# **Database Project**

**Student Last Name: Hao First Name: Zhang**

# **Overview**

A database will be created for a medical clinic to manage the appointments of patients, the visits and bills as well as managing the ways of payments.

# **Purpose and Objective**

The database will help the medical clinic manage the appointments from their patients, as well as their bills. For every patient, the information about name, age, gender, address, phone number and insurance information will be stored in the database. And the information of doctor will be stored either. A patient can make many appointments with one or more doctors in the clinic, and a doctor can accept appointments with many patients. However, each appointment is made with only one doctor and one patient. So, for an appointment, the name of patient, the name of doctor and visit time will be stored. If it is an emergency, the appointment time will be “unscheduled”.

If kept, an appointment yields a visit. The visit yields a diagnosis. Each visit will be stored in patients’ medical history. For medical history, information about patient name, diagnosis and date will be stored.

Each patient visit creates a bill. For a bill, information about doctor, patient, amount, payment and the deductible will be stored. And if patient has an insurance company to pay the bill, the deductible will be submitted to the payment.

## Diagram Tool

Oracle SQL Data Modeler will be used to create diagrams such as Data Flow Diagrams and Entity Relationship Diagrams.

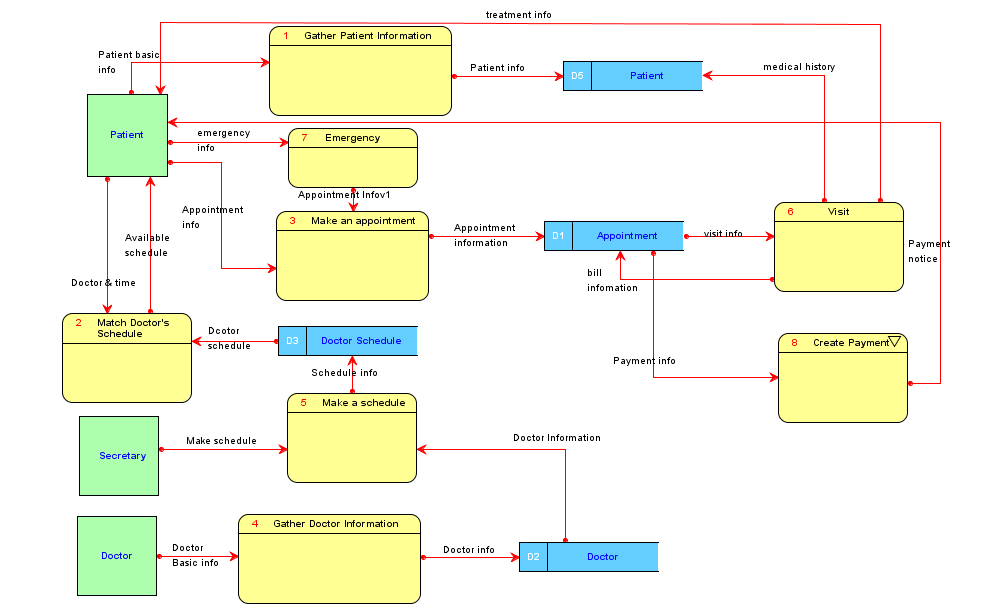
## Database

Oracle 11g will be used to create the database. Oracle SQL Developer will be used to access the database.

## Hardware and Software

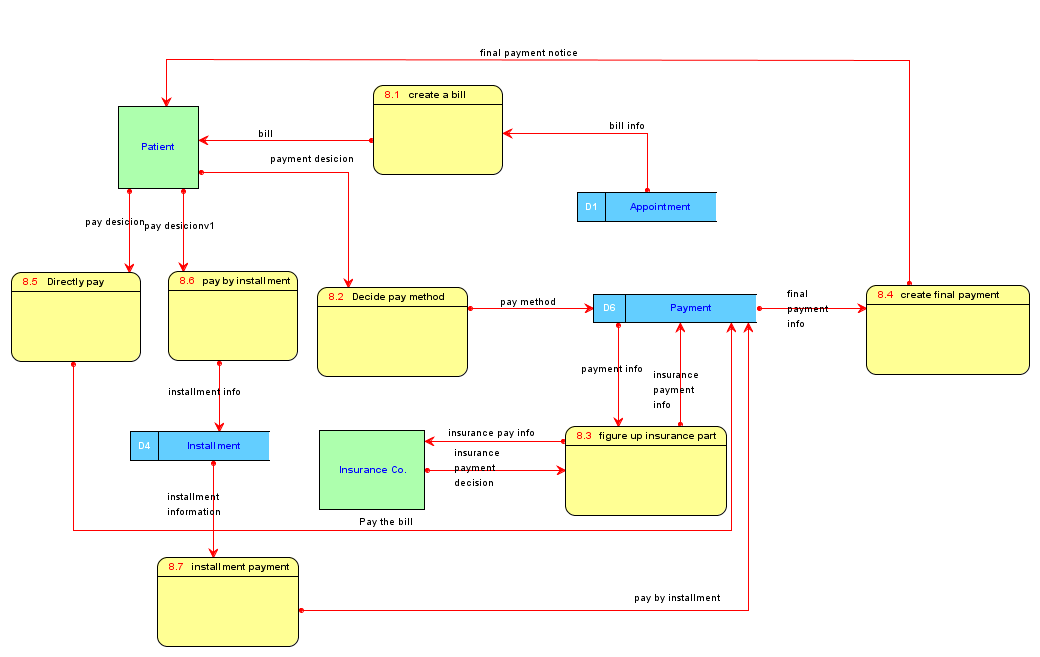
The database will be hosted on a Linux server at The George Washington University. SQL Developer will be used to access the database. For offsite access, the server will be accessed using https://vpn.gwu.edu.

