

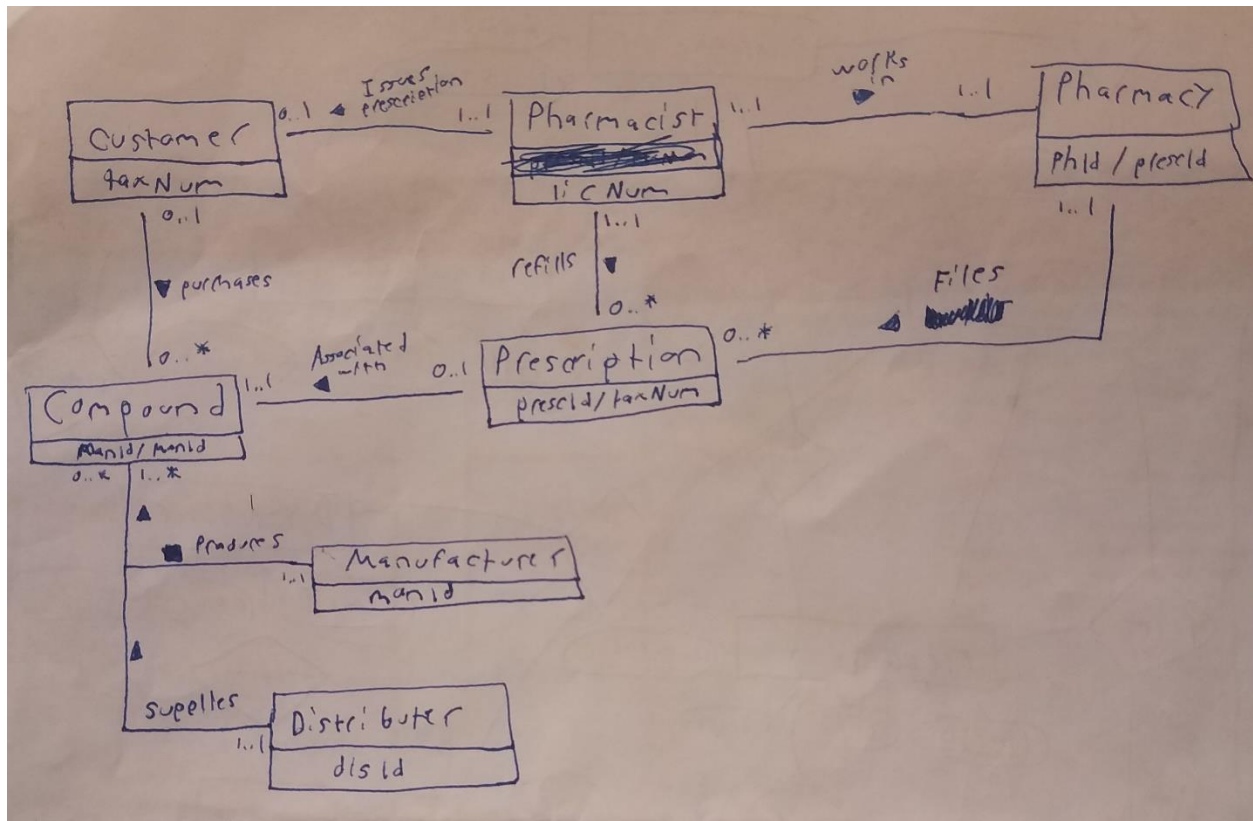
Prescription Drug Refill System

Conceptual Design:

Entity Name	Description	Aliases	Occurrence
Customer	General term describing the Customer that	Customer	Customer may have many active prescriptions which he brings to the pharmacy to get filed
Prescription	General term describing the prescription for the compounds	Prescription	Prescription is issued for a customer by a physician.
Distributor	General term describing the distributor of compounds	Distributor	Supplies the compounds produced by the manufacturer
Manufacturer	General term describing the manufacturer of the compounds	Manufacturer	Produces multiple compounds
Pharmacist	General term describing the pharmacist that issues prescriptions	Pharmacist	Issues prescriptions to a customer and handles all refills
Pharmacy	General term describing the Pharmacy where prescriptions are held	Pharmacy	Files prescriptions and holds them for a specified amount of time
Compound	General term describing the compound that can be prescribed	Compound	A drug that comes with a set of instructions to be prescribed to a customer by a physician

