DataBase Systems

HEALTH CENTER

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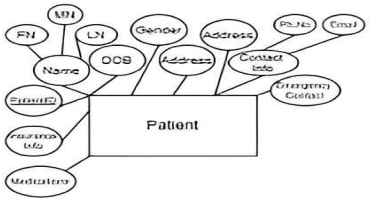
Health center database system

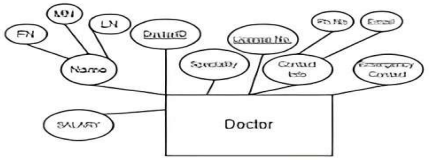
The health center is a place where people go to when they're suffering from a certain cause keeps track of patients , appointments ,doctors ,lab tests , clinical departments, receptionists , insurance ,medications ,medical records and nurses.

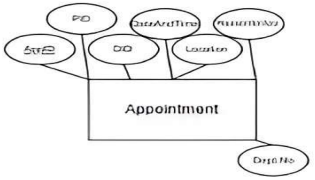
When a patient enters the health center ,they'll be directed to the receptionist to take their data and book the wanted appointment or lab test . The receptionist asks the patient about their full name ,birthdate ,phone no , insurance and medication. Then the patient is asked about what type of appointment they want book , if they have insurance a discount is added to the appointment and if not ,no discount will be added.

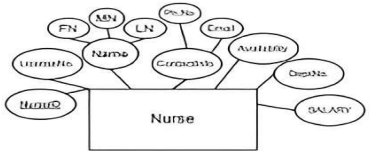
The doctor is notified about the appointment , it's date and the nurse that will be helping the doctor in the appointment, when the patient enters their appointment ,the doctor asks the patient about their name to view their medical record which will be showing the history of the patient . The patient specifies their symptoms, and the doctor will analyze the reason and search for right medication according to the purpose. The doctor then decides if the patient needs a lab test or not.

