



Databases and XML (1) – 08.02.2016



Time	Activity
08.30	Welcome and presentation of the course
09.00	Quiz
09.20	ER diagrams
09.30	Data modelling exercise
10.00	Break
10.30	Introduction to SQL
10.45	SQL assignment
12.00	Break
12.30	SQL blog assignment
13.55	Sum up, next time and homework

Today's agenda



- My initials: TOSK
- My office: A2.15

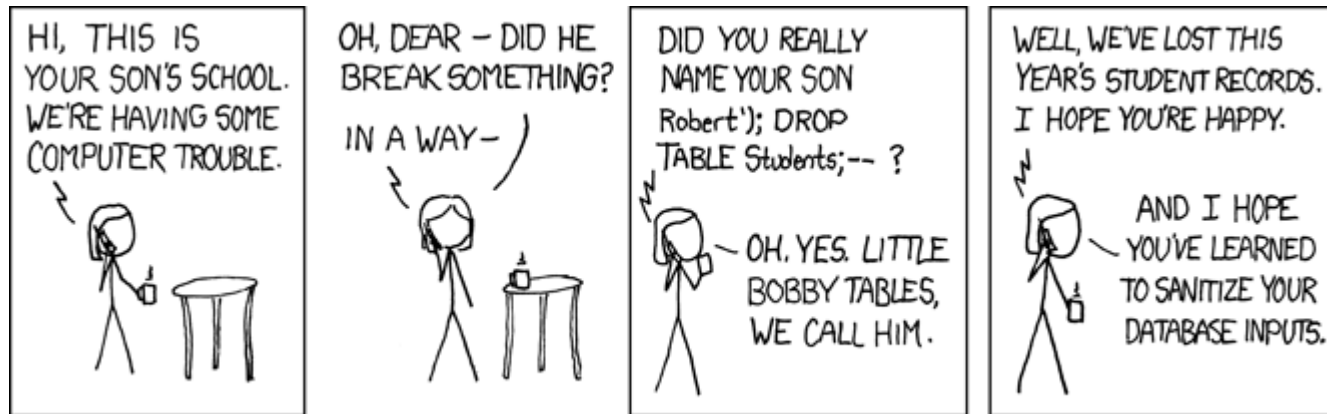
- MSc of Science
- Examples of Computer experience:
 - Designing brand new database for a cheese dairy
 - Navigating in huge production database systems at Arla

- SQL server 2008, 2012

Torill H. Skytte



And my son is named Robert...



Her daughter is named Help I'm trapped in a driver's license factory.

xkcd.com/327

Bobby Tables

Database design and ER modelling (Chen and Crow's foot)

Basic SQL commands

SELECT, INSERT, UPDATE, DELETE, WHERE, ORDER BY, JOINS, GROUP BY

Advanced SQL commands

Views, Stored Procedures, Triggers, Transactions

Microsoft SQL Server

NoSQL (MongoDB)

JSON and XML

Course description



18. March @ 23.59

The mandatory assignment consists mostly (75%) of the assignments from the lectures

Mandatory Assignment



Preparation: reading, video and assignments

Today's subject

Exercise(s)

Wrap up / more subjects

Assignment

Conclusions

Typical lecture day



You meet up prepared
(3,5 hours of lectures = at least 7 hours of preparation)

You participate actively in study groups
and try to finish all the exercises

You hand in your assignments on time

My expectations to you



Socrative.com

Room: TORILL

Quiz



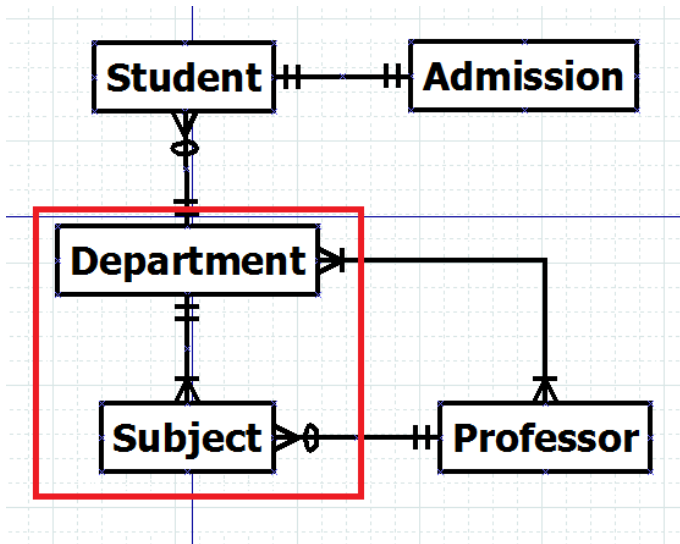
- Your name and age
- What is your educational background?
- Favorite travel destination
- Favorite TV/Netflix show

