

UTD- Fall 2022

# CS 6360 Database Design - Database Project

Phase 3

Team members

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Phase 3: Normalization and Database Implementation and Testing (20%)

**a) Specify a set of functional dependencies for each relation presented then show the normalization process and normalized tables for each relation to 3NF (if applicable).**

Functional Dependencies:

1)      Medicine Table.

i)Medicine\_Id → Name, Description

2)      Availability Table

i)Medicine\_ID, Store\_ID → Medicine\_ID, Store\_ID (Trivial)

3)       Pharmacy Table

i)Store\_ID → Name, Location

4)      Patient Table

i)Patient\_ID → FirstName, LastName, Age, Gender, PhoneNo, Medical\_History.

5)      Prescription Table

i)Patient\_ID, Doctor\_ID, Date & Time → Suggestions, Medicine\_ID

6)      Appointment Table

i)Patient\_ID, Doctor\_ID, Date & Time → Status, Payment\_amount, Rating\_By\_Patient, Patient\_feedback, Doctor\_Comments

ii) Date&Time → Status

7)      Doctor Table

i) Doctor\_ID → FirstName, LastName, Ratings, Specialization, Availability, year\_of\_exp, Fee

ii) Ratings,Specialization,year\_of\_exp → Fee

Normalization of Tables:

First Normal Form:

All the tables are in first normal form as they do not contain any multivalued or composite or nested relations.

Second Normal Form:

1. Medicine Table - The table is already in 2NF as it does not contain any partial functional dependency.
2. Availability Table - The table is already in 2NF as it does not contain any partial functional dependency.
3. Pharmacy Table - The table is already in 2NF as it does not contain any partial functional dependency.
4. Patient Table - The table is already in 2NF as it does not contain any partial functional dependency.
5. Prescription Table - The table is already in 2NF as it does not contain any partial functional dependency.
6. Appointment Table - The table is already in 2NF as it does not contain any partial functional dependency.
7. Doctor Table - The table is already in 2NF as it does not contain any partial functional dependency.

Third Normal Form:

1. Medicine Table - The table is already in 3NF as it does not contain any transitive dependency.
2. Availability Table - The table is already in 3NF as it does not contain any transitive dependency.
3. Pharmacy Table - The table is already in 3NF as it does not contain any transitive dependency.
4. Patient Table - The table is already in 3NF as it does not contain any transitive dependency.
5. Prescription Table - The table is already in 3NF as it does not contain any transitive dependency.
6. Appointment Table - The table is already in 3NF as it does not contain any transitive dependency.
7. Doctor Table - The table is already in 3NF as it does not contain any transitive dependency.

**b) Show the implementation of tables in the target DBMS (snapshots of tables in DBMS)**

1) Patient Table –

i) Creating Patient table -

Graphical user interface, text, application

Description automatically generated

ii)Inserting into Patient Table –

Graphical user interface, text

Description automatically generated

iii)Snapshot of Patient Table –

Graphical user interface, text, application

Description automatically generated

2) Doctor Table –

i)Creating Doctor Table –

Graphical user interface, text, application

Description automatically generated

ii)Inserting into Doctor Table –

Graphical user interface, text

Description automatically generated with medium confidence

iii) Snapshot of Doctor Table –

Graphical user interface, application

Description automatically generated

3)Medicine Table –

i)Creating Medicine Table –

Graphical user interface, text, application, email

Description automatically generated

ii)Inserting into Medicine Table –

Text

Description automatically generated

iii)Snapshot of Medicine Table –

Graphical user interface, text

Description automatically generated

4)Appointment Table –

i)Creating Appointment Table –

Graphical user interface, text, application

Description automatically generated

ii)Inserting into Appointment Table –

Graphical user interface, table

Description automatically generated

iii)Snapshot of Appointment Table –

Graphical user interface, text, application, email

Description automatically generated

5)Prescription Table –

i)Creating Prescription Table –

Graphical user interface, text, application

Description automatically generated

ii)Inserting into Prescription Table –

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Description automatically generated

iii)Snapshot of Prescription Table –

Graphical user interface, text, application, email

Description automatically generated

6)Pharmacy Table –

i)Creating Pharmacy Table –

Graphical user interface, text, application, email

Description automatically generated

ii)Inserting into Pharmacy Table –

Graphical user interface, text

Description automatically generated

iii) Snapshot of Pharmacy Table –

Graphical user interface, text, application

Description automatically generated

7)Availability Table –

i)Creating Availability Table –

Graphical user interface, text, application, email

Description automatically generated

ii)Inserting into Availability Table –

Table

Description automatically generated

iii)Snapshot of Availability Table –

Graphical user interface, table

Description automatically generated with medium confidence

**c) SQL statements for database construction and data population.**

1)Patient Table –

i)Creating Patient Table –

create table patient(id int primary key,

first\_name varchar(30),

last\_name varchar(30),

age int,

gender varchar(10),

phone\_no varchar(10),

medical\_history varchar(50)

