Course A7B36DBS: **Database Systems**

Practice 04:

SQL – Data Querying and Views

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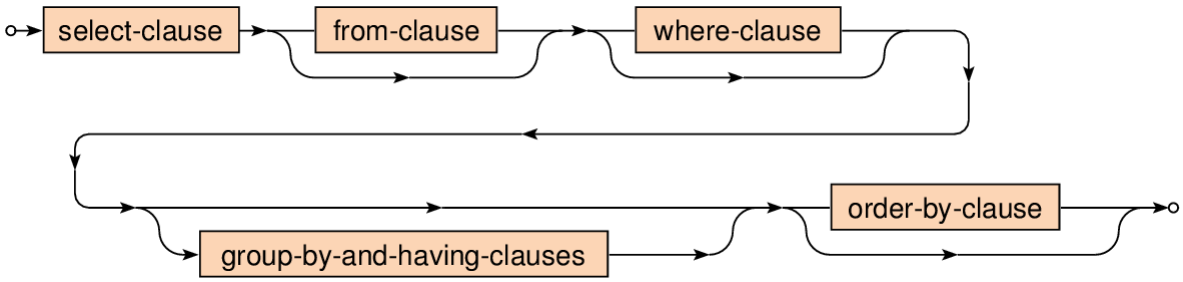
Select Queries

- **SELECT statements** in a nutshell
  - **SELECT** clause: which columns should be included in the result table
  - **FROM** clause: which source tables should provide data we want to query
  - **WHERE** clause: condition a row must satisfy to be included in the result
  - **GROUP BY** clause: which attributes should be used for the aggregation
  - **HAVING** clause: condition an aggregated row must satisfy to be in the result
  - **ORDER BY** clause: attributes that are used to sort rows of the final result



Assignments

Database Schema

- Assume the following relational database schema

Student(id, name, address)

Teacher(id, name, phone, department)
department ⊆ Department(name)

Department(name, chair)
chair ⊆ Teacher(id)

Course(code, title, annotation)

Dependency(course, requisite)
course ⊆ Course(code), requisite ⊆ Course(code)

Schedule(course, teacher, semester, day, time, room)
course ⊆ Course(code), teacher ⊆ Teacher(id), room ⊆ Room(number)

Room(number, building, capacity)

Enrollment(student, semester, course, result)
student ⊆ Student(id), course ⊆ Course(code)

Exercise 1

- Express the following query in SQL
  - Teachers from department with a name *KSI*

Exercise 2

- Express the following query in SQL
  - Names of teachers from all departments that have *Tomas Skopal* as a department chief

Exercise 3

- Express the following query in SQL
  - Codes and titles of all courses that are taught on *Mondays* or *Fridays* during this semester (*2015-1*)

Exercise 4

- Express the following query in SQL
  - Codes and titles of all courses that are not taught on *Mondays* and nor on *Fridays* during this semester (*2015-1*)

Exercise 5

- Express the following query in SQL
  - Names and ids of all students that have no enrolled course in this academic year (semesters *2015-1* and *2015-2*)

Exercise 6

- Express the following query in SQL
  - Distinct names of students that have enrolled at least one course taught by someone from *KSI* department (regardless a particular semester)

Exercise 7

- Express the following query in SQL
  - Distinct names of teachers who have conflicts in their planned schedules for the next semester (*2015-2*)
    - Two scheduled events are in a conflict with each other if and only if…
      - they have overlapping times, but also
      - when there is less than 10 minutes for a break / 45 minutes for a transfer in case of events scheduled within the same / in different buildings respectively
    - Assume that…
      - each schedule event is expected to be 90 minutes long
      - you can use a standard subtraction operator (–) on times and expect to get a difference in a number of minutes

Exercise 8

- Express the following query in SQL
  - Names of students that are enrolled only in courses taught by teachers from *KSI* during this semester
    - Assume only students with at least one enrolled course
    - Order these students according to their names

Exercise 9

- Express the following query in SQL
  - Overall and average capacity of all rooms within each building

Exercise 10

- Express the following query in SQL
  - Overall numbers of enrolled students and average achieved results for all the courses taught during the previous semester (*2014-2*)
    - Return course titles instead of their codes
    - Include courses that have no enrolled students
    - Exclude courses that have some enrolled students but all of them have their results undefined (i.e. NULL)
    - Return the courses in a descending order according to the numbers of enrolled students