University of Basel

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Introduction to Databases — Autumn 2024

Exercise 1

(Theory) Hand-in: 09.10.2024 (ADAM, 23:59)
(Practical) Hand-in: 09.10.2024 (during Exercise)

Solving the Exercises: The exercises must be solved in small groups of two people. Use the notations introduced in the lecture. The DMI plagiarism guidelines apply for this lecture.

Submission Information: Please upload all (Theory) deliverables BEFORE the deadline to ADAM as **a single PDF** and all (Practical) as **separate text files** using the team hand-in feature. Solutions that are handed in too late cannot be considered. For practical exercises upload the deliverables to ADAM and present them to one of the assistants/tutors during the exercises, both is required to recieve the points!

Task (Practical) 1: Groups (1 Points)

This will be by far the easiest task. Form pairs and let the tutors know to get your first point. Be careful with your choice: The groups are fixed for the duration of the course. You will also have to hand in exercises on ADAM with your partner.

Hand-In: Register your group by sending a mail with your names to the tutors. In return you will get credentials to connect to the teaching database. Do not share your credentials outside your group.

Task (Practical) 2: Connect to the database (2 Points)

For this task it is required to complete the previous tasks first.

(For this task you may Google or ask a LLM)

You will now connect to the database and execute a few queries. The database you connect to is called `introdb` and you connect on port `5432`. Additionally, you have to be in the network of the university. Use a tool of your choice, e.g. the open-source community edition of dbeaver. Other options are JetBrains DataGrip, or psql if you prefer a command line tool. To connect to the database with Python will be object of the next exercise. To verify that you are correctly connected, run the following SQL command:

```
SELECT version();
```

Hand-In: Show that you can execute the version command. What database software is used?

Task (Practical) 3: Exploring the database (3 Points)

For this task it is required to complete the previous tasks first.

Now that you are successfully connected, have a look around. What data does this database hold?

Now execute the following query. What does it do?

```
SELECT COUNT(*)
  FROM games
 WHERE result = '1-0'
```

Hand-In: Explain the assistants/tutors what data is in the database. What does the example query do?

Task (Practical) 4: Exploring the database II (1 Points)

Now execute the following query and plot the result with a program of your choice.

```
SELECT EXTRACT(MONTH FROM game_start), COUNT(*)
  FROM games
GROUP BY EXTRACT(MONTH FROM game_start)
```

Hand-In: What does the example query do? Show the plot to the assistants.

Task (Theory) 5: Questions (3 Points)

Answer the following questions and explain your answers:

- What are the advantages and disadvantages of using databases to manage data compared to file-based approaches? *(2 advantages and 2 disadvantages as bullet points)*
- What is the link to the official documentation for the `version()` function used in the first task and to which category of functions does it belong?