Introduction to Database Systems

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Why do you need
a database system?

To store data,
        why not just use a file system?

Advantages of a Database System

- It answers *queries* fast

  Q1: among a set of blog pages, find those pages written by Steven Sinofsky after 2011

  Q2: among a set of employers, increase the salary by 20% for those who have worked longer then 4 years

- Queries (from multiple users) can execute *concurrently* without affecting each other

- It *recovers* from crash

  – No corrupt data after restart

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Goals

- To use a DB system (in only 2 weeks)
- To understand the internals of a DB system
  - Architecture
  - Design trade-offs
  - Optimizations
  - Specializations

Prerequisites

- Data structure
- Good programming skill
  - OOP (C++ or Java)
  - Multi-threaded programming
  - Project management tools like Git

Syllabus

- [Here](#)
  - Subject to change
- Mon: lecture
- Thu: labs (TA time)
  - Trace code
  - Give your new assignments
  - Review your pass assignments
- Homework every 2 weeks
  - Requires not only code, but also report
 - Summarizing **diff from TA's code** and **your observations**

Grading

- Homework (x5): 50%
- SQL & Java quiz: 15%
  - *On next Thu (2/27)*
- Midterm exam: 15%
- Final project: 20%

- Q/A Bonus: up to 5%

Resources

- Text Book
  - Lecture notes
  - Reference links
- Course page
  - http://www.cs.nthu.edu.tw/~shwu
- TODO
  - Register your team

About the Quiz…

- Coverage:
  - Java concurrency
  - How to use a DBMS (SQL language)
- On **2/27**
- Assigned readings:
  - Java Concurrency Tutorial
  - SQL Tutorial
  - ~~Chaps 2 and 3 on ER & relational models~~
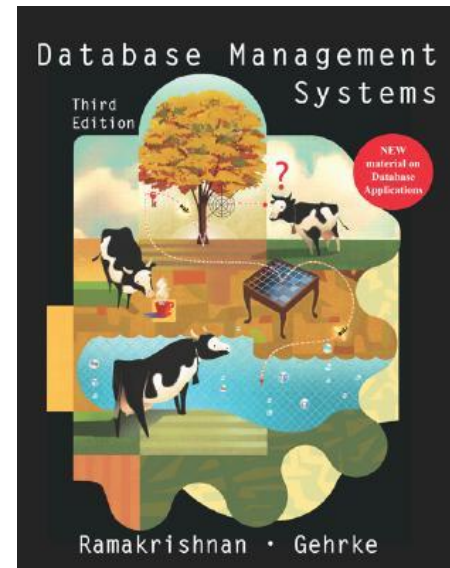
Questions?

FAQ (1/2)

- Do I need to write programs in this course?
  - A lot!
  - ***We will give extensive coding assignments***
- Do I need to write code with others?
  - Yes, 1~3 students a team

FAQ (2/2)

- Do we need to come to the class?
  - No, as long as you can pass
- Can I use AI to write code?
  - Sure, but only make it helpful to you
- Is this a light-loading class or heavy-loading class?
  - Should be *heavy* to most students
  - *Reserve time, otherwise you will have high chance to fall*