Welcome to TDDD81 Database Technology

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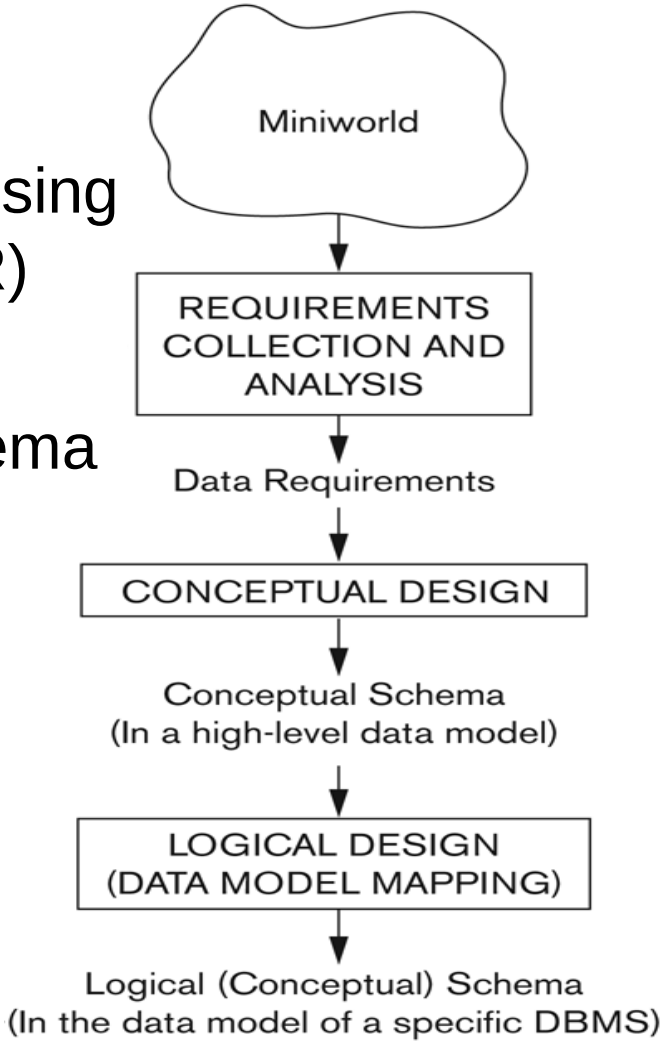
Topics and Intended Learning Outcomes

Course Topics

1. Fundamental concepts
2. Relational databases
3. EER modeling
4. Mapping of EER diagrams to relations
5. SQL
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

Image source: https://commons.wikimedia.org/wiki/File:ATC_Admission_Exam_(2).JPG

Four Assignments

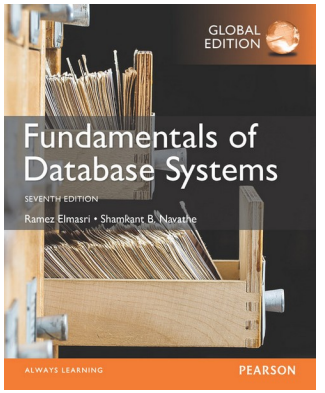
1. Database design and EER modeling
2. SQL
3. Functional dependencies and normalization
4. BrianAir project, *4a*: initial design, *4b*: improved design
   4c: implementation, *4d*: urkund analysis

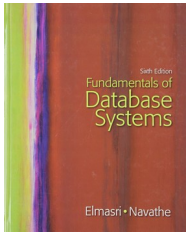
- Deadlines on the course Website
  - *hard deadlines* for assignments 4a and 4b
- To be solved in pairs
  - register with lab partners in Webreg no later than Jan.23
- Use MySQL server for assignments 2 and 4c
  - need access to MySQL server provided by LiU IT
  - instructions on the course Website

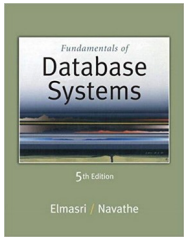
Organization of the Course

Structure of the Course

- Schedule on the course Website
- 12 lecture sessions (4 of them in VT2!)
  - Flipped-classroom style
- 9 lab sessions
  - 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 (beginning of VT2)
  - Discussion of #4a hand-ins (mandatory!)
- Text book: Elmasri and Navathe. *Fundamentals of Database Systems*, Addison Wesley, 7th edition

