

# 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 (3<sup>rd</sup>)*, 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>
- Don't forget about the CS Message boards

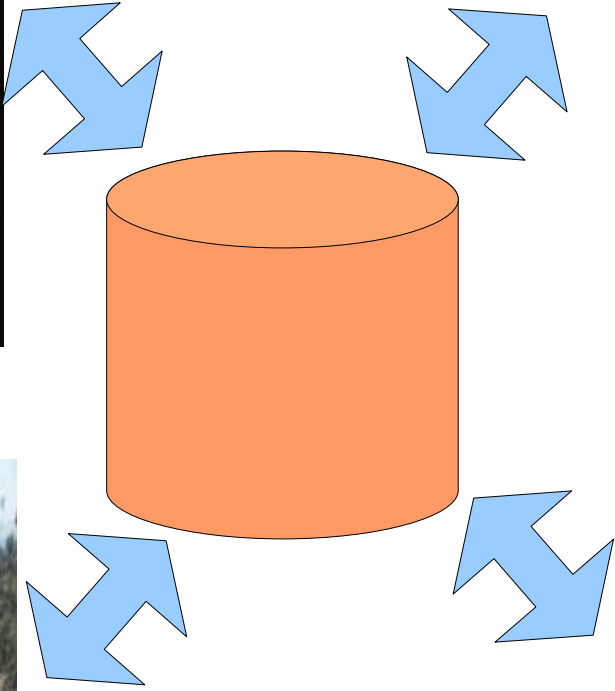
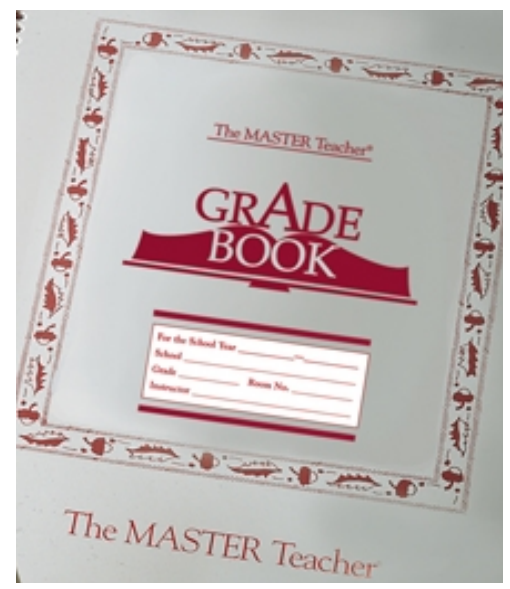
# Database Projects

- All database projects are to be done using MySQL 5.0 Community Server
  - <http://dev.mysql.com/downloads/mysql/5.0.html#downloads>
  - <http://www.apachefriends.org/en/index.html>
- 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!



- [http://www.smallbars.com/bin/GL\\_CompassRoom2.jpg](http://www.smallbars.com/bin/GL_CompassRoom2.jpg)
- [http://www.loc.gov/exhibits/treasures/images/at0069\\_4s.jpg](http://www.loc.gov/exhibits/treasures/images/at0069_4s.jpg)
- <http://www.goboxers.com/facilities/lincoln-park/webcam.cfm>
- <http://www.masterteacher.com/graphics/products/prodpics600/1210.jpg>

Where is the data?  
How do we model it?

# Database Usage Scenario



**Pacific University C**  
take your first

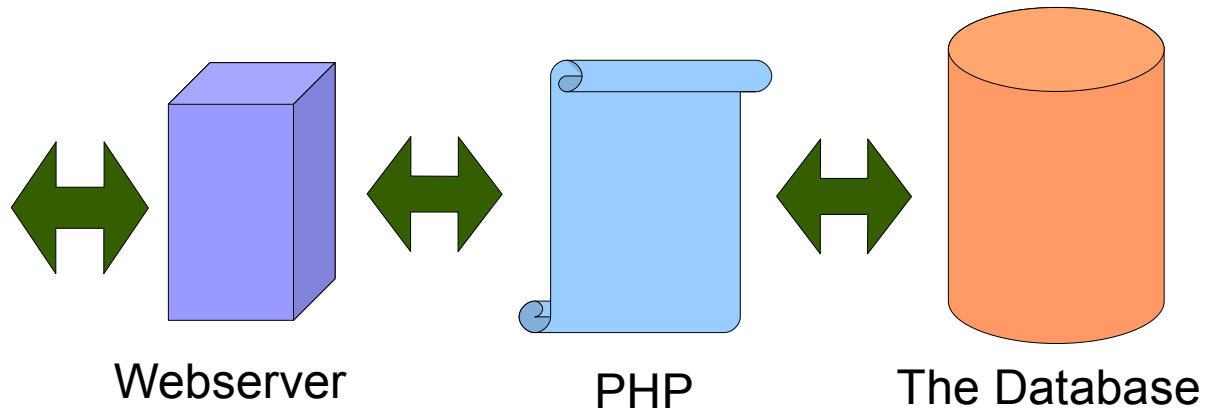
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The time now is Wed Jul 11, 2007 1:28 pm

**Pacific University Computer Science Forums Forum Index**

Forum	
<b>Tools</b>	
	<b>Linux</b> Discuss your experiences with Linux, what works, what doesn't, how do I do that?
	<b>Eclipse</b> Discuss your experience with Eclipse!

User



# 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