



# Försättsblad till skriftlig tentamen vid Linköpings universitet

(fylls i av ansvarig)

<b>Datum för tentamen</b>	2010-12-21
<b>Sal</b>	U14, U15
<b>Tid</b>	8-12
<b>Kurskod</b>	TDDD43
<b>Provkod</b>	TEN1
<b>Kursnamn/benämning</b>	Databases and data models - advanced course
<b>Institution</b>	<i>IDA</i>
<b>Antal uppgifter som ingår i tentamen</b>	9
<b>Antal sidor på tentamen (inkl. försättsbladet)</b>	4
<b>Jour/Kursansvarig</b>	Lena Strömbäck
<b>Telefon under skrivtid</b>	013-282324, 0709-396776
<b>Besöker salen ca kl.</b>	9 och 11
<b>Kursadministratör (namn + tfnr + mailadress)</b>	Madeleine Häger Dahlgvist 282360 madeleine.hager.dahlqvist@liu.se
<b>Tillåtna hjälpmedel</b>	Inga
<b>Övrigt (exempel när resultat kan ses på webben, betygsgränser, visning, övriga salar tentan går i m.m.)</b>	15 points required for pass. Approx. 20 points required for grade 4 ECTS B Approx. 25 points required for grade 5 ECTS A
<b>Vilken typ av papper ska användas, rutigt eller linjerat</b>	Valfritt
<b>Antal exemplar i påsen</b>	

**Written exam in**

**TDDD43 Databases and Data Models Advanced course**

Location: U14, U15

Date: 2010-12-21

Time: 8-12

Equipment: None

**Requirements:**

15 points is required for passing the exam

Approx. 20 points is required for grade 4

Approx. 25 points is required for grade 5

The results are announced within two weeks

Teacher in charge: Lena Strömbäck, 0709-39 6776, 013-28 23 24

**Use one sheet for each question.**

**Write name and personal number on each sheet.**

**Only write on one side of each sheet.**

**Give relevant answers to the question.**

**Points can be deducted for answers that are not answers to the question.**

### 1. OLD ---- XML modeling and querying (6p)

Carl-Jan has a lot of friends and he likes to invite them for dinner. His aim is to always have a perfect dinner. Therefore he wants to keep records of any allergies and what food his friends have been eating on earlier occasions. To do this he needs to store: Name and allergies for each friend, name and the recipe for each dish he has prepared, and finally information about what food each friend has been eating and when.

- a) How can this be modeled in XML? Give an example XML file. The file must contain at least 3 friends, 3 recipes and 3 examples of what someone has eaten. At least one of the friends must be allergic to more than one thing. (2p)
- b) Give one example where your model could have been designed differently. Show the alternative solution for this part of the model. (1p)
- c) Express the query “Which allergies does John have?” for your model. (1p)
- d) Express the query “List allergies for all guests that have been eating Duck surprise” for your model. (2p)

### 2. RDF (4p)

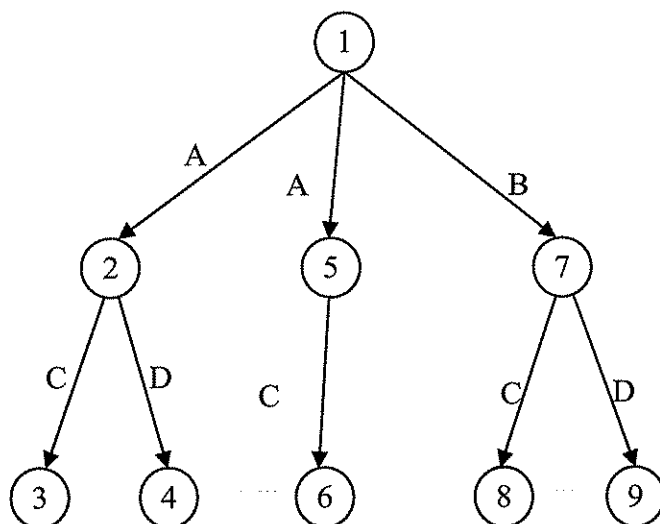
- a) Describe the main principles on how data is represented in RDF. (2p)
- b) Model the example in question 1 as an RDF model. You do not need to use the exact RDF syntax. (2p)

### 3. XML storage (2p)

Describe briefly the main principle behind how data is shredded in HShreX when not using annotations.

### 4. Data Guides (2p)

Below a simple sample data set is given. Draw one minimal data guide and one strong data guide for this data. Use the OEM model.



## 5. OODBMS modeling (4p)

- Model the information in the following text using the object-oriented data model. Include examples of inheritance, composite objects, operator overloading. (3p)
- Are there parts that cannot be represented? If so, which parts and are there other formalisms that could represent this? (1p)

“LFC is a women football team. A football team is a team with at least 11 members and all members are football players. At least one of the members is a goal keeper. Teams that have at least 10 members are large teams. LFC is Swedish champion. The Swedish champion is entitled to play in the European Champions League.”

## 6. Semantic Web (3p)

- Give the 4 components of ontologies and give an example for each. (2p)
- Which of the components are included in taxonomies and in logics? Specify possible restrictions on the components. (1p)

## 7. Description logics (3p)

Define the following concepts using description logics:

C1: computer science conference for which there exists a Swedish participant

C2: computer science conference for which there exists a Swedish participant and there exists a Belgian participant

Does C2 subsume C1, i.e. C1 isa C2? Prove your answer using a tableau algorithm.

## 8. Integration (3p)

- Compare the global as view approach versus the local as view approach for integration of data sources regarding the following issue: easy/hard query processing. Explain your answer with an example. (2p)
- Describe the meaning of the following SRS query:  
[PersonellDB-family:Lambrix] > SalaryDB (1p)

## 9. Ontology alignment (3p)

- Define the notions of precision, recall, f-measure. (1p)
- What is the influence of the threshold on precision and recall for matchers based on string matching? Explain why. (1p)
- What is the idea behind double threshold filtering? (1p)