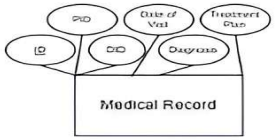
Rough ER schema

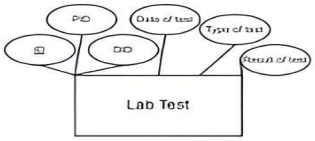


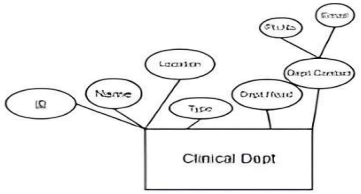


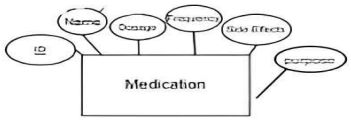


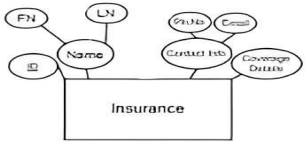


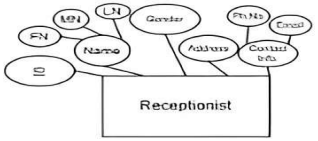




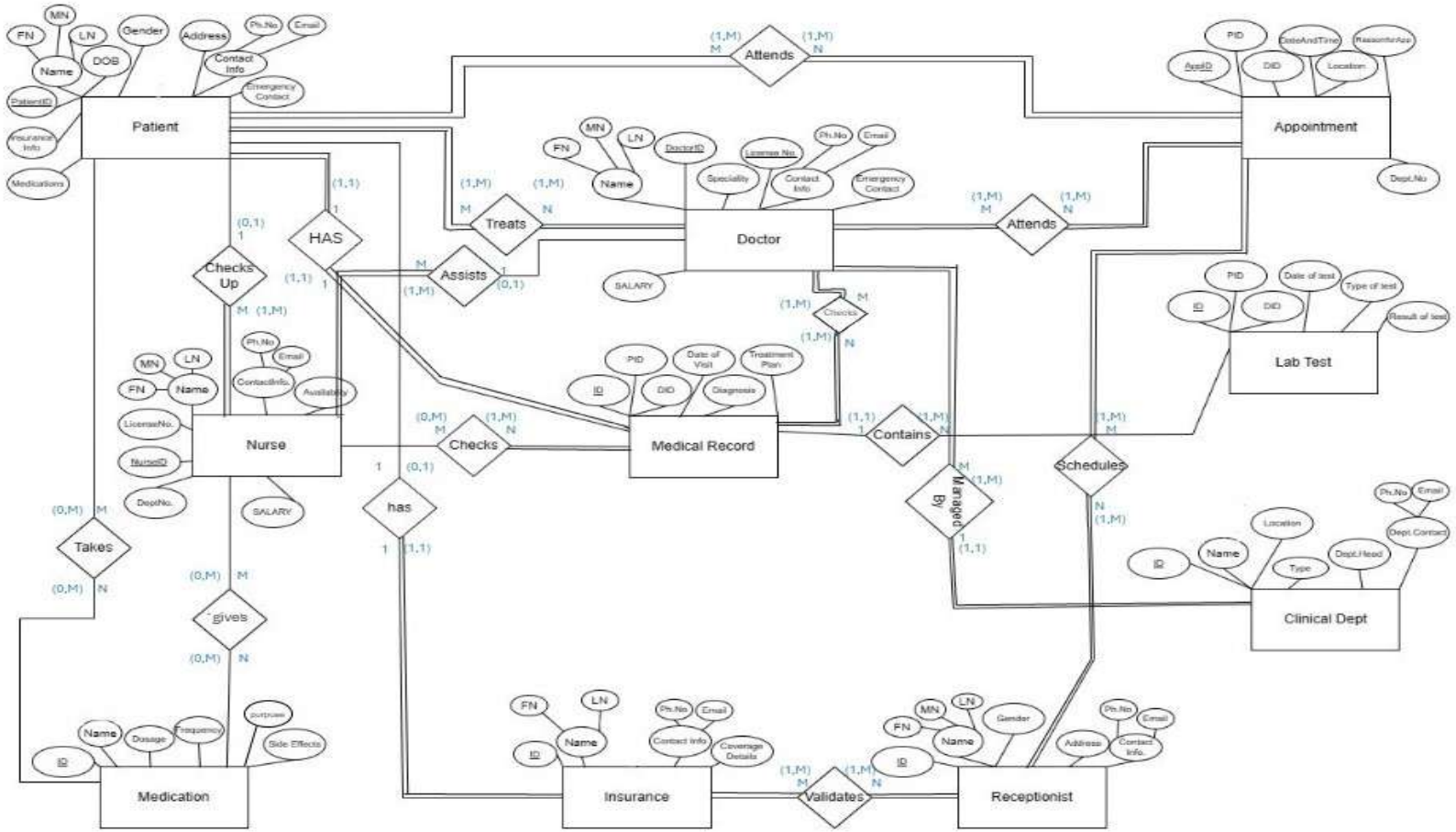




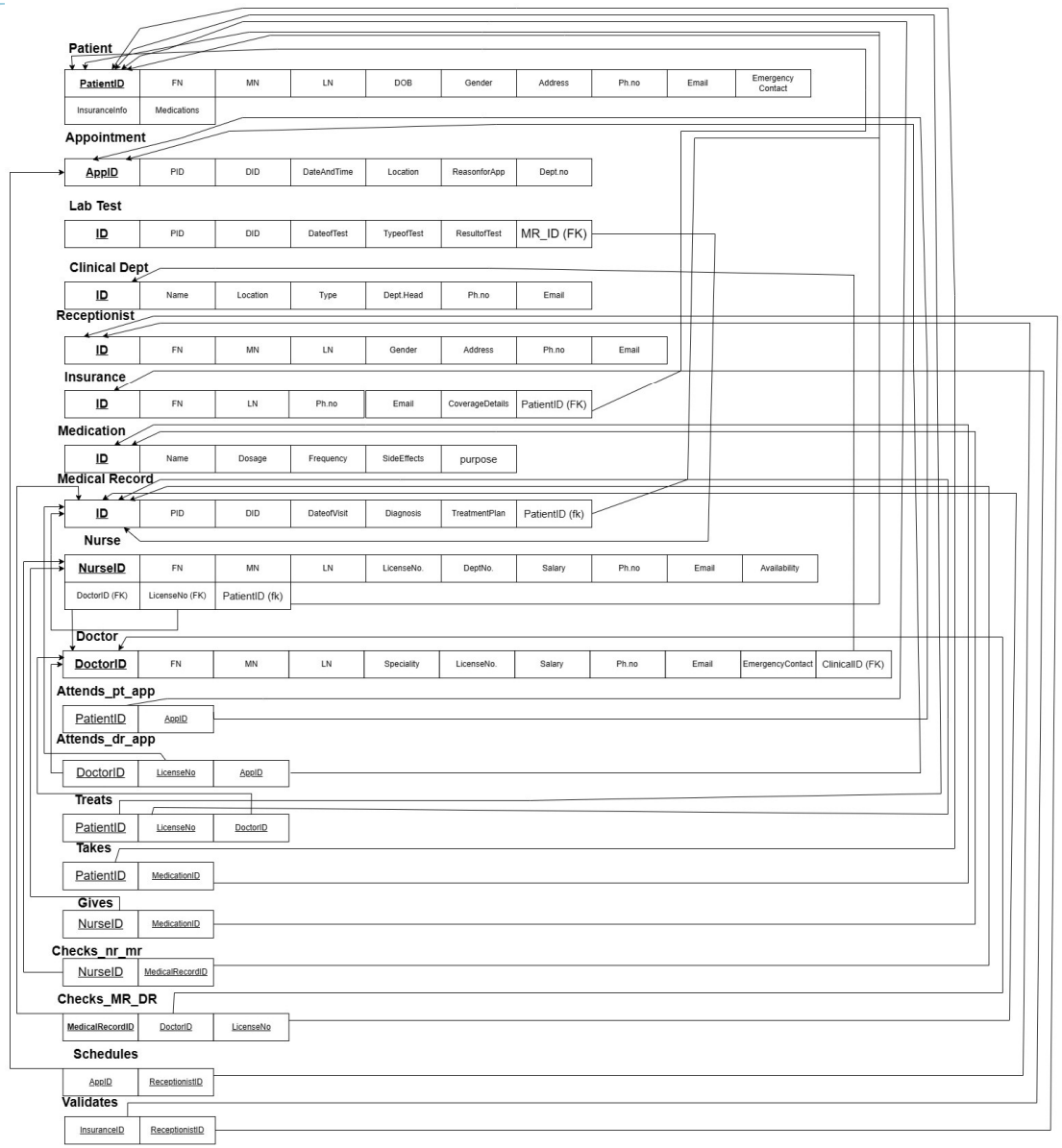




Final ER Diagram



Relational mapping



System Queries:

Display Dates of visit of a patient named 'John Smith'

- **Statement:**

select a.DateTimeofapp,p.fn,p.ln from patient p join appointement a on p.patientid=a.appid where p.fn='John' and p.ln='Smith'

- **Output:**

DATETIMEOFAPP	FN	LN
25-NOV-23	John	Smith

- **Relational Algebra:**

$$\pi_{\text{DateTimeofapp,fn,ln}}\left(\sigma_{\text{fn='Joe' and ln='Smith'}}\left(p \bowtie_{\text{p.patientid=a.appid}} a\right)\right)$$

- **Purpose:**

viewing date of visit for a patient (searching by a patient's first name and last name)

Display name of clinical department and type of lab test related to it

Statement:

select c.name,l.typeoftest from labtest l join clinicaldept c on l.id=c.id

Output:

NAME	TYPEOFTEST
General Medicine	Blood test
