The Entity-Relationship Model, Part 1

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1   Administrivia

Announcements

Assignment

Project deliverable one due Tuesday at 5:00 pm.

Read 3.9–3.13.

From Last Time

Introduction and background.

Outline

1. Socrative questions.

2. E-R Diagram practice.

Coming Up

The entity-relationship model, part 2.

2 Socrative Questions

Socrative room: CHAMBER42

1. The basic objects in the E-R model include all of the following EXCEPT
   A. entities
   B. attributes
   C. relationships
   D. classes

2. In the E-R model, the set of values permitted for an attribute is called the
   A. domain
   B. range
   C. entity set
   D. instance

3. Any attribute or set of attributes that uniquely identifies an entity is called a
   A. superkey
   B. candidate key
   C. primary key
   D. secondary key

4. In the E-R model, connections or interactions between entities are called
   A. attributes
   B. links
   C. relationships
   D. tuples

5. In the E-R model, the number of entities that can map to one another under a relationship is called the
   A. degree of the relationship
   B. cardinality of the relationship
   C. order of the relationship
   D. descriptor of the relationship

6. In the E-R model, when an entity set is related to itself, we call the relationship
   A. recursive
   B. dominant
   C. role-defined
   D. weak

7. In the E-R model, an entity that is existence dependent on another and does not have a key of its own is called
   A. a weak entity
   B. a dominant entity
   C. a parent entity
   D. a referential entity
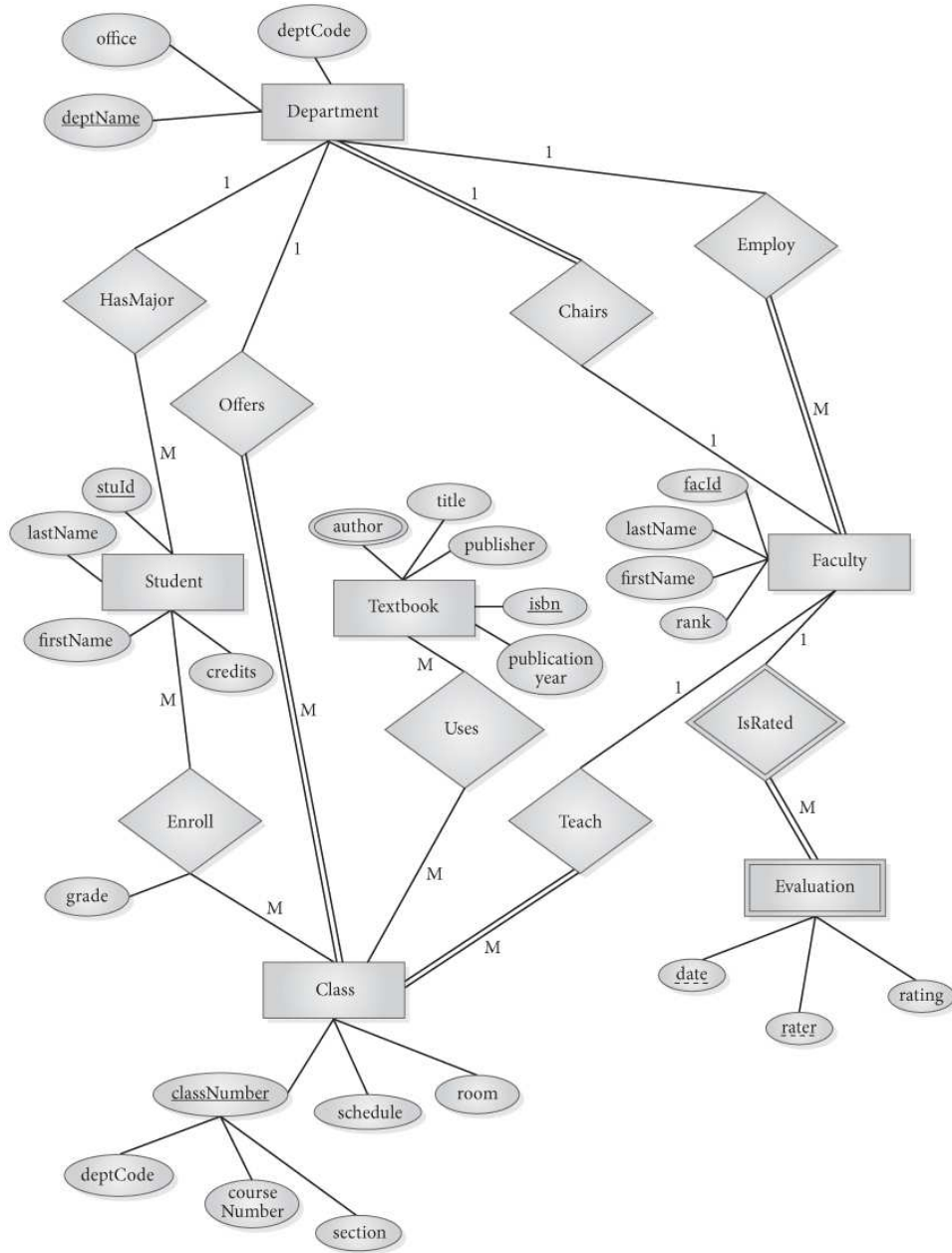
8. The data model level that an E-R diagram best describes is the
   A. external
   B. conceptual
   C. physical
   D. internal

