Tutorial Week 2: Conceptual Modelling

11.03.2014

Welcome and Tutorial Organisation

Please check with your tutor about the general tutorial organisation. This is also a good opportunity to tell each other your background and why you take these unit this year.

Introduction to the Online Learning Facilities

A large part of this unit will be supported by several online facilities. Let’s start by having a look at each system and verify that you can actually log in.

**SIT Lab login:** Please login to one of the lab computers with your UniKey login. If you cannot login, please contact the tutor.

**USyd eLearning ('Blackboard'):** Lecture slides, online recordings, homeworks and submission of assignments will be handled through the central eLearning system (Blackboard) of the University of Sydney. You can login using your UniKey at:

https://elearning.sydney.edu.au

Familiarise yourself with the layout and structure of our eLearning site. Please take especially attention to the organisation of material under

- the menu on the sidebar (notice how it can be hidden and shown again)
- the location of lecture slides and online recordings
- the links to homeworks and assignments
- My Grades

Then start the initial online test about the technical background under the 'Tutorials' menu.

**Piazza online forums:** For the discussion forum and online FAQ we use a new system, called Piazza. We have send you an invitation link via email; please follow the link that was part of that email and create a new login in that system to be able to participate in the online discussions:

https://piazza.com/sydney.edu.au/semester12014/info2120/home
Exercise 1: Conceptual Modelling with the textbook’s E-R Notation

We start by getting a first understanding of the graphical E-R notation used in this lecture.

The following two (or more) entity types are given. Suggest some suitable relationship types that connect the given entities of each subquestion in a meaningful way. Which identifier attributes would you add?

a) Book Author

b) Car Engine

c) Aircraft Jet Propeller Aircraft Glider

d) Hotel has Room Cleaner
Exercise 2: Case Study: Student Registration System (Kifer/Bernstein/Lewis, Section 4.8)

Next we read and analyze a more complex given E-R database model.

The following E-R diagram is an example of an American student registration system. This diagram refers to the case study of a student registration system from the Kifer/Bernstein/Lewis book, section 4.8. You can read the corresponding text description from the book on our course website.

![E-R Diagram](image)

a) Discuss how this model reflects the University of Sydney and which parts or constraints you would need to add or change for the student registration system being usable here in Sydney.

Exercise 3: The Entity-Relationship Model

Design small E-R diagrams for each of the following scenarios:

a) A chemistry department wants to have a database of all chemicals in the stockroom. The information includes the name, molecular formula, amount on hand, date purchased, supplier, and supplier contact information.

b) A space agency wants to develop a database of all satellites that humans have launched into space. Data includes the satellite identification, date of launch, destruction date, purpose, maximum orbital altitude, launching location, launching agency, and contact information for agency.
Homework 1: E-R Model Interpretation
In eLearning, you find our first homework quiz (under the menu 'Homeworks'). This week sets a couple of questions on the correct modelling and interpretation of E-R diagrams. You have one week to submit your answers.

INFO2820 - Advanced Stream:

Exercise 4: ADVANCED INFO2820 ONLY: DATALOG Lab
Please start by downloading the Datalog Educational System (DES), an open-source deductive database, from the following website of the University of Madrid and then use it for working on this exercise:

http://www.fdi.ucm.es/profesor/fernan/des/

We provide an introductory walk-through exercise for DES on our website. Please follow the steps there first before continuing here.

Given the following parts-subparts hierarchy of a Trike factory (the numbers on the edges are the counts on how many sub-parts are needed):

```
<table>
<thead>
<tr>
<th>trike</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1] tire [1]</td>
</tr>
<tr>
<td>[1] frame [1]</td>
</tr>
<tr>
<td>[1] seat [1]</td>
</tr>
</tbody>
</table>
```

a) Model the given Trike data set in DATALOG using DES.

Using your deductive parts database, answer the following queries in DATALOG:

b) List all parts out of which a wheel is made.

c) Check for which parts a pedal is needed.

d) Out of which main components (means direct sub-parts) is a trike made?

e) How many actual instances of each (sub-)parts do we need to build a trike?