

Introduction

CPS 116
Introduction to Database Systems

Random things to do after this course 2

Course roadmap 3

- ❖ Relational databases
 - Relational algebra, database design, SQL, app programming
- ❖ XML
 - Data model and query languages, app programming, interplay between XML and relational databases
- ❖ Database internals
 - Storage, indexing, query processing and optimization, concurrency control and recovery
- ❖ Topics beyond traditional databases
 - Data warehousing and data mining
 - Web and keyword searches
 - Streams and continuous queries

Misc. course information

- ❖ Book: *Database Systems: The Complete Book*, by H. Garcia-Molina, J. D. Ullman, and J. Widom
 - Either get the "value pack" bundled with Gradiance, or buy Gradiance separately
- ❖ Web site: <http://www.cs.duke.edu/courses/fall107/cps116/>
 - Course information; tentative syllabus and reference sections in GMUW; lecture slides, assignments, programming notes
- ❖ Blackboard: for grades only
- ❖ Mailing list: cps116@cs.duke.edu
 - Messages of general interest only
- ❖ No "official" recitation sessions; help sessions for assignments, project, and exams to be scheduled

Grading

[90%, 100%]	A- / A / A+
[80%, 90%]	B- / B / B+
[70%, 80%]	C- / C / C+
[60%, 70%]	D
[0%, 60%]	F

- ❖ No curves
- ❖ Scale may be adjusted downwards (i.e., grades upwards) if, for example, an exam is too difficult
- ❖ Scale will not go upwards—mistake would be mine alone if I made an exam too easy

Course load

- ❖ Four homework assignments (35%)
 - Including Gradiance as well as additional written and programming problems
- ❖ Course project (25%)
 - Details to be given in the third week of class
- ❖ Midterm and final (20% each)
 - Open book, open notes
 - Final is comprehensive, but emphasizes the second half of the course

Example projects

- ❖ Facebook⁺
 - Tyler Brock and Beth Trushkowsky, 2005
- ❖ Web-based K-ville tenting management
 - Zach Marshall, 2005
- ❖ yourTunes: social music networking
 - Nick Patrick, 2006
- ❖ ERS: a content management system for capturing experimental and computational workflows
 - Collaboration with Duke immunologists
- ❖ Babase tools: for a baboon life history database
 - Collaboration with Duke and Princeton biologists

So, what is a database system?

From Oxford Dictionary:

- ❖ Database: an organized body of related information
- ❖ Database system, DataBase Management System (DBMS): a software system that facilitates the creation and maintenance and use of an electronic database

What do you want from a DBMS?

- ❖ Keep data around (persistent)
- ❖ Answer queries (questions) about data
- ❖ Update data
- ❖ Example: a traditional banking application
 - Data: Each account belongs to a branch, has a number, an owner, a balance, ...; each branch has a location, a manager, ...
 - Persistency: Balance can't disappear after a power outage
 - Query: What's the balance in Homer Simpson's account? What's the difference in average balance between Springfield and Capitol City accounts?
 - Modification: Homer withdraws \$100; charge account with lower than \$500 balance with a \$5 fee
