CS 445
Introduction to Database Systems

TTH 1:00 – 2:15

Chadd Williams

Office Hours	M	2-4pm
	Tue	11-noon
	Thur	1-2

Overview

- Practical introduction to databases
  - theory + hands on projects
- Topics
  - Relational Model
  - Database Design
  - Structured Query Language (SQL)
  - Web accessible databases
  - Cloud computing
- There will be a number of lab days for hands on work
  - approximately 6

Syllabus

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

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

First DB Assignment	Design Docs	8 pts
	MySQL DB	12 pts
Big DB Assignment	Design Docs	25 pts
	MySQL DB	30 pts
	Web Interface	15 pts
	Presentations	10 pts

- 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/cs445f09
- Don't forget about the CS Message boards

Database Projects

- All database projects are to be done using MySQL 5.1 Community Server
  - http://dev.mysql.com/downloads/mysql/5.1.html#downloads
  - http://www.apachefriends.org/en/index.html
- First DB Assignment
  - Learn to use MySQL & SQL
  - Build graphical front end (Web/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
  - 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 9)
- What's a database?
  - DBMS?
- Why do we use one?
- Who uses one?
- How do we model the data?

DATA!


Chicago Daily Tribune

HOME

DEWEY DEFEATS TRUMAN

G.O.P. Sweep Indicated in State; Boyle Leads in City

REPUBLICAN TICKET AHEAD OF 1944 VOTE

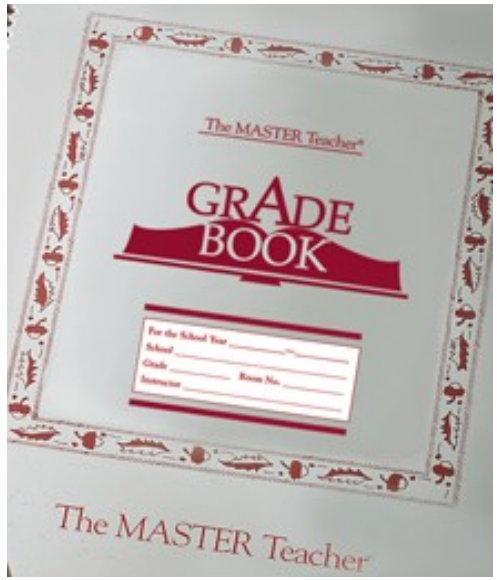
Tops Coghlan in Hot Race for Attorney

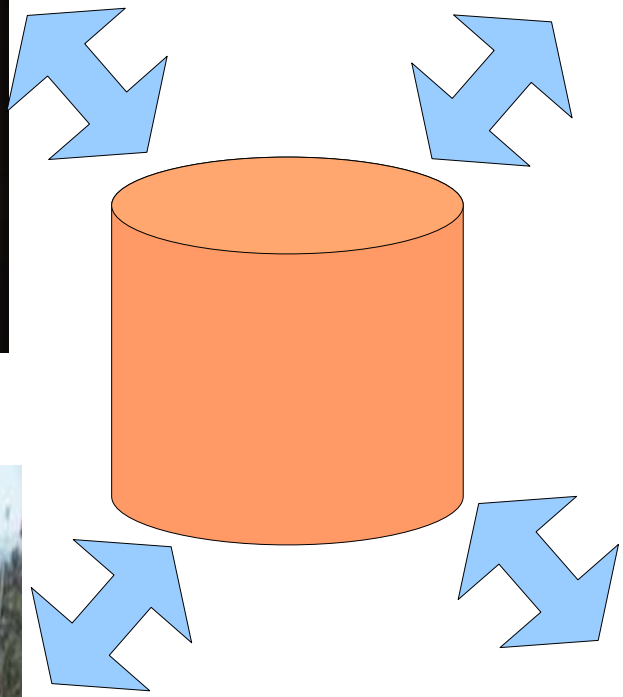
RECORD CITY VOTE SEEN IN LATE TALLIES

BULLETINS ON ELECTIONS

Early Count Gives G.O.P. Senate Edge

PUTS G.O.P. BACK IN THE WHITE HOUSE

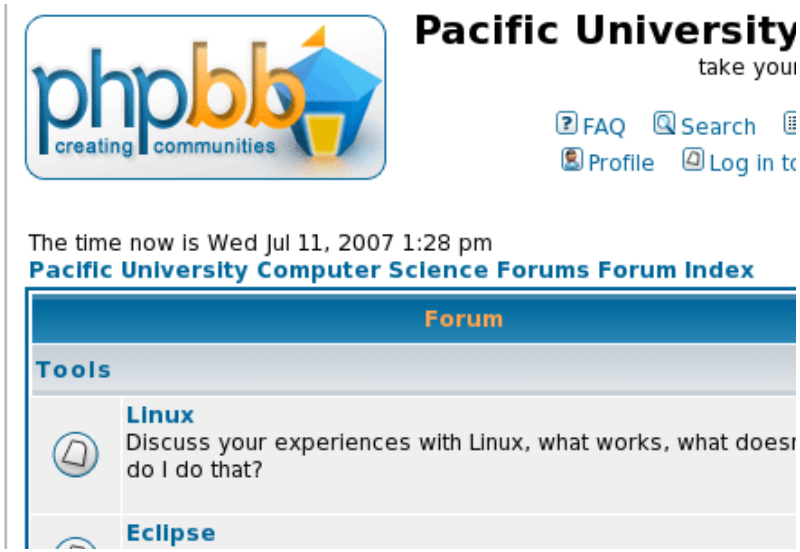




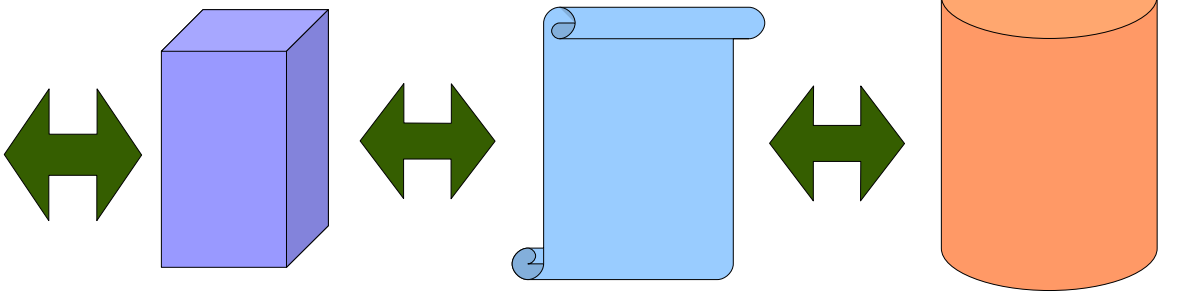
http://www.smallbars.com/bin/GL_CompassRoom2.jpg
http://www.loc.gov/exhibits/treasures/images/at0069_4s.jpg
http://www.goboxers.com/facilities/lincoln-park/webcam.cfm
http://www.masterteacher.com/graphics/products/prodpics600/1210.jpg

Where it the data?
How do we model it?

Database Usage Scenario



User



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

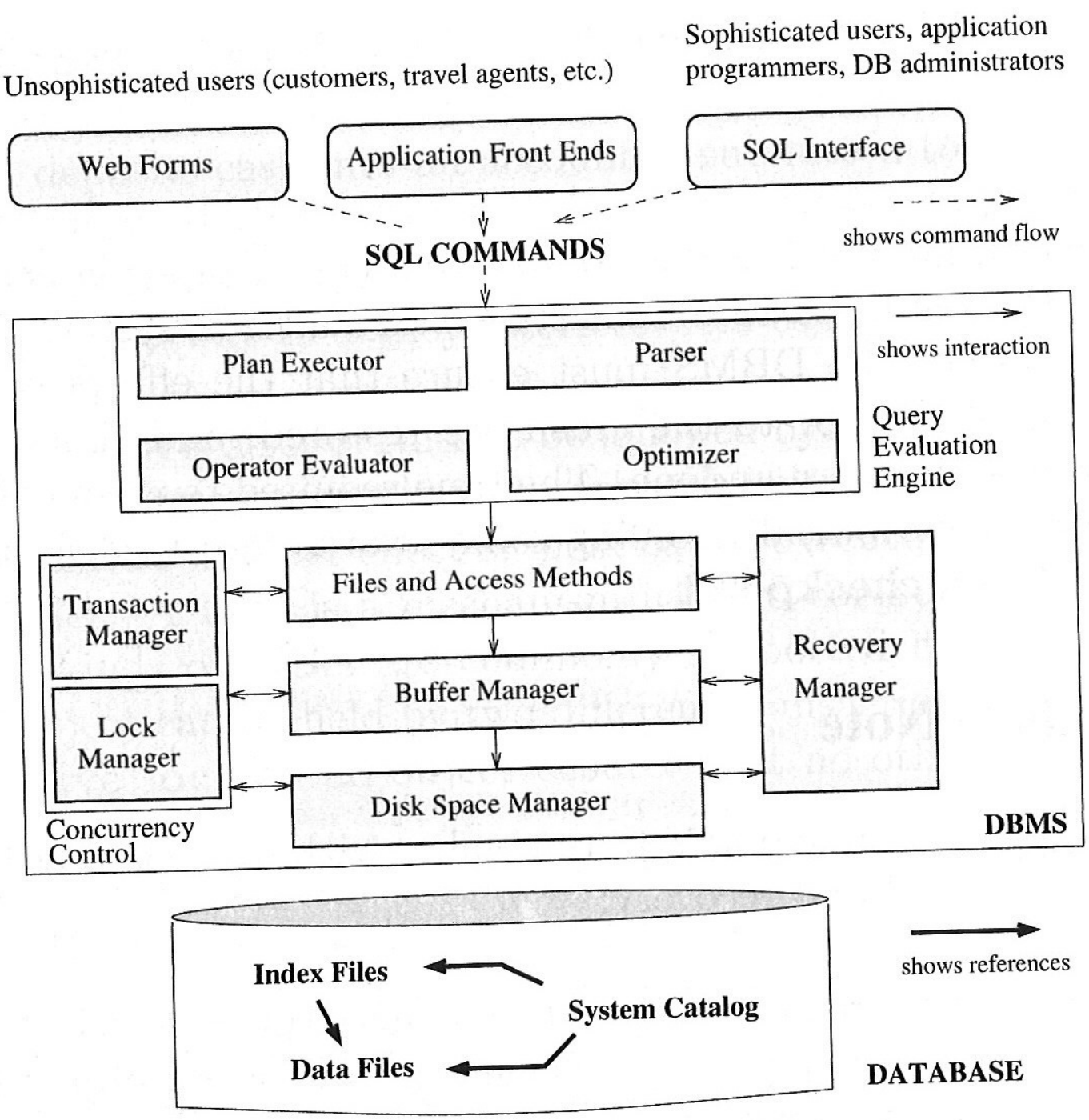


Figure 1.3 Architecture of a DBMS