E/R – ODL – UML
CS145

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Problem Statement

- The Prescriptions-R-X chain of pharmacies has offered to give you a free lifetime supply of medicine if you design its database. Given the rising cost of health care, you agree. Here's the information that you gather:
  - 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.

Problem Statement
Cont'd

- 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.

Problem Statement
Cont'd

- 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.

Problem Statement
Cont'd

– 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.

Question

- Draw an ER diagram that captures the preceding information.

Question
Cont'd

- How would your design change if each drug must be sold at a fixed price by all pharmacies?

- How would your design change if the design requirements change as follows: If a doctor prescribes the same drug for the same patient more than once, several such prescriptions may have to be stored.

Solution

- Since the drug is sold at a *fixed* price, add the price attribute to the Drug entity set and eliminate it from the Sell relationship set.

- The date information can't be modeled as an attribute. Create a new entity set: Prescription_date and make Prescription a 4-way relationship set.

Question
Cont'd

- Draw a UML diagram that captures the preceding information.

Question
Cont'd

- Use ODL to represent the preceding information.