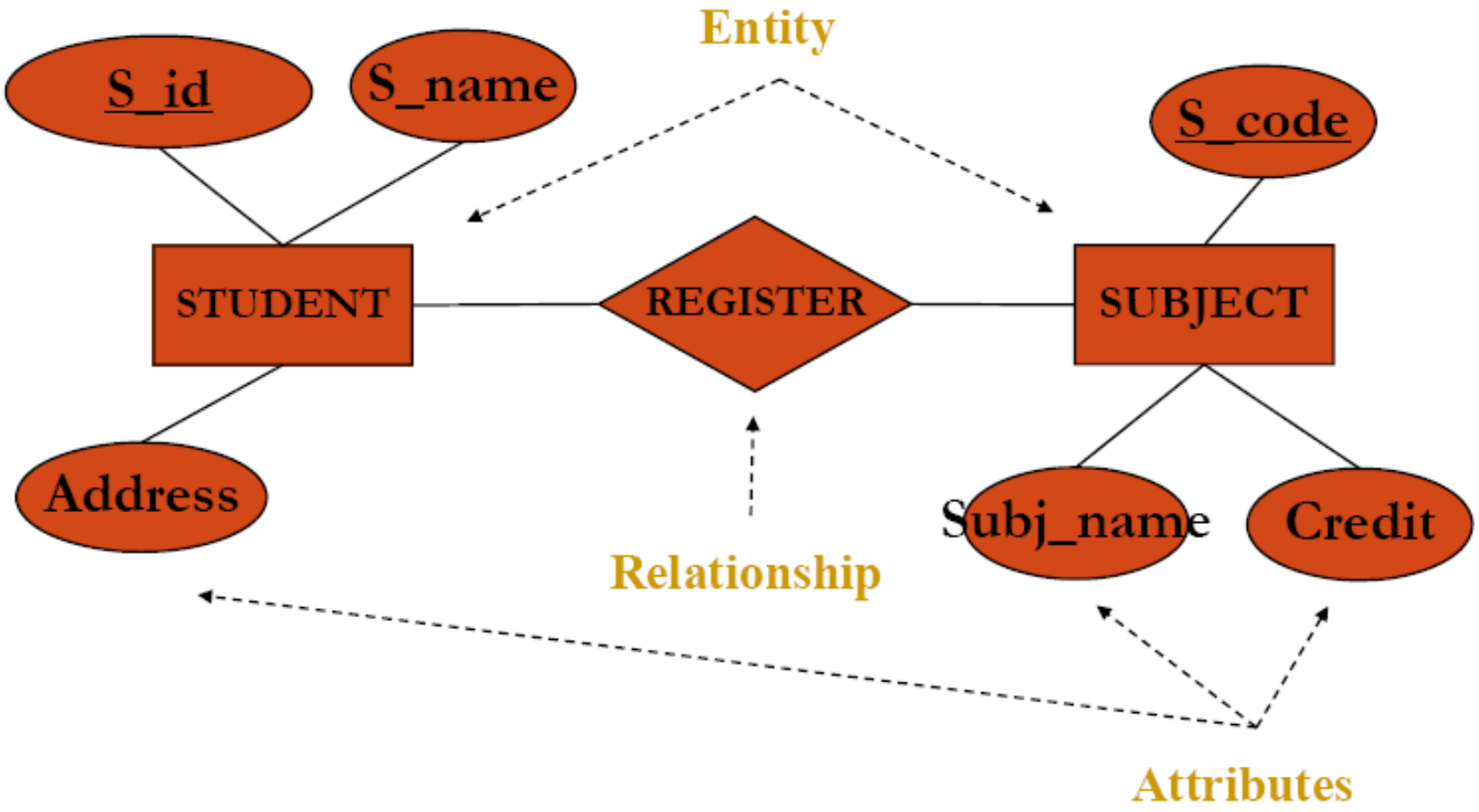
The Entity-Relationship Model (cont.)