**The DFD:**



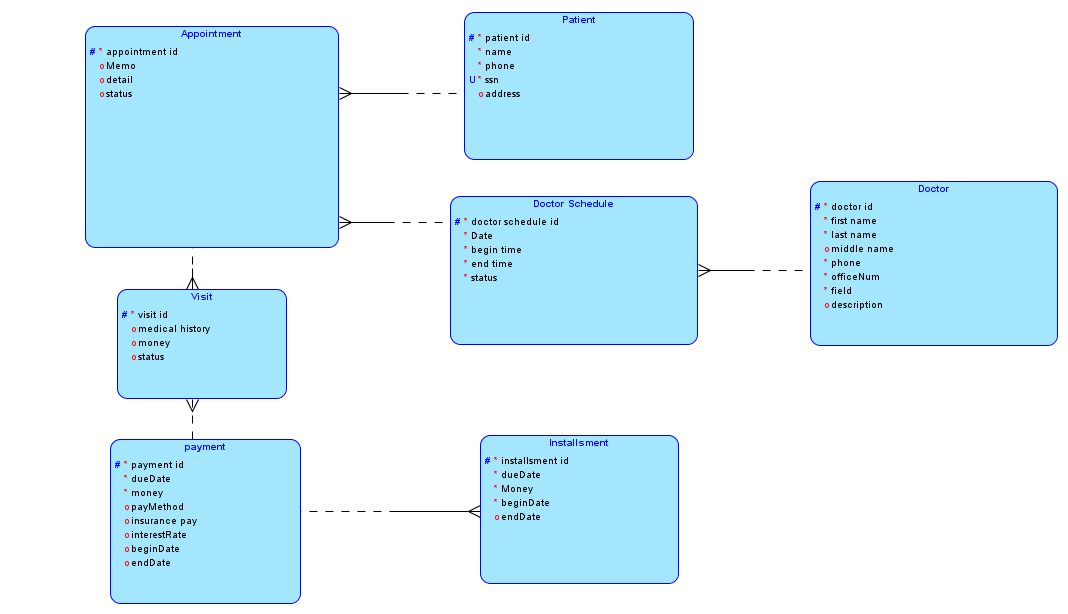
*Figure 1*: Data Flow Diagram of Clinic

**The DFD of Process “Create Payment”:**



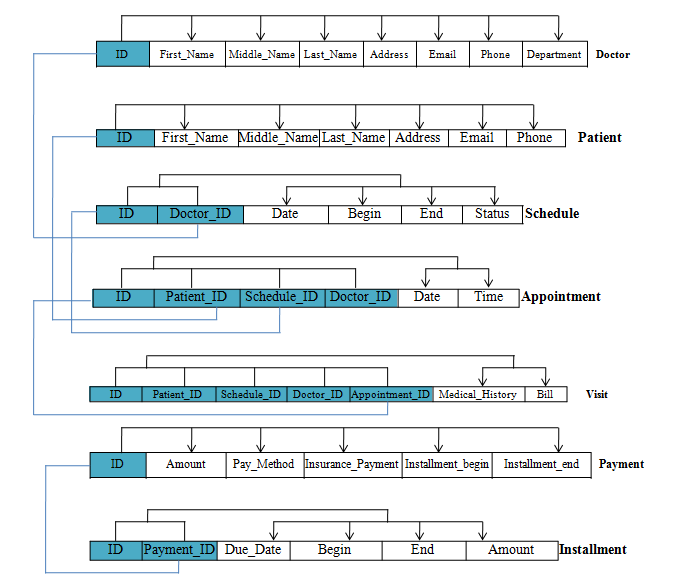
*Figure 2*: Data Flow Diagram of Create Payment

