Database Systems, ITU, Fall 2006

Rasmus Pagh

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Group project – part 1

This is the first part of the **mandatory** group project. The project is to be carried out in groups; the members of each group are announced on the course home page. It is up to the members of your group to agree on how to work together (meeting times, etc.) This part of the project should be handed in **by e-mail** to the teaching assistant associated with your group, no later than:

Tuesday September 26, 23.59 PM.

Purpose

This is the first of three hand-ins that constitute a small database development project. This first part develops competences in ER modeling.

Case description

The setting of the group project is the newly founded (fictional!) IT University of Atlantis (abbreviated "IT@"). Located in an impressive pyramid made of steel and glass, an increasing number of faculty and students, and a myriad of courses and study lines has made it pressing to implement a database recording all administrative information. As a working group on the project, you have recently visited IT University of Copenhagen, where a similar system exists, with a web-based user interface called `my.itu`. The aim of this first hand-in is to make an initial ER diagram for the IT@ system, based on the below description, and identify a list of issues that need to be clarified before a final EER diagram can be made.

Data

The system should contain:

- Common data about all persons associated with IT@ (students, alumni, faculty, and other employees), including name, address, social security number, birth date, nationality, and e-mail address.

- Data on courses held and planned, including name, manning, course description, association with a study line, location (in time and space), and size in ECTS.

- Data on students, including enrollment (study line, and year), how many ECTS have been passed, and graduation date (if applicable).

- Course and exam information for all students, including location of exams, what courses the students enrolled for, in what courses they qualified for the exam, and how they fared at every exam attempt.

- Information on course dependencies, i.e., on what competences are required to follow each course, and what competences are obtained during each course. The system should also record data on the competences held by the students when entering IT@ (i.e., not obtained in any course of IT@).

- Information on the various study lines, including the competences required to enter a study line, the courses offered by the study line, and the competences required to get a degree from the study line.

If your project group has x members, your system must additionally contain data on $2x - 2$ of the following points (your choice):

- Student projects, including members of each project, project description, exam information, size in ECTS, etc.

- Employment: For each position held, the title of the position, the starting time (and possibly the ending time) of employment, etc. Every faculty and administrative employee is member of a department. This information should be stored, along with information on who is the department head of each department.

- Payment of salaries for employees, including wages (monthly or hourly), bank information, tax rate, amount payed, etc.

- Bodies of IT@, i.e. groups of students and faculty with various areas of responsibility. You should record the members of each body, including historical information (who was in the body earlier).

- Information on tutoring. Tutors are experienced students, who are each assigned a group of at most three (new) students that they are supposed to help in various ways. The IT@ system should contain data on these groups.

- Information on meetings. A meeting consists of a group of people in a room for some period of time. The system should be able to record whether people invited for a meeting confirmed or rejected participation.

Queries

To shed some more light on how data is to be represented, the administration of IT@ has provided a number of examples of queries they would like the system to support:

Queries on the common part for all groups:

1. "How many students do we have of each nationality?"

2. "What is the average total number of ECTS for students in each study line?"

3. "How many persons are registered in each of the different groups of persons?" (this may require several queries).

4. "Who in the faculty lives on the same address as another faculty?"

5. "What was the total number of ECTS for courses in the fall of 2005, specified for each study line?"

6. "Which students have taken a course (s)he did not have the competences for?"

7. "How many students need more competences to get a degree from their study line?"

8. "What students did not pass any course in 2005?"

9. "Who in the faculty are also alumni, and what were their average grade?"

10. "How many of our students live in an area with postal code above 2999?"

Queries on the optional parts:

1. "What is the average grade in courses and projects, respectively, for each student?"

2. "Is it true that grades in projects are higher than grades in courses?"

3. "How many people were employed each year (give a list of years and numbers)?"

4. "What is the size of the different departments?"

5. "How much does each department cost in salary?"

6. "Who was in the various bodies at the beginning of 2004?"

7. "Which body has had the highest number of different members?"

8. "What students enrolled in 2005 are lacking a tutor?"

9. "What tutors had less than three students assigned?"

10. "How much time has been spent in meetings (past or planned)?"

What should be handed in

You should hand in a draft data model for the system, including:

- **ER diagram**. An ER diagram for the system, using the ER notation of RG. For clarity you may wish to omit attributes from this diagram.

- **Description of entities, relationships and their attributes**. A short description in words for all parts of the ER diagram whose meaning is not **completely** obvious.

- **List of issues to be clarified**. List any choices or interpretations made when making the ER diagram. You will later discuss these with your teaching assistant. The list should contain all questions you need to address before making a final ER diagram in the second group hand-in.

One the first page, clearly specify the contributing members of your group. The project should be sent as a **single file in PDF format**. One easy way to produce a file in PDF format is to use the printers/copiers at ITU to scan all the pages, and e-mail the PDF file to you. This is done in almost the same way as if you were to copy the pages, except that you press "send" and specify your full e-mail address before "copying". Note that this also allows you to include hand-written text and diagrams. Another option (in Windows) is to use the PDFwriter printer driver (see link on course web page).