

This document contains material—taken verbatim from the final examination—that you may want to study beforehand. Several exam questions are based around the material given here, and becoming familiar with it on your own time could free up valuable time during the exam for working the actual questions. The exam coversheet is also included for your reference.

You do not need to copy any of this information to your crib sheet, it all appears in the exam.

## Final Examination

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*CSCC43 – Introduction to Databases*

*17 Apr 2013*

Name:

UTorID:

### Instructions

Write your name and UtorID on the test!

Do not turn this page until receiving the signal to start.

Exam aids allowed: one sheet of paper containing whatever you want (hand written or printed).

Skip any problem if you still don't know how to solve it after trying for one minute, and come back later if you have time.

Do the easiest problems first! Don't work the first problem until you have looked at all of them.

The exam is printed single-sided to give you ample space for scratch work.

**You should have eighteen pages total and ten questions.** The last page describes the schema used for RA and SQL queries in problems 2 and 3; you may tear it off and refer to it while you work the problems.

You have 170 minutes to complete the exam. Each problem is marked with a recommended time budget to help you pace yourself.

NOTE: an optional, voluntary survey accompanies the exam. If you wish, you can fill it out while waiting for the exam to start (please do not waste actual exam time on it!). The survey is anonymous will have no impact on your mark, but your choice to participate would give valuable guidance for improving the course.

## Voluntary survey (while you wait for the exam to start)

1. How much did group work in class help you learn the material versus working alone?

-2	-1	0	1	2
working alone is much better		makes no real difference		group work is much better

2. Was peer marking in class a helpful part of learning?

-2	-1	0	1	2
waste of time		maybe/don't know		very helpful

3. Would it have helped your learning if the readings included simple problem sets?

-2	-1	0	1	2
waste of time		maybe/don't know		very helpful

4. Pretend it's the start of the semester again, and that every lecture had a problem set that you could work for extra practice (not for course credit). Knowing what you know now, how many of those problem sets would you try to complete?

-2	-1	0	1	2
none of them		some of them		most of them

5. Pretend it's the start of the semester again. Knowing what you know now, how often would you use tools like sqlite3 and xmllint in class?

-2	-1	0	1	2
never		sometimes		frequently

6. Pretend it's the start of the semester again. Knowing what you know now, how often would you use tools like sqlite3/xmllint outside of class?

-2	-1	0	1	2
never		sometimes		frequently

7. Inverted teaching changes how students use their time, both inside and outside of class. How much did you learn per hour spent on the course, compared with other courses?

-2	-1	0	1	2
a lot less learning		same as other courses		a lot more learning

8. Overall, do you think inverted teaching is more effective than traditional lecturing?

-2	-1	0	1	2
traditional lecturing is much better		both styles are equally effective		inverted teaching is much better

What specific things did I do (good or bad) that strongly influenced your learning this semester?

```

CREATE TABLE T (
    m PRIMARY KEY,
    n,
    o UNIQUE
);
CREATE TABLE S (
    p PRIMARY KEY,
    q REFERENCES T(m)
);
CREATE TABLE R (
    a PRIMARY KEY REFERENCES T(o),
    b,
    c REFERENCES S(p)
);

```

```

<?xml version="1.0" standalone="no"?>
<!DOCTYPE RECIPES [
    <!ELEMENT RECIPES (RECIPE)+>
    <!ELEMENT RECIPE (INGREDIENTS, STEPS)>
    <!ATTLIST RECIPE name CDATA #REQUIRED>
    <!ATTLIST RECIPE type CDATA #IMPLIED>
    <!ATTLIST RECIPE keywords CDATA #IMPLIED>
    <!ELEMENT INGREDIENTS (INGREDIENT)+>
    <!ELEMENT INGREDIENT (NAME, QUANTITY)>
    <!ELEMENT NAME (#PCDATA)>
    <!ELEMENT QUANTITY EMPTY>
    <!ATTLIST QUANTITY amount CDATA #REQUIRED>
    <!ATTLIST QUANTITY units CDATA #REQUIRED>
    <!ELEMENT STEPS (STEP)+>
    <!ELEMENT STEP (#PCDATA)>
]>

```

```
<?xml version="1.0" standalone="no" ?>
<!DOCTYPE DATA SYSTEM "blah.dtd">
<DATA>
  <ANIMALS>
    <COW name = "Snowball" home = "Red Barn Acres"/>
    <HEN name = "Henrietta" birthdate = "120724" home = "Red
Barn Acres"/>
  </ANIMALS>
  <FARMS>
    <FARM owner = "Old MacDonald" name = "Red Barn Acres">
      A picturesque hobby farm on 150 acres
    </FARM>
    <FARM owner = "Egg Masters Inc" name = "Farm 23">
      A factory farm on a quarter section of land
    </FARM>
  </FARMS>
</DATA>
```

```
<?xml version="1.0" standalone="yes"?>
<a p="hello">
  <b x="1" y="5"/>
  <c n="100">
    <d real="true">no way</d>
    <d real="false">yes way</d>
    <d real="false">possibly</d>
  </c>
  <b x="3" y="1"/>
  <b x="2" y="6"/>
  <c n="52">
    <d real="false">truly</d>
  </c>
  <c n="50">
    <d real="true">really</d>
    <d real="true">actually</d>
  </c>
</a>
```

## Reference sheet: relational schema for mentorship problems

You may tear off this sheet and refer to it while working exam problems.

NOTE: this page will not be marked, but you must still hand it in with your exam.

- Mentorship(year, sponsor, budget)

A tuple in this relation represents information about a single year of the mentorship program: the year, the sponsoring company, and the budget for the program.

- Mentor(MID, name, email, employer, title, phone)

A tuple in this relation represents information about a mentor.

- MApplication(MID, year, capacity)

Records mentors who applied in a given year of the program, and how many students they are willing to work with that year.

MID references Mentor. Year references Mentorship.

- Student(SID, name, email, phone)

A tuple in this relation represents information about a student.

- SApplication(SID, year, cgpa)

A tuple in this relation indicates that a student applied to be mentored in a given year and had the given cgpa at the time.

SID references Student. Year references Mentorship.

- Expertise(MID, year, area)

A tuple represents an area, such as “web development” that a mentor declared expertise in for a particular year.

MID references Mentor. Year references Mentorship.

- Interest(SID, year, area, priority)

A tuple represents an area that a student has declared an interest in for a particular year. The attribute ‘priority’ indicates how strong the student’s interest in that area is, with 1 being the highest priority.

SID references Student. Year references Mentorship.

- Match(MID, SID, year)

A tuple indicates that a mentor was matched a student in the given year.

MID references Mentor. SID references Student. Year references Mentorship.