Pediatrics	Allergy panel
Cardiology	Lung function test
Oncology	Electrocardiogram
Orthopaedics	Mental health assessment
Neurology	Blood pressure check
Psychiatry	Hemoglobin A1c test
Dermatology	X-ray
Ophthalmology	Skin swab
ENT (Ear, Nose, and Throat)	MRI scan

Relational Algebra:

- ## Purpose:

viewing name of lab tests in each clinical dept (group by should be used but it's not because we inserted one lab test for each clinical dept)

Display name of receptionist who schedules certain appointment

- **Statement:**

select r.fn,r.ln,a.appid from receptionist r join appointement a on r.id=a.appid where a.appid=1

- **Output:**

FN	LN	APPID
Ahmed	Ali	1

- **Relational Algebra:**

$$\pi_{fn,ln,appid}\left(\sigma_{appid=1}\left(r \underset{r.id=a.appid}{\infty} a\right)\right)$$

- **Purpose:**

viewing the receptionist first name and last name who booked a specific appointment (searching by appointment id)

Display data of Patients treatment plan related to a doctor name 'John Doe'

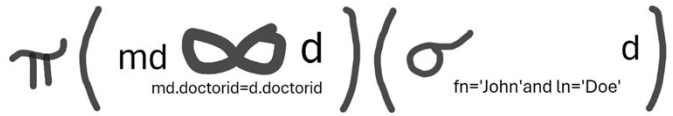
Statement:

select * from medicalrecord md join doctor d on md.doctorid=d.doctorid where d.fn='John'and d.ln='Doe'

Output:

ID	PATIENTID	DOCTORID	DATEOFVISIT	DIAGNOSIS	TREATMENTPLAN	DOCTORID	FN	MN	LN	SPECIALITY	LICENSE_NO	SALARY	PH_NO	EMAIL	EMERGENCYCONTACT	CLINICALID
9	4	1	17-APR-23	Skin infection	Antibiotics, topical cream	1	John	M.	Doe	Cardiology	1234	50000	1234567890	john.doe@example.com	9876543210	1

Relational Algebra:



Purpose:

viewing a patient's medical record and the doctor managing the treatment plan (searching by the Doctor's first name and last name)

Display all medications for a certain purpose like 'Pain Relief'

- **Statement:**

select* from medication where purpose like '%Pain relief%'

- **Output:**

ID	NAME	DOSAGE	FREQUENCY	PURPOSE	SIDEEFFECS
1	Acetaminophen	500	4	Pain relief, fever reduction	Nausea, vomiting, stomach pain
2	Ibuprofen	200	3	Pain relief, inflammation reduction	Upset stomach, heartburn, dizziness
3	Aspirin	325	2	Pain relief, fever reduction	Upset stomach, heartburn, bleeding
4	Naproxen	250	2	Pain relief, inflammation reduction	Upset stomach, headache, dizziness

- **Relational Algebra:**

$$\pi_{\text{medication}}\left(\sigma_{\text{purpose LIKE '\%Pain relief\%'}}(\text{medication})\right)$$

- **Purpose:**

viewing medications related to a specific purpose (searching by the purpose)

Display number of patients in each clinical department

Statement:

select count(patientid) ,c.name from patient p join clinicaldept c on p.patientid=c.id group by c.name

Output:

COUNT(PATIENTID)	NAME
1	Pediatrics
1	General Medicine
1	Dermatology
1	Cardiology
1	Oncology
1	ENT (Ear, Nose, and Throat)
1	Ophthalmology
1	Orthopaedics
1	Neurology
1	Psychiatry

Relational Algebra:

$$\pi_{\text{count(patientid,name)}}\left(\exists_{\text{c.name}}\left(p \underset{\text{p.patientid=c.id}}{\infty} c\right)\right)$$

Purpose:

viewing number of patients registered in each department

Display data of doctors who have appointments on a certain date

- **Statement:**

select* from doctor d join appointement a on d.doctorid=a.doctorid where a.DateTimeofapp='25-NOV-23'

- **Output:**

DOCTORID	FN	MN	LN	SPECIALITY	LICENSE_NO	SALARY	PH_NO	EMAIL	EMERGENCYCONTACT	CLINICALID	APPID	PATIENTID	DOCTORID	DATETIMEOFAPP	LOCATION	REASONOFAPP	DEPT_NO
8	Emily	S.	Harris	Obstetrics	9201	120000	6789012345	emily.harris@example.com	2345678901	8	1	5	8	25-NOV-23	Exam Room 3	Annual Checkup	15

- **Relational Algebra:** $\pi\left(d \bowtie_{d.doctorid=a.doctorid} a\right)\left(\sigma_{DateTimeofapp='25\text{-}NOV\text{-}23'} a\right)$

- **Purpose:**

viewing doctors who have appointments on a certain date (searching by the date)

Display data of the nurse that takes care of a patient named 'Robert'

Statement:

select * from nurse n join patient p on n.patientid = p.patientid where p.fn='Robert'

Output:

NURSEID	FN	MN	LN	LICENSENO	DEPT_NO	SALARY	PH_NO	EMAIL	AVAILABILITY	DOCTOR_ID	LICENSE_NO	PATIENTID
2	Michael	James	Johnson	2	8	80000	9876543210	m.johnson@hospital.com	On Leave	2	2	3

FN	MN	LN	DOB	GENDER	ADDRESS	PHONENO	EMAIL	EMERGENCYCONTACT	INSURANCEINFO	MEDICATIONS
Robert	Michael	Williams	09-MAR-03	M	789 Elm St, Anytown, CA 12345	1112223333	robert.williams@email.com	8889991234	Aetna	Losartan, Aspirin

Relational Algebra:

$$\pi\left(n \underset{n.patientid=p.patientid}{\infty} p\right)\left(\sigma_{fn='Robert'}\, p\right)$$

- **Purpose:**

  viewing name of nurse that takes care of a patient (searching by the patient's first name)

Display all patients who take medication named 'Losartan'

- **Statement:**

select * from patient where medications like '%Losartan%'