**The ERD:**



*Figure 3*: Entity-Relation Diagram

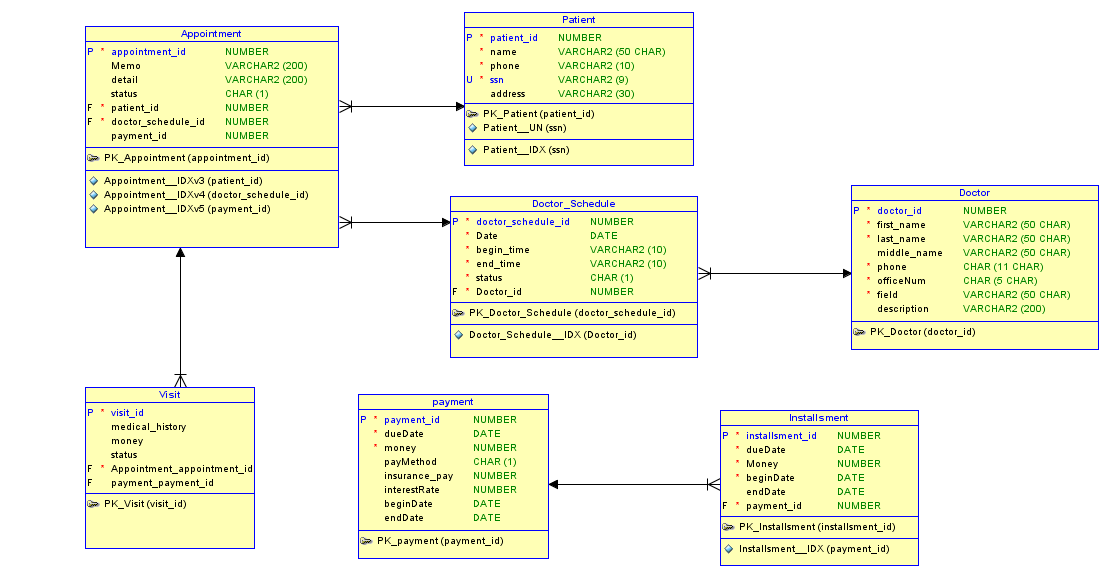
**The Dependency Diagram:**

****

*Figure 4*: Dependency Diagram

The dependency diagram shows how attributes are dependent on the primary keys. The attributes are dependent on the primacy keys, and the transitive dependencies have been removed.

**The Relational Diagram:**



*Figure 5*: Relational Diagram

Oracle Data Modeler generated the relationship diagram after the entities have been created. The relationship diagram transited from the entity relationship diagram. The difference with the relationship diagram is it also displays primary keys, unique attributes, and foreign keys as they are created in the database. The crows-feet notations in the relationship arrow denote that the table with the crows-feet has a foreign key to the table at the other end of the relationship.

**Normalization:**

All tables were designed originally with 3rd Normal Form and BCNF Normal Form in mind. These normalization rules are enforced in all tables. According to *Database Systems: Design, Implementation, and Management,* there rules are:

1. All of key attributes are defined.
2. There are no repeating groups in the table.
3. All attributes are dependent on the primary key.
4. It includes no partial dependencies.
5. It contains no transitive dependencies.

**Physical Design Process**

**Tables**

1. Doctor
2. Patient
3. Doctor Schedule
4. Appointment
5. Visit
6. Payment
7. Installsment

**Constraints**

1. Doctor:
   1. Primary Key(doctor\_id)
2. Patient:
   1. Primary Key(patient\_id)
   2. UNIQUE(ssn)
3. Doctor\_Schedule
   1. Primary Key(doctor\_schedule\_id)
   2. Foreign Key(doctor\_id)
4. Appointment
   1. Primary Key(appointment\_id)
   2. Foreign Key(patient\_id)
   3. Foreign Key(doctor\_schedule\_id)
5. Visit
   1. Primary Key(visit\_id)
   2. Foreign Key(appointment\_id)
   3. Foreign Key(payment\_id)
6. Payment
   1. Primary Key(payment\_id)
7. Installsment
   1. Primary Key(installsment\_id)
   2. Foreign Key(payment\_id)

**Indexes**

1. Appointment

Index for doctor\_ schedule\_id, patient\_ID.