Get to know your team



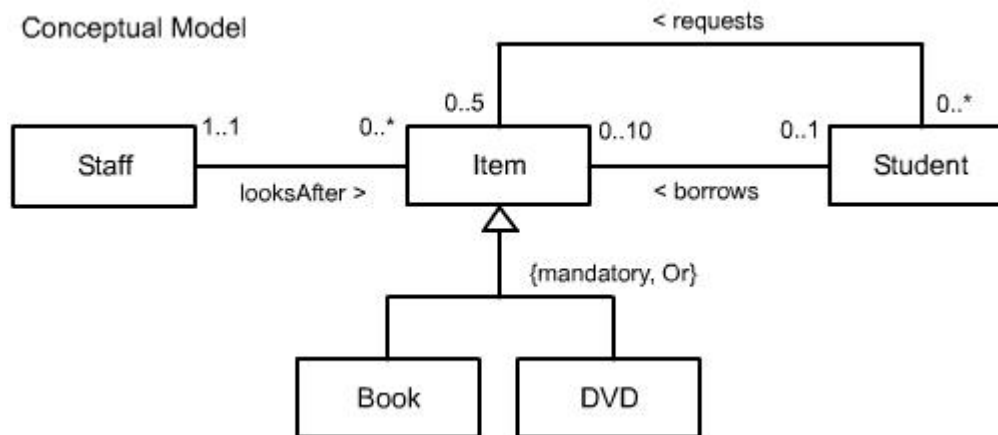
Entity-relationship model

Describing the different parts and relations in an abstract way before implementing them in a database.



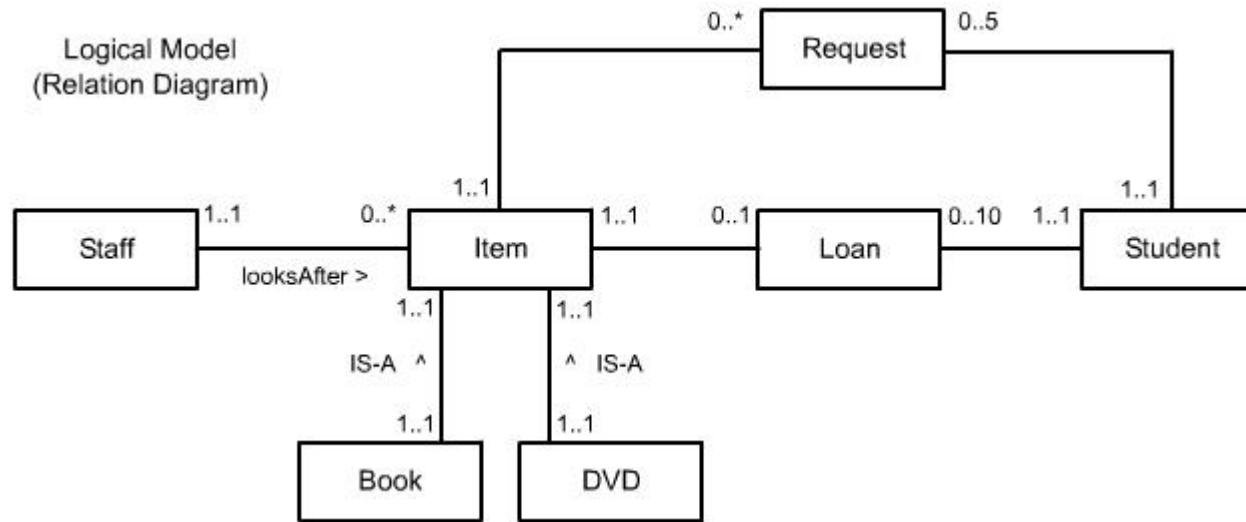
ER model

Conceptual data model – highest level ER, very little detailed. Useful e.g. to establish an overview for an entire enterprise.