- **Output:**

PATIENTID	FN	MN	LN	DOB	GENDER	ADDRESS	PHONENO	EMAIL	EMERGENCYCONTACT	INSURANCEINFO	MEDICATIONS
3	Robert	Michael	Williams	09-MAR-03	M	789 Elm St, Anytown, CA 12345	1112223333	robert.williams@email.com	8889991234	Aetna	Losartan, Aspirin
7	Michael	William	Davis	26-JAN-83	M	404 Cedar St, Anytown, CA 12345	8887776666	michael.davis@email.com	4445556666	Blue Cross Blue Shield	Omeprazole, Losartan
14	Emma	Sophia	Williams	29-NOV-79	F	678 Birch St, Anytown, CA 12345	4445556666	emma.williams@email.com	7778889999	-	Losartan

- **Relational Algebra:**

$$\pi_{\text{medication}}\left(\sigma_{\text{medications LIKE '\%Losartan\%'}}(\text{patient})\right)$$

- **Purpose:**

viewing patients who take certain medication (searching by the medication name)

Display Medical Record of a patient named 'David Jones'

Statement:

select * from medicalrecord m natural join patient p where p.fn ='David'and p.ln='Jones'

Output:

PATIENTID	ID	DOCTORID	DATEOFVISIT	DIAGNOSIS	TREATMENTPLAN	FN	MN	LN	DOB	GENDER
5	10	8	05-MAR-23	Back pain	Injections, physical therapy	David	James	Jones	04-DEC-86	M

ADDRESS	PHONENO	EMAIL	EMERGENCYCONTACT	INSURANCEINFO	MEDICATIONS
202 Pine St, Anytown, CA 12345	5556667777	david.jones@email.com	6667778888	Humana	Acetaminophen, Glipizide

Relational Algebra:

$$\pi(m * p)(\sigma_{fn='David' \text{ and } ln='Jones'} p)$$

- **Purpose:**

viewing a certain patient's medical report (searching by the patient's first and last name)

Display all patients who have insurance

- **Statement:**

select * from patient where insuranceinfo is not null

- **Output:**

PATIENTID	FN	MN	LN	DOB	GENDER	ADDRESS	PHONENO	EMAIL	EMERGENCYCONTACT	INSURANCEINFO	MEDICATIONS
1	John	David	Smith	23-MAY-80	M	123 Main St, Anytown, CA 12345	1234567890	john.smith@email.com	9876543210	Blue Cross Blue Shield	Lisinopril, Metformin
2	Mary	Elizabeth	Johnson	17-OCT-91	F	456 Oak Ave, Anytown, CA 12345	9876543210	mary.johnson@email.com	1234567890	UnitedHealthcare	Ibuprofen, Omeprazole
3	Robert	Michael	Williams	09-MAR-03	M	789 Elm St, Anytown, CA 12345	1112223333	robert.williams@email.com	8889991234	Aetna	Losartan, Aspirin
4	Patricia	Anne	Brown	22-JUL-75	F	101 Maple St, Anytown, CA 12345	4445556666	patricia.brown@email.com	7778889999	Cigna	Naproxen, Lisinopril
5	David	James	Jones	04-DEC-86	M	202 Pine St, Anytown, CA 12345	5556667777	david.jones@email.com	6667778888	Humana	Acetaminophen, Glipizide
6	Jennifer	Louise	Miller	15-JUN-99	F	303 Birch St, Anytown, CA 12345	2223334444	jennifer.miller@email.com	5551234567	Kaiser Permanente	None
7	Michael	William	Davis	26-JAN-83	M	404 Cedar St, Anytown, CA 12345	8887776666	michael.davis@email.com	4445556666	Blue Cross Blue Shield	Omeprazole, Losartan
8	Linda	Susan	Garcia	11-SEP-72	F	505 Willow St, Anytown, CA 12345	7778889999	linda.garcia@email.com	3334445555	UnitedHealthcare	Aspirin, Naproxen
9	Richard	Steven	Rodriguez	20-APR-95	M	606 Ash St, Anytown, CA 12345	6667778888	richard.rodriguez@email.com	27173921383	Aetna	Brufeen
10	Elizabeth	Catherine	Allen	29-AUG-00	F	707 Walnut St, Anytown, CA 12345	3334445555	elizabeth.allen@email.com	2223334444	Aetna	Metformin, Glipizide

- **Relational Algebra:**

$$\pi_{\text{patient}}\left(\sigma_{\text{insuranceinfo is not NULL}}\text{patient}\right)$$