1. Patient

Index for ssn

1. Doctor\_Schedule

Index for doctor\_id

1. Installsment

Index for payment\_id

**Data Definition Language (DDL)**

**Create tables, sequences and triggers**

CREATE TABLE Appointment

(

appointment\_id NUMBER NOT NULL ,

Memo VARCHAR2 (200) ,

detail VARCHAR2 (200) ,

status CHAR (1) ,

patient\_id NUMBER NOT NULL ,

doctor\_schedule\_id NUMBER NOT NULL

) ;

CREATE INDEX Appointment\_\_IDXv3 ON Appointment

( patient\_id ASC

) ;

CREATE INDEX Appointment\_\_IDXv4 ON Appointment

( doctor\_schedule\_id ASC

) ;

ALTER TABLE Appointment ADD CONSTRAINT PK\_Appointment PRIMARY KEY

(

appointment\_id

)

;

CREATE TABLE Doctor

(

doctor\_id NUMBER NOT NULL ,

first\_name VARCHAR2 (50 CHAR) NOT NULL ,

last\_name VARCHAR2 (50 CHAR) NOT NULL ,

middle\_name VARCHAR2 (50 CHAR) ,

phone CHAR (11 CHAR) NOT NULL ,

officeNum CHAR (5 CHAR) NOT NULL ,

field VARCHAR2 (50 CHAR) NOT NULL ,

description VARCHAR2 (200)

) ;

ALTER TABLE Doctor ADD CONSTRAINT PK\_Doctor PRIMARY KEY

(

doctor\_id

)

;

CREATE TABLE Doctor\_Schedule

(

doctor\_schedule\_id NUMBER NOT NULL ,

"Date" DATE NOT NULL ,

begin\_time VARCHAR2 (10) NOT NULL ,

end\_time VARCHAR2 (10) NOT NULL ,

status CHAR (1) NOT NULL ,

Doctor\_id NUMBER NOT NULL

) ;

CREATE INDEX Doctor\_Schedule\_\_IDX ON Doctor\_Schedule

( Doctor\_id ASC

) ;

ALTER TABLE Doctor\_Schedule ADD CONSTRAINT PK\_Doctor\_Schedule PRIMARY KEY

(

doctor\_schedule\_id

)

;

CREATE TABLE Installsment

(

installsment\_id NUMBER NOT NULL ,

dueDate DATE NOT NULL ,

Money NUMBER NOT NULL ,

beginDate DATE NOT NULL ,

endDate DATE ,

payment\_id NUMBER NOT NULL

) ;

CREATE INDEX Installsment\_\_IDX ON Installsment

( payment\_id ASC

) ;

ALTER TABLE Installsment ADD CONSTRAINT PK\_Installsment PRIMARY KEY

(

installsment\_id

)

;

CREATE TABLE Patient

(

patient\_id NUMBER NOT NULL ,

name VARCHAR2 (50 CHAR) NOT NULL ,

phone VARCHAR2 (10) NOT NULL ,

ssn VARCHAR2 (9) NOT NULL ,

address VARCHAR2 (30)

) ;

ALTER TABLE Patient ADD CONSTRAINT CK\_Patientv1 CHECK

(

LENGTH(PHONE) = 10 AND regexp\_like(PHONE, '^[[:digit:]]{10}$')

)

;

ALTER TABLE Patient ADD CONSTRAINT CK\_Patient CHECK

(

LENGTH(SSN) = 9 AND regexp\_like(SSN, '^[[:digit:]]{9}$')

)

;

CREATE UNIQUE INDEX Patient\_\_IDX ON Patient

(

ssn ASC

)

;

ALTER TABLE Patient ADD CONSTRAINT PK\_Patient PRIMARY KEY

(

patient\_id

)

;

ALTER TABLE Patient ADD CONSTRAINT Patient\_\_UN UNIQUE

(

ssn

)

;

CREATE TABLE Visit

(

visit\_id NUMBER NOT NULL ,

medical\_history VARCHAR2 (200) ,

money NUMBER ,

status NUMBER ,

Appointment\_appointment\_id NUMBER NOT NULL ,

payment\_payment\_id NUMBER

) ;

ALTER TABLE Visit ADD CONSTRAINT PK\_Visit PRIMARY KEY

(

visit\_id

)

;

CREATE TABLE payment

(

payment\_id NUMBER NOT NULL ,

dueDate DATE NOT NULL ,

money NUMBER NOT NULL ,

payMethod CHAR (1) ,

insurance\_pay NUMBER ,

interestRate NUMBER ,

beginDate DATE ,

endDate DATE

) ;

ALTER TABLE payment ADD CONSTRAINT PK\_payment PRIMARY KEY

(

payment\_id

)

;

ALTER TABLE Appointment ADD CONSTRAINT FK\_Appointment\_Doctor\_Schedule FOREIGN KEY ( doctor\_schedule\_id ) REFERENCES Doctor\_Schedule ( doctor\_schedule\_id ) ;

ALTER TABLE Appointment ADD CONSTRAINT FK\_Appointment\_Patient FOREIGN KEY ( patient\_id ) REFERENCES Patient ( patient\_id ) ;

ALTER TABLE Doctor\_Schedule ADD CONSTRAINT FK\_Doctor\_Schedule\_Doctor FOREIGN KEY ( Doctor\_id ) REFERENCES Doctor ( doctor\_id ) ;