Entity name	Multiplicity	Relationship	Multiplicity	Entity name
Pharmacist	1..1	refills	0..*	Prescription
Pharmacist	1..1	Issues Prescription	0..1	Customer
Customer	0..1	Purchases	0..*	Compound
Manufacturer	1..1	Produces	1..*	Compound
Distributor	1..1	Supplies	0..*	Compound
Pharmacist	1..1	Works in	1..1	Pharmacy
Pharmacy	1..1	files	0..*	Prescription

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Results: A basic overview and rough draft of the database schema with entities, multiplicity and relationships established.

Logical Design

Customer (taxNum, custName, custAddress, ,DOB, phone) Primary Key taxNum Alternate Key custName	Pharmacy (phId, expDate, startDate, currentDate, prescId) Primary Key phId Foreign Key prescId references Prescription(prescId)
Prescription (prescId, Specs, instruct, diagnosticId, routeAd, fillType, taxNum, compld) Primary Key prescId Foreign Key taxNum references Customer(taxnum) Foreign Key compld references Compound(compld)	Compound (compld, size, form, strength, secong, brandName, routeAd, instruct, taxNum) Primary Key compld Foreign key taxNum references Customer(taxnum) Foreign key manId references Manufacturer(manId)
Distributer (disId, disName, disAddress) Primary Key disId Alternate Key disName Foreign Key compld references Compound(compld)	Refill (refillNo, quantity, numRefills, prescId) Primary refillNo Foreign Key prescId references Prescription(prescId)
Manufacturer (manId, manName, manAddress, compld) Primary Key manId Alternate Key manName	Generic Substitution (genNo, genType, compld) Primary Key genNo Foreign Key compld references Compound(compld)
Pharmacist (licNum, pName, pAddress, taxNum) Primary Key licNum Alternate Key pName Foreign key taxNum references Customer(taxnum)	

Customer (taxNum, custName, custAddress, ,DOB, phone) Primary Key taxNum NOT NULL Alternate Key custName
Prescription (prescId, Specs, instruct, diagnosticId, routeAd fillType, taxNum, compld) Primary Key prescId NOT NULL

<p>Foreign Key taxNum references Customer(taxnum) ON UPDATE CASCADE ON DELETE CASCADE</p> <p>Foreign Key compld references Compound(compld) ON UPDATE CASCADE ON DELETE NO ACTION</p>
<p>Distributor (disId, disName, disAddress, compld) Primary Key disId NOT NULL Foreign Key compld references Compound(compld) ON UPDATE CASCADE ON DELETE NO ACTION</p>
<p>Manufacturer (manId, manName, manAddress, compld) Primary Key manId NOT NULL Alternate Key manName</p>
<p>Pharmacist (licNum, pName, pAddress, taxNum) Primary Key licNum NOT NULL Alternate Key pName Foreign key taxNum references Customer(taxnum) ON UPDATE CASCADE ON DELETE SET NULL</p>
<p>Pharmacy (phId, expDate, startDate, currentDate, prescId) Primary Key phId NOT NULL Foreign Key prescId references Prescription(prescId) ON UPDATE CASCADE ON DELETE CASCADE</p> <p>CONSTRAINT time-held-test check((CAST(DATEDIFF(@startDate, @currentdate) / 60 / 60 / 24 / 30 / 12) <= 5))</p>
<p>Compound (compld, size, form, strength, secIng, brandName, routeAd, instruct, taxNum) Primary Key compld Foreign key taxNum references Customer(taxnum) ON UPDATE CASCADE ON DELETE SET NULL Foreign key compld references Manufacturer(manId) ON UPDATE CASCADE ON DELETE CASCADE Foreign key manId references Distributer(disId) ON UPDATE CASCADE ON DELETE SET NULL</p>

Refill (refillNo, quantity, numRefills, prescId)

