BMEVITMAB04-EN – Databases

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23 September 2021 – 2nd Tutorial: ER modelling II.

Exercise 1. Consider the following set of requirements for a university database that is used to keep track of students' transcripts.

- The university keeps track of each student's name, student number, social security number, current address and phone, permanent address and phone, birth date, gender, year of study (1st year, 2nd year etc). Some user applications need to refer to the city, and post code of the student's permanent address, and to the student's last name. Both social security number and student number have unique values for each student.
- Each department is described by a name, department code, office number, office phone, and college. Both name and code have unique values for each department.
- Each course has a course name, description, course number, number of semester hours, level, and offering department. The value of course number is unique for each course. Some courses may be offered by multiple departments (e.g. interdisciplinary courses).
- Each section has an instructor, semester, year, course, and section number. The section number distinguishes different sections of the same course that are taught during the same semester/year; its values are 1, 2, 3, ...; up to the number of sections taught during each semester.
- Each section may be part of multiple courses. Sections are only identified through the course offering them
- Each student belongs to a major department and optionally to a minor department and is following a single course (e.g. B.A. in Music, B.Sc. in Informatics etc).

Note any unspecified requirements, and make appropriate assumptions to make the specification complete.

If there is no IS-A relationship above, use your imagination and come up with one!

Exercise 2. Consider the design of the database of the Department for Education on Figure 1. This DB stores data about schools, teachers, students, classes and subjects.

Make your own deductions of the design and share it with the group.

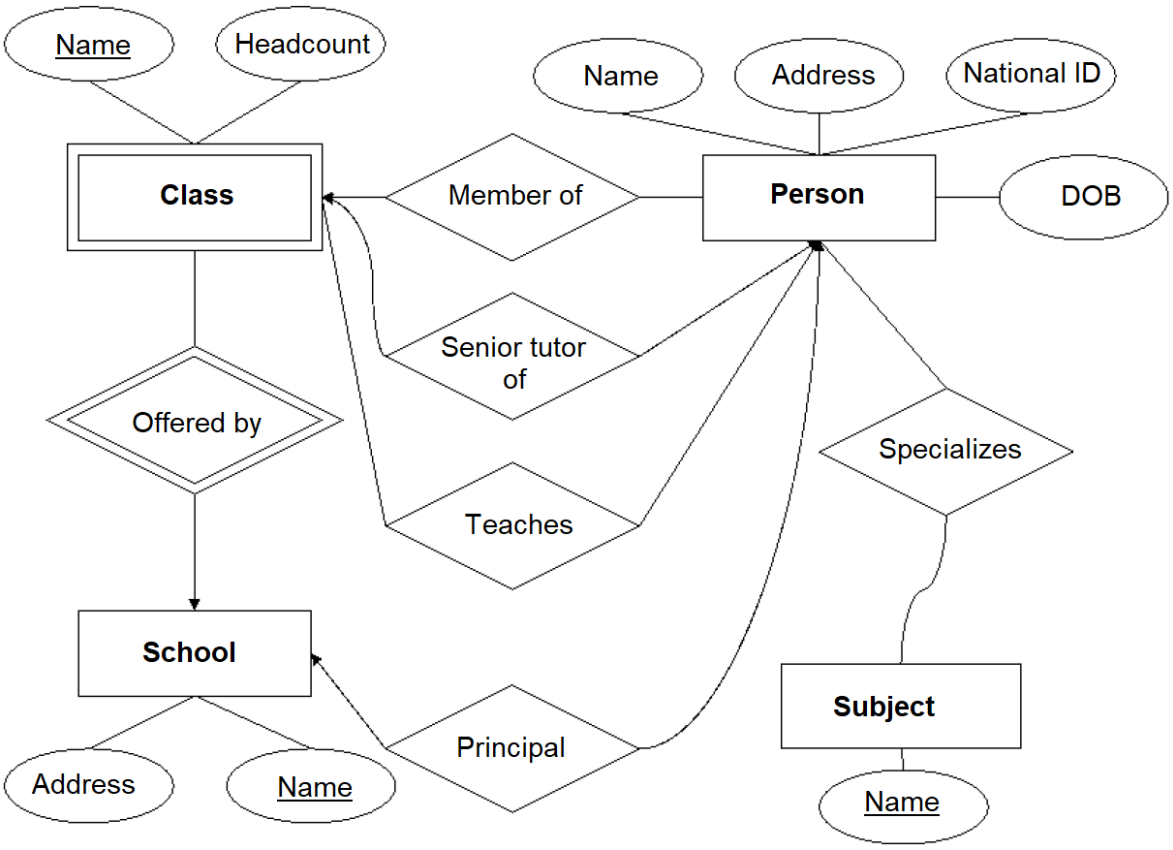

Figure 1: SchoolDB, version 1.