ALTER TABLE Installsment ADD CONSTRAINT FK\_Installsment\_payment FOREIGN KEY ( payment\_id ) REFERENCES payment ( payment\_id ) ;

ALTER TABLE Visit ADD CONSTRAINT FK\_Visit\_Appointment FOREIGN KEY ( Appointment\_appointment\_id ) REFERENCES Appointment ( appointment\_id ) ;

ALTER TABLE Visit ADD CONSTRAINT FK\_Visit\_payment FOREIGN KEY ( payment\_payment\_id ) REFERENCES payment ( payment\_id ) ;

CREATE SEQUENCE APPOINTMENT\_ID\_SEQ START WITH 1 NOCACHE ORDER ;

CREATE OR REPLACE TRIGGER APPOINTMENT\_ID\_TRG BEFORE

INSERT ON Appointment FOR EACH ROW WHEN (NEW.appointment\_id IS NULL) BEGIN

SELECT APPOINTMENT\_ID\_SEQ.NEXTVAL

INTO :NEW.appointment\_id

FROM DUAL;

END;

/

CREATE SEQUENCE DOCTOR\_ID\_SEQ START WITH 1 NOCACHE ORDER ;

CREATE OR REPLACE TRIGGER DOCTOR\_ID\_TRG BEFORE

INSERT ON Doctor FOR EACH ROW WHEN (NEW.doctor\_id IS NULL) BEGIN

SELECT DOCTOR\_ID\_SEQ.NEXTVAL INTO :NEW.doctor\_id FROM DUAL;

END;

/

CREATE SEQUENCE DOCTOR\_SCHEDULE\_ID\_SEQ START WITH 1 NOCACHE ORDER ;

CREATE OR REPLACE TRIGGER DOCTOR\_SCHEDULE\_ID\_TRG BEFORE

INSERT ON Doctor\_Schedule FOR EACH ROW WHEN (NEW.doctor\_schedule\_id IS NULL) BEGIN

SELECT DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL

INTO :NEW.doctor\_schedule\_id

FROM DUAL;

END;

/

CREATE SEQUENCE INSTALLSMENT\_ID\_SEQ START WITH 1 NOCACHE ORDER ;

CREATE OR REPLACE TRIGGER INSTALLSMENT\_ID\_TRG BEFORE

INSERT ON Installsment FOR EACH ROW WHEN (NEW.installsment\_id IS NULL) BEGIN

SELECT INSTALLSMENT\_ID\_SEQ.NEXTVAL

INTO :NEW.installsment\_id

FROM DUAL;

END;

/

CREATE SEQUENCE PATIENT\_ID\_SEQ START WITH 1 NOCACHE ORDER ;

CREATE OR REPLACE TRIGGER PATIENT\_ID\_TRG BEFORE

INSERT ON Patient FOR EACH ROW WHEN (NEW.patient\_id IS NULL) BEGIN

SELECT PATIENT\_ID\_SEQ.NEXTVAL INTO :NEW.patient\_id FROM DUAL;

END;

/

CREATE SEQUENCE VISIT\_ID\_SEQ START WITH 1 NOCACHE ORDER ;

CREATE OR REPLACE TRIGGER VISIT \_ID\_TRG BEFORE

INSERT ON Visit FOR EACH ROW WHEN (NEW.visit \_id IS NULL) BEGIN

SELECT APPOINTMENT\_ID\_SEQ.NEXTVAL

INTO :NEW. visit \_id

FROM DUAL;

END;

/

CREATE SEQUENCE PAYMENT\_ID\_SEQ START WITH 1 NOCACHE ORDER ;

CREATE OR REPLACE TRIGGER PAYMENT\_ID\_TRG BEFORE

INSERT ON payment FOR EACH ROW WHEN (NEW.payment\_id IS NULL) BEGIN

SELECT PAYMENT\_ID\_SEQ.NEXTVAL INTO :NEW.payment\_id FROM DUAL;

END;

**Insert Data**

INSERT INTO DOCTOR (DOCTOR\_ID,FIRST\_NAME, LAST\_NAME, PHONE, OFFICENUM, FIELD, DESCRIPTION) VALUES (DOCTOR\_ID\_SEQ.NEXTVAL,'Hao', 'Zhang', '5712163655', '2', 'physical', 'nice');

INSERT INTO DOCTOR (DOCTOR\_ID,FIRST\_NAME, LAST\_NAME, PHONE, OFFICENUM, FIELD, DESCRIPTION) VALUES (DOCTOR\_ID\_SEQ.NEXTVAL,'Hao', 'Zhang', '5712163655', '3', 'heart', 'nice');

INSERT INTO DOCTOR (DOCTOR\_ID,FIRST\_NAME, LAST\_NAME, PHONE, OFFICENUM, FIELD, DESCRIPTION) VALUES (DOCTOR\_ID\_SEQ.NEXTVAL,'Hao1', 'Zhang', '5712163655', '4', 'brain', 'nice');