Primary refillNo NOT NULL

Foreign Key prescId **references**

Prescription(prescId) ON UPDATE CASCADE ON DELETE CASCADE

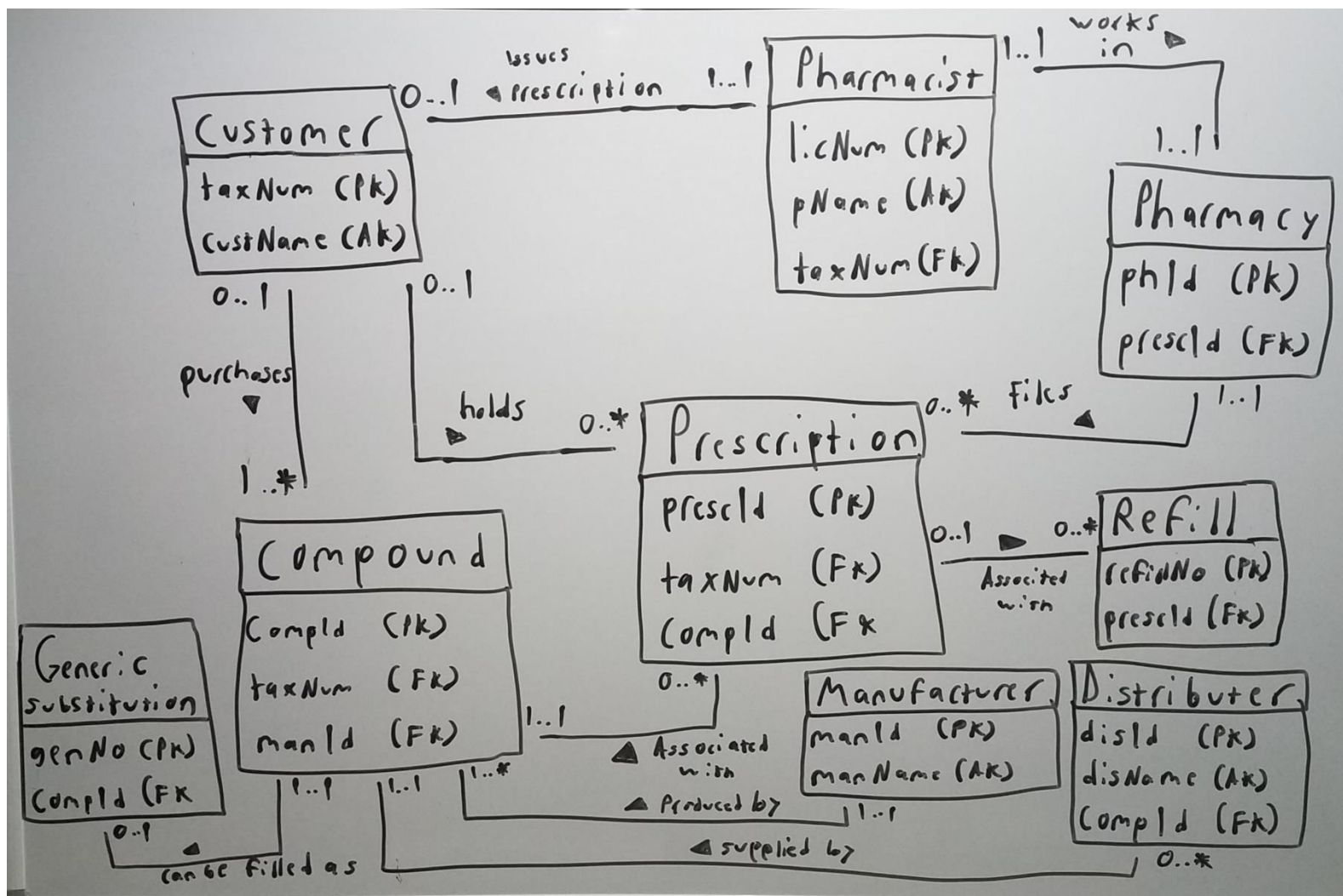
CONSTRAINT quantity-test **check**(value <= numRefills)

Generic Substitution (genNo, genType, compld)

Primary Key genNo NOT NULL

Foreign Key compld **references**

Compound(compld) ON UPDATE CASCADE ON DELETE NO ACTION



Results:

- Defined all primary keys and foreign keys for entities.
- Created new entities Refill and Generic substitution to further break down tables.
- Adjusted multiplicities for some of the tables ex: Prescription now has 0..* multiplicity for its relationship with compound .
- Modified some of the table attributes ex: Compound table no longer has manufacturer Id as both its primary and foreign key.
- Added relationship between Prescription and Customer.
- further refined EER Diagram to include primary and foreign keys

