

What is a Relationship?

Mix/Max Cardinalities

What is a relationship?

- ▶ Association of two (or more) “things” (entities) in the real world.
- ▶ Captures how entities interact and the constraints on that interaction.
- ▶ Why do we care about that ?
 - ▶ It reflects the real world.
 - ▶ The mapping ratios (refined as min/max cardinalities) help capture and enforce business rules of the real world.

Objectives

- ▶ Revisit the relationship concept
- ▶ Revisit mapping ratios
- ▶ Revisit min/max cardinalities from Crow's Feet Notation
- ▶ Introduce min/max cardinalities for Chen's Notation

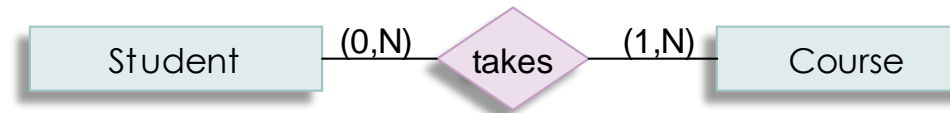
- ▶ NOTE: You need to know the positioning of Mapping Ratios on a conceptual model
 - ▶ Min/max cardinalities are at a finer level of detail and are part of both the Chen's Notation and Crow's Feet notation.
 - ▶ Use min/max cardinalities for Quiz 1 and Assignment 3.

Student Course (Revisited)

Mapping Ratios

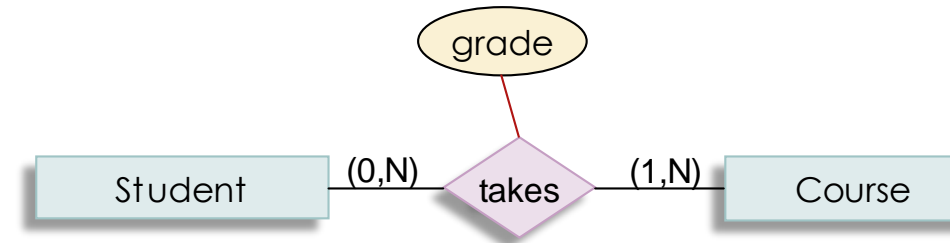


Min/max cardinalities



Read as: a student takes no courses or up to many courses. A course is taken by at least one student and could be taken by many students.

Relationship attribute



Here: representing the concept of a grade. It is a relationship attribute for a many-to-many relationship. Understand that the min/max cardinalities are a finer level of detail than M:N.

Course Enrollment Example



Task: Suppose you want to develop a database to keep track of students, the courses they take, and the professors who teach the courses.

Description: For each student, you will need to know their name and address, and, obviously, each student must be uniquely identified. For professors, you only need an id and their name because the rest of their information is stored elsewhere (e.g., in a human resources database). Each course must have a title and number of credit hours.

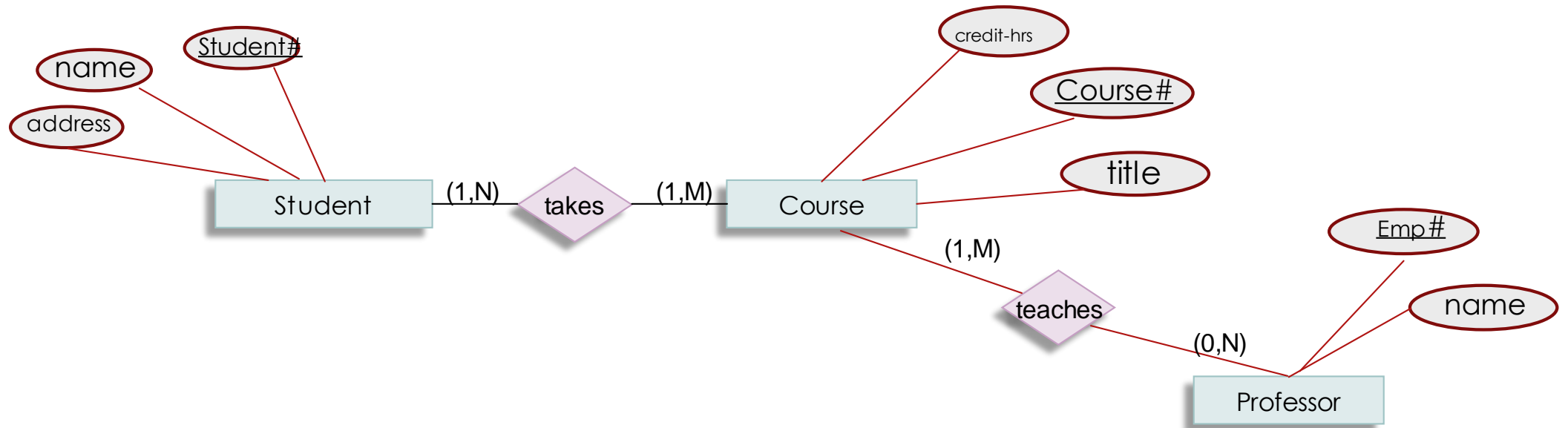
Instruction: Draw the entity-relationship model for this situation using the Chen notation. Use min/max cardinalities.

