

# Introduction to Database Systems

Shan-Hung Wu  
CS, NTHU

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 than 4 years
- Queries (from multiple users) can execute *concurrently* without affecting each other
- It *recovers* from crash
  - No corrupt data after restart

# Advantages of a Database System

- It answers *queries* fast
  - Q1: among a set of web 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 than 4 years
- Queries (from multiple users) can execute ***concurrently*** without affecting each other
- It ***recovers*** from crash
  - No corrupt data after restart

# Goals

- To use a DB system (in only 2 weeks)
- To understand how to *write* a DB system
  - Architecture
  - Trade-offs

# Prerequisites

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

# Syllabus

- [Here](#)
  - Subject to change
- Mon: lecture
- Thu: labs (TA time)
  - Explain your new assignment
  - Review your pass assignment
- Homework every 2 weeks
  - Not only code, but also reports
  - Summarizing *diff from TA's code* and *your observations*



# Grading

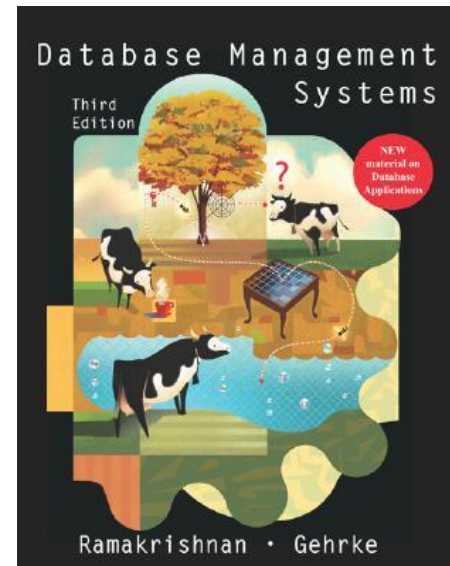
- Homework (x5): 50%
- SQL & Java quiz: 15%  
– *On next Thu (2/23)*
- Midterm exam: 15%
- Final project: 20%
- Q/A Bonus: up to 5%

# Resources

- Text Book
  - Lecture notes
  - Reference links
- Course page
  - [link](#)
- TODO
  - Register your team

# About the Quiz...

- Coverage:
  - Java concurrency
  - How to use a DBMS (SQL language)
- On **2/23**
- 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
- 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*