Welcome to TDDD81 Database Technology



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Topics and Intended Learning Outcomes



Course Topics

- 1. Fundamental concepts
- 2. Relational databases
- 3. SQL
- 4. EER modeling
- 5. Mapping of EER diagrams to relations
- 6. Functional dependencies and normalization

- 7. Stored procedures and triggers
- 8. Data structures for DBs
- 9. Introduction to Transaction Processing
- 10. Concurrency Control
- 11. Database Recovery
- 12. Query Processing



After the course you should be able to ...

- Design relational databases for different types of example domains by first creating a conceptual schema using the Enhanced Entity-Relationship (EER) model and then translating this conceptual schema into a corresponding logical schema captured in the relational data model.
- Analyze and improve the quality of given relational database schemas based on the formal measure of *normal forms*.





After the course you should be able to ...

- *Employ the SQL language* to query and to modify several example relational databases, as well as to create such a database with a given relational database schema.
- Compare the cost of finding and updating records in database storage files when using different approaches to organize and to index such files.
- Apply basic techniques that DBMSs can use to identify and to avoid problems that may occur when multiple users access a database concurrently.
- Apply recovery algorithms that DBMSs use to guarantee persistence of data even in the case of system failures.



Examination



Final Exam

- During the exam period after the course
- Dates: see pointer on the course Website





Four Assignments

- 1. Database design and EER modeling
- 2. SQL
- 3. Functional dependencies and normalization
- 4. BrianAir project, *4a*: initial design, *4b*: improved design *4c*: implementation, *4d*: urkund analysis
- Deadlines on the course Website
 - hard deadlines for assignments 4a and 4b
- To be solved in pairs
 - register with lab partners in Webreg before Feb.7
- Use MySQL server for assignments 2 and 4c
 - need access to MySQL server provided by LiU IT
 - instructions on the course Website



Organization of the Course



Structure of the Course

- Schedule on the course Website
- 12 lecture sessions (4 of them in VT2!)
 - Flipped-classroom style
- 9 lab sessions (all in VT1)
 - First three: focus on assignment #2 (SQL), in VT1
 - Remaining six: focus on assignment #4c, in VT2 (not all of these six lab sessions will be supervised)
- 1 teaching session (in VT1)
 - Discussion of #4a hand-ins (mandatory!)
- Text book: Elmasri and Navathe. *Fundamentals of Database Systems*, Addison Wesley, 7th edition









Flipped Classroom-like Model

- Idea:
 - you watch a video lecture *before* the lecture session
 - we use the lecture session to do some quizzes, go through some additional examples, and discuss questions and things that were unclear to you in these video lectures





Flipped Classroom-like Model

- Idea:
 - you watch a video lecture *before* the lecture session
 - we use the lecture session to do some quizzes, go through some additional examples, and discuss questions and things that were unclear to you in these video lectures
- In contrast to trying to replicate traditional lectures
 - more flexibility in terms of when you watch the videos (plus, you can pause, repeat, fast-forward, etc.)
 - role of the lecture sessions: give you ample opportunity to ask questions and to reinforce your learning of the concepts





Database Technology Topic 1: Introduction

Did you watch the video lecture?

- 1) Yes, all of it
- 2) Yes, partially
- 3) No, sorry
- 4) Video lecture??



Earlier Versions of the Course



EvalLiUate Evaluations 2020 & 2021



Take-Aways from Free-Text Fields

- Many students liked the flipped-classroom lectures, but not all
- Many complaints about having to watch videos in the evenings, and a stressful schedule, in particular during the first weeks
- Complaints about a long period in the middle without any lectures and course-related activities
- → Keep the flipped-classroom lectures
- Schedule reorganized
 - topics in the beginning reordered (all DB design topics moved before SQL)
 - not so packed in the first weeks; spread out more over all of VT1
 - BrianAir project in VT2 now, including the corresponding lab sessions
- Video watching schedule now part of the schedule in TimeEdit
 - see the teaching activities called "Information"
 - attention: no need to watch the videos in exactly these time slots



Take-Aways from Free-Text Fields (cont'd)

- Lab assignments very much appreciated, including particularly the BrianAir project
- Complaints about one of the two lab assistants (praises for the other one)
- No changes to the assignments
 - but assignments 1 and 2 swapped (due to reordering of lecture topics)
- Lab assistant is not in this course anymore
- Please let me know if you have issues!



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