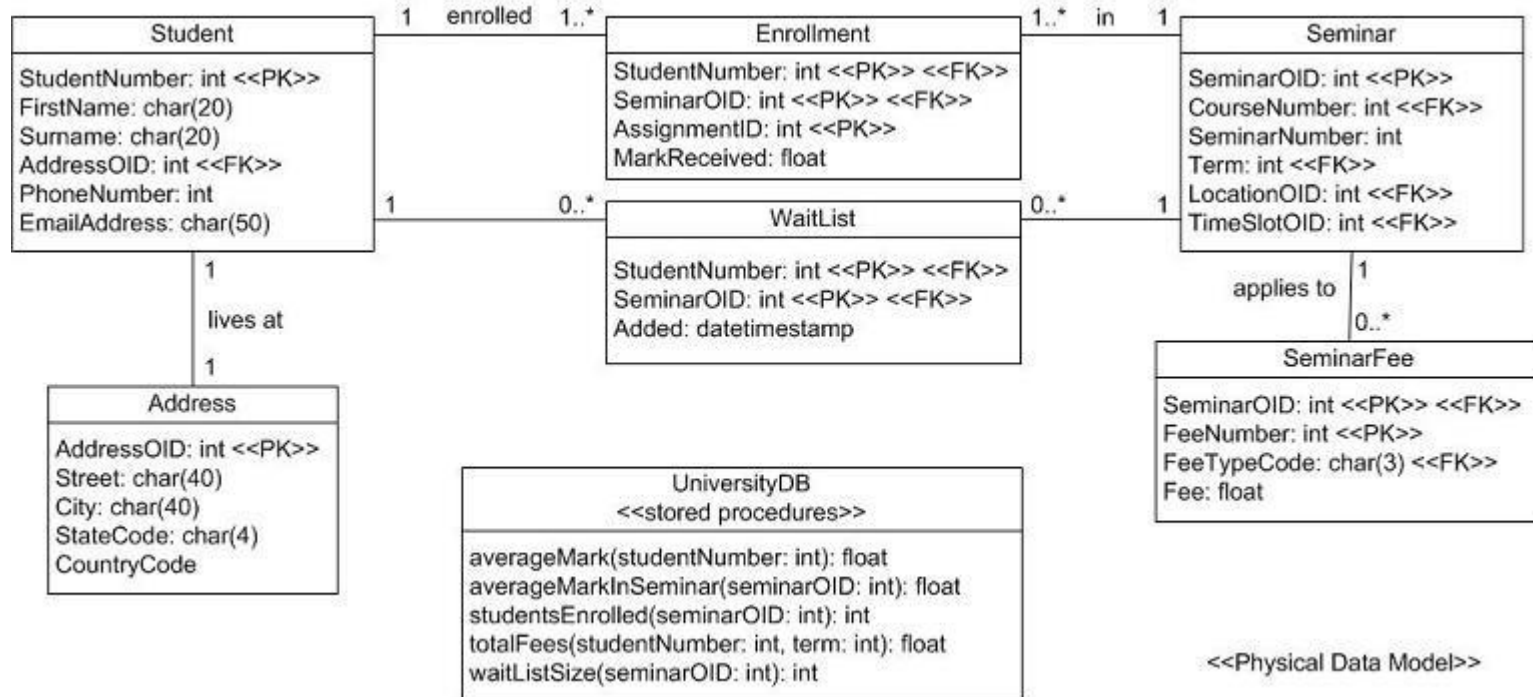
ER model

Logical data model – includes master data entities, operational and transactional data entities. Independent of technology.



ER model

Physical data model – contains enough details to actually implement the database, like a picture of the database, but made in advance.



ER model

Data modelling exercise



Our data is the result of two questions from the PollApp exercise last week ("Favorite pet?" and "Favorite cake?").

With data modelling (ER diagram) as a tool, we now want to plan a database to collect our data.

What will the ER diagram look like after 1., 2., and 3. order normalization?

