Software Engineering

هندسة البرمجيات

جامعة بغداد
كلية التربيه للعلوم الصرفه/ابن الهيثم
قسم علوم الحاسبات
المرحلة الثالثة

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Structured Analysis

Entity-Relationship Model/Diagram (ER)

Topics covered

- What is Entity-Relationship Model (ER)?
- Constraints of relationship
  - Modality & Cardinality
- Forms of Cardinality
  - One-to-one
  - One-to-many
  - Many-to-many

Entity-Relationship Diagram (ER)

- Entity-Relationship Model is a popular notation used to show the relationship between entities. It was first introduced as part of entity-relationship model by Peter Chen in 1976.
- All of theses modeling nations may be used for requirements definition and analysis as well as for design.
- In fact, the preferred approach is to use same notation starting at requirements analysis and continuing through the design of the software.
- ER Model creates a set of entities with their attributes, a set of constraints and relation among them.

Entity-Relationship Diagram (ER)

- Entity - An entity in ER Model is a real world being, which has some properties called attributes. Every attribute is defined by its corresponding set of values, called domain.
- For example, Consider a school database. Here, a student is an entity. Student has various attributes like name, id, age and class etc.
- The logical association among entities is called relationship. Relationships are mapped with entities in various ways. Mapping cardinalities define the number of associations between two entities.

Entity-Relationship Model (ER)

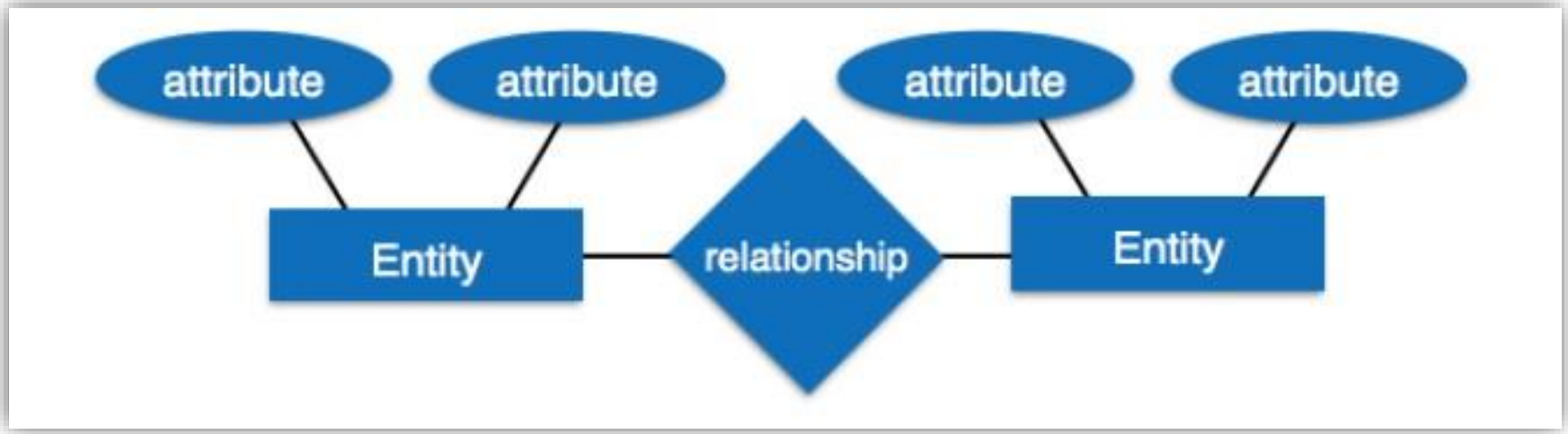

Figure 24: Entity-Relationship Model (ER)

The constraints of relationship

- ❖ Modality (Zero)
- ❖ Cardinality
  - One-to-one
  - One-to-many
  - Many-to-many

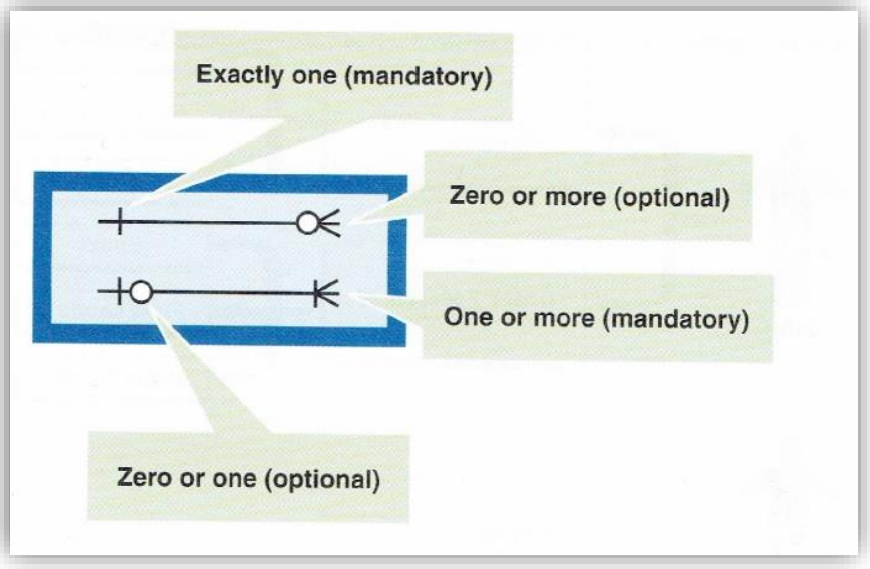

Figure 25: Constraints of relationship

Modality (zero or one, zero or many)

