null,
    Name varchar(20) not null,
    Department_name varchar(50) not null,
    Wardroom_id varchar(5) not null,
    Quantity int default 0 check (Quantity>=0),
    TypeOfEquipment varchar(15),
    Status varchar(15),
    primary key(Equipment_ID ,Name, Department_name, Wardroom_id),
    foreign key(Department_name) references Department on delete cascade,
    foreign key(Wardroom_id) references Wardrooms on delete cascade,
    check(TypeOfEquipment in ('one use','reusable')),
    check(Status in ('good','need checking'))
)
```

Table created.



Views



Question 1 : Create a view to enter appointment details for the doctor with doctor_id = 'D0001':

```
1 v create view D0001_Appointments as
2 select *
3 from appointment
4 where doctor_id = 'D0001'
5 with check option;
6
```

View created.

```
8 select * from D0001_Appointments;
```

APPOINTMENT_ID	PATIENT_ID	DEPARTMENT_NAME	SUB_DEPT_NAME	WARDROOM_ID	DOCTOR_ID	APPOINTMENT_DATE	STATUS
A0001	P0001	Diagnostic Service Center	Cardiology Center	WR010	D0001	15-APR-24	scheduled



Question 2: Create a view that enter all the doctor information whose salary is higher than the average salary among all doctors:

```
356  create view HighPaid_Doctors as
357  select *
358  from doctor
359  where salary > (select avg(salary) from doctor)
360  with check option;
361
```

View created.

```
362  select * from HighPaid_Doctors;
```

DOCTOR_ID	FULL_NAME	JOB_TITLE	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	EMAIL	PHONE_NUMBER
D0001	John Smith	Cardiologist	Diagnostic Service Center	Cardiology Center	Male	10-MAY-80	American	15 years	40000	john.smith@example.com	+966508346785
D0002	Emily Johnson	Radiologist	Diagnostic Service Center	Radiology Center	Female	22-AUG-85	Canadian	12 years	45000	emily.johnson@example.com	+966589647789
D0005	Michael Brown	Pharmacist	Therapeutic Service Center	Pharmacy Center	Male	29-SEP-82	Indian	18 years	42000	michael.brown@example.com	+966548346785



Question 3 : Create a view to enter all data of Saudi nurse:

```
15 v create view Saudi_Nurse as
16 select *
17 from nurse
18 where nationality = 'Saudi'
19     with check option;
```

View created.

```
13 | select * from Saudi_Nurse;
14 |
```

NURSE_ID	FULL_NAME	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	EMAIL	PHONE_NUMBER
N0002	Ahmad Khalid	Support Service Center	Safety	Male	17-MAY-90	Saudi	2 years	16000	ahmad@icloud.com	+966558767896



Question 4 : Make a view to enter the values of Equipment ID, Name , Department_name and wardroom ID of equipment in department that starts with 'Financial' :

```
1 v create view Financial_dept_equipment as
2     select Equipment_ID ,Name,Department_name,Wardroom_id
3         from equipment
4         where Department_name like 'Financial%'
5             with check option ;
```

View created.

```
1 select * from Financial_dept_equipment;
2
3
```

EQUIPMENT_ID	NAME	DEPARTMENT_NAME	WARDROOM_ID
EQ001	Computer	Financial Service Center	WR007
EQ001	Computer	Financial Service Center	WR008
EQ005	Printer	Financial Service Center	WR008
EQ006	Chair	Financial Service Center	WR007
EQ006	Chair	Financial Service Center	WR008



Question 5 : Make a view to enter wardrooms in the safety sub department:

```
1 v create view safety_wardrooms as  
2     select *  
3     from wardrooms  
4     where sub_dept_name = 'Safety'  
5     with check option ;
```

View created.

```
1 select * from safety_wardrooms;  
2  
3
```

WARDROOM_ID	SUB_DEPT_NAME	DEPARTMENT_NAME	AVAILABILITY
WR002	Safety	Support Service Center	Non Available



Question 6 : Make a view to enter only Patient_ID,Full_name ,Phone ,Blood_type , Date_of_birth,Gender from Patient where Gender = female :

```
2 v create view PatientG as
3   select Patient_ID,Full_name ,Phone ,Blood_type,Date_of_birth,Gender
4   from Patient
5   where Gender like 'Female'
6   with check option
```

View created.

```
8   select *
9   from PatientG
```

PATIENT_ID	FULL_NAME	PHONE	BLOOD_TYPE	DATE_OF_BIRTH	GENDER
P0001	Bella Smith	+966582539011	0+	03-JUN-95	Female
P0003	Nora Khalid	+966584390017	0-	21-AUG-00	Female



Data Manipulation Language (DML)





Records for department table:



```
insert into Department values ('Administrative Service Center', 450000);

insert into Department values ('Financial Service Center', 380000);

insert into Department values ('Diagnostic Service Center', 190000);

insert into Department values ('Therapeutic Service Center', 420000);

insert into Department values ('Support Service Center', 90000);
```

DEPARTMENT_NAME	BUDGET
Administrative Service Center	450000
Financial Service Center	380000
Diagnostic Service Center	190000
Therapeutic Service Center	420000
Support Service Center	90000



Records for sub_dept table:



```
insert into Sub_dept values ('Admission Center', 'Administrative Service Center' );
insert into Sub_dept values ('Information Center', 'Administrative Service Center' );
insert into Sub_dept values ('Human Resources', 'Administrative Service Center' );

insert into Sub_dept values ('Accounting Center', 'Financial Service Center' );
insert into Sub_dept values ('Billing Center', 'Financial Service Center' );

insert into Sub_dept values ('Radiology Center', 'Diagnostic Service Center' );
insert into Sub_dept values ('Cardiology Center', 'Diagnostic Service Center' );

insert into Sub_dept values ('Medical Psychology Center', 'Therapeutic Service Center' );
insert into Sub_dept values ('Dietary Center', 'Therapeutic Service Center' );
insert into Sub_dept values ('Pharmacy Center', 'Therapeutic Service Center' );
insert into Sub_dept values ('Physical Therapy Center', 'Therapeutic Service Center' );

insert into Sub_dept values ('Safety', 'Support Service Center' );
insert into Sub_dept values ('Housekeeping and Maintenance', 'Support Service Center' );
```

SUB_DEPT_NAME	DEPARTMENT_NAME
Admission Center	Administrative Service Center
Information Center	Administrative Service Center
Human Resources	Administrative Service Center
Accounting Center	Financial Service Center
Billing Center	Financial Service Center
Radiology Center	Diagnostic Service Center
Cardiology Center	Diagnostic Service Center
Medical Psychology Center	Therapeutic Service Center
Dietary Center	Therapeutic Service Center
Pharmacy Center	Therapeutic Service Center
Physical Therapy Center	Therapeutic Service Center
Safety	Support Service Center
Housekeeping and Maintenance	Support Service Center



Records for doctor table:



```
INSERT INTO doctor VALUES ('D0001', 'John Smith', 'Cardiologist', 'Diagnostic Service Center', 'Cardiology Center',  
'Male', DATE '1980-05-10', 'American', '15 years', 40000.00, 'john.smith@example.com', '+966508346785');
```

```
INSERT INTO doctor VALUES ('D0002', 'Emily Johnson', 'Radiologist', 'Diagnostic Service Center', 'Radiology Center',  
'Female', DATE '1985-08-22', 'Canadian', '12 years', 45000.00, 'emily.johnson@example.com', '+966589647789');
```

```
INSERT INTO doctor VALUES ('D0003', 'David Wilson', 'Physical Therapist', 'Therapeutic Service Center', 'Physical Therapy Center',  
'Male', DATE '1976-11-07', 'British', '20 years', 38000.00, 'david.wilson@example.com', '+966560028233');
```

```
INSERT INTO doctor VALUES ('D0004', 'Sarah Davis', 'Dietitian', 'Therapeutic Service Center', 'Dietary Center',  
'Female', DATE '1990-02-15', 'Australian', '8 years', 32000.00, 'sarah.davis@example.com', '+966551670432');
```

```
INSERT INTO doctor VALUES ('D0005', 'Michael Brown', 'Pharmacist', 'Therapeutic Service Center', 'Pharmacy Center',  
'Male', DATE '1982-09-29', 'Indian', '18 years', 42000.00, 'michael.brown@example.com', '+966548346785');
```

DOCTOR_ID	FULL_NAME	JOB_TITLE	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	EMAIL	PHONE_NUMBER
D0001	John Smith	Cardiologist	Diagnostic Service Center	Cardiology Center	Male	10-MAY-80	American	15 years	40000	john.smith@example.com	+966508346785
D0002	Emily Johnson	Radiologist	Diagnostic Service Center	Radiology Center	Female	22-AUG-85	Canadian	12 years	45000	emily.johnson@example.com	+966589647789
D0003	David Wilson	Physical Therapist	Therapeutic Service Center	Physical Therapy Center	Male	07-NOV-76	British	20 years	38000	david.wilson@example.com	+966560028233
D0004	Sarah Davis	Dietitian	Therapeutic Service Center	Dietary Center	Female	15-FEB-90	Australian	8 years	32000	sarah.davis@example.com	+966551670432
D0005	Michael Brown	Pharmacist	Therapeutic Service Center	Pharmacy Center	Male	29-SEP-82	Indian	18 years	42000	michael.brown@example.com	+966548346785



Records for nurse table:



```
insert into Nurse values
('N0001','Nora Joesph','Support Service Center','Housekeeping and Maintenance','Female','22-JAN-1980','Canadian','6 years'
,'27000.00','nora@gmail.com','+966567890547');

insert into Nurse values
('N0002','Ahmad Khalid','Support Service Center','Safety','Male','17-MAY-1990','Saudi','2 years','16000.00',
'ahmad@icloud.com','+966558767896');

insert into Nurse values
('N0003','Noah Arin','Administrative Service Center','Admission Center','Male','19-MAY-1985','French','4 years','19000.00',
'noah@hotmail.com','+966554678989');

insert into Nurse values
('N0004','Dalia Joan','Administrative Service Center','Information Center','Female','19-AUG-1991','Indian','5 years','20000.00',
'dalia@gmail.com','+966554328909');

insert into Nurse values
('N0005','Lola Darin','Administrative Service Center','Human Resources','Female','27-SEP-1992','Irish','3 years','17000.00',
'lola@hotmail.com','+966555678967');
```

NURSE_ID	FULL_NAME	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	EMAIL	PHONE_NUMBER
N0001	Nora Joesph	Support Service Center	Housekeeping and Maintenance	Female	22-JAN-80	Canadian	6 years	27000	nora@gmail.com	+966567890547
N0002	Ahmad Khalid	Support Service Center	Safety	Male	17-MAY-90	Saudi	2 years	16000	ahmad@icloud.com	+966558767896
N0003	Noah Arin	Administrative Service Center	Admission Center	Male	19-MAY-85	French	4 years	19000	noah@hotmail.com	+966554678989
N0004	Dalia Joan	Administrative Service Center	Information Center	Female	19-AUG-91	Indian	5 years	20000	dalia@gmail.com	+966554328909
N0005	Lola Darin	Administrative Service Center	Human Resources	Female	27-SEP-92	Irish	3 years	17000	lola@hotmail.com	+966555678967



Records for patient table:



```
insert into Patient
values('P0001', 'Bella Smith', '03-JUN-1995', 'Female', '+966582539011', 'Alrabwah', 'American', 'O+');

insert into Patient
values('P0002', 'Gorge Miller', '16-MAY-1989', 'Male', '+966538771683', 'Almalqa', 'British', 'AB-');

insert into Patient
values('P0003', 'Nora Khalid', '21-AUG-2000', 'Female', '+966584390017', 'Qurtoba', 'Saudi', 'O-');

insert into Patient
values('P0004', 'Mohammad Kumar', '07-FEB-1998', 'Male', '+966525339610', 'Alnahdha', 'Indian', 'O+');

insert into Patient
values('P0005', 'Abdulaziz Ahmad', '11-OCT-1995', 'Male', '+966537295618', 'Alremal', 'Saudi', 'B+');
```

PATIENT_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	PHONE_NUMBER	ADDRESS	NATIONALITY	BLOOD_TYPE
P0001	Bella Smith	03-JUN-95	Female	+966582539011	Alrabwah	American	O+
P0002	Gorge Miller	16-MAY-89	Male	+966538771683	Almalqa	British	AB-
P0003	Nora Khalid	21-AUG-00	Female	+966584390017	Qurtoba	Saudi	O-
P0004	Mohammad Kumar	07-FEB-98	Male	+966525339610	Alnahdha	Indian	O+
P0005	Abdulaziz Ahmad	11-OCT-95	Male	+966537295618	Alremal	Saudi	B+



Records for staff table:

