The Prescriptions-R-X chain of pharmacies has offered to give you and your two neighbors a free lifetime supply of medicine if you design its database. Given the rising cost of health care, you agree. Here are the requirements.

Requirements:
- Patients are identified by an SSN, and their names, addresses, and ages must be recorded.
- Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded.
- Each pharmaceutical company is identified by name and has a phone number.
- For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer.
- Each pharmacy has a name, address, and phone number.
- Every patient has a primary physician. Every doctor has at least one patient.
- Each pharmacy sells several drugs and has a price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another.
- Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors. Each prescription has a date and a quantity associated with it. You can assume that, if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored.
- Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract.
- Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.

A possible ER diagram for these requirements is given below. Translate this ER diagram into a set of relations and constraints. Note that some constraints present in the requirements above are not expressed in the ER diagram. Make sure they are present in your relational schema.
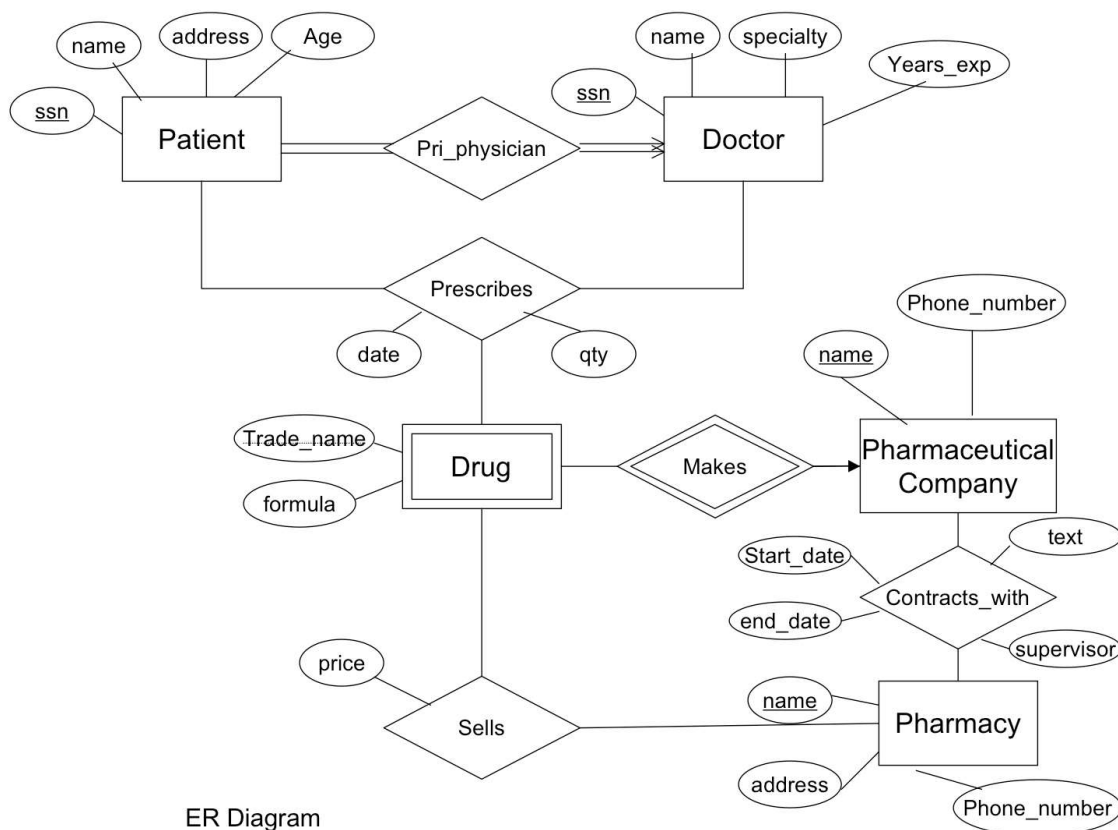
ER Diagram

Here are some of the relations:

- Doctor(ssn,name,specialty,years_exp); Primary key = ssn
- Pharmacy(name,address,phone_number); primary key = name

Now, create the others. *Remember to specify foreign keys and any other applicable constraint.*

Discussion Questions

1. How would you translate the Patient entity if it included both the *date of birth* for patient and a derived attribute *age*?
2. If contract is made into a ternary relationship that includes Supervisor as an entity, how would you translate that?

One possible schema:

1. CREATE TABLE Pri Phy Patient (ssn CHAR(11),
name CHAR(20),
age INTEGER,
address CHAR(20),
phy ssn CHAR(11),
PRIMARY KEY (ssn),
FOREIGN KEY (phy ssn) REFERENCES Doctor)

2. CREATE TABLE Prescription (ssn CHAR(11),
phy ssn CHAR(11),
date CHAR(11),
quantity INTEGER,
trade name CHAR(20),
      pharm id CHAR(11),
PRIMARY KEY (ssn, phy ssn),
FOREIGN KEY (ssn) REFERENCES Patient,
FOREIGN KEY (phy ssn) REFERENCES Doctor,
FOREIGN KEY (trade name, pharm id)
References Make Drug)

3. CREATE TABLE Make Drug (trade name CHAR(20),
pharm id CHAR(11),
PRIMARY KEY (trade name, pharm id),
FOREIGN KEY (trade name) REFERENCES Drug,
FOREIGN KEY (pharm id) REFERENCES Pharm co ON DELETE CASCADE)

4. CREATE TABLE Sell (price INTEGER,
name CHAR(10),
trade name CHAR(10),
PRIMARY KEY (name, trade name),
FOREIGN KEY (name) REFERENCES Pharmacy,
FOREIGN KEY (trade name) REFERENCES Drug)

5. CREATE TABLE Contract (name CHAR(20),
pharm id CHAR(11),
start date CHAR(11),
end date CHAR(11),
text CHAR(10000),
supervisor CHAR(20),
PRIMARY KEY (name, pharm id),
FOREIGN KEY (name) REFERENCES Pharmacy,
      FOREIGN KEY (pharm id) REFERENCES Pharm co)

CREATE TABLE Doctor (ssn CHAR(11),
      name CHAR(20),
      specialty CHAR(20),
      year_experience INTEGER,
      PRIMARY KEY (ssn))

CREATE TABLE Pharmacy (name CHAR(20),
    Phone_number CHAR(11),
    address CHAR(40),

```
    PRIMARY KEY (name))

CREATE TABLE Pharma_co ( name CHAR(20),
    Phone_number CHAR(11),
    PRIMARY KEY (name))
```