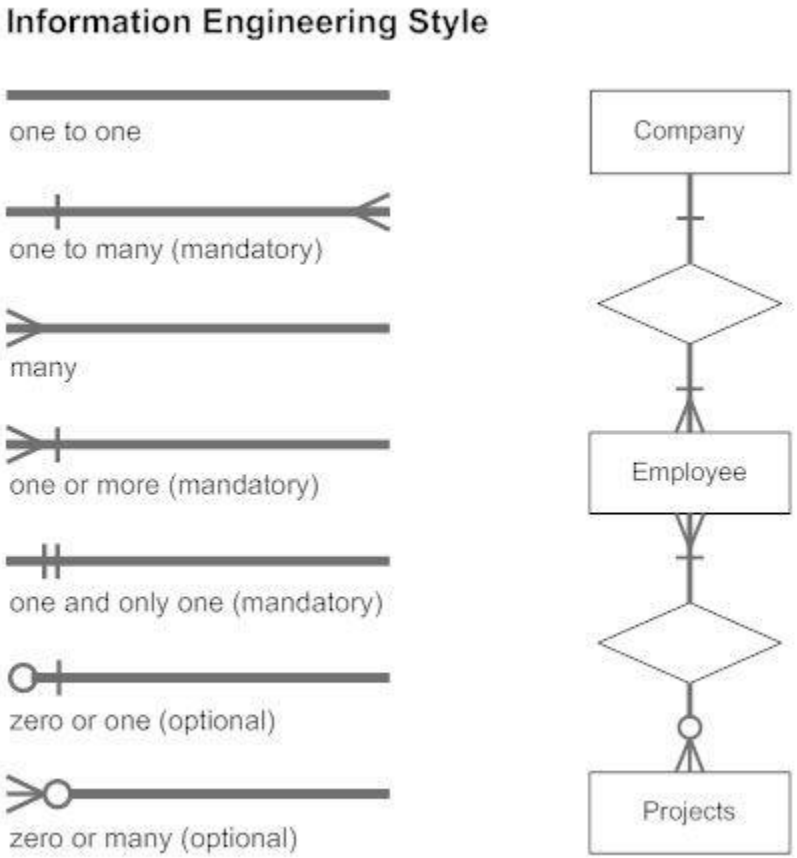

Figure 26: zero or one, zero or many

Cardinality (One-to-one)

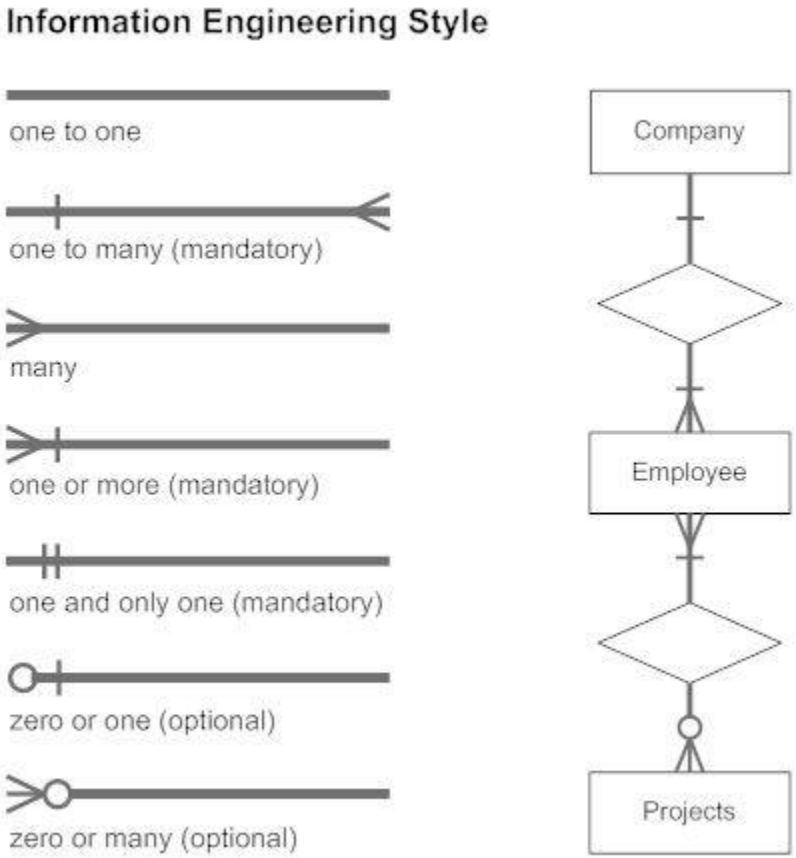

Figure 27: One-to-one

Cardinality (One-to-many)

