Midterm Review Sheet

Information

- The midterm exam will be held on Monday November 4 from 11:00 AM until 12:15 PM in the Gates Computer Science Building Room B01 (the Hewlett-Packard Auditorium) on the Stanford campus. All students, including SITN students, are expected to attend the exam on-campus. There will be no makeup exams, no early exams, and no exceptions!
- The exam will be closed book. However, each student may bring up to three pages of prepared notes. That's six total sides of writing on 8-1/2"x11" paper.
- A sample solution for Assignment #4 will be available in postscript in the course directory and via the course web page at 8:00 PM on Thursday October 31. Hard-copies of the sample solution will be available in the course file drawer by 10:00 AM on Friday November 1.

Changes to Office Hours

There will be the following changes in office hours for the coming week:

Sunday November 3: Open question-and-answer session, 7:00-8:30 PM, Building 380 ("math corner"), Room 380Y (basement). Oliver will conduct this Q&A session in place of his normal Tuesday session, although this session will not be televised. Please bring questions or specific problems you would like Oliver to work out.

Monday November 4: Meng-You's 5:00–6:00 PM office hours are canceled.

Tuesday November 5: Oliver's 9:00–10:30 AM office hours are canceled.

Tuesday November 5: The 12:00–12:50 PM televised Q&A session is canceled.

Tuesday November 5: Meng-You's 8:00–10:00 PM Sweet Hall office hours are canceled.

Material Covered

The exam will cover:

- All lectures through Wednesday October 30
- Textbook readings: Chapters 1, 2.1–2.6, 3.1–3.4, 4.1, 5.1–5.7, 6, 7.1, 7.3
- Postings on the course newsgroup covering technical material
- Assignments 1–4

Since the material on constraints and triggers covered in class and in Chapter 6 has not yet been exercised in an assignment, any questions regarding this material on the exam will be straightforward; similarly for the material on "programming with SQL."

What follows is an outline of the material we have covered so far. All of this material is fair game for the midterm exam unless specified otherwise.

1. Basic motivation and database terminology
2. Object-oriented database design using ODL
   - Classes, attributes, relationships, keys
   - Set and inverse relationships
   - Subclasses, inheritance
3. Entity-relationship model and E/R diagrams
   - Entity sets, entities, relationship sets, relationships, attributes
   - Arity of relationships (one-to-one, one-to-many, etc.)
   - Numerocity will not be covered
   - Keys, roles
   - Weak entity sets
   - Subclasses
4. Relational model
   - Relations (tables), attributes (columns), tuples (rows)
   - Keys, null values
   - Schema versus instance
   - Translating ODL and E/R designs to relational
5. Relational algebra
   - Basic operators: select (σ), project (π), Cartesian product ($\times$), union ($\cup$), difference ($-$), rename (ρ)
   - Abbreviations: natural join ($\bowtie$), theta join ($\bowtie_\theta$) intersection ($\cap$)
6. SQL
   - Data definition: **create table**, **drop table**
   - Data manipulation: **select-from-where** command
   - Subqueries, aggregates, duplicates, null values
   - Data modification: **insert**, **delete**, **update**
7. Indexes
   - Properties of indexes
   - Creating indexes in SQL
8. Programming with SQL
   - Embedded SQL, cursors
   - Dynamic SQL will not be covered
   - Stored procedures will not be covered

9. Constraints and triggers
   - Key constraints
   - Referential integrity
   - Non-null constraints
   - Attribute-based "**check**" constraints
   - Relation-based "**check**" constraints
   - General assertions
   - SQL3 triggers