```
Insert into Staff values('001','John Doe','Administrative Assistant','Administrative Service Center','Admission Center',
    'Male',TO_DATE('15/5/1990','DD,MM/YYYY'),'American','Eight Years',60000,'johndoe@gmail.com','+96601234567891');

insert into Staff values ('002','Jane Smith','Electronic Health Record Manager','Administrative Service Center','Information Center',
    'Female',TO_DATE('20/10/1988','DD,MM/YYYY'),'Canadian','Five Years',55000,'janesmith@gmail.com','+9660987654321');

insert into Staff values ('003','Mike Johnson','Pharmacy Clerk','Therapeutic Service Center','Pharmacy Center',
    'Male',TO_DATE('25/3/1995','DD,MM/YYYY'),'British','Three Years',45000,'mikejohnson@gmail.com','+9660456789012');

insert into Staff values ('004','Sarah Lee','Industry Accounting','Financial Service Center','Accounting Center',
    'Female',TO_DATE('12/8/1992','DD,MM/YYYY'),'Australian','Six Years',58000,'sarahlee@gmail.com','+9660789012345');

insert into Staff values ('005','David Brown','Billing Representative','Financial Service Center','Billing Center',
    'Male',TO_DATE('30/11/1987','DD,MM/YYYY'),'French','Seven Years',62000,'davidbrown@gmail.com','+9660234567890');

insert into Staff values ('006','Emily Wang','Radiation Therapist','Diagnostic Service Center','Radiology Center',
    'Female',TO_DATE('18/4/1989','DD,MM/YYYY'),'Chines','Seven Years',55000,'emilywang@gmail.com','+9660345678901');

insert into Staff values ('007','Michael Garcia','Cardiovascular Technician','Diagnostic Service Center','Cardiology Center',
    'Male',TO_DATE('22/7/1983','DD,MM/YYYY'),'Spanish','Nine Years',70000,'michaelgarcia@gmail.com','+9660981312118');

insert into Staff values ('008','Thomas Miller','Safety Manager','Support Service Center','Safety',
    'Male',TO_DATE('12/7/1987','DD,MM/YYYY'),'German','Nine Years',65000,'thomasmiller@gmail.com','+9660654321098');

insert into Staff values ('009','Jessica Garcia','HR Director','Administrative Service Center','Human Resources',
    'Female',TO_DATE('8/1/1991','DD,MM/YYYY'),'British','Six Years',55000,'jessica.garcia@gmail.com','+9660543210987');

insert into Staff values('010','Daniel Martinez','Medical Billing Specialist','Financial Service Center','Billing Center',
    'Male',TO_DATE('20/6/1984','DD,MM/YYYY'),'Mexican','Ten Years',77000,'Daniel.martinez@gmail.com','+9660432109876');
```





Records for staff table:

```
insert into Staff values('011','Sophia Nguyen','Administrative Coordinator','Administrative Service Center','Admission Center',
'Female',TO_DATE('28/3/1986','DD,MM/YYYY'),'Vietnam','Eight Years',60000,'Sophia.nguyen@gmail.com','+9660321098765');

insert into Staff values('012','William Taylor','Privacy Officer','Administrative Service Center','Information Center',
'Male',TO_DATE('16/10/1983','DD,MM/YYYY'),'Australian','Eleven Years',85000,'williamtaylor@gmail.com','+9660210987654');

insert into Staff values('013','Alex Rodriguez','Housekeeping Supervisor','Support Service Center','Housekeeping and Maintenance',
'Male',TO_DATE('30/11/1987','DD,MM/YYYY'),'Mexican','Six Years',40000,'alex.rodriguez@gmail.com','+9660789912345');

insert into Staff values('014','Alice Chang','Accounting Training','Financial Service Center','Accounting Center',
'Female',TO_DATE('12/4/1983','DD,MM/YYYY'),'Japanese','Nine Years',73000,'alicechang@gmail.com','+9660890123456');

insert into Staff values('015','Mohammed Ail','Pharmacy Assistant','Therapeutic Service Center','Pharmacy Center',
'Male',TO_DATE('5/1/1993','DD,MM/YYYY'),'Saudi Arabian','Four Years',38000,'mohammedali@gmail.com','+9660901234567');

insert into Staff values('016','Sophia Kim','Radiology Manager','Diagnostic Service Center','Radiology Center',
'Female',TO_DATE('12/3/1991','DD,MM/YYYY'),'French','Five Years',42000,'sophiakim@gmail.com','+9660589432016');

insert into Staff values('017','Omar Ahmed','Cardiology Consultant','Diagnostic Service Center','Cardiology Center',
'Male',TO_DATE('13/7/1995','DD,MM/YYYY'),'Jordanian','Three Years',35000,'omarahmed@gmail.com','+9660765890231');

insert into Staff values('018','Olivia Anderson','Maintenance Supervisor','Support Service Center','Housekeeping and Maintenance',
'Female',TO_DATE('5/12/1989','DD,MM/YYYY'),'German','Seven Years',74000,'oliviaanderson@gmail.com','+9660109876543');

insert into Staff values('019','Ryan Scott','Safety Coordinator','Support Service Center','Safety',
'Male',TO_DATE('14/8/1980','DD,MM/YYYY'),'Canadian','Ten Years',80000,'ryanscott@gmail.com','+9660098765432');

insert into Staff values('020','Ella Lewis','HR Assistant','Administrative Service Center','Human Resources',
'Female',TO_DATE('20/6/1993','DD,MM/YYYY'),'British','Six Years',66000,'ellalewis@gmail.com','+9660876790542');
```



STAFF_ID	FULL_NAME	JOB_TITLE	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	EMAIL	PHONE_NUMBER
001	John Doe	Administrative Assistant	Administrative Service Center	Admission Center	Male	15-MAY-90	American	Eight Years	60000	johndoe@gmail.com	+9660123456789
002	Jane Smith	Electronic Health Record Manager	Administrative Service Center	Information Center	Female	20-OCT-88	Canadian	Five Years	55000	janesmith@gmail.com	+9660987654321
003	Mike Johnson	Pharmacy Clerk	Therapeutic Service Center	Pharmacy Center	Male	25-MAR-95	British	Three Years	45000	mikejohnson@gmail.com	+9660456789012
004	Sarah Lee	Industry Accounting	Financial Service Center	Accounting Center	Female	12-AUG-92	Australian	Six Years	58000	sarahlee@gmail.com	+9660789012345
005	David Brown	Billing Representative	Financial Service Center	Billing Center	Male	30-NOV-87	French	Seven Years	62000	davidbrown@gmail.com	+9660234567890
006	Emily Wang	Radiation Therapist	Diagnostic Service Center	Radiology Center	Female	18-APR-89	Chines	Seven Years	55000	emilywang@gmail.com	+9660345678901
007	Michael Garcia	Cardiovascular Technician	Diagnostic Service Center	Cardiology Center	Male	22-JUL-83	Spanish	Nine Years	70000	michaelgarcia@gmail.com	+9660981312118
008	Thomas Miller	Safety Manager	Support Service Center	Safety	Male	12-JUL-87	German	Nine Years	65000	thomasmiller@gmail.com	+9660654321098
009	Jessica Garcia	HR Director	Administrative Service Center	Human Resources	Female	08-JAN-91	British	Six Years	55000	jessica.garcia@gmail.com	+9660543210987
010	Daniel Martinez	Medical Billing Specialist	Financial Service Center	Billing Center	Male	20-JUN-84	Mexican	Ten Years	77000	Daniel.martinez@gmail.com	+9660432109876
011	Sophia Nguyen	Administrative Coordinator	Administrative Service Center	Admission Center	Female	28-MAR-86	Vietnam	Eight Years	60000	Sophia.nguyen@gmail.com	+9660321098765
012	William Taylor	Privacy Officer	Administrative Service Center	Information Center	Male	16-OCT-83	Australian	Eleven Years	85000	williamtaylor@gmail.com	+9660210987654
013	Alex Rodriguez	Housekeeping Supervisor	Support Service Center	Housekeeping and Maintenance	Male	30-NOV-87	Mexican	Six Years	40000	alex.rodriguez@gmail.com	+9660789912345
014	Alice Chang	Accounting Training	Financial Service Center	Accounting Center	Female	12-APR-83	Japanese	Nine Years	73000	alicechang@gmail.com	+9660890123456
015	Mohammed Ail	Pharmacy Assistant	Therapeutic Service Center	Pharmacy Center	Male	05-JAN-93	Saudi Arabian	Four Years	38000	mohammedail@gmail.com	+9660901234567
016	Sophia Kim	Radiology Manager	Diagnostic Service Center	Radiology Center	Female	12-MAR-91	French	Five Years	42000	sophiakim@gmail.com	+9660589432016
017	Omar Ahmed	Cardiology Consultant	Diagnostic Service Center	Cardiology Center	Male	13-JUL-95	Jordanian	Three Years	35000	omarahmed@gmail.com	+9660765890231
018	Olivia Anderson	Maintenance Supervisor	Support Service Center	Housekeeping and Maintenance	Female	05-DEC-89	German	Seven Years	74000	oliviaanderson@gmail.com	+9660109876543
019	Ryan Scott	Safety Coordinator	Support Service Center	Safety	Male	14-AUG-80	Canadian	Ten Years	80000	ryanscott@gmail.com	+9660098765432
020	Ella Lewis	HR Assistant	Administrative Service Center	Human Resources	Female	20-JUN-93	British	Six Years	66000	ellalewis@gmail.com	+9660876790542



Records for wardrooms table:

```
Insert into Wardrooms values('WR001','Housekeeping and Maintenance','Support Service Center','Available');

Insert into Wardrooms values('WR002','Safety','Support Service Center','Non Available');

Insert into Wardrooms values('WR003','Pharmacy Center','Therapeutic Service Center','Available');

Insert into Wardrooms values('WR004','Admission Center','Administrative Service Center','Available');

Insert into Wardrooms values('WR005','Information Center','Administrative Service Center','Non Available');

Insert into Wardrooms values('WR006','Human Resources','Administrative Service Center','Available');

Insert into Wardrooms values('WR007','Accounting Center','Financial Service Center','Available');

Insert into Wardrooms values('WR008','Billing Center','Financial Service Center','Non Available');

Insert into Wardrooms values('WR009','Radiology Center','Diagnostic Service Center','Available');

Insert into Wardrooms values('WR010','Cardiology Center','Diagnostic Service Center','Non Available');

Insert into Wardrooms values('WR011','Dietary Center','Therapeutic Service Center','Available');

Insert into Wardrooms values('WR012','Medical Psychology Center','Therapeutic Service Center','Non Available');

Insert into Wardrooms values('WR013','Physical Therapy Center','Therapeutic Service Center','Available');

insert into wardrooms values('WR014','Cardiology Center','Diagnostic Service Center','Available');
```

WARDROOM_ID	SUB_DEPT_NAME	DEPARTMENT_NAME	AVAILABILITY
WR001	Housekeeping and Maintenance	Support Service Center	Available
WR002	Safety	Support Service Center	Non Available
WR003	Pharmacy Center	Therapeutic Service Center	Available
WR004	Admission Center	Administrative Service Center	Available
WR005	Information Center	Administrative Service Center	Non Available
WR006	Human Resources	Administrative Service Center	Available
WR007	Accounting Center	Financial Service Center	Available
WR008	Billing Center	Financial Service Center	Non Available
WR009	Radiology Center	Diagnostic Service Center	Available
WR010	Cardiology Center	Diagnostic Service Center	Non Available
WR011	Dietary Center	Therapeutic Service Center	Available
WR012	Medical Psychology Center	Therapeutic Service Center	Non Available
WR013	Physical Therapy Center	Therapeutic Service Center	Available
WR014	Cardiology Center	Diagnostic Service Center	Available



Records for Equipment table:



```
insert into Equipment values('EQ001','Computer','Administrative Service Center','WR006',10,'reusable','good');
insert into Equipment values('EQ002','Bed','Diagnostic Service Center','WR010',4,'reusable','good');
insert into Equipment values('EQ003','Crash Cart','Therapeutic Service Center','WR012',1,'reusable','good');
insert into Equipment values('EQ004','IV Fluid','Therapeutic Service Center','WR011',20,'one use','good');
insert into Equipment values('EQ005','Printer','Financial Service Center','WR008',1,'reusable','good');
insert into Equipment values('EQ006','Chair','Financial Service Center','WR007',6,'reusable','need checking');
insert into Equipment values('EQ007','Needle','Therapeutic Service Center','WR003',10,'one use','need checking');
insert into Equipment values('EQ008','Scanner','Support Service Center','WR001',2,'reusable','need checking');
insert into Equipment values('EQ009','Printer','Administrative Service Center','WR004',2,'reusable','good');

insert into Equipment values('EQ001','Computer','Support Service Center','WR002',5,'reusable','need checking');
insert into Equipment values('EQ000','Chair','Administrative Service Center','WR005',7,'reusable','good');
insert into Equipment values('EQ007','Needle','Therapeutic Service Center','WR013',15,'one use','good');
insert into Equipment values('EQ008','Scanner','Diagnostic Service Center','WR009',1,'reusable','good');
insert into Equipment values('EQ002','Bed','Therapeutic Service Center','WR012',2,'reusable','good');
insert into Equipment values('EQ006','Chair','Financial Service Center','WR008',5,'reusable','need checking');
insert into Equipment values('EQ001','Computer','Financial Service Center','WR008',5,'reusable','good');
insert into Equipment values('EQ001','Computer','Administrative Service Center','WR005',7,'reusable','good');
insert into Equipment values('EQ006','Chair','Diagnostic Service Center','WR009',4,'reusable','good');