);

ii)Inserting into Patient Table –

insert into patient values (1, 'Bob', 'Kelso', 35, 'Male', '365768921', 'none');

insert into patient values (2, 'Mike', 'Chang', 23, 'Male', '987456123', 'asthama');

insert into patient values (3, 'Kate', 'Park', 47, 'Female', '754831962', 'high blood pressure');

insert into patient values (4, 'Amy', 'Meadows', 18, 'Female', '678942135', 'none');

insert into patient values (5, 'Tom', 'Wilson', 10, 'Male', '123456789', 'asthama');

insert into patient values (7, 'Leo', 'Irvine', 52, 'Male', '156783490', 'fever');

insert into patient values (6, 'Mia', 'Chardy', 30, 'Female', '893456721', 'fever');

insert into patient values (8, 'James', 'Ward', 32, 'Male', '987479321', 'none');

insert into patient values (9, 'Lily', 'Gordon', 29, 'Female', '123654789', 'asthama');

insert into patient values (10, 'Thea', 'Adams', 15, 'Female', '893456321', 'fever');

iii)Snapshot of Patient Table –

select \* from patient;

2)Doctor Table –

i)Creating Doctor Table –

create table doctor(doctor\_id int primary key,

first\_name varchar(30),

last\_name varchar(30),

rating varchar(5),

specialization varchar(30),

availability varchar(10),

year\_of\_experience varchar(5),

fee varchar(5)

);

ii)Inserting into Doctor Table –

insert into doctor values (1, 'Hannah', 'White', '8', 'General Physician', 'Yes', '6.5', '70$');

insert into doctor values (2, 'Mark', 'Harris', '10', 'General Physician', 'No', '4', '30$');

insert into doctor values (3, 'Lewis', 'Grainer', '7.5', 'Pulmonologist', 'Yes', '10', '120$');

insert into doctor values (5, 'Molly', 'Smith', '9', 'General Physician', 'Yes', '8', '85$');

insert into doctor values (4, 'Richard', 'Anderson', '8', 'Cardiologist', 'Yes', '5', '80$');

insert into doctor values (6, 'John', 'Reid', '8.5', 'Cardiologist', 'Yes', '10', '160$');

insert into doctor values (7, 'Harry', 'Lewis', '6', 'Cardiologist', 'Yes', '5', '80$');

insert into doctor values (8, 'Darren', 'Clark', '5', 'Pulmonologist', 'No', '9', '100$');

insert into doctor values (9, 'Elliot', 'Wen', '4.5', 'General Physician', 'No', '4', '30$');

insert into doctor values (10, 'Matt', 'Ross', '6.5', 'Cardiologist', 'No', '2', '40$');

iii)Snapshot of Doctor Table –

select \* from doctor;

3)Medicine Table –

i)Creating Medicine Table –

ii)Inserting into Medicine Table –

insert into medicine values (1, 'Tylenol', 'fever reducer');

insert into medicine value (2, 'Benazepril', 'for high blood pressure');

insert into medicine value (3, 'Albuterol', 'asthama easer');

insert into medicine value (4, 'Crocin', 'fever and body pains');

insert into medicine value (5, 'Metformin', 'diabetes');

insert into medicine value (6, 'epinephrine', 'asthama healer');

iii)Snapshot of Medicine Table –

select \* from medicine;

4)Appointment Table –

i)Creating Appointment Table –

create table appointment(patient\_id int references patient(id),

doctor\_id int references doctor(doctor\_id),

date\_time date,

status varchar(15),

payment\_amt varchar(5),

rating\_by\_patient varchar(5),

patient\_feedback varchar(70),

doctor\_comments varchar(70),

constraint pk\_appointment primary key(patient\_id, doctor\_id, date\_time)

);

ii)Inserting into Appointment Table –

insert into appointment values (1, 1, '2022-08-14', 'Completed', '70$', 8, 'professional and understanding.explained conditions well', 'continue medicine for 3 days until condition improves');

insert into appointment values (2, 3, '2022-07-17', 'Completed', '120$', 7.5, 'listened and answered patiently', 'continue medicine for 1 week. avoid stress');

insert into appointment values (2, 5, '2022-10-05', 'Completed', '85$', 9, 'careful doctor', 'continue medicine for 4 days. revert if condition worsens');

insert into appointment values (7, 9, '2022-08-20', 'Completed', '30$', 4.5, 'prepared and very organized and really made taking care of me a priority', 'continue medicine for 3 days. revert if condition worsens');

insert into appointment values (3, 4, '2022-09-01', 'Completed', '80$', 8, 'excellent doctor', 'continue medicine for 2 weeks. light exercise');

insert into appointment values (9, 3, '2022-07-17', 'Completed', '120$', 7.5, 'appointment wasn't rushed', 'continue medicine for 1 week. revert if condition worsens');

insert into appointment values (4, 1, '2022-11-11', 'Completed', '70$', 8, 'listened and answered patiently', 'continue medicine for 3 days until condition improves');

insert into appointment values (10, 7, '2022-06-10', 'Completed', '80$', 6, 'no waiting time. friendly and knowledgable', 'continue medicine for 2 weeks. light exercise');

insert into appointment values (8, 6, '2022-10-19', 'Completed', '160$', 8.5, 'friendly and knowledgable. excellent suggestions', 'continue medicine for 2 weeks. revert if condition worsens');

insert into appointment values (5, 3, '2022-09-01', 'Completed', '120$', 7.5, 'friendly and knowledgable. excellent suggestions', 'continue medicine for 1 week. light exrcise. avoid stress');

insert into appointment values (7, 6, '2022-11-24', 'Upcoming', '160$', null, null, null);

iii)Snapshot of Appointment Table –

select \* from appointment;