Embedded SQL & Queries

Creation of tables:

```
alroece467@lawtech:~  
0) NOT NULL,taxNum SMALLINT(4) NOT NULL,DOB DATE NOT NULL,Phone BIGINT(10) NOT N ^  
ULL,PRIMARY KEY (taxNum),UNIQUE(custName));  
CREATE TABLE Customer ( custName VARCHAR(15) NOT NULL,custAddress VARCHAR(20) NO  
T NULL,taxNum SMALLINT(4) NOT NULL,DOB DATE NOT NULL,Phone BIGINT(10) NOT NULL,P  
RIMARY KEY (taxNum),UNIQUE(custName))  
  
*  
ERROR at line 1:  
ORA-00907: missing right parenthesis  
  
SQL> CREATE TABLE Customer (  
  custName VARCHAR(15) NOT NULL,  
  custAddress VARCHAR(20) NOT NULL,  
  taxNum NUMBER(4) NOT NULL,  
  DOB DATE NOT NULL,  
  Phone VARCHAR(10) NOT NULL,  
  PRIMARY KEY (taxNum),  
  UNIQUE(custName)  
)  
); 2 3 4 5 6 7 8 9  
  
Table created.
```


alroece467@lawtech:~

```
SQL> CREATE TABLE Compound (  
 2   compId VARCHAR(4) NOT NULL,  
 3   sizeC VARCHAR(1) NOT NULL,  
   form VARCHAR(7) NOT NULL,  
   strength VARCHAR(5) NOT NULL,  
 4   5   6   diagnosticId NUMBER(5) NOT NULL,  
 7   secIng VARCHAR(15),  
 8   brandName VARCHAR(10),  
 9   routeAd VARCHAR(15) NOT NULL,  
10   instruct VARCHAR(20) NOT NULL,  
11   taxNum NUMBER(4) NOT NULL,  
   PRIMARY KEY (compId),  
12  13   FOREIGN KEY (taxNum) REFERENCES Customer(taxNum)  
14 );
```

Table created.

```
SQL> CREATE TABLE Prescription (  
 2   prescId VARCHAR(4) NOT NULL,  
 3   instruct VARCHAR(20),  
   diagnosticId NUMBER(5),  
   routeAd VARCHAR(15),  
   fillType VARCHAR(15) NOT NULL,  
   compId VARCHAR(4) NOT NULL,
```

alroece467@lawtech:~

```
   diagnosticId NUMBER(5),  
   routeAd VARCHAR(15),  
   fillType VARCHAR(15) NOT NULL,  
   compId VARCHAR(4) NOT NULL,  
   taxNum NUMBER(4) NOT NULL,  
   PRIMARY KEY (prescId),  
   FOREIGN KEY (taxNum) REFERENCES Customer(taxnum) ,  
 4   5   6   7   8   9   10  11  FOREIGN KEY (compId) REFERENCES Compound(compId)  
); 12
```

Table created.

```
SQL> CREATE TABLE Pharmacy (  
   phId VARCHAR(5) NOT NULL,  
   expDate DATE NOT NULL,  
   timeHeld NUMBER(1) NOT NULL,  
   prescId VARCHAR(4) NOT NULL,  
   PRIMARY KEY (phId),  
   FOREIGN KEY (prescId) REFERENCES Prescription(prescId) ON DELETE CASCADE  
); 2   3   4   5   6   7   8
```