Example: Student and Courses

Student: (Student#, name, address ...)

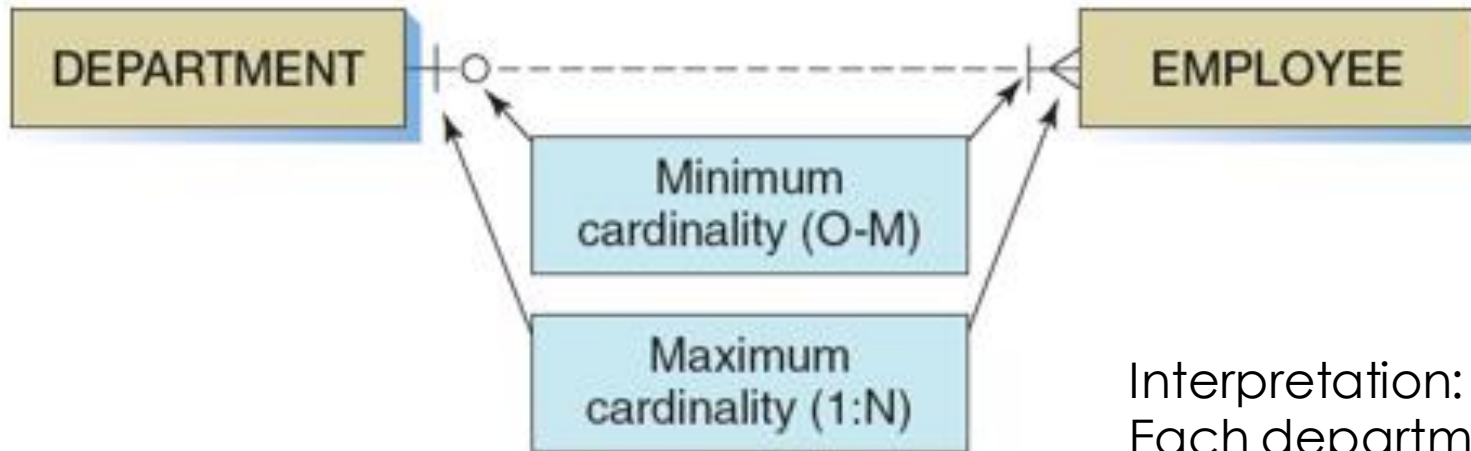
Course: (Course#, title, credit-hrs ...)

Professor: (Emp#, name, ...)



Crow's Feet

Note the contrast in the placement of min/max cardinalities.



(b) Crow's Foot Version

Interpretation:

Each department has at least one employee, but can have many.

Each employee is optionally assigned to one department. This is represented by the 'O' (stands for optional) and a maximum of 1.

Summary

- The relationship concept is important in conceptual modeling. It represents how things interact (are associated) with each other in the real world.
- The representation of min/max cardinalities is different in the crow's feet notation and Chen's notation.
- Know both of these notations.
- There are also different notations in the literature.
- The most important thing is to understand the syntax and how it works while recognizing that the syntax differs depending upon the representation (Chen's or Crow's Feet) you use.
- Be consistent in the use of notation (within a given problem).