DATABASES

DHBW Mannheim

Petko Rutesic
petko.rutesic@dhbw-mannheim.de

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 write and execute SQL queries using RDBMS
- evaluate storage structures of RDBMS
- read execution plans and optimize queries
- work with the 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 - SQL (printable version)
- 07 - Normalization (printable version)
- 08 - Database programming (printable version)
- 09 - Physical storage (printable version)
- 10 - Indexing and Hashing (printable version)
- 11 - Query Processing and Optimization (printable version)
- 12 - 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
- Miguel Grinberg, Flask Web Development, O'Reilly Media, 2014, ISBN 978-1-449-37262-0

TOOLS

Main database tools used in the course:

- PostgreSQL
- SQLite
- pgAdmin4
- MySQL Workbench

Programming languages and libraries:

- Python
- Flask web framework
- SQLAlchemy