Table created.

```
alroece467@lawtech:~  
SQL> CREATE TABLE Distributer (  
  disId VARCHAR(4) NOT NULL,  
  disName VARCHAR(10) NOT NULL,  
  disAddress VARCHAR(15) NOT NULL,  
  compId VARCHAR(4) NOT NULL,  
  PRIMARY KEY (disId),  
  FOREIGN KEY (compId) REFERENCES Compound(CompId) ,  
  UNIQUE(disName)  
); 2    3    4    5    6    7    8    9  
  
Table created.  
  
SQL> CREATE TABLE Refill (  
  refillNo VARCHAR(4) NOT NULL,  
  quantity NUMBER(2) NOT NULL,  
  numRefills NUMBER(4) NOT NULL,  
  prescId VARCHAR(4) NOT NULL,  
  PRIMARY KEY (refillNo),  
  FOREIGN KEY (prescId) REFERENCES Prescription(prescId)  
); 2    3    4    5    6    7    8  
  
Table created.
```

```
alroece467@lawtech:~  
Table created.  
  
SQL> CREATE TABLE Refill (  
  refillNo VARCHAR(4) NOT NULL,  
  quantity NUMBER(2) NOT NULL,  
  numRefills NUMBER(4) NOT NULL,  
  prescId VARCHAR(4) NOT NULL,  
  PRIMARY KEY (refillNo),  
  FOREIGN KEY (prescId) REFERENCES Prescription(prescId)  
); 2    3    4    5    6    7    8  
  
Table created.  
  
SQL> CREATE TABLE Generic_Substitution (  
  genNo VARCHAR(4),  
  genType VARCHAR(7),  
  compId VARCHAR(4),  
  PRIMARY KEY (genNo),  
  FOREIGN KEY (compId) REFERENCES Compound(compId)  
); 2    3    4    5    6    7  
  
Table created.  
  
SQL> █
```

Tuples Inserted:

Customer:

```
INSERT INTO Customer VALUES ('Orinda Carter', '42 Applegate Road', 1001,  
TO_DATE('1991/03/13','yyyy/mm/dd'), '7864237825');
```

```
INSERT INTO Customer VALUES ('Vere Stewart', '73 E. Academy Street', 1002,  
TO_DATE('1993/05/22','yyyy/mm/dd'), '7867348901');
```

```
INSERT INTO Customer VALUES ('Ryker Josh', '55 Bayberry Street ', 1003,  
TO_DATE('1990/11/05','yyyy/mm/dd'), '7863579254');
```

```
INSERT INTO Customer VALUES ('Farley Annie', '584 Branch Street ', 1004,  
TO_DATE('2000/10/10','yyyy/mm/dd'), '7860902487');
```

```
INSERT INTO Customer VALUES ('Nova Anne', '509 Race Street', 1005,  
TO_DATE('1985/07/30','yyyy/mm/dd'), '7860182586');
```

```
INSERT INTO Customer VALUES ('Greer Buster', '320 Airport Street ', 1006,  
TO_DATE('1995/11/25','yyyy/mm/dd'), '7861348790');
```

```
INSERT INTO Customer VALUES ('Jewell Hilary', 'Blue Spring Street', 1007,  
TO_DATE('1965/06/01','yyyy/mm/dd'), '7861113857');
```

Compound:

```
INSERT INTO Compound VALUES ('C100', 'S', 'tablet', '0.5%', 12001, NULL, NULL, 'oral', 'take as  
prescribed', 1001);
```

```
INSERT INTO Compound VALUES ('C101', 'S', 'liquid', '0.3%', 12009, NULL, NULL, 'injection', 'take as  
prescribed', 1003);
```

```
INSERT INTO Compound VALUES ('C102', 'M', 'pill', '25g', 12003, NULL, 'Glucotrol', 'oral', 'take as  
prescribed', 1004);
```

```
INSERT INTO Compound VALUES ('C103', 'S', 'tablet', '0.6%', 12005, NULL, 'Coumadin', 'oral', 'take as  
prescribed', 1001);
```

```
INSERT INTO Compound VALUES ('C104', 'L', 'tablet', '0.8%', 12005, NULL, 'Flonase', 'oral', 'take as  
prescribed', 1005);
```

```
INSERT INTO Compound VALUES ('C105', 'S', 'pill', '15g', 12000, NULL, 'Fosamax', 'oral', 'take as  
prescribed', 1004);
```

```
INSERT INTO Compound VALUES ('C106', 'M', 'liquid', '0.5%', 12002, NULL, 'Prilosec', 'topical', 'take as  
prescribed', 1001);
```

