CS 445
Introduction to Database Systems

TTH 1:00 – 2:15

Chadd Williams

Office Hours

M    1:00-2:00
Tue  11-noon
Thur 3-4
Overview

- Practical introduction to databases
  - theory + hands on projects

- Topics
  - Relational Model
  - Database Design
  - Structured Query Language (SQL)
  - Web accessible databases

- There will be a number of lab days for hands on work
  - approximately 4
Syllabus

- *Database Management Systems (3rd)*, Ramakrishnan & Gehrke

- Grades:
  - Midterm 1 15%
  - Midterm 2 15%
  - Final 20%
  - Homework/Quizzes 15%
  - Database Projects 35%

- Quizzes: frequent, unannounced, open-note quizzes will be given

- Late Policy: No late assignments accepted

- Grade Complaints: one paragraph summary of why the grade is wrong, within one week of receiving the graded material

- All projects are *individual* projects

- [http://zeus.cs.pacificu.edu/chadd/cs445f07](http://zeus.cs.pacificu.edu/chadd/cs445f07)

- Don't forget about the CS Message boards
Database Projects

- All database projects are to be done using MySQL 5.0 Community Server
  - http://dev.mysql.com/downloads/mysql/5.0.html#downloads

- Gradebook Example
  - Learn to use MySQL & SQL
  - Build graphical front end (MS Access/OpenOffice)

- Big Database Project
  - You design, document, and implement a database
    - I have topics ideas but you are free to come up with your own
  - Build a web-based front end
    - We will discuss how to do this using PHP and the Apache webserver
  - 3-5 minute presentation of your design
  - 7-10 minute presentation of your final design and implementation
Introduction to Databases

• Read Chapter 1
  – homework: page 23: 1.2, 1.6 (Due Sept 13)

• What's a database?
  – DBMS?

• Why do we use one?

• Who uses one?

• How do we model the data?
DATA!

Where is the data?
How do we model it?
Database Usage Scenario

The Database

Webserver

PHP

The Database
Why not just use a text file/file system/XML?

- Data Independence
- Efficient Data Access
- Data Integrity and Security
- Data Administration
- Concurrent Access/Crash Recovery
- Reduced Application Development Time

(page 9)
Storing data in the DB

• Data Models

• Semantic Data Model (high level)
  – Entity-Relationship (ER) Model
    • Entity:
    • Relationship:

• Relational Data Model (low level)

• Schema

• Constraints/Integrity
What's inside a Relational database?

- Tables
- Indexes/Keys
- Data
How do we access the data?

- Query Language
  - Structured Query Language (SQL)
  - What types of queries can we run?
What about multiple users?

- Transactions

- Concurrency
Dirty Details

- Figure 1.3 page 20