C019-320302
Databases & Web Services
Assignment 1

1. Car Rental Store *(12 points)*

RustOnWheels GmbH, a car rental startup, contracts you to establish their carpool and customer database. They educate you that the database should contain information about:

- **members** (identified by a member ID)
- **cars** (identified by the year it has been released and the serial number).

Store policy requires to annually renew membership in order to rent any cars. In addition to the identifying attributes, members also have a first name, last name and the joining date while cars have a manufacturer and a model name.

Next, you discuss some variations with RustOnWheels to find out what exactly they want. Each situation below is individual from the others, but the general conditions mentioned above hold always. For each item draw an ER (or UML) diagram with entities, relationships, and attributes describing it (assuming no further constraints hold):

1. Only the most recent year of membership should be stored for each member, and the previous years are discarded. This assumption is valid for all the following situations except #6.
2. Every member has rented at least one car.
3. Every member has rented exactly one car.
4. Every member has rented exactly one car, and every car needs to have at least one request in order to be available.
5. There is a special group *Convertibles*, and this group has an attribute *driverMinimumAge*. Update the diagram from situation #1 accordingly.
6. Revise situation #1 so that in case the member details haven't changed, multiple years instead of only the current can be stored.

2. Pharmacy Chain *(14 points)*

The Drugs'R'Us chain of pharmacies has offered to give you a free lifetime supply of medications if you design their database. Given the rising cost of healthcare, you agree. Here's the information that you gathered. Deliver one single ER (or UML) schema incorporating all statements below:

1. Patients are identified by an SSN; their name, address, and age must be recorded.
2. Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded.
3. Each pharmaceutical company in the chain is identified by its name and has a phone number.
4. For each drug, the trade name and formula (a string) must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely within the products of that company. If a pharmaceutical company closes (and, consequently, has to be deleted), you need not keep track of its products any longer.
5. Each pharmacy has a name, address, and phone number. A pharmacy can sell drugs to patients as long as they have a prescription from a doctor.
6. Every patient has a primary physician. Every doctor has at least one patient. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors.
7. 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.

If you cannot express some conditions in ER/UML then state the condition in writing, based on the schema elements.