9. In a business, if a department can have many workers, but each worker belongs to only one department, the cardinality of the department-to-worker relationship is
   A. one-to-one
   B. one-to-many
   C. many-to-one
   D. many-to-many

10. In a bank, if we assume that savings accounts can be jointly owned by two or more customers, and that a customer can have more than one savings accounts, the relationship between the savings accounts entity set and the customer entity set is
    A. one-to-one
    B. one-to-many
    C. many-to-one
    D. many-to-many

3   E-R Diagram Practice

1. Consider the following E-R Diagram:

(a) List two entities, two relationships, and two attributes.

(b) How is `depCode` related to `classNumber`?

(c) What is the primary key of `Department`?

(d) Is it an error that `Enroll` has an attribute? Why or why not?

(e) What is the degree of the `Offers` relationship?

(f) What is the cardinality of the `Offers` relationship?

(g) What is the meaning of the double line from `Class` to `Offers`?

(h) Describe the `Uses` relationship in words.

(i) Describe the `Teach` relationship in words.

2. A private book collector is designing a database to keep track of her purchases and book holdings. Consider the entity set `Book` with attributes `title`, `author`, `publisher`, `pubDate`, `numberPages`, `condition`, `cost`, and `datePurchased`.

   (a) Show how the entity set and its attributes would be represented on an E-R diagram.

   (b) Describe the domain of the `cost` attribute, making assumptions as necessary.

   (c) Identify a superkey for the `Book` entity set.

   (d) Identify all candidate keys for the entity set.

   (e) Identify a primary key for the entity set and underline it on the E-R diagram.

3. (a) Assume that in the same scenario as in the previous exercise, there is an entity set called `Purchase` with attributes `purchaseDate`, `totAmount`, and any others you wish to add to describe book purchases. A purchase may include several books. Show how this entity set and its relationship to `Book` would be represented on the E-R diagram.

   (b) Stating any necessary assumptions, make a decision about the cardinality and participation constraints of the relationship, and add appropriate symbols to the E-R diagram.

   (c) Assume there is another entity called `Seller` to be added to the diagram. The book collector makes purchases from many sellers, but each purchase is made from one seller. Making up attributes as needed, add this entity and appropriate relationship(s) to the diagram.

4. Design a database to keep data about college students, their academic advisors, the clubs they belong to, the moderators of the clubs, and the activities that the clubs sponsor. Assume that each student is assigned to one academic advisor, but an advisor counsels many students. Advisors do not have to be faculty members. Each student can belong to any number of clubs, and the clubs can sponsor any number of activities. The club must have some student members to exist. Each activity is sponsored by exactly one club, but there might be several activities for one day. Each club has one moderator, who might or might not be a faculty member. Draw a complete E-R diagram for this example. Include all constraints.