insert into Equipment values('EQ007','Needle','Diagnostic Service Center','WR010',16,'reusable','good');
insert into Equipment values('EQ006','Chair','Support Service Center','WR002',5,'reusable','good');
insert into Equipment values('EQ004','IV Fluid','Therapeutic Service Center','WR012',15,'one use','good');
insert into Equipment values('EQ002','Bed','Therapeutic Service Center','WR011',6,'reusable','good');
insert into Equipment values('EQ002','Bed','Therapeutic Service Center','WR003',3,'reusable','need checking');
insert into Equipment values('EQ003','Crash Cart','Therapeutic Service Center','WR003',1,'reusable','need checking');
insert into Equipment values('EQ005','Chair','Administrative Service Center','WR006',10,'reusable','good');
insert into Equipment values('EQ001','Computer','Financial Service Center','WR007',6,'reusable','need checking');
insert into Equipment values('EQ002','Bed','Therapeutic Service Center','WR013',3,'reusable','good');
```

EQUIPMENT_ID	NAME	DEPARTMENT_NAME	WARDROOM_ID	QUANTITY	TYPEOFEQUIPMENT	STATUS
EQ001	Computer	Administrative Service Center	WR006	10	reusable	good
EQ002	Bed	Diagnostic Service Center	WR010	4	reusable	good
EQ003	Crash Cart	Therapeutic Service Center	WR012	1	reusable	good
EQ004	IV Fluid	Therapeutic Service Center	WR011	20	one use	good
EQ005	Printer	Financial Service Center	WR008	1	reusable	good
EQ006	Chair	Financial Service Center	WR007	6	reusable	need checking
EQ007	Needle	Therapeutic Service Center	WR003	10	one use	need checking
EQ008	Scanner	Support Service Center	WR001	2	reusable	need checking
EQ005	Printer	Administrative Service Center	WR004	2	reusable	good
EQ001	Computer	Support Service Center	WR002	5	reusable	need checking
EQ006	Chair	Administrative Service Center	WR005	7	reusable	good
EQ007	Needle	Therapeutic Service Center	WR013	15	one use	good
EQ008	Scanner	Diagnostic Service Center	WR009	1	reusable	good
EQ002	Bed	Therapeutic Service Center	WR012	2	reusable	good
EQ006	Chair	Financial Service Center	WR008	5	reusable	need checking
EQ001	Computer	Financial Service Center	WR008	5	reusable	good
EQ001	Computer	Administrative Service Center	WR005	7	reusable	good
EQ006	Chair	Diagnostic Service Center	WR009	4	reusable	good
EQ007	Needle	Diagnostic Service Center	WR010	16	reusable	good
EQ006	Chair	Support Service Center	WR002	5	reusable	good
EQ004	IV Fluid	Therapeutic Service Center	WR012	15	one use	good
EQ002	Bed	Therapeutic Service Center	WR011	6	reusable	good
EQ002	Bed	Therapeutic Service Center	WR003	3	reusable	need checking
EQ003	Crash Cart	Therapeutic Service Center	WR003	1	reusable	need checking
EQ006	Chair	Administrative Service Center	WR006	10	reusable	good
EQ001	Computer	Financial Service Center	WR007	6	reusable	need checking
EQ002	Bed	Therapeutic Service Center	WR013	3	reusable	good



Records for Appointment table:



```
INSERT INTO Appointment VALUES ('A0001', 'P0001', 'Diagnostic Service Center',  
    'Cardiology Center', 'WR010', 'D0001', DATE '2024-04-15', 'scheduled');
```

```
INSERT INTO Appointment VALUES ('A0002', 'P0002', 'Diagnostic Service Center',  
    'Radiology Center', 'WR009', 'D0002', DATE '2024-04-16', 'completed');
```

```
INSERT INTO Appointment VALUES ('A0003', 'P0003', 'Therapeutic Service Center',  
    'Physical Therapy Center', 'WR013', 'D0003', DATE '2024-04-17', 'scheduled');
```

```
INSERT INTO Appointment VALUES ('A0004', 'P0004', 'Therapeutic Service Center',  
    'Dietary Center', 'WR011', 'D0004', DATE '2024-04-18', 'scheduled');
```

```
INSERT INTO Appointment VALUES ('A0005', 'P0005', 'Therapeutic Service Center',  
    'Pharmacy Center', 'WR003', 'D0005', DATE '2024-04-19', 'canceled');
```

APPOINTMENT_ID	PATIENT_ID	DEPARTMENT_NAME	SUB_DEPT_NAME	WARDROOM_ID	DOCTOR_ID	APPOINTMENT_DATE	STATUS
A0001	P0001	Diagnostic Service Center	Cardiology Center	WR010	D0001	15-APR-24	scheduled
A0002	P0002	Diagnostic Service Center	Radiology Center	WR009	D0002	16-APR-24	completed
A0003	P0003	Therapeutic Service Center	Physical Therapy Center	WR013	D0003	17-APR-24	scheduled
A0004	P0004	Therapeutic Service Center	Dietary Center	WR011	D0004	18-APR-24	scheduled
A0005	P0005	Therapeutic Service Center	Pharmacy Center	WR003	D0005	19-APR-24	canceled



Records for patient_satisfaction table:



```
insert into Patient_satisfaction  
values ('00001', 'P0002', 'D0001','N0005',3,'02-AUG-2023');  
  
insert into Patient_satisfaction  
values ('00002', 'P0005', 'D0003','N0002',5,'15-SEP-2023');  
  
insert into Patient_satisfaction  
values ('00003', 'P0003', 'D0004','N0001',2,'24-FEB-2024');  
  
insert into Patient_satisfaction  
values ('00004', 'P0002', 'D0005','N0005',5,'07-MAY-2024');  
  
insert into Patient_satisfaction  
values ('00005', 'P0001', 'D0002',NULL,4,'07-MAY-2024');  
  
insert into Patient_satisfaction  
values ('00006', 'P0004', 'D0001','N0004',4,'11-APR-2024');
```

SURVEY_ID	PATIENT_ID	DOCTOR_ID	NURSE_ID	RATING_SCALE	SURVEY_DATE
00001	P0002	D0001	N0005	3	02-AUG-23
00002	P0005	D0003	N0002	5	15-SEP-23
00003	P0003	D0004	N0001	2	24-FEB-24
00004	P0002	D0005	N0005	5	07-MAY-24
00005	P0001	D0002	-	4	07-MAY-24
00006	P0004	D0001	N0004	4	11-APR-24



Queries

select, update, delete, rename, like,
order by, between, different types of join
(inner, natural, left, right and full), alter,
aggregation functions, case clause, nested
queries, group by, and having clause





1-Show equipment_name, sub-department and wardroom number for each equipment that needs checking and order them by wardroom_id in ascending order:

```
1 v select name as Equipment_name, sub_dept_name, Equipment.wardroom_id
2 from Equipment inner join wardrooms on (Equipment.wardroom_id=wardrooms.wardroom_id)
3 where status = 'need checking'
4 order by Equipment.wardroom_id asc;
```

EQUIPMENT_NAME	SUB_DEPT_NAME	WARDROOM_ID
Scanner	Housekeeping and Maintenance	WR001
Computer	Safety	WR002
Needle	Pharmacy Center	WR003
Bed	Pharmacy Center	WR003
Crash Cart	Pharmacy Center	WR003
Chair	Accounting Center	WR007
Computer	Accounting Center	WR007
Chair	Billing Center	WR008



2-Find wardroom ID and sub-department of the available rooms in a department that starts with 'Therapeutic':

```
1 v select wardroom_id, sub_dept_name  
2   from wardrooms  
3 where department_name like 'Therapeutic%' and availability = 'Available';
```

WARDROOM_ID	SUB_DEPT_NAME
WR003	Pharmacy Center
WR011	Dietary Center
WR013	Physical Therapy Center



3-Find ALL wardroom IDs, sub-department names, equipment names and quantities (if available) for wardrooms in the Diagnostic Service Center department, on descending order according to wardroom ID:

```
1 v select wardrooms.wardroom_id,sub_dept_name,name as Equipment_name,quantity  
2   from equipment right outer join wardrooms on(Equipment.wardroom_id=wardrooms.wardroom_id)  
3   where wardrooms.department_name ='Diagnostic Service Center'  
4   order by wardroom_id desc;
```

WARDROOM_ID	SUB_DEPT_NAME	EQUIPMENT_NAME	QUANTITY
WR014	Cardiology Center	-	-
WR010	Cardiology Center	Needle	16
WR010	Cardiology Center	Bed	4
WR009	Radiology Center	Scanner	1
WR009	Radiology Center	Chair	4



4-Find wardroom IDs of rooms that don't have any equipment:



```
1 v select wardroom_id  
2   from wardrooms  
3 where wardroom_id not in (select distinct wardroom_id  
4   from equipment);
```

WARDROOM_ID
WR014



5-Show the department name and total number of rooms for all departments that have between 3 and 5 wardrooms:

```
1 v select department_name, count(*) as Number_of_rooms  
2 from wardrooms  
3 group by department_name  
4 having count(*) between 3 and 5;
```

DEPARTMENT_NAME	NUMBER_OF_ROOMS
Administrative Service Center	3
Therapeutic Service Center	4
Diagnostic Service Center	3



6-Change the status of the equipment EQ008 in wardroom WR001 to good:

```
1 v update equipment
2   set status='good'
3   where equipment_id = 'EQ008' and wardroom_id = 'WR001';
```

1 row(s) updated.

Before :

EQUIPMENT_ID	STATUS
EQ008	need checking

After :

EQUIPMENT_ID	STATUS
EQ008	good



7-Remove wardroom WRO14:



```
1 v delete from wardrooms  
2 where wardroom_id = 'WR014';  
3
```

1 row(s) deleted.

Before :

WARDROOM_ID	SUB_DEPT_NAME	DEPARTMENT_NAME	AVAILABILITY
WR014	Cardiology Center	Diagnostic Service Center	Available

After :

no data found



```
1 v select SURVEY_ID,PATIENT_ID,NURSE_ID, FULL_NAME as Nurse_name, RATING_SCALE  
2 from nurse natural full outer join Patient_satisfaction;  
3
```

SURVEY_ID	PATIENT_ID	NURSE_ID	NURSE_NAME	RATING_SCALE
00001	P0002	N0005	Lola Darin	3
00002	P0005	N0002	Ahmad Khalid	5
00003	P0003	N0001	Nora Joesph	2
00004	P0002	N0005	Lola Darin	5
00005	P0001	-	-	4
00006	P0004	N0004	Dalia Joan	4
-	-	N0003	Noah Arin	-

8-Retrieve Survey ID, Patient ID , Nurse ID , Nurse name and rating scale ,show ALL records in patient satisfaction AND nurse tables with the selected attributes:



9-Find doctor IDs and their corresponding average ratings for doctors whose average patient satisfaction rating is below 3:

```
1 v select doctor_id , avg(rating_scale) as avg_rating_scale  
2 from patient_satisfaction  
3 group by doctor_id  
4 having avg(rating_scale) < 3
```

DOCTOR_ID	AVG_RATING_SCALE
D0004	2



10- Find the Doctor_id and full_name of doctors who did not have any appointments scheduled between '2024-04-15' and '2024-04-17':

```
2 v Select Doctor_id , full_name  
3 From doctor  
4 Where doctor_id not in (select doctor_id from appointment where appointment_date between '15-APR-2024' and '17-APR-2024')  
5  
6
```

DOCTOR_ID	FULL_NAME
D0005	Michael Brown
D0004	Sarah Davis



11- Delete all appointments where the doctor's ID is 'D0003' and the patient's ID is either 'P0003' or 'P0005':

```
1 v delete from appointment  
2 where doctor_id = 'D0003'and patient_id in ('P0003', 'P0005');  
3
```

1 row(s) deleted.

Before :

APPOINTMENT_ID	PATIENT_ID	DEPARTMENT_NAME	SUB_DEPT_NAME	WARDROOM_ID	DOCTOR_ID	APPOINTMENT_DATE	STATUS
A0003	P0003	Therapeutic Service Center	Physical Therapy Center	WR013	D0003	17-APR-24	scheduled

After :

```
1 v select * from appointment  
2 where doctor_id = 'D0003'and patient_id in ('P0003', 'P0005');  
3
```

no data found



12-Update the salaries of doctors based on their years of experience. Increase the salary by 15% for doctors with exactly '20 years' of experience, and increase the salary by 10% for doctors with exactly '18 years' of experience. For all other doctors, keep their salaries unchanged:

```
1 v UPDATE doctor SET salary = CASE
2       WHEN experience = '20 years' THEN salary * 1.15
3       WHEN experience = '18 years' THEN salary * 1.1
4       ELSE salary
5   END;
6
7
```

5 row(s) updated.

Before :

EXPERIENCE	SALARY
20 years	38000
18 years	42000

After :

```
6 v SELECT experience, salary
7   FROM doctor
8 WHERE experience IN ('20 years', '18 years');
9
```

EXPERIENCE	SALARY
20 years	43700
18 years	46200



13- Find the total salary expenses for each department by summing up the salaries of all doctors within each department. Display the department name alongside the corresponding total salary expense:

```
1 v SELECT department_name, SUM(salary) AS total_salary_expense  
2 FROM doctor  
3 GROUP BY department_name;  
4  
5
```

DEPARTMENT_NAME	TOTAL_SALARY_EXPENSE
Therapeutic Service Center	112000
Diagnostic Service Center	85000



14- Find the doctor ID, doctor's full name, appointment ID, appointment date, and status for ALL doctors, including those who might not have any appointments yet:

```
1 SELECT d.doctor_id, full_name, Appointment_id, appointment_date, status  
2   FROM doctor d  
3 LEFT JOIN Appointment a ON d.doctor_id = a.doctor_id  
4
```

DOCTOR_ID	FULL_NAME	APPOINTMENT_ID	APPOINTMENT_DATE	STATUS
D0001	John Smith	A0001	15-APR-24	canceled
D0002	Emily Johnson	A0002	16-APR-24	completed
D0003	David Wilson	A0003	17-APR-24	canceled
D0004	Sarah Davis	A0004	18-APR-24	scheduled
D0005	Michael Brown	A0005	19-APR-24	scheduled
D0006	Mary Adams	-	-	-



15- Find departments where the highest salary among doctors is greater than or equal to 45000. Show the department name alongside this maximum salary (max_salary):

```
1 v SELECT department_name, MAX(salary) AS max_salary
2   FROM doctor
3 GROUP BY department_name
4 HAVING MAX(salary) >= 45000;
5
6
7
8
```

DEPARTMENT_NAME	MAX_SALARY
Diagnostic Service Center	45000



16-Find the number of sub departments in each department :

```
4  
5 v select DEPARTMENT_NAME , count(*) AS number_of_sub_department  
6 from sub_dept  
7 group by DEPARTMENT_NAME ;  
8
```

DEPARTMENT_NAME	NUMBER_OF_SUB_DEPARTMENT
Administrative Service Center	3
Financial Service Center	2
Support Service Center	2
Therapeutic Service Center	4
Diagnostic Service Center	2



17- Find the department and the number of sub departments it has , for the department that has the largest number of sub departments:

```
7 v SELECT Department_name, COUNT(*) AS num_sub_depts  
8 FROM Sub_dept  
9 GROUP BY Department_name  
10 HAVING COUNT(*) >= all( SELECT COUNT(*) AS num_sub_depts  
11 FROM Sub_dept  
12 GROUP BY Department_name);
```

DEPARTMENT_NAME	NUM_SUB_DEPTS
Therapeutic Service Center	4



18- Rename the attribute Sub_dept_name in sub department table to Sub_department_name :

Before :

SUB_DEPT_NAME	DEPARTMENT_NAME
Admission Center	Administrative Service Center
Information Center	Administrative Service Center
Human Resources	Administrative Service Center
Accounting Center	Financial Service Center
Billing Center	Financial Service Center
Radiology Center	Diagnostic Service Center
Cardiology Center	Diagnostic Service Center
Medical Psychology Center	Therapeutic Service Center

After :

4/3
474 ALTER TABLE Sub_dept RENAME COLUMN Sub_dept_name to Sub_department_name ;
475

SUB_DEPARTMENT_NAME	DEPARTMENT_NAME
Admission Center	Administrative Service Center
Information Center	Administrative Service Center
Human Resources	Administrative Service Center
Accounting Center	Financial Service Center
Billing Center	Financial Service Center
Radiology Center	Diagnostic Service Center
Cardiology Center	Diagnostic Service Center
Medical Psychology Center	Therapeutic Service Center



19-Find the sub departments that contains 'Center' :

```
SELECT SUB_DEPT_NAME  
FROM Sub_dept  
WHERE SUB_DEPT_NAME LIKE '%Center%'
```

SUB_DEPT_NAME

Accounting Center

Admission Center

Billing Center

Cardiology Center

Dietary Center

Information Center

Medical Psychology Center

Pharmacy Center

Physical Therapy Center

Radiology Center



20- Find the departments and number of doctors for each department that has more than 2 doctors:

```
17  
18 SELECT department_name, COUNT(*) AS total_doctors  
19 FROM doctor  
20 GROUP BY department_name  
21 HAVING COUNT(*) > 2;  
22
```

DEPARTMENT_NAME	TOTAL_DOCTORS
Therapeutic Service Center	3



21- Find name and salary of the highest paid male doctor:

```
479 ✓ select full_name, salary  
480   from doctor  
481   where GENDER= 'Male' and salary >=all ( select salary  
482                                         from doctor  
483                                         where GENDER= 'Male');  
484
```

FULL_NAME	SALARY
Michael Brown	42000



22- Find Nationality of Staff who has Experience for Six years AND for Three years :

```
1 ✓ select Nationality from Staff where Experience = 'Six Years'  
2 INTERSECT  
3 select Nationality from Staff where Experience = 'Three Years'  
4
```

NATIONALITY
British



23- Find department name and average salary of staff in each department having average salary is greater than 50000:

```
1 v select Department_name , avg(Salary)
2   from Staff
3   group by Department_name
4   having avg(Salary) > 50000
```

DEPARTMENT_NAME	AVG(SALARY)
Administrative Service Center	63500
Financial Service Center	67500
Support Service Center	64750
Diagnostic Service Center	50500



24- Show staff's name whose gender is female and her experience is six years or male and his experience is three years:

```
1 ✓ select Full_name from Staff where Gender = 'Female'and EXPERIENCE = 'Six Years'  
2 Union  
3 select Full_name from Staff where Gender = 'Male'and EXPERIENCE = 'Three Years'
```

FULL_NAME
Ella Lewis
Jessica Garcia
Mike Johnson
Omar Ahmed
Sarah Lee



25- Find staff_id of staff members born on 22 July 1983 with Spanish nationality, OR born on 8 January 1991, with British nationality:

```
1
2 v select staff_id from Staff where Date_Of_Birth = '22-JUL-83' and Nationality = 'Spanish'
3 union
4 select staff_id from Staff where Date_Of_Birth = '08-JAN-91' and Nationality = 'British'
```

STAFF_ID
007
009



26-Rename the column Experience to BackGround

3
4

ALTER TABLE Staff RENAME COLUMN EXPERINCE to BackGround ;

Table altered.

Before :

STAFF_ID	FULL_NAME	JOB_TITLE	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	
001	John Doe	Administrative Assistant	Administrative Service Center	Admission Center	Male	15-MAY-90	American	Eight Years	60000	johnd
002	Jane Smith	Electronic Health Record Manager	Administrative Service Center	Information Center	Female	20-OCT-88	Canadian	Five Years	55000	janesi
003	Mike Johnson	Pharmacy Clerk	Therapeutic Service Center	Pharmacy Center	Male	25-MAR-95	British	Three Years	45000	mikej
004	Sarah Lee	Industry Accounting	Financial Service Center	Accounting Center	Female	12-AUG-92	Australian	Six Years	58000	sarah
005	David Brown	Billing Representative	Financial Service Center	Billing Center	Male	30-NOV-87	French	Seven Years	62000	davidl
006	Emily Wang	Radiation Therapist	Diagnostic Service Center	Radiology Center	Female	18-APR-89	Chines	Seven Years	55000	emily
007	Michael Garcia	Cardiovascular Technician	Diagnostic Service Center	Cardiology Center	Male	22-JUL-83	Spanish	Nine Years	70000	micha
008	Thomas Miller	Safety Manager	Support Service Center	Safety	Male	12-JUL-87	German	Nine Years	65000	thoma
009	Jessica	HR Director	Administrative	Human	Female	08-JAN-91	British	Six Years	55000	jessica

After :

STAFF_ID	FULL_NAME	JOB_TITLE	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	BACKGROUND	SALARY		EMAIL	PHONE
001	John Doe	Administrative Assistant	Administrative Service Center	Admission Center	Male	15-MAY-90	American	Eight Years	60000	johndoe@gmail.com	+96601	
002	Jane Smith	Electronic Health Record Manager	Administrative Service Center	Information Center	Female	20-OCT-88	Canadian	Five Years	55000	jamesmith@gmail.com	+96602	
003	Mike Johnson	Pharmacy Clerk	Therapeutic Service Center	Pharmacy Center	Male	25-MAR-95	British	Three Years	45000	mikejohnson@gmail.com	+96604	
004	Sarah Lee	Industry Accounting	Financial Service Center	Accounting Center	Female	12-AUG-92	Australian	Six Years	58000	sarahlee@gmail.com	+96607	
005	David Brown	Billing Representative	Financial Service Center	Billing Center	Male	30-NOV-87	French	Seven Years	62000	davidbrown@gmail.com	+96602	
006	Emily Wang	Radiation Therapist	Diagnostic Service Center	Radiology Center	Female	18-APR-89	Chines	Seven Years	55000	emillywang@gmail.com	+96603	
007	Michael Garcia	Cardiovascular Technician	Diagnostic Service Center	Cardiology Center	Male	22-JUL-83	Spanish	Nine Years	70000	michaelgarcia@gmail.com	+96605	
008	Thomas Miller	Safety Manager	Support Service Center	Safety	Male	12-JUL-87	German	Nine Years	65000	thomasmiller@gmail.com	+96606	
009	Jessica	HR Director	Administrative	Human	Female	08-JAN-91	British	Six Years	55000	jessica.maria@gmail.com	+96605	



27 - Delete column Email from Staff table :

1 | ALTER TABLE Staff DROP COLUMN Email

2

Table altered.

Before :

STAFF_ID	FULL_NAME	JOB_TITLE	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	EMAIL	PHONE
001	John Doe	Administrative Assistant	Administrative Service Center	Admission Center	Male	15-MAY-90	American	Eight Years	60000	johndoe@gmail.com	+96601
002	Jane Smith	Electronic Health Record Manager	Administrative Service Center	Information Center	Female	20-OCT-88	Canadian	Five Years	55000	janesmith@gmail.com	+96605
003	Mike Johnson	Pharmacy Clerk	Therapeutic Service Center	Pharmacy Center	Male	25-MAR-95	British	Three Years	45000	mikejohnson@gmail.com	+96604
004	Sarah Lee	Industry Accounting	Financial Service Center	Accounting Center	Female	12-AUG-92	Australian	Six Years	58000	sarahlee@gmail.com	+96607
005	David Brown	Billing Representative	Financial Service Center	Billing Center	Male	30-NOV-87	French	Seven Years	62000	davidbrown@gmail.com	+96602
006	Emily Wang	Radiation Therapist	Diagnostic Service Center	Radiology Center	Female	18-APR-89	Chinese	Seven Years	55000	emilywang@gmail.com	+96603
007	Michael Garcia	Cardiovascular Technician	Diagnostic Service Center	Cardiology Center	Male	22-JUL-83	Spanish	Nine Years	70000	michaelgarcia@gmail.com	+96605
008	Thomas Miller	Safety Manager	Support Service Center	Safety	Male	12-JUL-87	German	Nine Years	65000	thomasmiller@gmail.com	+96606
009	Jessica Garcia	HR Director	Administrative Service Center	Human Resources	Female	08-JAN-91	British	Six Years	55000	jessica.garcia@gmail.com	+96605

After :

STAFF_ID	FULL_NAME	JOB_TITLE	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	PHONE_NUMBER
001	John Doe	Administrative Assistant	Administrative Service Center	Admission Center	Male	15-MAY-90	American	Eight Years	60000	+9660123456789
002	Jane Smith	Electronic Health Record Manager	Administrative Service Center	Information Center	Female	20-OCT-88	Canadian	Five Years	55000	+9660897654321
003	Mike Johnson	Pharmacy Clerk	Therapeutic Service Center	Pharmacy Center	Male	25-MAR-95	British	Three Years	45000	+9660456789012
004	Sarah Lee	Industry Accounting	Financial Service Center	Accounting Center	Female	12-AUG-92	Australian	Six Years	58000	+9660789012345
005	David Brown	Billing Representative	Financial Service Center	Billing Center	Male	30-NOV-87	French	Seven Years	62000	+9660234567890
006	Emily Wang	Radiation Therapist	Diagnostic Service Center	Radiology Center	Female	18-APR-89	Chinese	Seven Years	55000	+9660345678901
007	Michael Garcia	Cardiovascular Technician	Diagnostic Service Center	Cardiology Center	Male	22-JUL-83	Spanish	Nine Years	70000	+9660981312118
008	Thomas Miller	Safety Manager	Support Service Center	Safety	Male	12-JUL-87	German	Nine Years	65000	+9660654321098
009	Jessica Garcia	HR Director	Administrative Service Center	Human Resources	Female	08-JAN-91	British	Six Years	55000	+9660543210987



28- List the ID of Wardrooms along with the Budget of the Department :

```
1  
2 v select Wardroom_id , Budget  
3   from Department NATURAL JOIN Wardrooms
```

WARDROOM_ID	BUDGET
WR001	90000
WR004	450000
WR002	90000
WR003	420000
WR005	450000
WR006	450000
WR007	380000
WR008	380000
WR009	190000
WR010	190000
WR011	420000
WR012	420000
WR013	420000
WR014	190000



29-Retrieve Patient ID full name and blood type of patient whose blood type is 'O+':

```
168  
169 v select Patient_ID, Full_name, Blood_type  
170   from Patient  
171 where Blood_type Like 'O+';  
172
```

PATIENT_ID	FULL_NAME	BLOOD_TYPE
P0001	Bella Smith	O+
P0004	Mohammad Kumar	O+



30-Retrieve all patient satisfaction data and order them by their rating scale in descending order:

```
173 v select *
174 from Patient_satisfaction
175 order by Rating scale Desc;
```

SURVEY_ID	PATIENT_ID	DOCTOR_ID	NURSE_ID	RATING_SCALE	SURVEY_DATE
00002	P0005	D0003	N0002	5	15-SEP-23
00006	P0004	D0001	N0004	5	11-APR-24
00004	P0002	D0005	N0005	5	07-MAY-24
00005	P0001	D0002	-	4	07-MAY-24
00001	P0002	D0001	N0005	3	02-AUG-23
00003	P0003	D0004	N0001	2	24-FEB-24



31-Find survey ID, doctor ID and nurse ID with '5' rating scale, renaming the survey ID column to 'Surveynumber':

```
178 v select Survey_ID As Surveynumber, Doctor_ID, Nurse_ID  
179   from Patient_satisfaction  
180  where Rating_scale = 5 ;
```

SURVEYNUMBER	DOCTOR_ID	NURSE_ID
00002	D0003	N0002
00004	D0005	N0005



32-Update rating scale of the survey with ID '00006' to '5':



```
157 v Update Patient_satisfaction  
158 set Rating_scale = 5  
159 where Survey_ID = '00006';  
160
```

1 row(s) updated.

Before :

SURVEY_ID	RATING_SCALE
00006	4

After :

SURVEY_ID	RATING_SCALE
00006	5



33-Find the average rating scale of patient satisfaction survey:

```
156 v SELECT AVG(Rating_scale) AS AverageRating  
157 FROM Patient_satisfaction;
```

AVERAGERATING
4



34-Find the name, survey date and rating scale of every patient:

```
468 v select Full_name, Survey_Date, Rating_scale  
469 from Patient_satisfaction  
470 natural join Patient
```

FULL_NAME	SURVEY_DATE	RATING_SCALE
Gorge Miller	02-AUG-23	3
Abdulaziz Ahmad	15-SEP-23	5
Nora Khalid	24-FEB-24	2
Gorge Miller	07-MAY-24	5
Bella Smith	07-MAY-24	4
Mohammad Kumar	11-APR-24	4



35-List all patient's information of patients with Saudi nationality and date of birth between '01-JAN-1995' and '31-DEC-2000':

```
150 v SELECT *
151 FROM Patient
152 WHERE Nationality = 'Saudi'
153 AND Date_of_birth BETWEEN '01-JAN-1995' AND '31-DEC-2000';
154
```

PATIENT_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	PHONE	ADDRESS	NATIONALITY	BLOOD_TYPE
P0003	Nora Khalid	21-AUG-00	Female	+966584390017	Qurtoba	Saudi	O-
P0005	Abdulaziz Ahmad	11-OCT-95	Male	+966537295618	Alremal	Saudi	B+



36-Find names of departments whose budget is between 190000 and 450000 and Sort them in descending order according to budget:

```
357 v Select department_name  
358 From department  
359 Where Budget between 190000 and 450000  
360 Order by budget DESC;
```

DEPARTMENT_NAME
Administrative Service Center
Therapeutic Service Center
Financial Service Center
Diagnostic Service Center



37-Increase salaries of Nurses who work in the information Center by %5:



```
358 v Update Nurse  
359 Set salary = salary*1.05  
360 Where sub_dept_name= 'Information Center';
```

1 row(s) updated.

Before :

FULL_NAME	SUB_DEPT_NAME	SALARY
Dalia Joan	Information Center	20000

After :

FULL_NAME	SUB_DEPT_NAME	SALARY
Dalia Joan	Information Center	21000



38-Remove nurses who are associated with departments with a budget less than or equal 90000:



```
361 v Delete from nurse  
362 Where department_name in(select department_name  
363 from department  
364 where budget<=90000);  
365
```



2 row(s) deleted.

DEPARTMENT_NAME	BUDGET
Support Service Center	90000

Before :

FULL_NAME	DEPARTMENT_NAME
Nora Joesph	Support Service Center
Ahmad Khalid	Support Service Center
Noah Arin	Administrative Service Center
Dalia Joan	Administrative Service Center
Lola Darin	Administrative Service Center

After :

FULL_NAME	DEPARTMENT_NAME
Noah Arin	Administrative Service Center
Dalia Joan	Administrative Service Center
Lola Darin	Administrative Service Center



39-Add a Shift as a new column to Nurse table:



```
357 Alter table nurse add Shift varchar(15);
```

Before :

Table altered.

NURSE_ID	FULL_NAME	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	EMAIL	PHONE_NUMBER
N0001	Nora Joesph	Support Service Center	Housekeeping and Maintenance	Female	22-JAN-80	Canadian	6 years	27000	nora@gmail.com	+966567890547
N0002	Ahmad Khalid	Support Service Center	Safety	Male	17-MAY-90	Saudi	2 years	16000	ahmad@icloud.com	+966558767896
N0003	Noah Arin	Administrative Service Center	Admission Center	Male	19-MAY-85	French	4 years	19000	noah@hotmail.com	+966554678989
N0004	Dalia Joan	Administrative Service Center	Information Center	Female	19-AUG-91	Indian	5 years	20000	dalia@gmail.com	+966554328909
N0005	Lola Darin	Administrative Service Center	Human Resources	Female	27-SEP-92	Irish	3 years	17000	lola@hotmail.com	+966555678967

After :

NURSE_ID	FULL_NAME	DEPARTMENT_NAME	SUB_DEPT_NAME	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	EMAIL	PHONE_NUMBER	SHIFT
N0001	Nora Joesph	Support Service Center	Housekeeping and Maintenance	Female	22-JAN-80	Canadian	6 years	27000	nora@gmail.com	+966567890547	-
N0002	Ahmad Khalid	Support Service Center	Safety	Male	17-MAY-90	Saudi	2 years	16000	ahmad@icloud.com	+966558767896	-
N0003	Noah Arin	Administrative Service Center	Admission Center	Male	19-MAY-85	French	4 years	19000	noah@hotmail.com	+966554678989	-
N0004	Dalia Joan	Administrative Service Center	Information Center	Female	19-AUG-91	Indian	5 years	20000	dalia@gmail.com	+966554328909	-
N0005	Lola Darin	Administrative Service Center	Human Resources	Female	27-SEP-92	Irish	3 years	17000	lola@hotmail.com	+966555678967	-



40 -Find the minimum, maximum and total salaries of nurses working in the Administrative Service Center Department:

```
357 v select min(salary) as min_salary , max(salary) as max_salary , sum(salary) as sum_salaries  
358 from Nurse  
359 where Department_name='Administrative Service Center';  
360
```

MIN_SALARY	MAX_SALARY	SUM_SALARIES
17000	20000	56000



41-Find the department name, average salaries and total number of nurses for each department whose average salary is greater than 20000:

```
356 v Select department_name , avg(salary) as average_salaries , count(Nurse_ID) as
357   number_of_nurses
358   From Nurse
359   Group by department_name
360   Having avg(salary) >20000;
361
```

DEPARTMENT_NAME	AVERAGE_SALARIES	NUMBER_OF_NURSES
Support Service Center	21500	2



42-Find the names and salaries of nurses with salary greater than that of some nurse in the Administrative Service Center:

```
356 v Select full_name ,salary  
357 From nurse  
358 Where salary >some (select salary  
359           From nurse  
360           Where department_name = 'Administrative Service Center' );
```

FULL_NAME	SALARY
Nora Joesph	27000
Dalia Joan	20000
Noah Arin	19000



43-List ALL departments information records along with Full name, sub department name and experience of nurses (if available):

```
356 v Select department.department_name, department.budget, nurse.full_name,nurse.sub_dept_name, nurse.experience  
357 From department left outer join nurse  
358 on department.department_name = nurse.department_name;
```

DEPARTMENT_NAME	BUDGET	FULL_NAME	SUB_DEPT_NAME	EXPERIENCE
Support Service Center	90000	Nora Joesph	Housekeeping and Maintenance	6 years
Support Service Center	90000	Ahmad Khalid	Safety	2 years
Administrative Service Center	450000	Noah Arin	Admission Center	4 years
Administrative Service Center	450000	Dalia Joan	Information Center	5 years
Administrative Service Center	450000	Lola Darin	Human Resources	3 years
Financial Service Center	380000	-	-	-
Therapeutic Service Center	420000	-	-	-
Diagnostic Service Center	190000	-	-	-



44-Find the names and salaries of nurses with salary less than or equal that of all nurses in the Administrative Service Center department:

```
356 v Select full_name ,salary  
357 From nurse  
358 Where salary<=all(select salary  
359             From nurse  
360             Where department_name = 'Administrative Service Center' );  
361
```

FULL_NAME	SALARY
Lola Darin	17000
Ahmad Khalid	16000



45-List ALL sub department information records along with nurses information:



355 v Select *

```
356 From nurse right outer join sub_dept
```

```
357 Using(sub_dept_name ,department_name);
```



46-Find the names and annual salary of nurses whose name start with 'No':

```
355 v Select full_name ,salary*12 as annual_salary  
356 From nurse  
357 Where full_name like 'No%';
```

FULL_NAME	ANNUAL_SALARY
Nora Joesph	324000
Noah Arin	228000



47- Update the blood type of the patient with ID 'P0002' to 'O+':



```
488 ✓ UPDATE Patient  
489 SET Blood_type = 'O+'  
490 WHERE Patient_ID = 'P0002';  
491  
492  
493  
494
```

1 row(s) updated.

Before :

PATIENT_ID	BLOOD_TYPE
P0002	AB-

After :

PATIENT_ID	BLOOD_TYPE
P0002	O+



48-Remove records of patients born between January 1, 1990, and December 31, 1999:



```
510 ✓ DELETE FROM Patient  
511 WHERE Date_of_birth BETWEEN DATE '1990-01-01' AND DATE '1999-12-31';  
512  
513  
514  
515
```

3 row(s) deleted.

Before :

PATIENT_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	PHONE_NUMBER	ADDRESS	NATIONALITY	BLOOD_TYPE
P0001	Bella Smith	03-JUN-95	Female	+966582539011	Alrabwah	American	O+
P0004	Mohammad Kumar	07-FEB-98	Male	+966525339610	Alnahdha	Indian	O+
P0005	Abdulaziz Ahmad	11-OCT-95	Male	+966537295618	Alremal	Saudi	B+

After :

no data found



49-Retrieve full names and phone numbers of patients whose phone numbers start with '+96653':

```
478 ✓ SELECT Full_name, Phone_Number  
479   FROM Patient  
480   WHERE Phone_Number LIKE '+96653%';  
481  
482  
483
```

FULL_NAME	PHONE_NUMBER
Gorge Miller	+966538771683
Abdulaziz Ahmad	+966537295618



50- Retrieve all patients data and order them by their date of birth in descending order:

```
485 v SELECT * FROM Patient  
486 ORDER BY Date_of_birth DESC;  
487  
488
```

PATIENT_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	PHONE_NUMBER	ADDRESS	NATIONALITY	BLOOD_TYPE
P0003	Nora Khalid	21-AUG-00	Female	+966584390017	Qurtoba	Saudi	0-
P0004	Mohammad Kumar	07-FEB-98	Male	+966525339610	Alnahdha	Indian	0+
P0005	Abdulaziz Ahmad	11-OCT-95	Male	+966537295618	Alremal	Saudi	B+
P0001	Bella Smith	03-JUN-95	Female	+966582539011	Alrabwah	American	0+
P0002	Gorge Miller	16-MAY-89	Male	+966538771683	Almalqa	British	AB-



51 -List the full names, genders, and dates of birth of male patients, renaming the full name column to “PatientName”:

```
491 v SELECT Full_name AS PatientName, Gender, Date_of_birth  
492   FROM Patient  
493 WHERE Gender = 'Male';  
494  
495
```

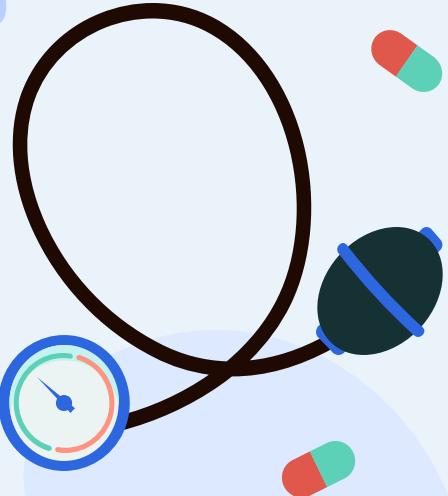
PATIENTNAME	GENDER	DATE_OF_BIRTH
Gorge Miller	Male	16-MAY-89
Mohammad Kumar	Male	07-FEB-98
Abdulaziz Ahmad	Male	11-OCT-95



52-Find the appointment IDs , appointment dates and full names of patients who have appointments:

```
499 ✓ SELECT appointment_id, appointment_date,full_name  
500 FROM Appointment  
501 NATURAL JOIN Patient;  
502  
503
```

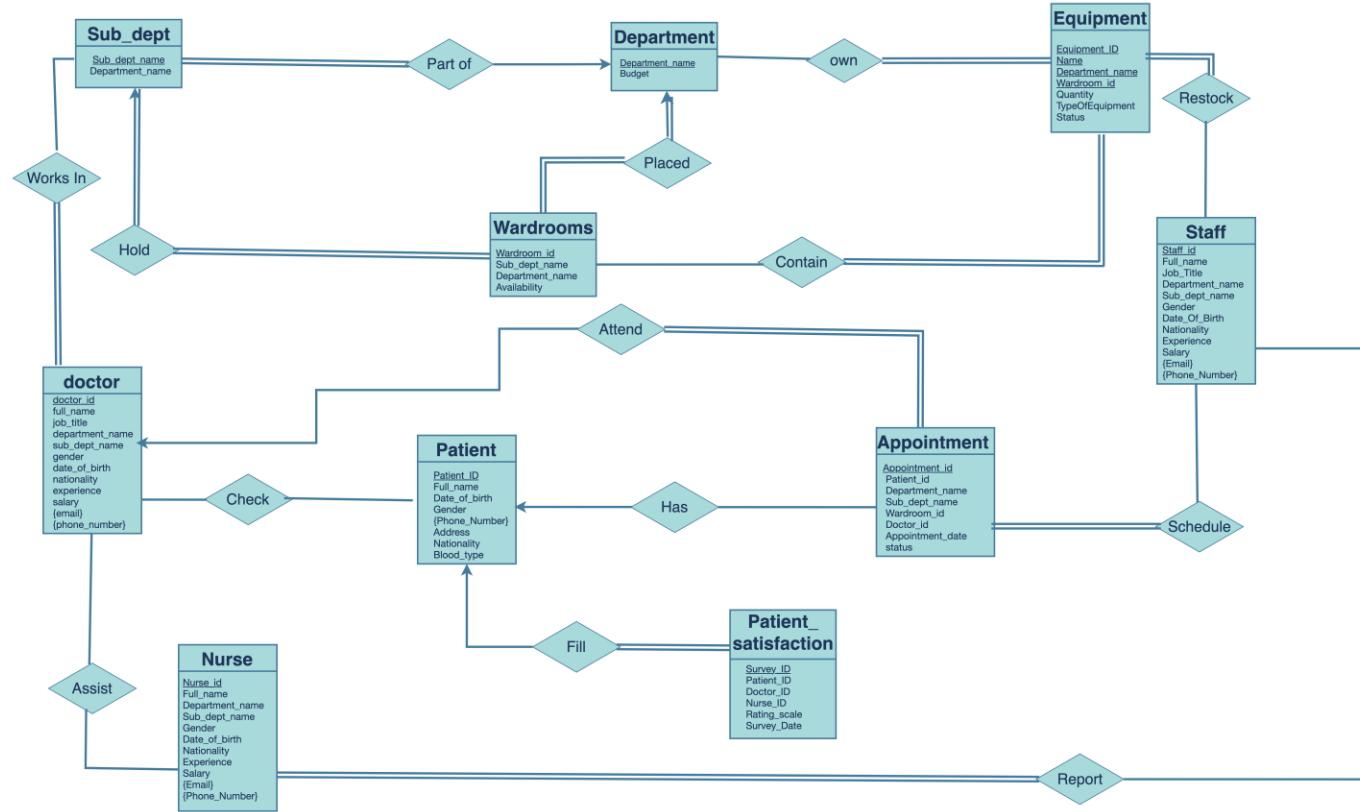
APPOINTMENT_ID	APPOINTMENT_DATE	FULL_NAME
A0001	15-APR-24	Bella Smith
A0002	16-APR-24	Gorge Miller
A0003	17-APR-24	Nora Khalid
A0004	18-APR-24	Mohammad Kumar



Entity relational Model (ERM)

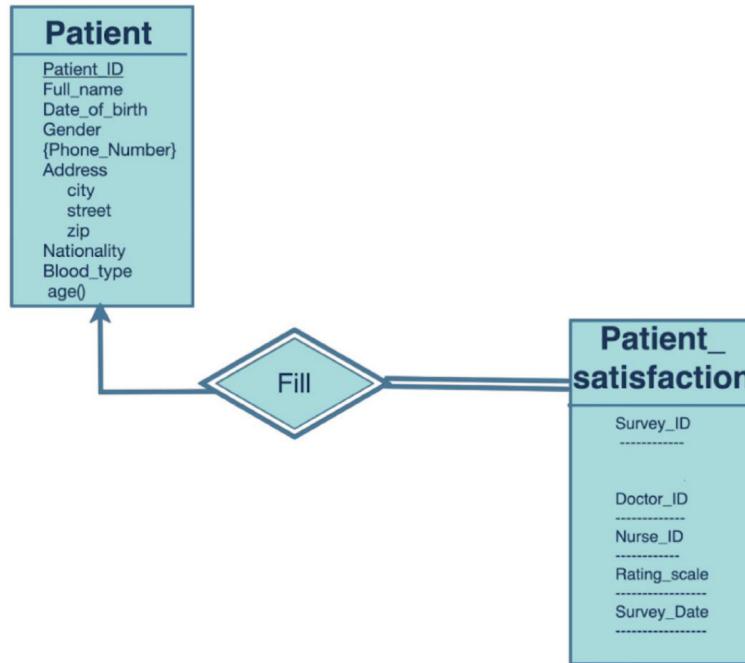


ER Diagram





ER Diagram cont...





Normalization Theory





First Table : Equipment



EQUIPMENT_ID	NAME	DEPARTMENT_NAME	SUB_DEPT_NAME	WARDROOM_ID	QUANTITY	TYPEOFEQUIPMENT	STATUS	SUPPLIER	SUPPLYING_CITY
EQ001	Computer	Financial Service Center	Accounting Center	WR007	6	reusable	need checking	Alraedah	Qassim
EQ001	Computer	Administrative Service Center	Admission Center	WR006	10	reusable	good	Alraedah	Qassim
EQ001	Computer	Support Service Center	Safety	WR002	5	reusable	need checking	Alraedah	Qassim
EQ001	Computer	Financial Service Center	Billing Center	WR008	5	reusable	good	Alraedah	Qassim
EQ001	Computer	Administrative Service Center	Information Center	WR005	7	reusable	good	Alraedah	Qassim
EQ002	Bed	Therapeutic Service Center	Physical Therapy Center	WR011	6	reusable	good	Alrajhi	Riyadh
EQ002	Bed	Therapeutic Service Center	Medical Psychology Center	WR003	3	reusable	need checking	Alrajhi	Riyadh
EQ002	Bed	Diagnostic Service Center	Radiology Center	WR010	4	reusable	good	Alrajhi	Riyadh
EQ002	Bed	Therapeutic Service Center	Dietary Center	WR013	3	reusable	good	Alrajhi	Riyadh
EQ002	Bed	Therapeutic Service Center	Physical Therapy Center	WR012	2	reusable	good	Alrajhi	Riyadh
EQ003	Crash Cart	Therapeutic Service Center	Dietary Center	WR003	1	reusable	need checking	Alrajhi	Riyadh
EQ003	Crash Cart	Therapeutic Service Center	Medical Psychology Center	WR012	1	reusable	good	Alrajhi	Riyadh
EQ004	IV Fluid	Therapeutic Service Center	Medical Psychology Center	WR012	15	one use	good	Gassan Alsuliman	Jeddah
EQ004	IV Fluid	Therapeutic Service Center	Dietary Center	WR011	20	one use	good	Gassan Alsuliman	Jeddah
EQ005	Printer	Administrative Service Center	Information Center	WR004	2	reusable	good	Alemyaz	Jeddah
EQ005	Printer	Financial Service Center	Accounting Center	WR008	1	reusable	good	Alemyaz	Jeddah
EQ006	Chair	Administrative Service Center	Information Center	WR005	7	reusable	good	Alhabib	Riyadh
EQ006	Chair	Support Service Center	Housekeeping and Maintenance	WR002	5	reusable	good	Alhabib	Riyadh
EQ006	Chair	Administrative Service Center	Admission Center	WR006	10	reusable	good	Alhabib	Riyadh
EQ006	Chair	Diagnostic Service Center	Cardiology Center	WR009	4	reusable	good	Alhabib	Riyadh
EQ006	Chair	Financial Service Center	Billing Center	WR007	6	reusable	need checking	Alhabib	Riyadh
EQ006	Chair	Financial Service Center	Accounting Center	WR008	5	reusable	need checking	Alhabib	Riyadh
EQ007	Needle	Therapeutic Service Center	Physical Therapy Center	WR003	10	one use	need checking	Alraedah	Qassim
EQ007	Needle	Diagnostic Service Center	Radiology Center	WR010	16	reusable	good	Alraedah	Qassim
EQ007	Needle	Therapeutic Service Center	Dietary Center	WR013	15	one use	good	Alraedah	Qassim
EQ008	Scanner	Support Service Center	Safety	WR001	2	reusable	need checking	Alemyaz	Jeddah
EQ008	Scanner	Diagnostic Service Center	Cardiology Center	WR009	1	reusable	good	Alemyaz	Jeddah

*In 1NF? NO, there are repeated attributes

1NF tables: Repeating attributes removed

EQUIPMENT_INFO1 table

EQUIPMENT_ID	EQUIPMENT_NAME	TYPEOFEQUIPMENT	SUPPLIER	SUPPLYING_CITY
EQ001	Computer	reusable	Alraedah	Qassim
EQ002	Bed	reusable	Alrajhi	Riyadh
EQ003	Crash Cart	reusable	Alrajhi	Riyadh
EQ004	IV Fluid	one use	Gassan Alsuliman	Jeddah
EQ005	Printer	reusable	Alemyaz	Jeddah
EQ006	Chair	reusable	Alhabib	Riyadh
EQ007	Needle	one use	Alraedah	Qassim
EQ008	Scanner	reusable	Alemyaz	Jeddah

In 1NF? YES
In 2NF? YES

Hospital_Equipments table

EQUIPMENT_ID	DEPARTMENT_NAME	SUB_DEPT_NAME	WARDROOM_ID	QUANTITY	STATUS
EQ001	Financial Service Center	Accounting Center	WR007	6	need checking
EQ001	Administrative Service Center	Information Center	WR005	7	good
EQ001	Support Service Center	Safety	WR002	5	need checking
EQ001	Administrative Service Center	Admission Center	WR006	10	good
EQ001	Financial Service Center	Billing Center	WR008	5	good
EQ002	Therapeutic Service Center	Physical Therapy Center	WR012	2	good
EQ002	Therapeutic Service Center	Medical Psychology Center	WR003	3	need checking
EQ002	Diagnostic Service Center	Radiology Center	WR010	4	good
EQ002	Therapeutic Service Center	Dietary Center	WR013	3	good
EQ002	Therapeutic Service Center	Physical Therapy Center	WR011	6	good
EQ003	Therapeutic Service Center	Medical Psychology Center	WR012	1	good
EQ003	Therapeutic Service Center	Dietary Center	WR003	1	need checking
EQ004	Therapeutic Service Center	Medical Psychology Center	WR012	15	good
EQ004	Therapeutic Service Center	Dietary Center	WR011	20	good
EQ005	Administrative Service Center	Information Center	WR004	2	good
EQ005	Financial Service Center	Accounting Center	WR008	1	good
EQ006	Support Service Center	Housekeeping and Maintenance	WR002	5	good
EQ006	Administrative Service Center	Information Center	WR005	7	good
EQ006	Administrative Service Center	Admission Center	WR006	10	good
EQ006	Diagnostic Service Center	Cardiology Center	WR009	4	good
EQ006	Financial Service Center	Billing Center	WR007	6	need checking
EQ006	Financial Service Center	Accounting Center	WR008	5	need checking
EQ007	Therapeutic Service Center	Dietary Center	WR013	15	good
EQ007	Diagnostic Service Center	Radiology Center	WR010	16	good
EQ007	Therapeutic Service Center	Physical Therapy Center	WR003	10	need checking
EQ008	Diagnostic Service Center	Cardiology Center	WR009	1	good
EQ008	Support Service Center	Safety	WR001	2	need checking

In 1NF? YES

* In 2NF? NO , Department_name attribute is partially dependent on Sub_dept_name.

2NF process : Removing partial key dependencies from Hospital_Equipment table

DEPARTMENT_AND_SUB_DEPT table

SUB_DEPT_NAME 🔍	DEPARTMENT_NAME
Information Center	Administrative Service Center
Admission Center	Administrative Service Center
Human Resources	Administrative Service Center
Radiology Center	Diagnostic Service Center
Cardiology Center	Diagnostic Service Center
Accounting Center	Financial Service Center
Billing Center	Financial Service Center
Housekeeping and Maintenance	Support Service Center
Safety	Support Service Center
Physical Therapy Center	Therapeutic Service Center
Pharmacy Center	Therapeutic Service Center
Dietary Center	Therapeutic Service Center
Medical Psychology Center	Therapeutic Service Center

In 1NF? YES
In 2NF? YES

HOSPITAL_EQUIPMENTS2 table

EQUIPMENT_ID	SUB_DEPT_NAME 🔍	WARDROOM_ID	QUANTITY	STATUS
EQ001	Safety	WR002	5	need checking
EQ001	Admission Center	WR006	10	good
EQ001	Billing Center	WR008	5	good
EQ001	Information Center	WR005	7	good
EQ001	Accounting Center	WR007	6	need checking
EQ002	Physical Therapy Center	WR012	2	good
EQ002	Physical Therapy Center	WR011	6	good
EQ002	Medical Psychology Center	WR003	3	need checking
EQ002	Radiology Center	WR010	4	good
EQ002	Dietary Center	WR013	3	good
EQ003	Dietary Center	WR003	1	need checking
EQ003	Medical Psychology Center	WR012	1	good
EQ004	Dietary Center	WR011	20	good
EQ004	Medical Psychology Center	WR012	15	good
EQ005	Accounting Center	WR008	1	good
EQ005	Information Center	WR004	2	good
EQ006	Billing Center	WR007	6	need checking
EQ006	Admission Center	WR006	10	good
EQ006	Accounting Center	WR008	5	need checking
EQ006	Housekeeping and Maintenance	WR002	5	good
EQ006	Cardiology Center	WR009	4	good
EQ006	Information Center	WR005	7	good
EQ007	Radiology Center	WR010	16	good
EQ007	Physical Therapy Center	WR003	10	need checking
EQ007	Dietary Center	WR013	15	good
EQ008	Safety	WR001	2	need checking
EQ008	Cardiology Center	WR009	1	good

In 1NF? YES
In 2NF? YES

2NF tables : Partial key dependencies removed



EQUIPMENT_INFO1 table

EQUIPMENT_ID	EUIPMENT_NAME	TYPEOFEQUIPMENT	SUPPLIER	SUPPLYING_CITY
EQ001	Computer	reusable	Alraedah	Qassim
EQ002	Bed	reusable	Alrajhi	Riyadh
EQ003	Crash Cart	reusable	Alrajhi	Riyadh
EQ004	IV Fluid	one use	Gassan Alsuliman	Jeddah
EQ005	Printer	reusable	Alemyaz	Jeddah
EQ006	Chair	reusable	Alhabib	Riyadh
EQ007	Needle	one use	Alraedah	Qassim
EQ008	Scanner	reusable	Alemyaz	Jeddah



* In 3NF? NO, The reasons are:

1- TypeOfEquipment is Transitively dependent on Equipment_id by Equipment_name.

2-Supplying_city is transitively dependent on Equipment_id by Supplier.

DEPARTMENT_AND_SUB_DEPT table

SUB_DEPT_NAME	DEPARTMENT_NAME
Information Center	Administrative Service Center
Admission Center	Administrative Service Center
Human Resources	Administrative Service Center
Radiology Center	Diagnostic Service Center
Cardiology Center	Diagnostic Service Center
Accounting Center	Financial Service Center
Billing Center	Financial Service Center
Housekeeping and Maintenance	Support Service Center
Safety	Support Service Center
Physical Therapy Center	Therapeutic Service Center
Pharmacy Center	Therapeutic Service Center
Dietary Center	Therapeutic Service Center
