1. APPOINTMENTS

- A doctor can be scheduled for many appointments, but may not have any scheduled at all. Each appointment is scheduled with exactly 1 doctor.
- A patient can schedule 1 or more appointments. One appointment is scheduled with exactly 1 patient.
- An appointment must generate exactly 1 bill, a bill is generated by only 1 appointment.
- One payment is applied to exactly 1 bill, and 1 bill can be paid off over time by several payments. A bill can be outstanding, having nothing yet paid on it at all.
- One patient can make many payments, but a single payment is made by only 1 patient.
- Some patients are insured by an insurance company. If they are insured, they can only carry insurance with one company. An insurance company can have many patients carry their policies.
- For patients that carry insurance, the insurance company will make payments. Each single payment is made by exactly 1 insurance company.

2. PROJECTS

- Some employees are researchers working on projects
- Every project has a leader investigator
- Every project must be funded by an agency
- A project may include several topics
- A topic could appear in several projects
- Researchers must produce report(s) for every project
- Each employee must have a supervisor, and a supervisor can supervise several employees

3. COMPANY

- A company sells products to multiple clients. You need to know the personal data of customers (name, surnames, address and date of birth).
- Each product has a name, code and a unit price. A customer can buy several products at the company, and the same product can be bought by several customers.
- The products are provided by different suppliers. Keep in mind that a product can only be provided by a supplier, and a supplier can sell different products. We want to know NIF, name and address of every supplier.

4. SCHOOL LIBRARY

- The school library manage cards of authors and books.
- Every card of author has the author code and name.
- Every card of book has the code, title, ISBN, publisher and number of pages.
- An author can write several books, and a book can be written by various authors.
- A book consists of copies. Each copy has a code and a location. A book has many copies and a copy belongs to only one book.
- Users of the school library also have a card in the library. We want to know the code, name, address and telephone of every user.
- Copies are lent to users. A user can borrow several copies, and a copy can be lent to multiple users. For every loan, we need to know the loan and return dates.

5. VIDEO RENTAL SHOP

Design an entity / relationship diagram for a video rental shop that wants to improve its service, using a database to store the information about the films offered to rent. This information is:

- For every film we want to know its title, country, producer and year.
- The cast of every film includes several actors (name, nationality, birthdate). Of course, an actor can appear in several films.
- Every film is directed by a director (name, nationality, years active) and a director can direct several films.
- Each film has one or more copies differentiated by a number and characterized by its condition.
- A copy can be found rented to a customer (ID, name, address, phone). You want to store the start date and the return date of the rental.
- Each customer can have a maximum of 4 copies rented at the same time.