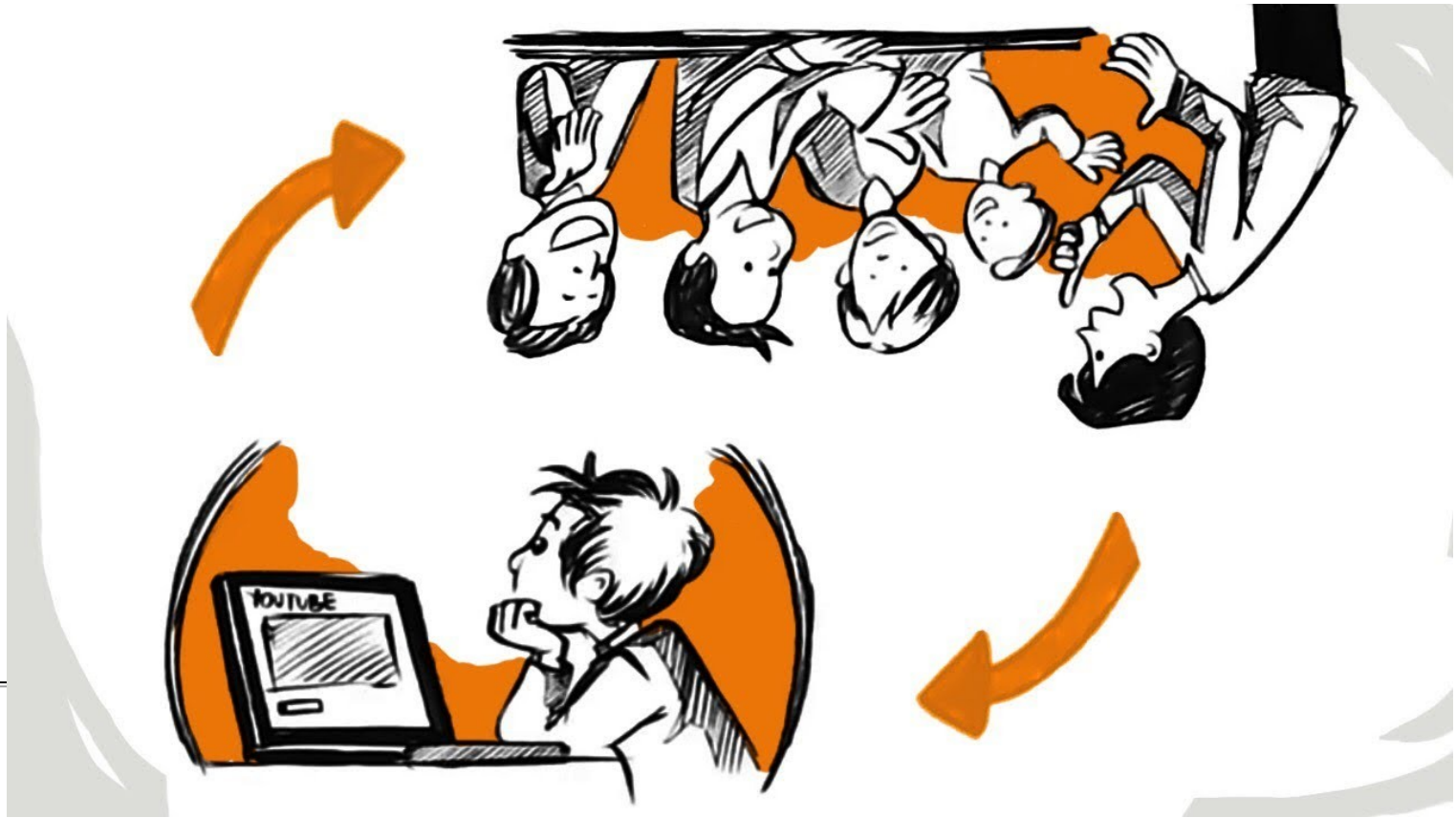






Flipped Classroom-like Model

- 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



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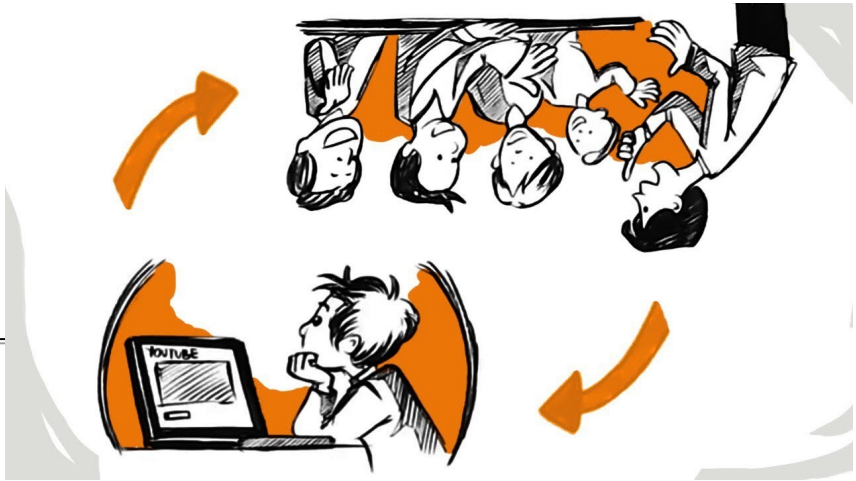
  - we use the lecture session to do some quizzes, go through some additional examples, and discuss questions and things that were unclear to you in these video lectures
- In contrast to traditional lectures
  - more flexibility in terms of when you watch the videos (plus, you can pause, repeat, fast-forward,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