- **Purpose:**

viewing patients who have insurance(you can also use null to view patients with no insurance)

Implementation Of The System:

Patient:

Creation:

create table patient(patientid number not null primary key, fn varchar2(20) not null, mn varchar2(20), ln varchar2(20) not null, dob Date not null, gender char, address varchar2(60) , phoneno number not null, email varchar2(60) , emergencycontact number not null, insuranceinfo varchar2(40), medications varchar2(60));

Insertion:

INSERT INTO patient VALUES (1, 'John', 'David', 'Smith', DATE '1980-05-23', 'M', '123 Main St, Anytown, CA 12345', 1234567890, 'john.smith@email.com', 9876543210, 'Blue Cross Blue Shield', 'Lisinopril, Metformin');

INSERT INTO patient VALUES (2, 'Mary', 'Elizabeth', 'Johnson', DATE '1991-10-17', 'F', '456 Oak Ave, Anytown, CA 12345', 9876543210, 'mary.johnson@email.com', 1234567890, 'UnitedHealthcare', 'Ibuprofen, Omeprazole');

INSERT INTO patient VALUES (3, 'Robert', 'Michael', 'Williams', DATE '2003-03-09', 'M', '789 Elm St, Anytown, CA 12345', 1112223333, 'robert.williams@email.com', 8889991234, 'Aetna', 'Losartan, Aspirin');

appointement:

- **Creation:**

```
create table appointement(appid number not null primary key, patientid number not null, doctorid number not null,
    DateTimeofapp DATE, Location varchar2(60), ReasonofApp varchar2(60), dept_no number not null);
```

- **Insertion:**

```
INSERT INTO appointement (appid, patientid, doctorid, DateTimeofapp, Location, ReasonofApp, dept_no) VALUES
(1, 5, 8, DATE '2023-11-25', 'Exam Room 3', 'Annual Checkup', 15) ;

INSERT INTO appointement (appid, patientid, doctorid, DateTimeofapp, Location, ReasonofApp, dept_no) VALUES
(2, 9, 2, DATE '2023-12-02', 'Telehealth', 'Follow-up Consultation', 12);

INSERT INTO appointement (appid, patientid, doctorid, DateTimeofapp, Location, ReasonofApp, dept_no) VALUES
(3, 4, 5, DATE '2023-12-10', 'Exam Room 2', 'Blood Pressure Check', 11);
```

Labtest:

- **Creation:**

create table labtest(id number not null primary key, patientid number not null, doctorid number not null, dateoftest Date, typeoftest varchar2(60), resultoftest varchar2(60), medicalrecordid number);

- **Insertion:**

INSERT INTO labtest VALUES (1, 11, 6, DATE '2023-12-06', 'Blood test', 'Normal results', 1);

INSERT INTO labtest VALUES (2, 12, 4, DATE '2023-11-19', 'Allergy panel', 'Positive for dust mites', 2);

INSERT INTO labtest VALUES (3, 13, 9, DATE '2023-10-26', 'Lung function test', 'Mild airway obstruction', 3);

Clinicaldept:

- **Creation:**

create table clinicaldept(id number not null primary key, name varchar2(60), location varchar2(60), typeofclinic varchar2(60), Dept_head varchar2(45), phone_no number, email varchar2(60));

- **Insertion:**

INSERT INTO clinicaldept (id, name, location, typeofclinic, Dept_head, phone_no, email) VALUES (1, 'General Medicine', 'Main Building, Floor 2', 'Outpatient', 'Dr. Ahmed Mohamed', 0102345678, 'ahmed.mohamed@gmail.com');

INSERT INTO clinicaldept (id, name, location, typeofclinic, Dept_head, phone_no, email) VALUES (2, 'Pediatrics', 'West Wing, Floor 3', 'Inpatient', 'Dr. Sarah Samir', 0119876543, 'sarah.samir@hotmail.com');

INSERT INTO clinicaldept (id, name, location, typeofclinic, Dept_head, phone_no, email) VALUES (3, 'Cardiology', 'East Wing, Floor 5', 'Outpatient', 'Dr. Omar Hassan', 0123579102, 'omar.hassan@yahoo.com');

Receptionist:

Creation:

create table receptionist(id number not null primary key, fn varchar2(20), mn varchar2(20), ln varchar2(20), gender char, address varchar2(60), ph_no number, email varchar2(60));

Insertion:

INSERT INTO receptionist (id, fn, mn, ln, gender, address, ph_no, email) VALUES (1, 'Ahmed', 'Sayed', 'Ali', 'M', '123 Main Street, Cairo', 0101234567, 'ahmed.ali@gmail.com');

INSERT INTO receptionist (id, fn, mn, ln, gender, address, ph_no, email) VALUES (2, 'Mariam', 'Ahmed', 'Hassan', 'F', '456 Elm Street, Giza', 0119876543, 'mariam.hassan@hotmail.com');

INSERT INTO receptionist (id, fn, mn, ln, gender, address, ph_no, email) VALUES (3, 'Omar', 'Mohamed', 'Ibrahim', 'M', '789 Park Avenue, Alexandria', 0125648972, 'omar.ibrahim@yahoo.com');

Insurance:

- **Creation:**

create table insurance(id number not null primary key, fn varchar2(20) not null, ln varchar2(20) not null, ph_no number, email varchar2(60), coveragedetails varchar2(80), patientid number);

- **Insertion:**

INSERT INTO insurance VALUES (1, 'Blue', 'Cross', 18004141845, 'customerservice@bcbs.com', '80% coverage for doctor visits, 70% for prescriptions, $2000 deductible', 1);

INSERT INTO insurance VALUES (2, 'UnitedHealthcare', 'Customer Service', 18669964546, 'customerservice@uhc.com', '75% coverage for doctor visits, 80% for prescriptions, $1500 deductible', 2);

INSERT INTO insurance VALUES (3, 'Aetna', 'Customer Service', 18008723862, 'customerservice@aetna.com', '60% coverage for doctor visits, 85% for prescriptions, $3000 deductible', 3);

Medication:

Creation:

create table medication(id number not null primary key, name varchar2(40) not null, dosage number not null, frequency number not null, purpose varchar2(20), sideeffecs varchar2(60));

Insertion:

INSERT INTO medication VALUES (2, 'Ibuprofen', 200, 3, 'Pain relief, inflammation reduction', 'Upset stomach, heartburn, dizziness');

INSERT INTO medication VALUES (3, 'Aspirin', 325, 2, 'Pain relief, fever reduction', 'Upset stomach, heartburn, bleeding');

INSERT INTO medication VALUES (21, 'Amoxicillin', 500, 3, 'Antibiotic for bacterial infections', 'Diarrhea, nausea, rash');

Medicalrecord:

- **Creation:**

create table medicalrecord(id number not null primary key, doctorid number not null, dateofvisit Date, diagnosis varchar2(60), treatmentplan varchar2(100), patientid number);

- **Insertion:**

INSERT INTO medicalrecord VALUES (1, 11, 6, DATE '2023-12-05', 'Sinus infection', 'Antibiotics, decongestants', 11);

INSERT INTO medicalrecord VALUES (2, 12, 4, DATE '2023-11-18', 'Allergic reaction', 'Antihistamines, steroids', 12);

INSERT INTO medicalrecord VALUES (3, 13, 9, DATE '2023-10-25', 'Asthma', 'Inhaler, allergy medication', 13);

Nurse:

Creation:

create table nurse(nurseid number not null primary key, fn varchar2(20) not null, mn varchar2(20) not null, ln varchar2(20) not null, licenseno number not null, dept_no number not null, salary number, ph_no number, email varchar2(60), availability varchar2(10), doctor_id number, license_no number, patientid number);

Insertion:

INSERT INTO nurse VALUES (1, 'Emily', 'Anne', 'Smith', 1, 4, 75000, 1234567890, 'e.smith@hospital.com', 'Available', 5, 1, 8);

INSERT INTO nurse VALUES (2, 'Michael', 'James', 'Johnson', 2, 8, 80000, 9876543210, 'm.johnson@hospital.com', 'On Leave', 2, 2, 3);

INSERT INTO nurse VALUES (3, 'Maria', 'Isabella', 'Rodriguez', 3, 6, 68000, 1112223333, 'm.rodriguez@hospital.com', 'Available', 3, 3, 15);

Doctor:

- **Creation:**

create table doctor(doctorid number not null primary key, fn varchar2(20) not null, mn varchar2(20) not null, ln varchar2(20) not null, speciality varchar2(20) not null, License_no number, salary number, ph_no number not null, email varchar2(60), emergencycontact number, clinicalid number)

- **Insertion:**

INSERT INTO doctor VALUES (1, 'John', 'David', 'Smith', 'Cardiology', 123456, 150000, 1234567890, 'john.smith@email.com', 9876543210, 1);

