Database Lecture 2
Entity-Relationship Model Addendum

Dr. Jefferson Fong

Tutorials

TA	Sections	Day	Time
Lily	1003, 1006	Wed	12:00 – 12:50
Steven	1002, 1005	Fri	12:00 – 12:50
Shichen	1001, 1004	Thu	17:00 – 17:50

- If you cannot attend the tutorial of your section, you can attend the tutorial of another section.
- In tutorials, you can
  - Finish your lab exercises if you haven't done so in the lab.
  - Ask TA questions in Chinese; the TA has some topics explanations and examples prepared.
- If no students show up after 15 minutes, the TA can leave.
  - If you plan to be late in a tutorial, make sure you let the TA know beforehand.

Installing XAMPP on your computer

- Error messages
  - Search online on how to fix the error.
  - Search Bing or Baidu, “XAMPP (your error message)”
  - In many cases, removing a file mention there would fix the problem.
    - Don’t remove the file; move it the for folder junk\ and rename the file to XXX_junk, where XXX is the old file name, in case you need to revert back to the old file.
- Mac users, any problem installing and running?
- Anyone using macros? Has different interfaces. We have manual.

Slide 3 Design process

[1.5 Database Design; 6.1 Overview of Design Process]

Design process has 4 phases:

Slide 4 Phase 1: Conceptual design creates **E-R diagram**

Slide 5 Phase 2: Logical-design creates **relational schema**

Slide 6 Phase 3: Optimization removes redundancies, use **functional dependencies** and **normal form**

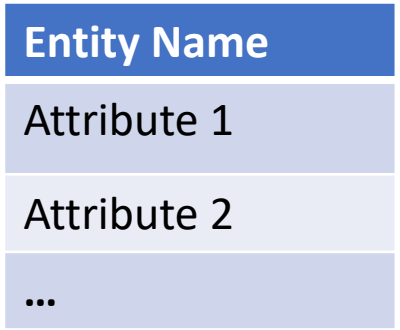
Slide 7 Phase 4: Physical-design, **SQL** coding

We will discuss the details of these phases in later lectures.

Phase 1 E-R Diagram covered in the rest of this lecture.

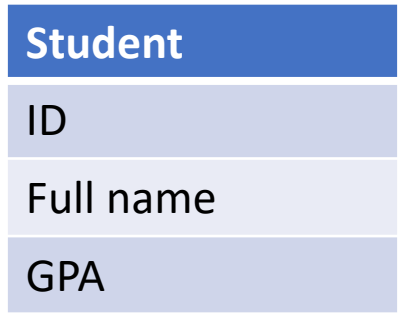
Slide 8 Entity Sets [6.2 The Entity Relationship Model]

- Entity-relationship (E-R) model includes:
  - Entity sets (Slide 8)
  - Relationship sets (Slide 19-23)
  - Attributes (Slide 9-10)



Slide 9-10 Attributes [6.3 Complex Attributes]

- Example of entity (object) and attributes in the class diagram you've learned in Java.



- Instead of class diagrams (in above right on this slide), this course uses the notation described in Slide 9-11.

Slide 11 Basic ER Features [6.9 E-R Diagrams, 6.10 Alternative Notations]

- The book uses a different notation called UML class diagrams.
- The PPT uses the version described in 6.10 Alternative Notations.
- More in the Summary slide near the end of this PPT.

Slide 12-14 Keys [6.5 Primary Key]

- Underline important stuff.

Slide 15-16 Multi-value attributes [6.3 Complex Attributes]

- Double ellipse for more than 1.

Slide 17-18 Composite attribute [6.3 Complex Attributes]

Slide 19-23 Relationship Sets [6.2.2 Relationship Sets]

Slide 19

- Relationship describes association between 2 or more entities.
- We can represent a relationship using a tuple, just like we represent a point in space using the tuple (x, y, z).

Slide 21

- (Alice, MacBeth) is a relationship.

borrow = { (Alice, MacBeth), (Bob, Three Body) … } is a relationship set.

Slide 25

- The ternary (3 “things”) relationship *enroll* involves the 3 entities student, course and instructor.

Slide 26 Roles [6.2.2]

- A *course* can be a *successor* or predecessor of another *course*.
- In slide 22 and 27, can add borrower as the role for the student
  - Similar to adding a comment to the code; sometimes comments are useful.

Slide 28 Derived attributes [6.3 Attributes]

- Derived attribute can be derived from other attributes; indicated by dash ellipse.

- Slide 30 Summary of E-R notation [6.9 Alternative Notations]

Slide 31 Exercises

- Add to the diagram in Slide 29.
- Which are entities (objects)? Which are attributes? Relationships (between 2 or more entities)?
  - Entities and attributes are nouns; relationships are (usually) verbs.
  - E.g. “students (noun) borrow (verb) books (noun).
  - That would help you to figure out how to draw the E-R diagram.
- “Programs, which have program codes, program names and the division that each program belongs to.”
  - Program (entity); code, name and divisions (attributes).