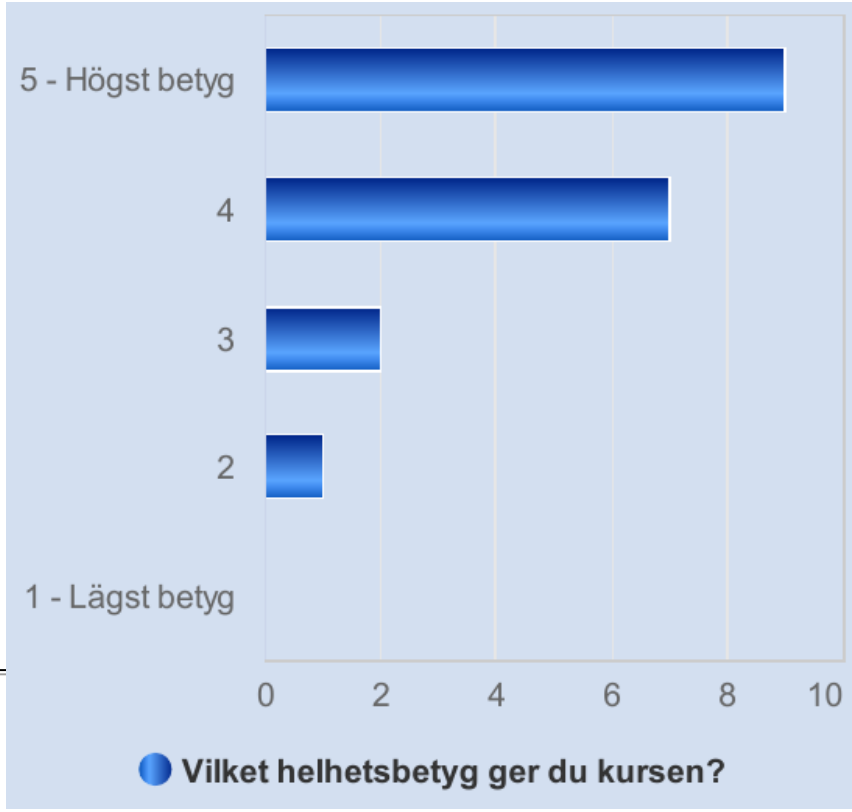
Did you watch the video lecture?

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

Earlier Versions of the Course

EvalLiUate Evaluations 2020–2022

	2020	2021	2022
Overall number of students	53	90	76
Students who answered	12 (22.6%)	22 (24.4%)	19 (25.0%)
Overall evaluation	3.25 (±0.97)	3.68 (±1.17)	4.26 (±0.87)



Quotes from Free-Text Fields

- *“Tycker kursen borde skett framförallt under jan-mars så att kunskaperna bättre kunde tillämpas i kandidatprojektet.*
  Vore också önskvärt att involvera implementation av moln databaser så det kunde användas i kandidatprojektet.”

- “*moln databaser*” – the course is about basic database technology, with a focus on relational / SQL databases; yet, many concepts, and even SQL, are also relevant when using DBaaS solutions of cloud service providers
- “*jan-mars*” – when to place the course moments is an ongoing issue :-(
  - this time: not so packed in the first weeks; spread out more over all of VT1
  - BrianAir project in VT2 now, including the corresponding lab sessions
  - Deadline for completing BrianAir project: mid VT2
    (i.e., not at the end of VT2 when you will have to wrap up your kandidatprojekt)

Quotes from Free-Text Fields (cont'd)

- *"I did not like the reverse classroom way of working. It felt like the recorded lectures were enough and that the lectures themselves were only an addition if you had questions. This also made it so that it was easier to put the recorded lectures on hold and watch them all at once before the exam."*
- "*I loved the flipped-classroom style of learning and didn't have to study as much last-minute for the exam as I do in other courses since I managed to learn along the way.*"

- *"The labs were good."*
- *"Laborationerna och projektet var roligt."*
- *"Gillade labbarna och projektet, perfekt sätt att förstå sig på kursens innehåll genom att praktiskt tillämpa det man lärt sig."*
- *"[..] the lab series is very good at teaching SQL and I believe most students were surprised at how good and fun it was to do the project in the end."*

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