

# DATABASES

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structure according to slides of Prof. Dr. Julian Reichwald

# Goals

After successfully completing the module students should be able to:

- explain basic features of Relational Database Management Systems (RDMS)
- transform a use case to the conceptual and implemented data model
- create a database and make SQL queries over it using RDBMS
- evaluate storage structures of RDBMS
- read execution plans and optimize queries
- work with transaction isolation layer

# Agenda

- 00 - Introduction (printable version)
- 01 - Motivation and basic concepts (printable version)
- 02 - Relational data model (printable version)
- 03 - Relational Algebra (printable version)
- 04 - Conceptual design (printable version)
- 05 - Logical design (printable version)
- 06 - Normalization (printable version)
- 07 - SQL (printable version)
- 08 - Physical storage (printable version)
- 09 - Indexing and Hashing (printable version)
- 10 - Query Processing and Optimization (printable version)
- 11 - Concurrency (printable version)
- README (printable version)

# PRÜFUNGSFORM

## Continuous assessment

- **Project** (database application): 20 points
  - design of a database
  - the database implementation in PostgreSQL
  - web application to access the database
- **Homeworks**: 5 bonus points
- **Exam**: 100 points (100 minutes)

# Literature

- R.A. Elmasri und S.B. Navathe. Fundamentals of Database Systems (6th Edition), Pearson , ISBN-13: 978-0136086208
- A. Silberschatz, H.F. Korth und S. Sudarshan. Database System Concepts (6th Edition) McGraw-Hill, 2011. ISBN-13 978-0-07-352332-3
- T. Studer, Relationale Datenbanken ,Springer-Verlag, 2016. ISBN 978-3-662-46570-7

# TOOLS

Following tools are used during lectures:

- PostgreSQL
- pgAdmin4