INSERT INTO DOCTOR (DOCTOR\_ID,FIRST\_NAME, LAST\_NAME, PHONE, OFFICENUM, FIELD, DESCRIPTION) VALUES (DOCTOR\_ID\_SEQ.NEXTVAL,'Hao2', 'Zhang', '5712163655', '5', 'nose', 'nice');

INSERT INTO DOCTOR (DOCTOR\_ID,FIRST\_NAME, LAST\_NAME, PHONE, OFFICENUM, FIELD, DESCRIPTION) VALUES (DOCTOR\_ID\_SEQ.NEXTVAL,'Hao3', 'Zhang', '5712163655', '6', 'eye', 'nice');

INSERT INTO DOCTOR (DOCTOR\_ID,FIRST\_NAME, LAST\_NAME, PHONE, OFFICENUM, FIELD, DESCRIPTION) VALUES (DOCTOR\_ID\_SEQ.NEXTVAL,'Hao4', 'Zhang', '5712163655', '7', 'ear', 'nice');

INSERT INTO DOCTOR (DOCTOR\_ID,FIRST\_NAME, LAST\_NAME, PHONE, OFFICENUM, FIELD, DESCRIPTION) VALUES (DOCTOR\_ID\_SEQ.NEXTVAL,'Hao5', 'Zhang', '5712163655', '8', 'mouse', 'nice');

INSERT INTO DOCTOR (DOCTOR\_ID,FIRST\_NAME, LAST\_NAME, PHONE, OFFICENUM, FIELD, DESCRIPTION) VALUES (DOCTOR\_ID\_SEQ.NEXTVAL,'Hao6', 'Zhang', '5712163655', '9', 'face', 'nice');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('14-NOV-13', 'DD-MON-RR'), '8am', '9am', '0', '1');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('14-NOV-13', 'DD-MON-RR'), '9am', '10am', '0', '1');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('14-NOV-13', 'DD-MON-RR'), '10am', '11am', '0', '1');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('14-NOV-13', 'DD-MON-RR'), '1pm', '2pm', '0', '1');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('15-NOV-13', 'DD-MON-RR'), '8am', '9am', '0', '2');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('15-NOV-13', 'DD-MON-RR'), '9am', '10am', '0', '2');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('15-NOV-13', 'DD-MON-RR'), '10am', '11am', '0', '2');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('15-NOV-13', 'DD-MON-RR'), '1pm', '2pm', '0', '2');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('14-NOV-13', 'DD-MON-RR'), '8am', '9am', '0', '3');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('14-NOV-13', 'DD-MON-RR'), '9am', '10am', '0', '3');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('14-NOV-13', 'DD-MON-RR'), '10am', '11am', '0', '3');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('14-NOV-13', 'DD-MON-RR'), '1pm', '2pm', '0', '3');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('15-NOV-13', 'DD-MON-RR'), '8am', '9am', '0', '4');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('15-NOV-13', 'DD-MON-RR'), '9am', '10am', '0', '4');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('15-NOV-13', 'DD-MON-RR'), '10am', '11am', '0', '4');

INSERT INTO DOCTOR\_SCHEDULE (DOCTOR\_SCHEDULE\_ID,"Date", BEGIN\_TIME, END\_TIME, STATUS, DOCTOR\_ID) VALUES (DOCTOR\_SCHEDULE\_ID\_SEQ.NEXTVAL,TO\_DATE('15-NOV-13', 'DD-MON-RR'), '1pm', '2pm', '0', '4');

INSERT INTO PATIENT (PATIENT\_ID,NAME, PHONE, SSN, ADDRESS) VALUES (PATIENT\_ID\_SEQ.NEXTVAL,'A', '5712163655', '111222333', '1900');

INSERT INTO PATIENT (PATIENT\_ID,NAME, PHONE, SSN, ADDRESS) VALUES (PATIENT\_ID\_SEQ.NEXTVAL,'B', '5712163655', '111222334', '1900');

INSERT INTO PATIENT (PATIENT\_ID,NAME, PHONE, SSN, ADDRESS) VALUES (PATIENT\_ID\_SEQ.NEXTVAL,'C', '5712163655', '111222335', '1900');

INSERT INTO PATIENT (PATIENT\_ID,NAME, PHONE, SSN, ADDRESS) VALUES (PATIENT\_ID\_SEQ.NEXTVAL,'D', '5712163655', '111222336', '1900');

INSERT INTO PATIENT (PATIENT\_ID,NAME, PHONE, SSN, ADDRESS) VALUES (PATIENT\_ID\_SEQ.NEXTVAL,'E', '5712163655', '111222337', '1900');