5 minutes on each normalization step
Draw each phase in an ER diagram

Data modelling exercise



AnswerId	Answer	Question	Email
1	Cat	Favorite pet	TOSK@eaaa.dk
2	Chocolate	Favorite cake	TOSK@eaaa.dk
3	Cat	Favorite pet	NIHA@eaaa.dk
4	Dream	Favorite cake	NIHA@eaaa.dk
5	Dog	Favorite pet	MVKH@eaaa.dk
6	Lemon	Favorite cake	MVKH@eaaa.dk
7	Dolphin	Favorite pet	JEAR@eaaa.dk
8	Cinnamon	Favorite cake	JEAR@eaaa.dk

1 NF

Answer
AnswerId
Answer
Question
Email

Data modelling 1 N

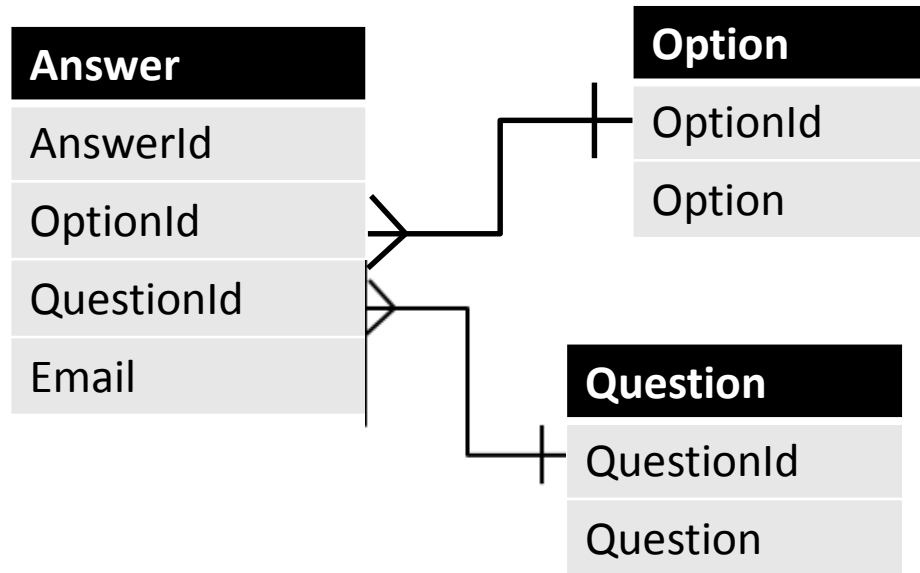


AnswerId	OptionId	Question Id	Email
1	1	1	TOSK@eaaa.dk
2	4	2	TOSK@eaaa.dk
3	1	1	NIHA@eaaa.dk
4	5	2	NIHA@eaaa.dk
5	2	1	MVKH@eaaa.dk
6	6	2	MVKH@eaaa.dk
7	3	1	JEAR@eaaa.dk
8	7	2	JEAR@eaaa.dk

OptionId	Option
1	Cat
2	Dog
3	Dolphin
4	Chocolate
5	Dream
6	Lemon
7	Cinnamon

QuestionId	Question
1	Favorite pet?
2	Favorite cake?

