

Course Wrap-up

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csc343 admin stuff

- We will post when A3 results are available.
- There are extra pre-exam office hours. See Piazza for a schedule

Preparing for the final

- Re-solve parts of the assignments where you didn't get full marks or your partner lead.
- For topics you aren't fully confident in, re-do the lecture prep and in-class exercises.
- To hit on things you need to practise, make up
 - your own queries in RA & SQL
 - your own methods in JDBC.
- Solve old tests and finals.

About using old finals

- The website has several
- If solutions aren't posted, it's because we don't have them in any shape for posting.
 - but we're happy to review them in office hours or exam prep sessions
- If you find old exams elsewhere, beware of coverage mismatches.
- Old E/R questions may use a different notation with weird arrows.
 - You are not responsible for this!

The final

- Comprehensive (covers the whole term), including:
 - relational model
 - RA
 - SQL and JDBC
 - XML and DTDs
 - FD theory and normalization
 - ER modelling and DB design
 - JSON

The final

- You need to know the syntax of each language.
 - Exception: We don't care much about your Java syntax.
- You don't need to memorize function/method APIs.
 - We will provide what you need.
- SQL **views** and RA **intermediate steps** are always welcome.
- Comments are not necessary, but may help us give you part marks.

The final

- Your exam is 26 pages long, but
 - 4 essentially blank pages are space for rough work
 - 1 page is the cover
- So it's really 21 pages, with lots of white space
- You need 40% on the final to pass the course, but
 - If the exam is unexpectedly long or difficult, we will raise the marks on it
 - We apply that rule with great care

Theme: expressive power

- $RA \subseteq SQL \subseteq Java$
- DTDs (very limited!) \subseteq XML Schema
- DTDs vs DDL to express constraints
- You can sometimes do surprisingly much with what appears to be very little

Theme: expressive power

- Expressive power vs computational complexity
 - 📖 SQL general assertions vs intra-table constraints.
 - 📖 SQL triggers are a tradeoff.
- Expressive power vs *language* complexity
 - 📖 RA vs SQL vs Java:
how complex are expressions/statements in the language; proofs about them?
 - 📖 But is some of the difference just good/bad design?

Theme: tradeoffs

- **materialized views vs virtual views**
 - save time: don't have to be recomputed on every use
 - lose time: must be updated when base tables change
 - lose space: must be stored
- **indices**
 - save time: search and other operations are faster
 - lose time: to build and maintain indices
 - lose space: must be stored
- **Rigidity of SQL vs flexibility of XML**
- **Normalized schema vs fast operations**
- **No redundancy vs preserve dependencies**

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- “Database System Technology”
- Takes the perspective of the DBMS builder.
- Topics like:
 - indices; query optimization
 - managing storage; concurrency control
 - transaction management
 - tuning for performance
 - data mining, data warehousing

Trends in DB Research

- managing huge amounts of data: approximate querying, statistical methods, self-tuning, power management
- managing uncertainty
- data privacy and security
- different kinds of data, e.g., temporal, spatial, data from sensors, social network data
- new languages (e.g., declarative) and interfaces, visualization of data
- Check out the VLDB conference

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