Prescription:

```
INSERT INTO Prescription VALUES ('P100', 'take as prescribed', NULL, NULL, 'fill genericaly', 'C100', 1002);
INSERT INTO Prescription VALUES ('P101', 'take as prescribed', 12005, NULL, 'fill genericaly', 'C103', 1005);
INSERT INTO Prescription VALUES ('P102', NULL, NULL, NULL, 'fill genericaly', 'C106', 1001);
INSERT INTO Prescription VALUES ('P103', 'take as prescribed', 12009, NULL, 'fill genericaly', 'C105', 1005);
INSERT INTO Prescription VALUES ('P104', NULL, NULL, NULL, 'fill genericaly', 'C104', 1002);
INSERT INTO Prescription VALUES ('P105', 'take as prescribed', 12003, NULL, 'fill genericaly', 'C102', 1007);
INSERT INTO Prescription VALUES ('P106', 'take as prescribed', 12002, 'injection', 'fill as written', 'C101', 1002);
```

Pharmacy:

```
INSERT INTO Pharmacy VALUES('PH100', TO_DATE('2019/07/13','yyyy/mm/dd'), 0, 'P100');
INSERT INTO Pharmacy VALUES('PH101', TO_DATE('2019/08/05','yyyy/mm/dd'), 2, 'P101');
INSERT INTO Pharmacy VALUES('PH102', TO_DATE('2019/09/22','yyyy/mm/dd'), 0, 'P102');
INSERT INTO Pharmacy VALUES('PH103', TO_DATE('2019/08/27','yyyy/mm/dd'), 1, 'P103');
INSERT INTO Pharmacy VALUES('PH104', TO_DATE('2019/01/09','yyyy/mm/dd'), 6, 'P104');
INSERT INTO Pharmacy VALUES('PH105', TO_DATE('2019/12/10','yyyy/mm/dd'), 3, 'P105');
INSERT INTO Pharmacy VALUES('PH106', TO_DATE('2019/11/11','yyyy/mm/dd'), 8, 'P106');
```

Pharmacist:

```
INSERT INTO Pharmacist VALUES(15000, 'Benny Kev', '68 Edgemont Ave', 1003);
INSERT INTO Pharmacist VALUES(15001, 'Bernie Nol', '62 Gonzal Road', 1006);
```

INSERT INTO Pharmacist VALUES(15002, 'Jon Sequo', '79 Winch St', 1007);
INSERT INTO Pharmacist VALUES(15003, 'Kian Dolph', '42 Div Lane', 1004);
INSERT INTO Pharmacist VALUES(15004, 'Jol Trace', '91 Augusta Ave', 1002);
INSERT INTO Pharmacist VALUES(15005, 'Cody Manny', '90 Olive Road', 1001);
INSERT INTO Pharmacist VALUES(15006, 'Page Cat', '88 S. Foxrun St', 1005);

Manufacturer:

INSERT INTO Manufacturer VALUES('M100', 'Accera', '40 Will Street', 'C100');
INSERT INTO Manufacturer VALUES('M101', 'Medicines', '531 2nd Ave.', 'C101');
INSERT INTO Manufacturer VALUES('M102', 'ParaPRO', '91 New Ave', 'C102');
INSERT INTO Manufacturer VALUES('M103', 'Wellstat', '595 Bank Road ', 'C103');
INSERT INTO Manufacturer VALUES('M104', 'Taiho', '34 Pheasant Dr', 'C104');
INSERT INTO Manufacturer VALUES('M105', 'Zanfel', '926 Central', 'C105');
INSERT INTO Manufacturer VALUES('M106', 'Uluru', '65 Gartner St', 'C106');

Distributor:

INSERT INTO Distributer VALUES('D100', 'CertaOne', '45 Grant Rd.', 'C100');
INSERT INTO Distributer VALUES('D101', 'EMTEC', '98 Smith Street', 'C102');
INSERT INTO Distributer VALUES('D102', 'AusComp', '47 Ridge Street', 'C103');
INSERT INTO Distributer VALUES('D103', 'Konference', '373 Miles Dr', 'C102');
INSERT INTO Distributer VALUES('D104', 'Mittoni', '7554 Golf St', 'C104');
INSERT INTO Distributer VALUES('D105', 'NEXTGEN', '60 Sage St', 'C106');
INSERT INTO Distributer VALUES('D106', 'Hills', '66 Forest St', 'C106');

Refill:

INSERT INTO Refill VALUES('R100', '2', '4', 'P100');

```
INSERT INTO Refill VALUES('R101', '1', '5', 'P101');
INSERT INTO Refill VALUES('R102', '3', '4', 'P102');
INSERT INTO Refill VALUES('R103', '5', '5', 'P103');
INSERT INTO Refill VALUES('R104', '0', '7', 'P104');
INSERT INTO Refill VALUES('R105', '3', '6', 'P105');
INSERT INTO Refill VALUES('R106', '1', '2', 'P106');
```

Generic_substitution:

```
INSERT INTO Generic_substitution VALUES('G100', 'placebo', 'C100');
INSERT INTO Generic_substitution VALUES('G101', 'warfarin', 'C103');
INSERT INTO Generic_substitution VALUES('G102', 'omeprazole', 'C106');
INSERT INTO Generic_substitution VALUES('G103', 'alendronate', 'C105');
INSERT INTO Generic_substitution VALUES('G104', 'fluticasone', 'C104');
INSERT INTO Generic_substitution VALUES('G105', 'glipizide', 'C102');
```

Embedded SQL Program:

alroece467@lawtech:~/templates/proc

```
rm -rf lib/libclntsh.so
[alroece467@lawtech proc]$ ./project

Connected to ORACLE as user: alroece467

Choose an option

List all the active prescriptions of a particular customer... Press 1
List the details of all the distributors and manufacturers for a particular compound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
```

1. List all the active prescriptions of a particular customer.

alroece467@lawtech:~/templates/proc

```
List the details of all the distributors and manufacturers for a particular compound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
1
Customer Tax Number?
1002
prescId
-----
P100
P104
P106
Choose an option
```

- List the details of all the distributors and manufacturers for a particular compound.

```
alroece467@lawtech:~/templates/proc
ound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
2
Compound Id?
C102
manId  manName  manAddress  compId  disId  disName  disAddress
-----  -
M102      ParaPRO    91 New Ave   C102    D101    EMTEC
          98 Smith Stree
M102      ParaPRO    91 New Ave   C102    D103    Konfe
          373 Miles Dr
Choose an option
```

- List the details (e.g., form, size, etc.) of a particular compound.

```
alroece467@lawtech:~/templates/proc
List all the active prescriptions of a particular customer... Press 1
List the details of all the distributors and manufacturers for a particular compound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
3
Compound Id?
C103
compId  sizeC  form  strength  diagnosticId  routeAd  instruct  taxNum
-----  -
C103 S  tablet 0.6% 12005 oral          take as prescribed 1001
Choose an option
```


4. List the total number of active prescriptions together with their detailed information in the database.

```
alroece467@lawtech:~/templates/proc
mation in the database... Press 4
List the number of refills left and the expiration date of a particular prescrip
tion... Press 5
List all the prescriptions that have compounds not appropriate for the condition
s being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database....
Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
4
num of prescriptions: 7
prescId  fillType  compId  taxNum
-----  -
P100          fill genericaly    C100          1002
P101          fill genericaly    C103          1005
P102          fill genericaly    C106          1001
P103          fill genericaly    C105          1005
P104          fill genericaly    C104          1002
P105          fill genericaly    C102          1007
P106          fill as written    C101          1002
Choose an option
```

5. List the number of refills left and the expiration date of a particular prescription.

```
List all the active prescriptions of a particular customer... Press 1
List the details of all the distributors and manufacturers for a particular compound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
5
Prescription Id?
P103
num of refills left: 5
expiration date: 27-AUG-19
Choose an option
```

6. List all the prescriptions that have compounds not appropriate for the conditions being treated.

```
alroece467@lawtech:~/templates/proc
Choose an option

List all the active prescriptions of a particular customer... Press 1
List the details of all the distributors and manufacturers for a particular compound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
6
prescId
-----
P106
P103
Choose an option
```

7. List all generic substitutions for a particular compound.

```
alroece467@lawtech:~/templates/proc
Choose an option

List all the active prescriptions of a particular customer... Press 1
List the details of all the distributors and manufacturers for a particular compound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
7
Compound Id?
C103
genNo  genType  compId
-----
G101  warfarin      C103
```

