Exercise 4

1 DML-DDL-Constraints

In this exercise you will have to create the database that has been explained in the lecture. For all the string attributes, use the `varchar(50)` data type. You will have to add constraints to ensure a consistent database.
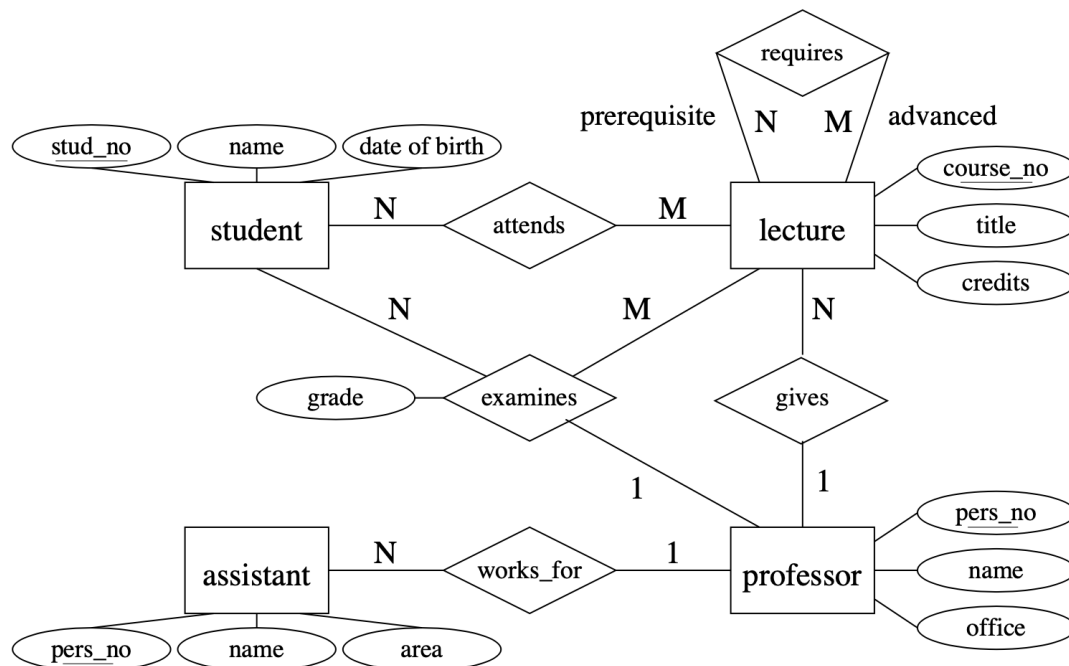

Figure 1: Database of a university explained in the lectures.

1. Create the tables *student*, *lecture*, *assistant* and *professor*. Every student, assistant and professor must have a name, every lecture needs a title and its credits must be higher than zero and less or equal to 60. Every professor needs a **unique** name and the office must be positive. Remember that due to the multiplicity of the relationships *works_for* and *gives*, they will be merged with the relations *assistant* and *lecture*, respectively. For that reason, you will have to add another attribute to the tables *assistant* and *lecture* which will be named *prof_pers_no*.

2. Create the table *examines*. The choice of the primary key for the table is unique and in accordance with the slide 72 (Converting Relationships (2)) from the lecture. Add constraints to the table in order to fulfil that the attribute *grade* is greater or equal to 1, smaller or equal to 6 and if it is not specified, the value 1 is automatically used.

3. Create the tables *requires* and *attends* in a similar manner as in task 2. Please, be carefull with the relation *requires*, it has two attributes called *advanced* and *prerequisite*, both together form the key of the relation, however the former cannot be *NULL* while the latter can. For the relation *attends*, whenever the foreign key *course_no* is deleted or changes we want it to be updated accordingly. In contrast, for the relation *requires*, whenever the *course_no* is deleted or changes we want the *advanced* attribute to be changed accordingly and the *prerequisite* to be set to *NULL*.

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Zurich UZH

Database Systems
Spring 2021

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4. Can the query of task 2 be computed before the queries of task 1? Why?

5. Insert the following tuples into the database.

professor

pers_no	name	office_no
312367	Smith, Johannes	114
312368	Thomson, Ioana	120

assistant

pers_no	name	area	prof_pers_no
332117	Love, David	76	312368
113582	Lopez, Esther	35	312368

6. Two new professors have joined the university 'Laurin, Johannes' and 'Bjorn, Emilia'. Their identification is 123332 and 409321, however they do not have an office for the moment. Add them to the database.

7. The administration found a free office for them, its number is 17. Please, update the office value for the two professors in one unique query.

8. Remove all the professors from the database whose first name is 'Johannes' in one query.

2 Understanding DML-DDL-Constraints

Given two tables with the following create statements:

```
1  create table composer(
2      name        varchar(30) primary key,
3      born        integer,
4      country     varchar(30));

1  create table music(
2      title       varchar(30),
3      years       integer,
4      composer    varchar(30)
5      foreign key(composer),
6      references composer(name));
```

Which of the following instances of the database are correct? If the instance is not correct explain why.

composer

1.
name	born	country
Grieg	1843	Norway
Chopin	1810	France
Chopin	1810	Poland

music

title	year	composer
Peer Gynt	1875	Grieg
Minute Waltz	1847	Chopin

composer

2.
name	born	country
Grieg	1843	Norway
Chopin	1810	France

music

title	year	composer
Peer Gynt	1875	Grieg
Minute Waltz	1847	Chopin
Kreutzer Sonata	1802	Beethoven

composer

3.
name	born	country
Grieg	1843	Norway
Chopin	1810	Poland

music

title	year	composer
Peer Gynt	1875	Grieg
Minute Waltz	1847	Chopin

4.

composer

name	born	country
Grieg	1843	Norway
Chopin	1810	France
Schobert	unknown	France

music

title	year	composer
Peer Gynt	1875	Grieg
Minute Waltz	1847	Chopin

5.

composer

name	born	country
Grieg	1843	Norway
Chopin	1810	France

music

title	year	composer
Peer Gynt	1875	Grieg
Minute Waltz	1847	Chopin
Revolutionary Etude	1831	Chopin

6.

composer

name	born	country
Grieg	1843	Norway
Chopin	1810	France

music

title	year	composer
Peer Gynt	1875	Grieg
Minute Waltz	1847	Chopin
Revolutionary Etude	1831	NULL