INSERT INTO PATIENT (PATIENT\_ID,NAME, PHONE, SSN, ADDRESS) VALUES (PATIENT\_ID\_SEQ.NEXTVAL,'F', '5712163655', '111222338', '1900');

INSERT INTO PATIENT (PATIENT\_ID,NAME, PHONE, SSN, ADDRESS) VALUES (PATIENT\_ID\_SEQ.NEXTVAL,'G', '5712163655', '111222339', '1900');

INSERT INTO PAYMENT (PAYMENT\_ID,DUEDATE, MONEY, PAYMETHOD, INSURANCE\_PAY, INTERESTRATE, BEGINDATE, ENDDATE) VALUES (PAYMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('30-NOV-13', 'DD-MON-RR'), '60000', '0', '30000', '5', TO\_DATE('14-NOV-13', 'DD-MON-RR'), TO\_DATE('20-NOV-13', 'DD-MON-RR'));

INSERT INTO PAYMENT (PAYMENT\_ID,DUEDATE, MONEY, PAYMETHOD, INSURANCE\_PAY, INTERESTRATE, BEGINDATE, ENDDATE) VALUES (PAYMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('30-NOV-13', 'DD-MON-RR'), '50000', '0', '20000', '4', TO\_DATE('14-NOV-13', 'DD-MON-RR'), TO\_DATE('20-NOV-13', 'DD-MON-RR'));

INSERT INTO PAYMENT (PAYMENT\_ID,DUEDATE, MONEY, PAYMETHOD, INSURANCE\_PAY, INTERESTRATE, BEGINDATE, ENDDATE) VALUES (PAYMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('30-NOV-13', 'DD-MON-RR'), '40000', '0', '10000', '3', TO\_DATE('14-NOV-13', 'DD-MON-RR'), TO\_DATE('20-NOV-13', 'DD-MON-RR'));

INSERT INTO PAYMENT (PAYMENT\_ID,DUEDATE, MONEY, PAYMETHOD, INSURANCE\_PAY, INTERESTRATE, BEGINDATE, ENDDATE) VALUES (PAYMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('30-NOV-13', 'DD-MON-RR'), '30000', '0', '15000', '2', TO\_DATE('14-NOV-13', 'DD-MON-RR'), TO\_DATE('20-NOV-13', 'DD-MON-RR'));

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', '20', 'a,b,c', '0', '1', '1', '1');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '1', '2', '1');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '1', '3', '1');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '1', '4', '1');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '2', '5', '2');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '2', '6', '2');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '2', '7', '2');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '2', '8', '2');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '3', '9', '3');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '3', '10', '3');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '3', '11', '3');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '3', '12', '3');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '4', '13', '4');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '4', '14', '4');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '4', '15', '4');

INSERT INTO APPOINTMENT (APPOINTMENT\_ID,MEMO, DETAIL, STATUS, PATIENT\_ID, DOCTOR\_SCHEDULE\_ID, PAYMENT\_ID) VALUES (APPOINTMENT\_ID\_SEQ.NEXTVAL,'hurry', 'a,b,c', '0', '4', '16', '4');

INSERT INTO INSTALLSMENT (INSTALLSMENT\_ID, DUEDATE, MONEY, BEGINDATE, PAYMENT\_ID) VALUES (INSTALLSMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('14-DEC-13', 'DD-MON-RR'), '2500', TO\_DATE('14-NOV-13', 'DD-MON-RR'), '2');

INSERT INTO INSTALLSMENT (INSTALLSMENT\_ID,DUEDATE, MONEY, BEGINDATE, PAYMENT\_ID) VALUES (INSTALLSMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('14-JAN-13', 'DD-MON-RR'), '2500', TO\_DATE('14-NOV-13', 'DD-MON-RR'), '2');

INSERT INTO INSTALLSMENT (INSTALLSMENT\_ID,DUEDATE, MONEY, BEGINDATE, PAYMENT\_ID) VALUES (INSTALLSMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('14-FEB-13', 'DD-MON-RR'), '2500', TO\_DATE('14-NOV-13', 'DD-MON-RR'), '2');

INSERT INTO INSTALLSMENT (INSTALLSMENT\_ID,DUEDATE, MONEY, BEGINDATE, PAYMENT\_ID) VALUES (INSTALLSMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('14-MAR-13', 'DD-MON-RR'), '2500', TO\_DATE('14-NOV-13', 'DD-MON-RR'), '2');

INSERT INTO INSTALLSMENT (INSTALLSMENT\_ID,DUEDATE, MONEY, BEGINDATE, PAYMENT\_ID) VALUES (INSTALLSMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('14-DEC-13', 'DD-MON-RR'), '2500', TO\_DATE('14-NOV-13', 'DD-MON-RR'), '3');

