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Week 12

DB1102 / PGR 111 – DATABASES



Today's topics

(Today's textbook chapters: Everything from earlier lessons.)

- Reminder: Student evaluation of PGR111 / DB1102
- Repetition from previous lessons
 - Misc topics, after your requests



Student evaluation of course

- Quick reminder:
 - Please [fill in the student evaluations](#) for this course! :-)
 - (You did a "midterm evaluation" earlier, now its time to do the "end of semester" evaluation.)
- Status, our two courses:
 - [DB1102](#): Have been open a few weeks, [50% answers so far](#).
 - [PGR111](#): [Opened today!](#) (Monday 14. of November.)
 - (I don't know why they didn't open both at the same time.)

Repetition

Topics requested by you

Topics requested by you (students)

- Database design,
 - UML "numbering": 1..1, 0..*, etc. How do you decide on these?
 - Then follow up with CREATE TABLE statements (including data types).
 - What are constraints for FKs in create table statements? (And in selects?)
 - Finally some INSERTs.
- The normalization steps (from UNF to BCNF).
 - Walkthrough of the normalization process & how to find the dependencies.
- *IF TIME LEFT*: Walkthrough of some advanced SELECT statements.
 - Subqueries (some examples)
 - JOIN: How do you specify the columns you should join on? With composite FKs?
 - GROUP BY & HAVING
 - LIKE

ER modelling

- **ER modelling.** Topic: Corona. (Actual exam text from 2020, in Norwegian).
 - As part of infection tracking, a university wants to develop a solution to keep track of which people are present in a physical session on campus. For that, they need a database.
- You will be tasked with modelling the database. The data is described as follows:
 - We need to store information about people in the database. We need to store both name and contact information (email and telephone number). Furthermore, we must store information about persons being present in specific physical sessions. A physical session can, for example, be a lecture or lab exercise. A physical session will have a start time, an end time and will apply to a specific subject in a specific room. We need to store both course code, course name and how many registered students there are in the course. We would like to store a description of the room and the current maximum capacity (number of people). It is not necessary to distinguish which roles the people have in the physical session. If a student, supervisor or lecturer gets Corona, we can now find out which people have been in the same physical room as the infected person.

ER modelling – cont.

- **Task:** Draw a model for your proposed solution. You can choose whether you want to use crow's feet or UML notation. If you choose crow's feet, you do not need to distinguish between identifying and non-identifying relationships. (UML notation does not distinguish between this anyway.) Your model must contain:
 - The entities and their attributes.
 - Primary keys and foreign keys.
 - The relationships between the entities.
 - The multiplicity (participation and cardinality) of the relationships.
 - If necessary, composite entities.
- If you think something is unclear, make your own assumptions. In that case, remember to account for these. Yes, when we store personal data, there are certain rules that come into play, but it is not something you need to take into account in this task.
- We recommend using a program, such as Lucidchart, to draw the model. You can also choose to draw by hand and paste the image of your drawing, but it may then be more difficult for the assessor to read it.

Normalization

- **Normalization.** Topic: Company equipment. (Exam text 2020, in Norwegian).
 - A company has a database that keeps track of the company's equipment (machines, chairs, etc.), employees and where the employees have their workplace. The information is collected in two tables and extracts from these are shown below. Column names in bold are primary keys. EmployeeNr in the first table is a foreign key to EmployeeNr in the second table (marked with an underscore).
- **Task:**
 - Normalize the tables to 3rd normal form. Explain your own assumptions about the data where you need to. You can choose to introduce new columns if desired.
 - Justify why your solution meets the requirements for 3rd normal form.
- *NOTE: We'll do BCNF as well, since you requested that. :-)*

Normalization – cont.

- The tables:

| PK, FK | | | | PK | | PK | |
|------------|-----------|----------|----------|-----------|-------|------------|-------------|
| EmployeeNr | FirstName | LastName | Phone | EquipType | Cost | Aquired | Brand |
| 123456 | Jens | Jensen | 55555555 | PC | 10000 | 2019-01-02 | Lenovo |
| 123456 | Jens | Jensen | 55555555 | Mobil | 9000 | 2019-01-02 | IPhone |
| 123456 | Jens | Jensen | 55555555 | Stol | 3490 | 2018-12-12 | Zareto |
| 234567 | Kari | Normann | 66666666 | Mac | 13900 | 2017-05-05 | MacBook Pro |
| 234567 | Kari | Normann | 66666666 | Mobil | 9900 | 2019-05-05 | Samsung |
| 234567 | Kari | Normann | 66666666 | Stol | 3900 | 2017-07-05 | Watford |
| 234567 | Kari | Normann | 66666666 | Headsett | 2900 | 2017-08-05 | Boss |

| PK | | | | | | | |
|------------|-----------|----------|----------|-------|----------|-------|-------------|
| EmployeeNr | FirstName | LastName | Phone | Room | Location | Floor | Address |
| 123456 | Jens | Jensen | 55555555 | 12 | Oslo | 1 | Smalveien 1 |
| 234567 | Kari | Normann | 66666666 | 12 | Oslo | 1 | Smalveien 1 |
| 345678 | Ole | Olsen | 77777777 | 22 | Oslo | 2 | Smalveien 1 |
| 445544 | Lise | Olsen | 88888888 | Gløtt | Bergen | 5 | Brygga 2 |
| 554455 | Per | Persen | 88668866 | Gløtt | Bergen | 5 | Brygga 2 |
| 989898 | Eva | Jensen | 45454545 | Regn | Bergen | 5 | Brygga 2 |
| 323232 | Nils | Nilsen | 23343223 | Regn | Bergen | 5 | Brygga 2 |

****If time left**** Live SQL demos

- Will use remaining time today on live SQL demos.
- Make sure you ask questions:
 - This is our last DB-lesson together!
- For [more walkthroughs on SQL](#), see Canvas videos:
 - [Per's Zoom recording on Mandatory Coursework](#) (in Norwegian).
 - [My lecture #6: sum-up of SQL](#) (in English and Norwegian).

Finally ...

Thank you !!!

- Thank you for a lovely semester. On my part, at least! O_o
 - I *might* see you again, lecturing some of your coming courses?
 - Time will show!
 - But for those I'm not going to be a lecturer for again:
 - I hope you have had a good first semester at Kristiania!
 - And I wish you the best for your further studies with us! :-D
- *TOMAS without H(appy Xmas just yet: I wish you some happy exams first!)*