Can a database designed like this store the fact that a particular teacher teaches a particular subject to a particular class? Why?

Now, take a look at version 2 of the same database on Figure 2.

What do you deduce now?

Can a database designed like this store certified but currently not actively taught specializations of a teacher?

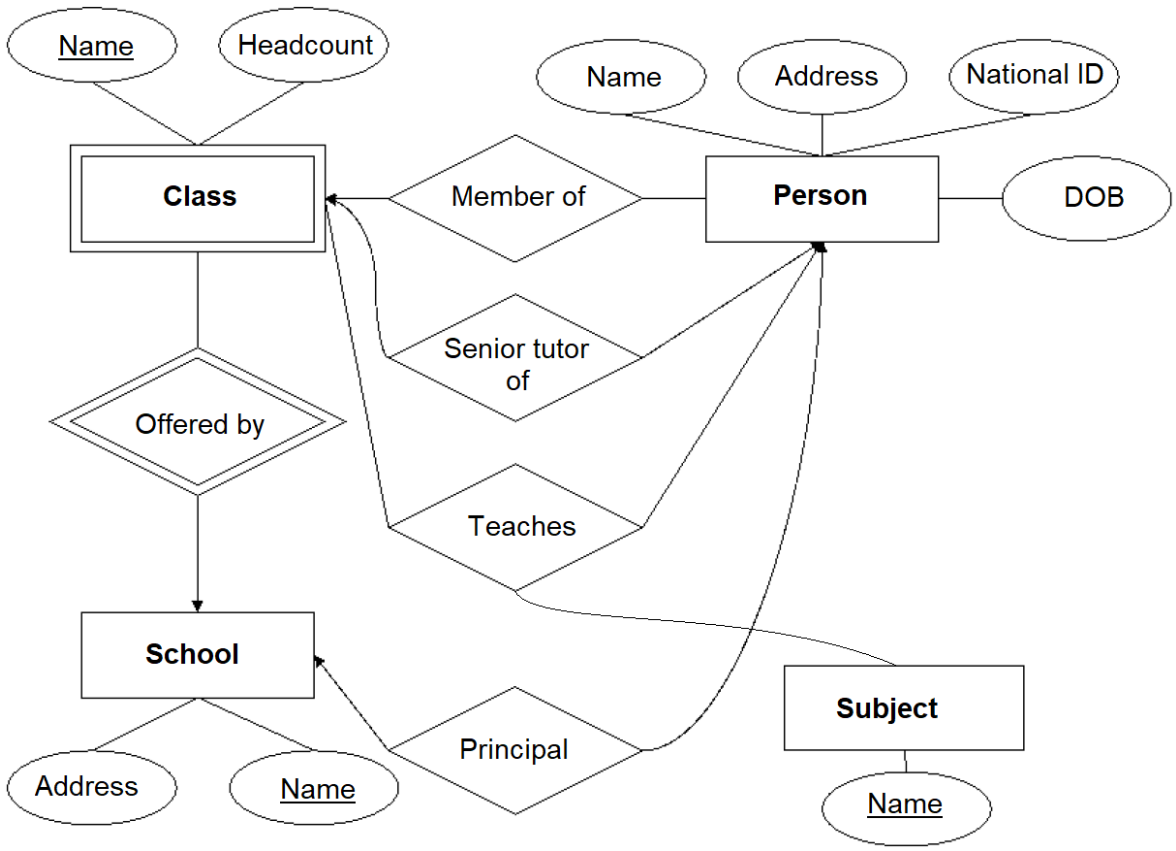

Figure 2: SchoolDB, version 2.