Exercise for *Database System Concepts for Non-Computer Scientist* im WiSe 18/19

Alexander van Renen (renen@in.tum.de)
http://db.in.tum.de/teaching/ws1819/DBSandere/?lang=en

**Sheet 07**

**Exercise 1**

Write SQL queries for following tasks on our university database:

(a) Find all *Students* that know Sokrates from a *Lecture*.

(b) Find all *Students* that attend at least one *Lecture* together with Fichte.

(c) Find *Assistants of Professors* that taught Carnap – e.g., as a potential advisor for a thesis.

(d) Determine the names of *Professors* that Theophrastos knows from *Lectures*.

(e) Which *Lectures* are attended by *Students* in the 1.-4. semester? Print out the title of those lectures.

**Solution:**

(a) Find all *Students* that know Sokrates from a *Lecture*.

```
select distinct s.studNr, s.name
from Students s, attend a, Lectures l, Professors p
where s.studNr = a.studNr
    and a.lectureNr = l.lectureNr
    and l.given_by = p.persNr
    and p.name = 'Sokrates';
```

`DISTINCT` is necessary if we do not want duplicates in our result. Alternatively, we could also write the query using nested queries. However, by looking at the resulting query it should be clear that the former one should be preferred, as it is easier to read and understand.

```
select distinct s.studNr, s.name
from Students s
where s.studNr in
    (select a.studNr
     from attend a
     where a.lectureNr in
         (select l.lectureNr
          from Lectures l
          where l.given_by in
              (select p.persNr
               from Professors p
               where p.name = 'Sokrates'
               )
         )
    )
```

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(b) Find all *Students* that attend at least one *Lecture* together with Fichte.

    select distinct other_s.studNr, other_s.name
    from Students fichte_s, attend fichte_a, attend
        other_a, Students other_s
    where fichte_s.name = 'Fichte'
        and fichte_a.studNr = fichte_s.studNr
        and other_a.lectureNr = fichte_a.lectureNr
        and other_s.studNr = other_a.studNr
        and other_s.studNr <> fichte_s.studnr

(c) Find Assistants of *Professors* that taught Carnap – e.g., as a potential advisor for a thesis.

    select distinct b.perNr, b.name
    from Students s, attend a, Lectures l, Assistants b
    where s.name = 'Carnap'
        and a.studNr = s.studNr
        and a.lectureNr = l.lectureNr
        and l.given_by = b.boss

    The query should return both the name and the persNr, otherwise two assistants with the same name could not be distinguished.

(d) Determine the names of *Professors* that Theophrastos knows from *Lectures*.

    select p.persNr, p.name
    from Professors p, attend a, Lectures l, Students s
    where p.persNr = l.given_by
        and l.lectureNr = a.lectureNr
        and a.studNr = s.studNr
        and s.name = 'Theophrastos';

(e) Which *Lectures* are attended by *Students* in the 1.-4. semester? Print out the title of those lectures.

    select l.title
    from Lectures l, attend a, Students s
    where l.lectureNr = a.lectureNr
        and a.studNr = s.studNr
        and s.semester between 1 and 4;