8. Insert a new prescription of a new customer into the database

```
alroece467@lawtech:~/templates/proc
Delete all prescriptions that are more than five years old from the database....
Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
8
Customer Name?
Ale Rod
Customer Address?
67 Oak Road
Tax Number?
1008
Phone?
7864569234

1 row created
Prescription Number?
P107
Compound Number?
C104

1 row created
Choose an option

List all the active prescriptions of a particular customer... Press 1
```

```
alroece467@lawtech:~/templates/proc
Nova Anne      509 Race Street      1005 30-JUL-85 7860182586
Greer Buster   320 Airport Street   1006 25-NOV-95 7861348790
Jewell Hilary  Blue Spring Street   1007 01-JUN-65 7861113857

8 rows selected.

SQL> select * from customer where taxnum = 1008
2 ;

CUSTNAME      CUSTADDRESS          TAXNUM DOB          PHONE
-----
Ale Rod        67 Oak Road          1008 11-NOV-85 7864569234

SQL> select * from prescription where prescid = 'P107';

PRES INSTRUCT      DIAGNOSTICID ROUTEAD      FILLTYPE      COMP
-----
TAXNUM
-----
P107              1008              fill as written C104

SQL>
```

9. Delete all prescriptions that are more than five years old from the database.

```
alroece467@lawtech:~/templates/proc
Connected to ORACLE as user: alroece467

Choose an option

List all the active prescriptions of a particular customer... Press 1
List the details of all the distributors and manufacturers for a particular compound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
9
deleted rows
Choose an option

Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
4
num of prescriptions: 5
prescId  fillType  compId  taxNum
-----  -
P100          fill genericaly  C100          1002
P101          fill genericaly  C103          1005
P102          fill genericaly  C106          1001
P103          fill genericaly  C105          1005
P105          fill genericaly  C102          1007
Choose an option

List all the active prescriptions of a particular customer... Press 1
List the details of all the distributors and manufacturers for a particular compound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
```

Rows P104 and P106 deleted

10. Update the address information for a particular physician.

```
alroece467@lawtech:~/templates/proc
ound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
10
Pharmacist License Number?
15000
New Address?
15 Drury Lane
Updated address to
Choose an option

List all the active prescriptions of a particular customer... Press 1
List the details of all the distributors and manufacturers for a particular comp

alroece467@lawtech:~/templates/proc
Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
11
[alroece467@lawtech proc]$ sqlplus

SQL*Plus: Release 12.1.0.1.0 Production on Sat May 4 05:51:47 2019

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Enter user-name: alroece467
Enter password:
Last Successful login time: Sat May 04 2019 05:50:57 -04:00

Connected to:
Oracle Database 12c Release 12.1.0.1.0 - 64bit Production

SQL> SELECT * FROM pharmacist WHERE licNum = 15000;

  LICNUM PNAME      PADDRESS      TAXNUM
-----
15000 Benny Kev  15 Drury Lane      1003

SQL>
```

Exit

```
alroece467@lawtech:~/templates/proc
[alroece467@lawtech proc]$ ./project

Connected to ORACLE as user: alroece467

Choose an option

List all the active prescriptions of a particular customer... Press 1
List the details of all the distributors and manufacturers for a particular compound... Press 2
List the details (e.g., form, size, etc.) of a particular compound... Press 3
List the total number of active prescriptions together with their detailed information in the database... Press 4
List the number of refills left and the expiration date of a particular prescription... Press 5
List all the prescriptions that have compounds not appropriate for the conditions being treated.... Press 6
List all generic substitutions for a particular compound... Press 7
Insert a new prescription of a new customer into the database.... Press 8
Delete all prescriptions that are more than five years old from the database.... Press 9
Update the address information for a particular physician... Press 10
To exit..... Press 11
11
[alroece467@lawtech proc]$
```

Note: I had to exclude variables from some queries as some of the variables can be null and the INTO function could not fetch them. I could also not find a way to convert user input into a date format that can be inserted when creating a new customer row for Date of Birth, so I statically defined that tuple in the program itself, making each inserted customer have the same birthdate.

Conclusion:

The database schema works as intended for many of the queries required. There is room for improvement as there were only seven tuples inserted for every entity, making it a small sample size. The transitions between conceptual and logical design were necessary in ensuring the refinement of many of the relations in the database. The design stages for the database were also an integral part of keeping a structured view of how the creation of the database is progressing. Careful planning and the validations that came at each stage were efficient in minimizing room for error and keeping the integrity of the data.

