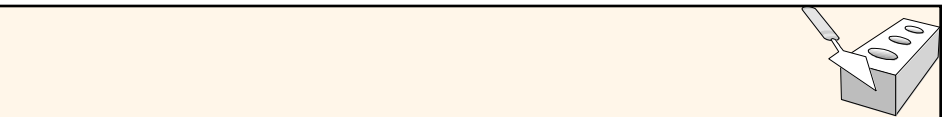
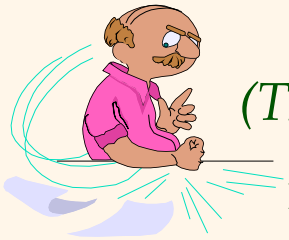


Introduction to Data Management



Lecture #1
(The Course "Trailer")

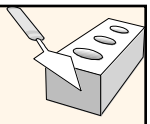
Instructor: Mike Carey
mjcarey@ics.uci.edu

Today's Topics

- Welcome to my (tie for) biggest class *ever*!
- Read (and live by!) the course wiki page:
  - http://www.ics.uci.edu/~cs122a/
- Also follow (and live by) the Piazza page:
  - https://piazza.com/uci/spring2019/cs122a/home
- Let's peek at the wiki page, and then lets also preview what lies ahead...
- ***Note*:** There *will* be a quiz in this week's initial discussion sessions...!
  - *Note*: You **must** attend the session you registered for.

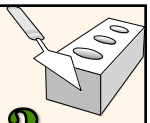
What is a Database System?

- What's a *database*?
  - A very large, integrated collection of data
- Usually a model of a *real-world enterprise*
  - ***Entities*** (*e.g.*, students, courses, Facebook users, …) with attributes (*e.g.*, name, birthdate, GPA, …)
  - ***Relationships*** (*e.g.*, Susan is *taking* CS 234, Susan is a *friend of* Lynn, …)
- What's a *database management system* (DBMS)?
  - A software system designed to store, manage, and provide access to one or more databases

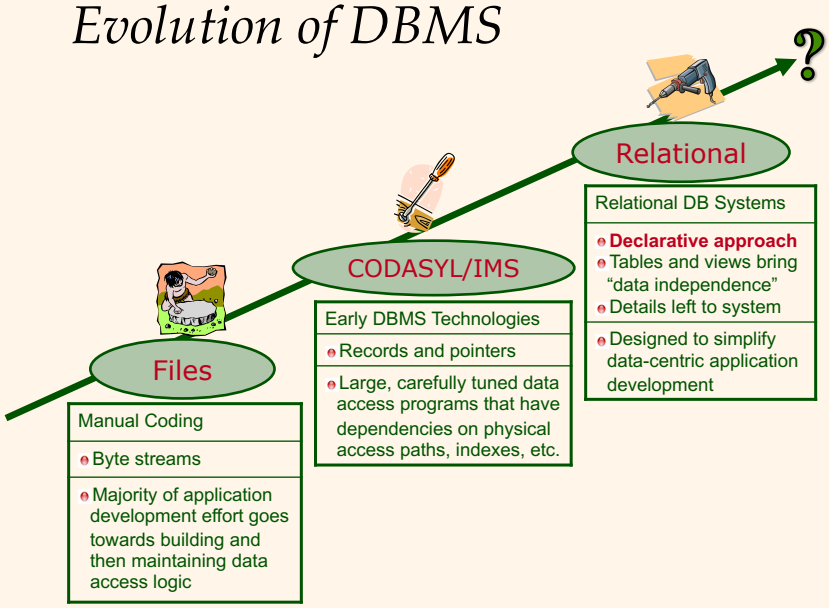


File Systems vs. DBMS

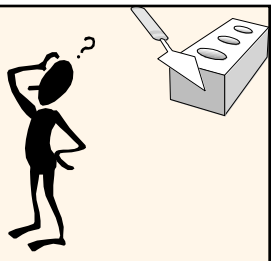
- Application programs must sometimes *stage large datasets* between main memory and secondary storage (for buffering huge data sets, getting page-oriented access, etc.)
- *Special code needed* for different queries, and that code must be (stay) correct and efficient
- Must *protect data from inconsistency* due to multiple concurrent users
- *Crash recovery* is important since data is now the currency of the day (corporate jewels)
- *Security and access control* are also important(!)



Evolution of DBMS



Why Use a DBMS?



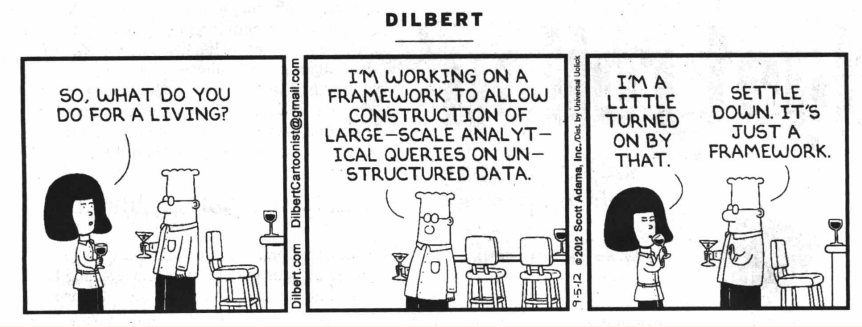
- Data independence.
- Efficient data access.
- Reduced application development time.
- Data integrity and security.
- Uniform data administration.
- Concurrent access, recovery from crashes.

Why Study Databases?

- Shift from *computation* to *information*
  - At the "low end": explosion of the web (a mess!)
  - At the "high end": scientific applications, social data analytics, …
- Datasets increasing in diversity and volume
  - Digital libraries, interactive video, Human Genome project, EOS project , the Web itself, …
  - Mobile devices, Internet of Things, …
  - ***… need for DBMS exploding!***

- DBMS field encompasses most of CS!!
  - OS, languages, theory, AI, multimedia, logic, …

Why Study Databases (Really)?



Big Data! ☺

https://www.cio.com/article/3292983/what-is-a-data-engineer.html

To Be Continued...