5)Prescription Table –

i)Creating Prescription Table –

create table prescription(patient\_id int references patient(id),

doctor\_id int references doctor(doctor\_id),

date\_time date references appointment(date\_time),

suggestions varchar(50),

medicine\_id varchar(15) references medicine(medicine\_id),

constraint pk\_prescription primary key(patient\_id, doctor\_id, date\_time, medicine\_id)

);

ii)Inserting into Prescription Table –

insert into prescription values (1, 1 , '2022-08-14', 'twice per day - morning and night', '4' );

insert into prescription values (2, 3 , '2022-07-17', 'twice per day - morning and evening', '3' );

insert into prescription values (2, 5 , '2022-10-05', 'once per day - morning', '1' );

insert into prescription values (7, 9 , '2022-08-20', 'once per day - morning', '4' );

insert into prescription values (3, 4 , '2022-09-01', 'twice per day - morning and evening', '2' );

insert into prescription values (9, 3 , '2022-07-17', 'twice per day - morning and evening', '6' );

insert into prescription values (4, 1 , '2022-11-11', 'once per day - evening', '1' );

insert into prescription values (10, 7 , '2022-06-10', 'once per day - morning and evening', '6' );

insert into prescription values (8, 6 , '2022-10-19', 'once per day - morning', '2' );

insert into prescription values (5, 3 , '2022-09-01', 'once per day - evening', '1' );

iii)Snapshot of Prescription Table –

select \* from prescription;

6)Pharmacy Table –

i)Creating Pharmacy Table –

create table pharmacy(store\_id int primary key,

store\_name varchar(30),

location varchar(30)

);

ii)Inserting into Pharmacy Table –

insert into pharmacy values (123, 'CVS Irving', '8th Street, Irving');

insert into pharmacy values (456, 'Walgreens Frisco', '123 North Blvd, Frisco');

insert into pharmacy values (297, 'CVS Richardson', '3rd Avenue, Richardson');

insert into pharmacy values (36, 'Walgreens Plano', '83 Blvd, Plano');

insert into pharmacy values (14, 'Abrams Pharmacy', '42nd Avenue, Plano');

iii)Snapshot of Pharmacy Table -

select \* from pharmacy;

7)Availability Table –

i)Creating Availability Table –

create table availability(medicine\_id varchar(15) references medicine(medicine\_id),

store\_id int references pharamacy(store\_id),

availability boolean,

count int,

price varchar(5),

constraint pk\_availability primary key(medicine\_id, store\_id)

);

ii)Inserting into Availability Table –

insert into availability values (1, 456, true, 20, '3$');

insert into availability values (1, 297, true, 5, '3$');

insert into availability values (1, 36, true, 2, '3$');

insert into availability values (1, 14, true, 12, '3$');

insert into availability values (1, 123, true, 7, '3$');

insert into availability values (3, 297, true, 10, '5$');

insert into availability values (3, 36, false, 0, '5$');

insert into availability values (3, 14, true, 1, '5$');

insert into availability values (3, 456, true, 9, '5$');

insert into availability values (2, 123, true, 3, '4$');

insert into availability values (2, 36, true, 18, '4$');

insert into availability values (2, 14, false, 0, '4$');

insert into availability values (2, 456, true, 15, '4$');

insert into availability values (2, 297, true, 4, '4$');

insert into availability values (4, 456, true, 3, '2$');

insert into availability values (4, 297, false, 0, '2$');

insert into availability values (4, 36, true, 17, '2$');

insert into availability values (4, 14, true, 6, '2$');

insert into availability values (5, 123, true, 14, '7$');

insert into availability values (5, 456, true, 30, '7$');

iii)Snapshot of Availability Table -

select \* from availability;

**d) Additional queries and views (snapshots of query and view implementations)**

1) Categories of Doctors available -

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2) List of doctors with a particular specialization -

Text

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3) Details of a particular doctor –

Text

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4) List of medicines prescribed in an appointment -

Text

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5) Name of store where the prescribed medicine is available –

Text

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6) Details of a particular pharmacy store -

Text

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7) List all upcoming appointments for a doctor -

Text

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8) All past appointments of a patient and feedback form doctor -

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9) Deleting a particular appointment -

Graphical user interface, text

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10) Rescheduling an appointment -

To reschedule an appointment it must be an upcoming appointment, we already know the value of doctor\_id and patient\_id.

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11) View to get specialization of doctors –

i)Creating view -

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ii)Snapshot of view –

A picture containing diagram

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