Medical Psychology Center	Therapeutic Service Center

In 3NF? YES



HOSPITAL_EQUIPMENTS2 table

EQUIPMENT_ID	SUB_DEPT_NAME	WARDROOM_ID	QUANTITY	STATUS
EQ001	Safety	WR002	5	need checking
EQ001	Admission Center	WR006	10	good
EQ001	Billing Center	WR008	5	good
EQ001	Information Center	WR005	7	good
EQ001	Accounting Center	WR007	6	need checking
EQ002	Physical Therapy Center	WR012	2	good
EQ002	Physical Therapy Center	WR011	6	good
EQ002	Medical Psychology Center	WR003	3	need checking
EQ002	Radiology Center	WR010	4	good
EQ002	Dietary Center	WR013	3	good
EQ003	Dietary Center	WR003	1	need checking
EQ003	Medical Psychology Center	WR012	1	good
EQ004	Dietary Center	WR011	20	good
EQ004	Medical Psychology Center	WR012	15	good
EQ005	Accounting Center	WR008	1	good
EQ005	Information Center	WR004	2	good
EQ006	Billing Center	WR007	6	need checking
EQ006	Admission Center	WR006	10	good
EQ006	Accounting Center	WR008	5	need checking
EQ006	Housekeeping and Maintenance	WR002	5	good
EQ006	Cardiology Center	WR009	4	good
EQ006	Information Center	WR005	7	good
EQ007	Radiology Center	WR010	16	good
EQ007	Physical Therapy Center	WR003	10	need checking
EQ007	Dietary Center	WR013	15	good
EQ008	Safety	WR001	2	need checking
EQ008	Cardiology Center	WR009	1	good

In 3NF? YES

3NF process : Removing non-key dependencies (Transitive Dependency) From Equipment_Info1 table



EQUIPMENT_SUPPLYING table

EQUIPMENT_ID	SUPPLIER	SUPPLYING_CITY
EQ001	Alraedah	Qassim
EQ002	Alrajhi	Riyadh
EQ003	Alrajhi	Riyadh
EQ004	Gassan Alsuliman	Jeddah
EQ005	Alemyaz	Jeddah
EQ006	Alhabib	Riyadh
EQ007	Alraedah	Qassim
EQ008	Alemyaz	Jeddah

* In 3NF? NO,
Supplying_city is
transitively dependent
on Equipment_id by Supplier.



Equipment_info2 table

EQUIPMENT_ID	EQUIPMENT_NAME	TYPEOFEQUIPMENT
EQ001	Computer	reusable
EQ002	Bed	reusable
EQ003	Crash Cart	reusable
EQ004	IV Fluid	one use
EQ005	Printer	reusable
EQ006	Chair	reusable
EQ007	Needle	one use
EQ008	Scanner	reusable

* In 3NF? NO,
TypeOfEquipment is Transitively
dependent on Equipment_id by
Equipment_name.

3NF process : Removing non-key dependencies (Transitive Dependency) From Equipment_supplying table

EQUIPMENT_SUPPLIER table

EQUIPMENT_ID	SUPPLIER
EQ001	Alraedah
EQ002	Alrajhi
EQ003	Alrajhi
EQ004	Gassan Alsuliman
EQ005	Alemyaz
EQ006	Alhabib
EQ007	Alraedah
EQ008	Alemyaz

In 3NF? YES

SUPPLYING_INFO table

SUPPLIER	SUPPLYING_CITY
Alemyaz	Jeddah
Gassan Alsuliman	Jeddah
Alraedah	Qassim
Alhabib	Riyadh
Alrajhi	Riyadh

In 3NF? YES

3NF process : Removing non-key dependencies (Transitive Dependency) From Equipment_info2 table

Equipment_info3 table

EQUIPMENT_ID	EQUIPMENT_NAME
EQ002	Bed
EQ006	Chair
EQ001	Computer
EQ003	Crash Cart
EQ004	IV Fluid
EQ007	Needle
EQ005	Printer
EQ008	Scanner

In 3NF? YES

Equipment_info4 table

EQUIPMENT_NAME	TYPEOFEQUIPMENT
Bed	reusable
Chair	reusable
Computer	reusable
Crash Cart	reusable
IV Fluid	one use
Needle	one use
Printer	reusable
Scanner	reusable

In 3NF? YES

3NF tables: Non-key dependencies (TransitivDependency) removed

HOSPITAL_EQUIPMENTS2 table				
EQUIPMENT_ID	SUB_DEPT_NAME	WARDROOM_ID	QUANTITY	STATUS
EQ001	Safety	WR002	5	need checking
EQ001	Admission Center	WR006	10	good
EQ001	Billing Center	WR008	5	good
EQ001	Information Center	WR005	7	good
EQ001	Accounting Center	WR007	6	need checking
EQ002	Physical Therapy Center	WR012	2	good
EQ002	Physical Therapy Center	WR011	6	good
EQ002	Medical Psychology Center	WR003	3	need checking
EQ002	Radiology Center	WR010	4	good
EQ002	Dietary Center	WR013	3	good
EQ003	Dietary Center	WR003	1	need checking
EQ003	Medical Psychology Center	WR012	1	good
EQ004	Dietary Center	WR011	20	good
EQ004	Medical Psychology Center	WR012	15	good
EQ005	Accounting Center	WR008	1	good
EQ005	Information Center	WR004	2	good
EQ006	Billing Center	WR007	6	need checking
EQ006	Admission Center	WR006	10	good
EQ006	Accounting Center	WR008	5	need checking
EQ006	Housekeeping and Maintenance	WR002	5	good
EQ006	Cardiology Center	WR009	4	good
EQ006	Information Center	WR005	7	good
EQ007	Radiology Center	WR010	16	good
EQ007	Physical Therapy Center	WR003	10	need checking
EQ007	Dietary Center	WR013	15	good
EQ008	Safety	WR001	2	need checking
EQ008	Cardiology Center	WR009	1	good

Equipment_info3 table	
EQUIPMENT_ID	EQUIPMENT_NAME
EQ002	Bed
EQ006	Chair
EQ001	Computer
EQ003	Crash Cart
EQ004	IV Fluid
EQ007	Needle
EQ005	Printer
EQ008	Scanner

Equipment_info4 table	
EQUIPMENT_NAME	TYPEOFEQUIPMENT
Bed	reusable
Chair	reusable
Computer	reusable
Crash Cart	reusable
IV Fluid	one use
Needle	one use
Printer	reusable
Scanner	reusable

DEPARTMENT_AND_SUB_DEPT table	
SUB_DEPT_NAME	DEPARTMENT_NAME
Information Center	Administrative Service Center
Admission Center	Administrative Service Center
Human Resources	Administrative Service Center
Radiology Center	Diagnostic Service Center
Cardiology Center	Diagnostic Service Center
Accounting Center	Financial Service Center
Billing Center	Financial Service Center
Housekeeping and Maintenance	Support Service Center
Safety	Support Service Center
Physical Therapy Center	Therapeutic Service Center
Pharmacy Center	Therapeutic Service Center
Dietary Center	Therapeutic Service Center
Medical Psychology Center	Therapeutic Service Center

SUPPLYING_INFO table	
SUPPLIER	SUPPLYING_CITY
Alemtiyaz	Jeddah
Gassan Alsuliman	Jeddah
Alraedah	Qassim
Alhabib	Riyadh
Alrajhi	Riyadh

EQUIPMENT_SUPPLIER table	
EQUIPMENT_ID	SUPPLIER
EQ001	Alraedah
EQ002	Alrajhi
EQ003	Alrajhi
EQ004	Gassan Alsuliman
EQ005	Alemtiyaz
EQ006	Alhabib
EQ007	Alraedah
EQ008	Alemtiyaz



Second Table :

Doctor



DOCTOR table

FULL_NAME	DEPARTMENT_NAME	SUBDEPTNO	FLOOR	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY	CONTACT	EMAIL	PHONE_NUMBER
John Smith	Diagnostic Service Center	111	1	Male	10-MAY-80	American	15 years	40000	1	john.smith@example.com	966508346785
John Smith	Diagnostic Service Center	111	1	Male	10-MAY-80	American	15 years	40000	2	john.smith2@example.com	966593427549
Emily Johnson	Diagnostic Service Center	112	1	Female	22-AUG-85	Canadian	12 years	45000	1	emily.johnson@example.com	966589647789
Emily Johnson	Diagnostic Service Center	112	1	Female	22-AUG-85	Canadian	12 years	45000	2	emily2@example.com	966518400274
David Wilson	Therapeutic Service Center	211	2	Male	07-NOV-76	British	20 years	38000	1	david.wilson@example.com	966560028233
David Wilson	Therapeutic Service Center	211	2	Male	07-NOV-76	British	20 years	38000	2	david.2@example.com	966527837943
Sarah Davis	Therapeutic Service Center	212	2	Female	15-FEB-90	Australian	8 years	32000	1	sarah.davis@example.com	966551670432
Sarah Davis	Therapeutic Service Center	212	2	Female	15-FEB-90	Australian	8 years	32000	2	sarah.da2@example.com	966529638624
Michael Brown	Therapeutic Service Center	213	2	Male	29-SEP-82	Indian	18 years	42000	1	michael.brown@example.com	966548346785
Michael Brown	Therapeutic Service Center	213	2	Male	29-SEP-82	Indian	18 years	42000	2	michael.br2@example.com	966599263947

*In 1NF? NO, there are repeated attributes

1NF tables: Repeating attributes removed

In 2NF? YES →

Emergency_contact_doctor table

FULL_NAME	SUBDEPTNO	CONTACT	EMAIL	PHONE_NUMBER
John Smith	111	1	john.smith@example.com	+966508346785
John Smith	111	2	john.smith2@example.com	+966593427549
Emily Johnson	112	1	emily.johnson@example.com	+966589647789
Emily Johnson	112	2	emily2@example.com	+966518400274
David Wilson	211	1	david.wilson@example.com	+966560028233
David Wilson	211	2	david.2@example.com	+966527837943
Sarah Davis	212	1	sarah.davis@example.com	+966551670432
Sarah Davis	212	2	sarah.da2@example.com	+966529638624
Michael Brown	213	1	michael.brown@example.com	+966548346785
Michael Brown	213	2	michael.br2@example.com	+966599263947

Doctor_basic table

FULL_NAME	DEPARTMENT_NAME	SUBDEPTNO	FLOOR	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY
John Smith	Diagnostic Service Center	111	1	Male	10-MAY-80	American	15 years	40000
Emily Johnson	Diagnostic Service Center	112	1	Female	22-AUG-85	Canadian	12 years	45000
David Wilson	Therapeutic Service Center	211	2	Male	07-NOV-76	British	20 years	38000
Sarah Davis	Therapeutic Service Center	212	2	Female	15-FEB-90	Australian	8 years	32000
Michael Brown	Therapeutic Service Center	213	2	Male	29-SEP-82	Indian	18 years	42000

* In 2NF? NO ,
Department_name and Floor
attributes are partially
dependent on SubdeptNO.

2NF process : Removing partial key dependencies from Doctor_Basic table

Doctor_Basic_Info table

FULL_NAME	SUBDEPTNO	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY
John Smith	111	Male	10-MAY-80	American	15 years	40000
Emily Johnson	112	Female	22-AUG-85	Canadian	12 years	45000
David Wilson	211	Male	07-NOV-76	British	20 years	38000
Sarah Davis	212	Female	15-FEB-90	Australian	8 years	32000
Michael Brown	213	Male	29-SEP-82	Indian	18 years	42000

SubDept_Info table

SUBDEPTNO	DEPARTMENT_NAME	FLOOR
111	Diagnostic Service Center	1
112	Diagnostic Service Center	1
211	Therapeutic Service Center	2
212	Therapeutic Service Center	2
213	Therapeutic Service Center	2

2NF tables : Partial key dependencies removed