2NF



Data modelling 2N

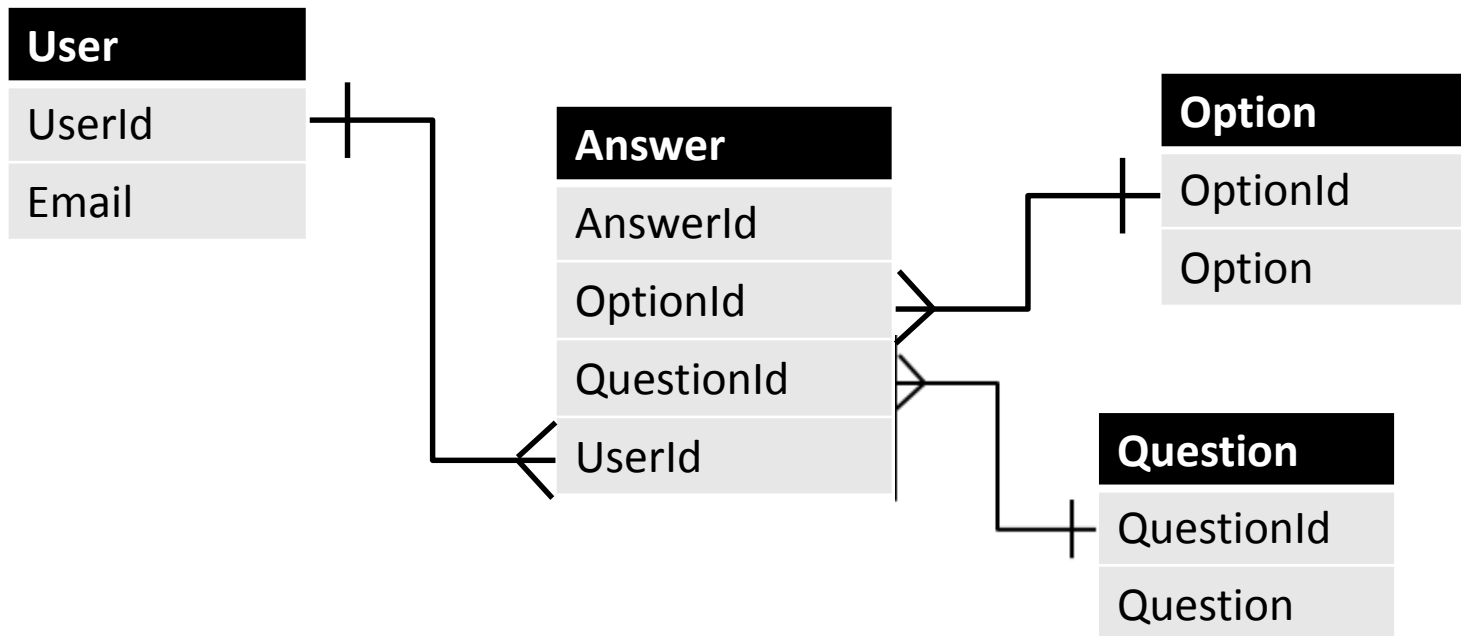
AnswerId	OptionId	Question Id	UserId
1	1	1	1
2	4	2	1
3	1	1	2
4	5	2	2
5	2	1	3
6	6	2	3
7	3	1	4
8	7	2	4

OptionId	Option
1	Cat
2	Dog
3	Dolphin
4	Chocolate
5	Dream
6	Lemon
7	Cinnamon

QuestionId	Question
1	Favorite pet?
2	Favorite cake?

UserId	Email
1	TOSK@eaaa.dk
2	NIHA@eaaa.dk
3	MVKH@eaaa.dk
4	JEAR@eaaa.dk

3NF



Data modelling 3N

Break



Structured Query Language

1974 – SEQUEL (Structured English Query Language)

Declarative programming language – resembles English and is very logical.

Transform-oriented language – a language designed to use relations to transform inputs into required outputs.

Nonprocedural language – you specify *what* information you require, rather than *how* to get it.

Most common language in relational databases. The first and, so far, only standard language to gain wide acceptance.

Basic queries consist of:

CREATE, ALTER, DROP

SELECT, WHERE, ORDER BY

INSERT, UPDATE, DELETE

SQL

Formal terms	Alternative 1	Alternative 2
Relation	Table	File
Tuple	Row	Record
Attribute	Column	Field

A **domain** is the set of allowable values for one or more attributes.

The **degree** of a relation is the number of attributes it contains.

The **cardinality** of a relation is the number of tuples it contains.

Terminology



SQL assignment



Rum ▼ Personlige værktøjer ▼ Søg TimeTable Skema/Fravær WISEflow

Dagens WU-16V (1wu16v1)

Navigations sti: WU-16V (1wu16v1) > 1st semester > Databases > Exercises

Rum

Deltagere

Documents

1st semester

2nd semester

3rd semester

☒ Vis egenskaber

Exercises

Fælles sider (0)

Ingen sider

Oprettet af : Torill Hages??ther Skytte (2016-02-01)

Min adgang : Ændre rettighed

1st semester

☐ Titel

☐ Gå et niveau op

☐ ▼ SQL-2 Start of the blog.pdf

☐ ▼ SQL-1-poll app.pdf

SQL assignment

Break

Continue SQL assignment



Next week's topic:

Complex data modelling

Normalization, participation, constraints, Crow's foot and Chen

Advanced SQL

Embedded SELECTs, Views

Assignment: SQL-2 Start of the Blog.pdf

Read:

- MSDN1 (again if you already read it for this week)
- Chapter 3 in T-SQL
- Beginning T-SQL – Views.pdf

Pluralsight videos:

[\[DATAMODEL\]](#)

Homework and preparation

