

INTRODUCTION TO RELATIONAL DATABASE SYSTEMS

DATENBANKSYSTEME 1 (INF 3131)

Torsten Grust
Universität Tübingen

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WELCOME!

This course will introduce you to the world of **Relational Database Systems**, the dominating database technology in use today (since the early 1970s).

- All data in Relational Database Systems takes a **rectangular, tabular shape**:

A	B	C
.	.	.
.	.	.
.	.	.

- Relational Database Systems benefit from this restricted **data model** in a number of ways:
 1. A **data language** to insert into, extract from, and manipulate such data tables is simple.
 2. The formal model behind this idea is simple as well.
 3. Regular data layout admits a super-efficient implementation (→ Datenbanksysteme 2).

TORSTEN GRUST?

Time Frame	Affiliation/Position
1989–1994	Diploma in Computer Science, TU Clausthal
1994–1999	Promotion (PhD), U Konstanz
2000	<i>Visiting Researcher</i> , IBM (USA)
2000–2004	Habilitation, U Konstanz
2004–2005	Professor Database Systems, TU Clausthal
2005–2008	Professor Database Systems, TU Munich
since 2008	Professor Database Systems, U Tübingen

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Mastodon: [@Teggy@home.social](#) (*Professor, likes database systems, programming languages, and SC Freiburg ツ*)

WSI, Sand 13, B318

ADMINISTRIVIA (1)

LECTURES (INCLUDES 10-MIN BREAK)

Time Slot	Room
Monday, 10:15–11:55	Room A301, Sand 1
Tuesday, 10:15–11:55	Room A301, Sand 1

TUTORIALS

Time Slot	Room
Thursday, 12:15–13:45	Room A301, Sand 1

ADMINISTRIVIA (2)

END-TERM EXAM

- A 90-minute **written exam** on July 25 2023, 12:00–14:00, Lecture Halls N3/N5. Passing earns you **9 ECTS**.
- You may bring a A4 double-sided *cheat sheet*.

WEEKLY EXERCISE SHEETS

- We will distribute and collect **weekly exercise sheets**, each with a handful of problems (Wednesday → next Thursday before 12:00).
- **No points**, grades, or bonuses whatsoever—instead, each problem receives a 👍/👎 mark and detailed comments.
- Score 👍 on $\frac{1}{2}$ of all assignments to be admitted to end-term exam.
- **No teams**, everyone hands in their individual problem solutions (we will not hunt for plagiarism—collaborate freely).

WEEKLY ASSIGNMENTS & TUTORIALS

Organized and run by **Louisa Lambrecht** and **Tim Fischer**.

1. Expand on lecture material,
2. develop additional code, run additional examples, ...,
3. discuss solutions to weekly exercise sheets.

Exercises sheets and tutorials will start in the second week of the semester once we have collected the first batch of interesting material. First tutorial: April 27, 2023.

ADMINISTRIVIA (3)

DB1 DISCORD

⚠ **Sign up for the DB1 Discord!** This is *not* optional
(all announcements and discussions regarding DB1 will happen there):

<https://db.cs.uni-tuebingen.de/discord>

DB1 GITHUB

- Download **slides** (PDF—bring a print-out and take notes), sample data, code, ... Bugs do happen, thus check for updated material.
- Download **exercise sheets** via `git pull`, upload your solutions via `git push`.
- See the **DB1 Discord** for the gory details (URLs, repos).

TOUCH THE DATA

- Whenever reasonable, we will try to lay our hands on data (and not only talk about it).
- Expect lots of **live interaction with data files and tools** during the course.
- We will use the programming language **Python** to perform ad-hoc manipulation of data files and illustrate database system functionality.



`python.org`, Python 3.10 used in lectures

- Basic Python constructs suffice (mostly nested loops, conditionals, arrays, dictionaries).

TOUCH LOTS OF DATA

- The Relational Database System **PostgreSQL** will be the primary tool in this course.



`postgresql.org`, PostgreSQL 14.7 used in lectures, any version 14.x or 15.x probably OK

- Straightforward to install and use on a variety of platforms (macOS, Linux, Windows).
- Complete, standards-conformant, efficient, extensible, open to inspection, and generally awesome.
- Implements **SQL** (*The Intergalactic Dataspeak*), the main language spoken in this course.

QUESTIONS SO FAR?

- *Can I bring my mobile computing device to the lecture?*
Yes, if you use it to run Python or PostgreSQL ツ.
- *Do I need to copy the Python/SQL/... code that you develop during the lecture?*
No, (most) code and data will be available on GitHub.
- *Do you value feedback (on course contents as well as form)?*
Most definitely (also: you *will* find bugs in the slides/material).
Please participate in the mid-semester student's evaluation of our courses.
Thank you!