

# Introduction to Databases, ITU, Fall 2003

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## Exercises on September 30

You are unlikely to be able to do all the exercises in two hours. Therefore you are encouraged to prepare at home, and use the exercises for those parts you find difficult.

Note: The first two exercises have been postponed one week.

1. ~~GUW 3.7.2.~~
2. ~~GUW 3.7.3 i) and ii) for the relation schema and dependencies in a).~~
3. Based on the below description, perform the steps of the database design process:
  - E/R modeling
  - Transformation to relations
  - Normalization
  - Relation schema definition in SQL

In cases of doubt, make reasonable assumptions.

### A hospital patient database

A hospital consists of a number of departments specializing in different areas. To each department is associated a number of physicians, again specializing in different subareas. One physician is the head of each department. The physicians use initials to identify themselves in the hospital records. The initials are unique within each department, but not across departments. The patient database should record the above information, and link it to information on patients. In connection with each stay at the hospital, the staff fill in information on cards similar to the one shown below. The database should be able to record this information.

Date of arrival: 20030826	Date of return: 20030823	Department: Surgery
CPR number: 111171-1111 Name: Pat Iento Weight: 71 kg Height: 171 cm	<b>Patient's bed</b> Number: QBF-03 Length: 220 cm Max load: 150 kg	Social insurance: Yes
<b>Previous illness</b> Date / diagnosis /doctor: 010187 / Anthrax / BHM 090999 / Appendicitis / JD	<b>Diagnosis / doctor</b> Appendicitis / PDI Inflammation / PDI	<b>Medication</b> H1 pain killer

**To be handed in no later than October 10, 11.59 AM:**

**As always, your hand-in must be completed individually.**

This is the second in the series of hand-ins in which you will be developing a relational database for a data set of your own choosing. In the first hand-in you constructed an E/R diagram, and possibly revised it after feedback from your teaching assistant. Please include the (revised) E/R diagram with this hand-in.

1. Convert the E/R diagram into relation schemas using the method presented in the course.
2. Find all keys in the resulting relations. Argue for each key that it is indeed a key, and (briefly) argue that there are no other keys.

**No hand-in for October 17 – enjoy your autumn break!**