INSERT INTO doctor VALUES (2, 'Jane', 'Marie', 'Doe', 'Pediatrics', 654321, 120000, 9876543210, 'jane.doe@email.com', 1234567890, 2);

INSERT INTO doctor VALUES (3, 'Peter', 'James', 'Johnson', 'Oncology', 987654, 180000, 5551234567, 'peter.johnson@email.com', 8889991234, 3);

Implementation Of System Relations:

Attends Patient Appointement:

- **Creation:**

```
create table attends_pt_app(
    patientid number not null references patient(patientid),
    appid number not null references appointement(appid),
    PRIMARY KEY(patientid, appid)
)
```

- **Insertion:**

```
INSERT INTO attends_pt_app VALUES (1, 1);

INSERT INTO attends_pt_app VALUES (2, 2);

INSERT INTO attends_pt_app VALUES (3, 3);
```

Attends Doctor Appointement:

- **Creation:**

```
create table attends_dr_app(
    doctorid number not null references doctor(doctorid),
    licenseno number not null references medicalrecord(id),
    appid number not null references appointement(appid),
    PRIMARY KEY(doctorid, licenseno, appid))
)
```

- **Insertion:**

```
INSERT INTO treats VALUES (1, 2, 2);

INSERT INTO treats VALUES (2, 5, 5);

INSERT INTO treats VALUES (3, 1, 1);
```

Treats:

- **Creation:**

```
create table treats(
    patientid number not null references patient(patientid),
    licenseno number not null references medicalrecord(id),
    doctorid number not null references doctor(doctorid),
    PRIMARY KEY(doctorid, licenseno, patientid)
)
```

Insertion:

```
INSERT INTO treats VALUES (1, 2, 2);

INSERT INTO treats VALUES (2, 5, 5);

INSERT INTO treats VALUES (3, 1, 1);
```

Takes:

- **Creation:**

```
create table takes(
    patientid number not null references patient(patientid),
    medicationid number not null references medication(id),
    PRIMARY KEY(medicationid, patientid)
)
```

- **Insertion:**

```
INSERT INTO takes VALUES (12, 20);

INSERT INTO takes VALUES (13, 6);

INSERT INTO takes VALUES (13, 14);
```

Gives:

- **Creation:**

```
create table gives(
    nurseid number not null references nurse(nurseid),
    medicationid number not null references medication(id),
    PRIMARY KEY(medicationid, nurseid)
)
```

Insertion:

```
INSERT INTO gives VALUES (8, 22);

INSERT INTO gives VALUES (9, 17);

INSERT INTO gives VALUES (9, 26);
```

Checks Nurse Medical Record:

- **Creation:**

```
create table checks_nr_mr(
    nurseid number not null references nurse(nurseid),
    medicalrecordid number not null references medicalrecord(id),
    PRIMARY KEY(medicalrecordid, nurseid)
)
```

- **Insertion:**

```
INSERT INTO checks_nr_mr VALUES (1, 1);

INSERT INTO checks_nr_mr VALUES (2, 2);

INSERT INTO checks_nr_mr VALUES (3, 3);
```

Checks Medical Record Doctor:

- **Creation:**

```
create table checks_mr_dr(
    doctorid number not null references doctor(doctorid),
    medicalrecordid number not null references medicalrecord(id),
    insuranceid number not null references insurance(id),
    PRIMARY KEY(medicalrecordid, doctorid, insuranceid)
)
```

Insertion:

```
INSERT INTO checks_mr_dr VALUES (5, 10, 4);

INSERT INTO checks_mr_dr VALUES (6, 2, 2);

INSERT INTO checks_mr_dr VALUES (6, 8, 3);
```

Schedules:

- **Creation:**

```
create table schedules(
    appid number not null references appointement(appid),
    receptionistid number not null references receptionist(id),
    PRIMARY KEY(appid, receptionistid)
)
```

- **Insertion:**

```
INSERT INTO schedules VALUES (5, 2);

INSERT INTO schedules VALUES (6, 1);

INSERT INTO schedules VALUES (10, 1);
```

Validates:

- **Creation:**

```
create table validates(
    receptionistid number not null references receptionist(id),
    insuranceid number not null references insurance(id),
    PRIMARY KEY(insuranceid, receptionistid)
)
```

Insertion:

```
INSERT INTO validates VALUES (8, 8);

INSERT INTO validates VALUES (9, 4);

INSERT INTO validates VALUES (2, 5);
```