INSERT INTO INSTALLSMENT (INSTALLSMENT\_ID,DUEDATE, MONEY, BEGINDATE, PAYMENT\_ID) VALUES (INSTALLSMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('14-JAN-13', 'DD-MON-RR'), '2500', TO\_DATE('14-NOV-13', 'DD-MON-RR'), '3');

INSERT INTO INSTALLSMENT (INSTALLSMENT\_ID,DUEDATE, MONEY, BEGINDATE, PAYMENT\_ID) VALUES (INSTALLSMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('14-FEB-13', 'DD-MON-RR'), '2500', TO\_DATE('14-NOV-13', 'DD-MON-RR'), '3');

INSERT INTO INSTALLSMENT (INSTALLSMENT\_ID,DUEDATE, MONEY, BEGINDATE, PAYMENT\_ID) VALUES (INSTALLSMENT\_ID\_SEQ.NEXTVAL,TO\_DATE('14-MAR-13', 'DD-MON-RR'), '2500', TO\_DATE('14-NOV-13', 'DD-MON-RR'), '3');

INSERT INTO VISIT (VISIT\_ID, MEDICAL\_HISTORY, MONEY, STATUS, APPOINTMENT\_ID, PAYMENT\_ID) VALUES (VISIT\_ID\_SEQ.NEXTVAL, '1 PILL A', '30', '1', '1', '1');

INSERT INTO VISIT (VISIT\_ID, MEDICAL\_HISTORY, MONEY, STATUS, APPOINTMENT\_ID, PAYMENT\_ID) VALUES (VISIT\_ID\_SEQ.NEXTVAL, '1 PILL A', '30', '1', '2', '2');

INSERT INTO VISIT (VISIT\_ID, MEDICAL\_HISTORY, MONEY, STATUS, APPOINTMENT\_ID, PAYMENT\_ID) VALUES (VISIT\_ID\_SEQ.NEXTVAL, '1 PILL A', '30', '1', '3', '3');

INSERT INTO VISIT (VISIT\_ID, MEDICAL\_HISTORY, MONEY, STATUS, APPOINTMENT\_ID, PAYMENT\_ID) VALUES (VISIT\_ID\_SEQ.NEXTVAL, '1 PILL A', '30', '1', '4', '4');

INSERT INTO VISIT (VISIT\_ID, MEDICAL\_HISTORY, MONEY, STATUS, APPOINTMENT\_ID, PAYMENT\_ID) VALUES (VISIT\_ID\_SEQ.NEXTVAL, '1 PILL A', '30', '1', '5', '5');

INSERT INTO VISIT (VISIT\_ID, MEDICAL\_HISTORY, MONEY, STATUS, APPOINTMENT\_ID, PAYMENT\_ID) VALUES (VISIT\_ID\_SEQ.NEXTVAL, '1 PILL A', '30', '1', '6', '6');

INSERT INTO VISIT (VISIT\_ID, MEDICAL\_HISTORY, MONEY, STATUS, APPOINTMENT\_ID, PAYMENT\_ID) VALUES (VISIT\_ID\_SEQ.NEXTVAL, '1 PILL A', '30', '1', '7', '7');

**SELECT Statements**

select name as name from patient

union

select first\_name||last\_name as name from doctor;

select name from patient order by patient\_id;

select unique d.first\_name || d.last\_name as name ,ds."Date" as "Date", ds.begin\_time, ds.end\_time from DOCTOR d, DOCTOR\_SCHEDULE ds

where d.doctor\_id = ds.doctor\_id;

select ds."Date" || ' ' ||ds. begin\_time || '-' || ds.end\_time as "Date",

p.name as patientName , d.first\_name || ' ' || d.last\_name as doctorName

from Appointment a

join patient p on p.patient\_id = a.patient\_id and p.name = 'A'

join doctor\_schedule ds on ds.doctor\_schedule\_id = a.doctor\_schedule\_id

join Doctor d on d.doctor\_id = ds.doctor\_id

select i.money, i.beginDate

from installsment i

join payment p using(payment\_id)

where p.money > 40000;

select d.first\_name || ' ' || d.last\_name as doctorName

from doctor d

where d.doctor\_id in (

select doctor\_id from doctor\_schedule

where begin\_time = '8am' and end\_time = '9am'

);

select ds.begin\_time || '-' || ds.end\_time as OpenTime, ds.status as status

from doctor\_schedule ds

where ds.doctor\_id = (

select doctor\_id from doctor d

where first\_name = 'Junchao'

);

select money, payMethod, insurance\_pay

from payment p

where exists(

select 1 from installsment i

where i.payment\_id = p.payment\_id

);

select min(sum(a.money)) from appointment a group by a.patient\_id;

select count(\*), (select name from patient p where p.patient\_id = a.patient\_id) as "name"

from appointment a group by a.patient\_id;