

Database Systems Implementation

Overview and Organization

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University of Waterloo

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Course Outline

- 1 Functionality provided by a Database Management System (review).
- 2 How do (typical) Database Management Systems work?
 - Anatomy of a DBMS: the big picture.
 - Storing data on disks, physical representation, index structures, etc.
 - Relational Algebra: the operational approach.
 - Query optimization. Cost of relational operations.
 - Transaction processing and recovery.

What is it NOT about

1 Introduction to SQL and/or Data Modelling

⇒ take CS348

... ok, I'll quickly review the Relational Model, SQL, and Relational Algebra

2 DBMS Administration

3 (Particular) commercial DBMS implementation

⇒ we use PostgreSQL, but material covered in classes is generic.

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Organization

Instructor: David Toman

e-mail: david@uwaterloo.ca

phone: x34447 (use e-mail—*much* more reliable)

Classes: TT 1:00 – 2:20 MC 2034

Office: DC 3344 (Tue 3:30-5pm)

Class Info: <http://db.uwaterloo.ca/~david/cs448>

TA's: Mojdeh, Mona

⇒ office hours, etc., TBA on the web site

Books, Lecture Notes, etc.

Required Textbook:

Database Management Systems.

R. Ramakrishnan and J. Gehrke. McGraw-Hill. 3rd Ed.

Other Books:

Database and Knowledge-Base Systems I., II.

Jeff Ullman. Comp. Sci. Press, 1988.

Foundations of Databases.

Abiteboul, Hull, and Vianu. Addison-Wesley, 1995.

Lecture Notes:

Additional *lecture notes* and *copies of transparencies* are/will be available from the class WWW page.

Assessment

- lectures (no influence on grade),
- homework assignments: 40%
- midterm exam: 30%
- final exam: 30%
mark $\geq 50\%$ on the final is needed to pass.
- a project: (CS642 only, in lieu of the final examination)

Fine print: *the usual university policies on academic honesty, fair use of computing facilities, etc., apply by default.*

Assignments

All assignments are based on modifying PostgreSQL source:

⇒ requires familiarity with UNIX programming environment

- 1 Prefix Key Compression
- 2 Symmetric Hash Join
- 3 Query Optimization