Doctor_Basic_Info table

FULL_NAME	SUBDEPTNO	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY
John Smith	111	Male	10-MAY-80	American	15 years	40000
Emily Johnson	112	Female	22-AUG-85	Canadian	12 years	45000
David Wilson	211	Male	07-NOV-76	British	20 years	38000
Sarah Davis	212	Female	15-FEB-90	Australian	8 years	32000
Michael Brown	213	Male	29-SEP-82	Indian	18 years	42000

In 3NF? YES

Emergency_contact_doctor table

FULL_NAME	SUBDEPTNO	CONTACT	EMAIL	PHONE_NUMBER
John Smith	111	1	john.smith@example.com	+966508346785
John Smith	111	2	john.smith2@example.com	+966593427549
Emily Johnson	112	1	emily.johnson@example.com	+966589647789
Emily Johnson	112	2	emily2@example.com	+966518400274
David Wilson	211	1	david.wilson@example.com	+966560028233
David Wilson	211	2	david.2@example.com	+966527837943
Sarah Davis	212	1	sarah.davis@example.com	+966551670432
Sarah Davis	212	2	sarah.da2@example.com	+966529638624
Michael Brown	213	1	michael.brown@example.com	+966548346785
Michael Brown	213	2	michael.br2@example.com	+966599263947

In 3NF? YES

SubDept_Info table

SUBDEPTNO	DEPARTMENT_NAME	FLOOR
111	Diagnostic Service Center	1
112	Diagnostic Service Center	1
211	Therapeutic Service Center	2
212	Therapeutic Service Center	2
213	Therapeutic Service Center	2

* In 3NF? NO, Floor is Transitively dependent on subdeptNo by Department_name .

3NF process : Removing non-key dependencies (Transitive Dependency) From Subdept_Info table

SubDeptNO_Dept table



SUBDEPTNO	DEPARTMENT_NAME
111	Diagnostic Service Center
112	Diagnostic Service Center
211	Therapeutic Service Center
212	Therapeutic Service Center
213	Therapeutic Service Center

Dept_Floor table



DEPARTMENT_NAME	FLOOR
Diagnostic Service Center	1
Therapeutic Service Center	2

3NF tables: Non-key dependencies (Transitive Dependency)removed

Emergency_contact_doctor table

Primary Key
Foreign Keys

FULL_NAME	SUBDEPTNO	CONTACT	EMAIL	PHONE_NUMBER
John Smith	111	1	john.smith@example.com	+966508346785
John Smith	111	2	john.smith2@example.com	+966593427549
Emily Johnson	112	1	emily.johnson@example.com	+966589647789
Emily Johnson	112	2	emily2@example.com	+966518400274
David Wilson	211	1	david.wilson@example.com	+966560028233
David Wilson	211	2	david.2@example.com	+966527837943
Sarah Davis	212	1	sarah.davis@example.com	+966551670432
Sarah Davis	212	2	sarah.da2@example.com	+966529638624
Michael Brown	213	1	michael.brown@example.com	+966548346785
Michael Brown	213	2	michael.br2@example.com	+966599263947

Dept_Floor table

Primary Key

DEPARTMENT_NAME	FLOOR
Diagnostic Service Center	1
Therapeutic Service Center	2

SubDeptNO_Dept table

Primary Key

SUBDEPTNO	DEPARTMENT_NAME
111	Diagnostic Service Center
112	Diagnostic Service Center
211	Therapeutic Service Center
212	Therapeutic Service Center
213	Therapeutic Service Center

Doctor_Basic_Info table

Primary Key
Foreign Keys

FULL_NAME	SUBDEPTNO	GENDER	DATE_OF_BIRTH	NATIONALITY	EXPERIENCE	SALARY
John Smith	111	Male	10-MAY-80	American	15 years	40000
Emily Johnson	112	Female	22-AUG-85	Canadian	12 years	45000
David Wilson	211	Male	07-NOV-76	British	20 years	38000
Sarah Davis	212	Female	15-FEB-90	Australian	8 years	32000
Michael Brown	213	Male	29-SEP-82	Indian	18 years	42000



Third Table :

Patient



PHONE_ID	FAMILY_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	PHONE	ZIP	CITY	NATIONALITY	BLOOD_TYPE	HEALTH_INSURANCE
1	F0001	Bella Smith	03-JUN-95	Female	+966582539011	12345	Buraidah	American	O+	9375925
2	F0001	Bella Smith	03-JUN-95	Female	+966582539012	12345	Buraidah	American	O+	9375925
1	F0002	Gorge Miller	16-MAY-89	Male	+966538771683	67890	Riyadh	British	A-	2844201
2	F0002	Gorge Miller	16-MAY-89	Male	+966538771684	67890	Riyadh	British	A-	2844201
1	F0003	Nora Khalid	21-AUG-00	Female	+966584390017	54321	Makkah	Saudi	B+	1100935
2	F0003	Nora Khalid	21-AUG-00	Female	+966584390018	54321	Makkah	Saudi	B+	1100935
1	F0004	Mohammad Kumar	07-FEB-98	Male	+966525339610	98765	Madinah	Indian	AB-	8264517
2	F0004	Mohammad Kumar	07-FEB-98	Male	+966525339611	98765	Madinah	Indian	AB-	8264517
1	F0005	Abdulaziz Ahmad	11-OCT-95	Male	+966537295618	45678	Jeddah	Saudi	A+	6461863
2	F0005	Abdulaziz Ahmad	11-OCT-95	Male	+966537295619	45678	Jeddah	Saudi	A+	6461863

*In 1NF? NO, there are repeated attributes

1NF tables : Repeating attributes removed

Patient_contact table

			
FAMILY_ID	FULL_NAME	PHONE_ID	PHONE
F0001	Bella Smith	1	+966582539011
F0001	Bella Smith	2	+966582539012
F0002	Gorge Miller	1	+966538771683
F0002	Gorge Miller	2	+966538771684
F0003	Nora Khalid	1	+966584390017
F0003	Nora Khalid	2	+966584390018
F0004	Mohammad Kumar	1	+966525339610
F0004	Mohammad Kumar	2	+966525339611
F0005	Abdulaziz Ahmad	1	+966537295618
F0005	Abdulaziz Ahmad	2	+966537295619

In 1NF? YES
In 2NF? YES

Patient_Info table

								
FAMILY_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	ZIP	CITY	NATIONALITY	BLOOD_TYPE	HEALTH_INSURANCE
F0001	Bella Smith	03-JUN-95	Female	12345	Buraidah	American	O+	9375925
F0002	Gorge Miller	16-MAY-89	Male	67890	Riyadh	British	A-	2844201
F0003	Nora Khalid	21-AUG-00	Female	54321	Makkah	Saudi	B+	1100935
F0004	Mohammad Kumar	07-FEB-98	Male	98765	Madinah	Indian	AB-	8264517
F0005	Abdulaziz Ahmad	11-OCT-95	Male	45678	Jeddah	Saudi	A+	6461863

In 1NF ?YES

* In 2NF? NO , Health_insurance is partially dependent on Family_id.

2NF process : Removing partial key dependencies from Patient_Info table

Family_Info table

FAMILY_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	ZIP	CITY	NATIONALITY	BLOOD_TYPE
F0001	Bella Smith	03-JUN-95	Female	12345	Buraidah	American	O+
F0002	Gorge Miller	16-MAY-89	Male	67890	Riyadh	British	A-
F0003	Nora Khalid	21-AUG-00	Female	54321	Makkah	Saudi	B+
F0004	Mohammad Kumar	07-FEB-98	Male	98765	Madinah	Indian	AB-
F0005	Abdulaziz Ahmad	11-OCT-95	Male	45678	Jeddah	Saudi	A+

In 1NF? YES
In 2NF? YES

Family_Insurance table

FAMILY_ID	HEALTH_INSURANCE
F0001	9375925
F0002	2844201
F0003	1100935
F0004	8264517
F0005	6461863

In 1NF? YES
In 2NF? YES

2NF tables : Partial key dependencies removed

Family_Info table

FAMILY_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	ZIP	CITY	NATIONALITY	BLOOD_TYPE
F0001	Bella Smith	03-JUN-95	Female	12345	Buraidah	American	O+
F0002	Gorge Miller	16-MAY-89	Male	67890	Riyadh	British	A-
F0003	Nora Khalid	21-AUG-00	Female	54321	Makkah	Saudi	B+
F0004	Mohammad Kumar	07-FEB-98	Male	98765	Madinah	Indian	AB-
F0005	Abdulaziz Ahmad	11-OCT-95	Male	45678	Jeddah	Saudi	A+

* In 3NF? NO,City is transitively dependent on Family_id by ZIP.

Family_Insurance table

FAMILY_ID	HEALTH_INSURANCE
F0001	9375925
F0002	2844201
F0003	1100935
F0004	8264517
F0005	6461863

In 3NF? YES

Patient_contact table

FAMILY_ID	FULL_NAME	PHONE_ID	PHONE
F0001	Bella Smith	1	+966582539011
F0001	Bella Smith	2	+966582539012
F0002	Gorge Miller	1	+966538771683
F0002	Gorge Miller	2	+966538771684
F0003	Nora Khalid	1	+966584390017
F0003	Nora Khalid	2	+966584390018
F0004	Mohammad Kumar	1	+966525339610
F0004	Mohammad Kumar	2	+966525339611
F0005	Abdulaziz Ahmad	1	+966537295618
F0005	Abdulaziz Ahmad	2	+966537295619

In 3NF? YES

3NF process : Removing non-key dependencies (Transitive Dependency) From Family_Info table

Family_Patient_Info table

FAMILY_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	NATIONALITY	BLOOD_TYPE	ZIP
F0001	Bella Smith	03-JUN-95	Female	American	O+	12345
F0002	Gorge Miller	16-MAY-89	Male	British	A-	67890
F0003	Nora Khalid	21-AUG-00	Female	Saudi	B+	54321
F0004	Mohammad Kumar	07-FEB-98	Male	Indian	AB-	98765
F0005	Abdulaziz Ahmad	11-OCT-95	Male	Saudi	A+	45678

In 3NF? YES

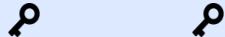
ZIP_City table

ZIP	CITY
12345	Buraидah
67890	Riyadh
54321	Makkah
98765	Madinah
45678	Jeddah

In 3NF? YES

3NF tables: Non-key dependencies (Transitive Dependency) removed

Family_Patient_Info table



FAMILY_ID	FULL_NAME	DATE_OF_BIRTH	GENDER	NATIONALITY	BLOOD_TYPE	ZIP
F0001	Bella Smith	03-JUN-95	Female	American	O+	12345
F0002	Gorge Miller	16-MAY-89	Male	British	A-	67890
F0003	Nora Khalid	21-AUG-00	Female	Saudi	B+	54321
F0004	Mohammad Kumar	07-FEB-98	Male	Indian	AB-	98765
F0005	Abdulaziz Ahmad	11-OCT-95	Male	Saudi	A+	45678

Family_Insurance table



FAMILY_ID	HEALTH_INSURANCE
F0001	9375925
F0002	2844201
F0003	1100935
F0004	8264517
F0005	6461863

Patient_contact table



FAMILY_ID	FULL_NAME	PHONE_ID	PHONE
F0001	Bella Smith	1	+966582539011
F0001	Bella Smith	2	+966582539012
F0002	Gorge Miller	1	+966538771683
F0002	Gorge Miller	2	+966538771684
F0003	Nora Khalid	1	+966584390017
F0003	Nora Khalid	2	+966584390018
F0004	Mohammad Kumar	1	+966525339610
F0004	Mohammad Kumar	2	+966525339611
F0005	Abdulaziz Ahmad	1	+966537295618
F0005	Abdulaziz Ahmad	2	+966537295619

ZIP_City able



ZIP	CITY
12345	Buraidah
67890	Riyadh
54321	Makkah
98765	Madinah
45678	Jeddah



Presented By :

Section Group No.3377

Names and IDs :

- Aljazey Alokab - 441203328
- Yasmin Altwaijry - 441212947
- Kadi Albakri - 441203464
- Rawan Alfouzan – 441203131
- Remas Aliessa - 441203422
- Joud Alobaidan - 441203410
- Bilsan Almanaee -441203277



Thank you