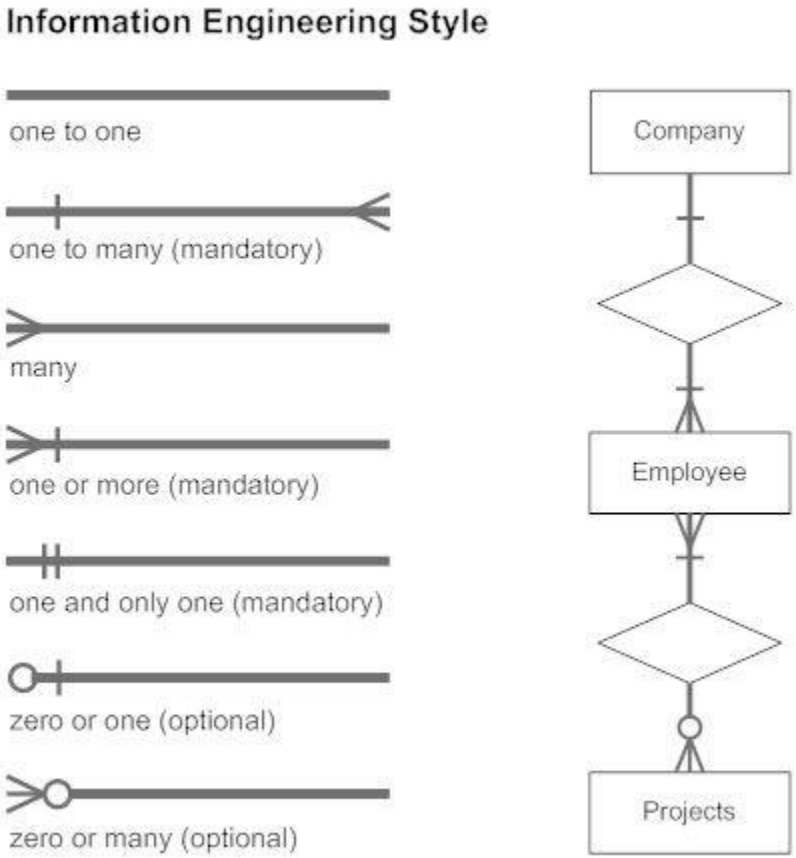

Figure 27: One-to-many

Cardinality (Many-to-many)

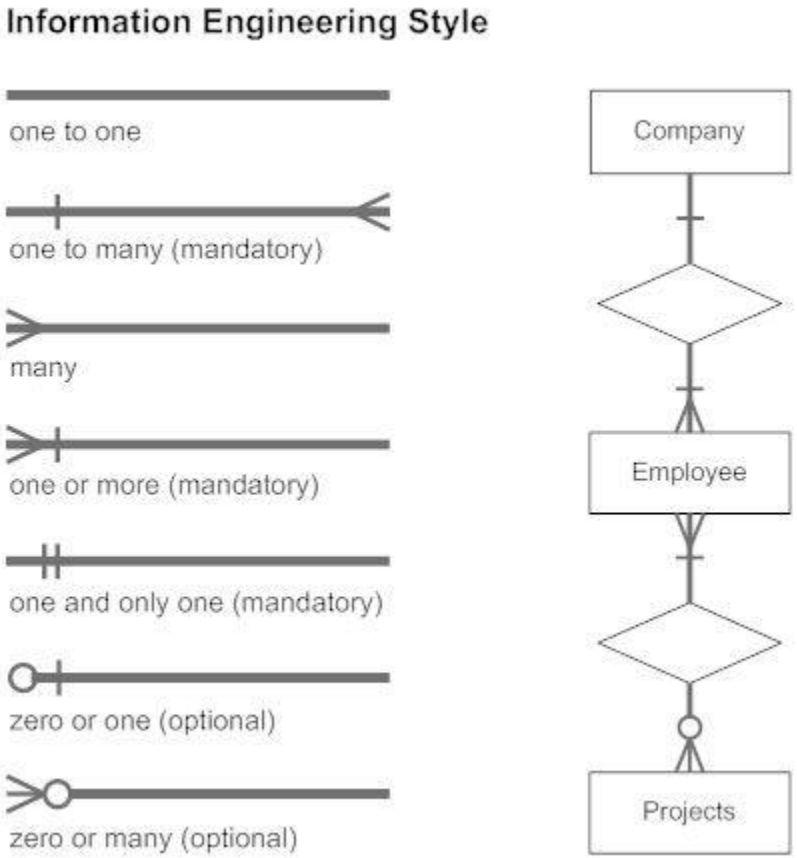

Figure 28: Many-to-many

Quiz?

Explain in ER model the relationship between programmers and modules where a programmer may write several modules and each module may also be written by several programmers.

Thanks