EGCI321: LECTURE03 (WEEK 02)

E-R Diagram

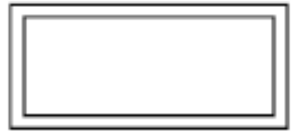

Entity
S_id
S_name
S_code
STUDENT
REGISTER
SUBJECT
Address
Subj_name
Credit
Relationship
Attributes

Example of Entities

- Persons: customer, employee, student, supplier
- Place: building, room, branch office, campus
- Objects: book, machine, product, part
- Events: invoice, order, registration
- Concepts: account, course, stock

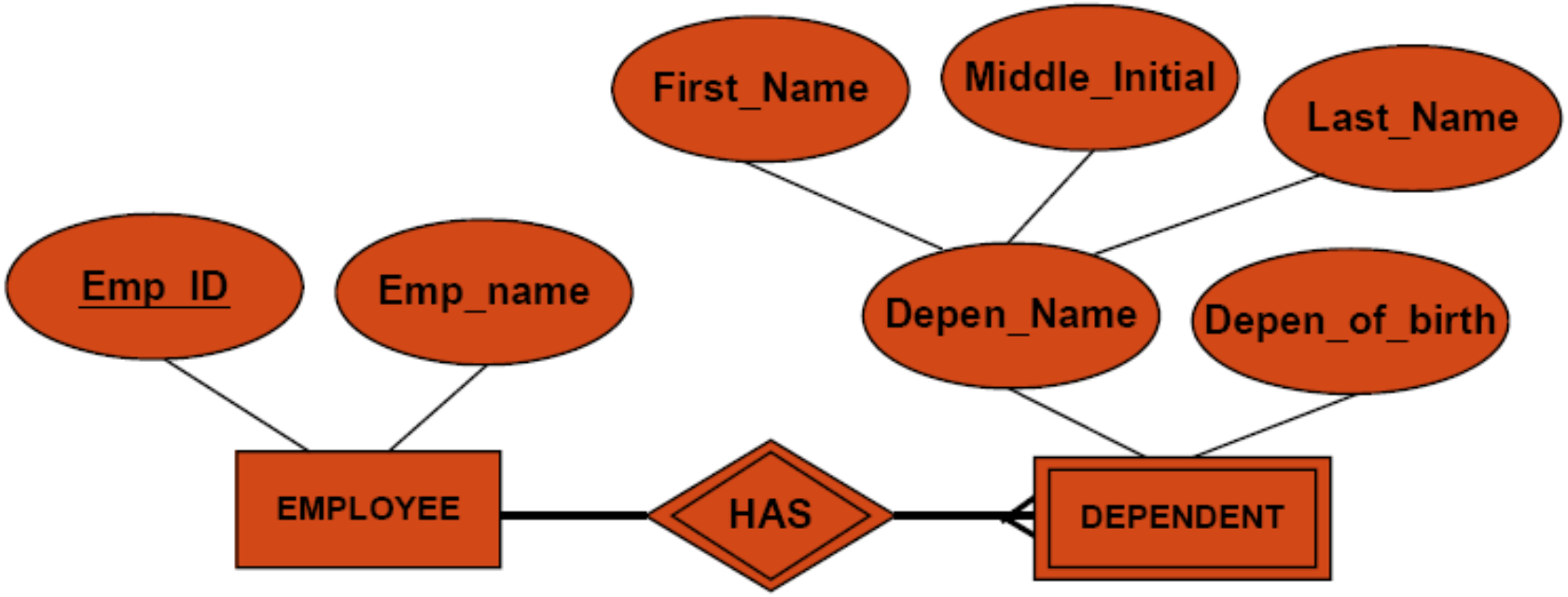
Type of entities

Strong Entity



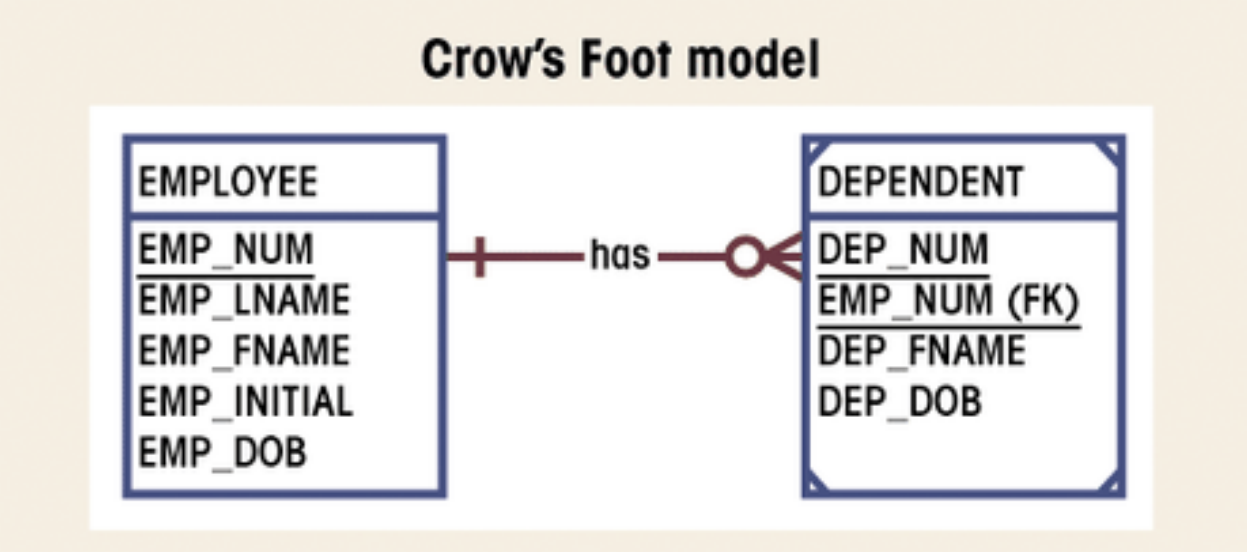
Weak Entity

Strong and Weak Entities



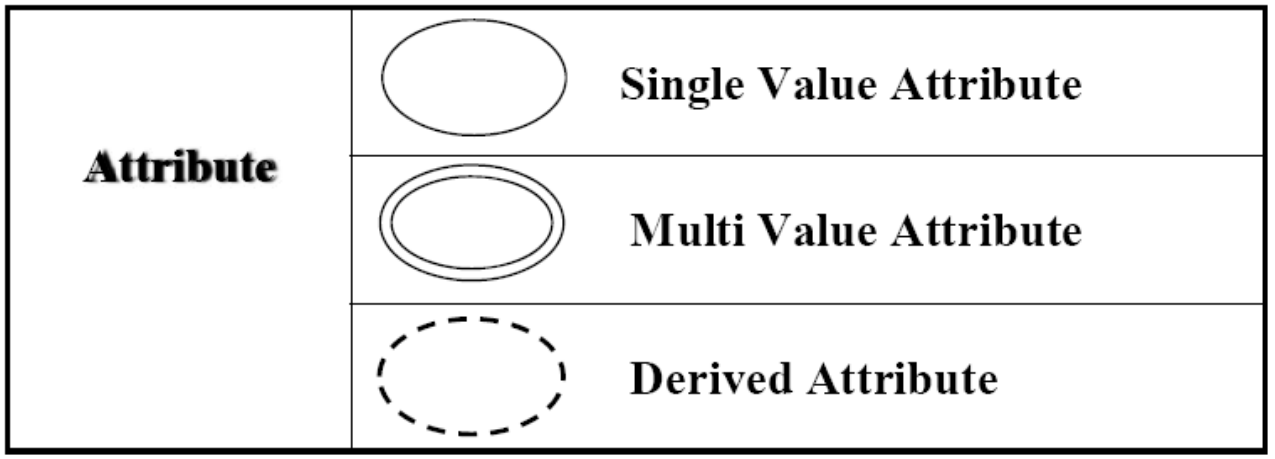
Weak Entity

- Existence-dependent on another entity
- Has primary key that is partially or totally derived from parent entity

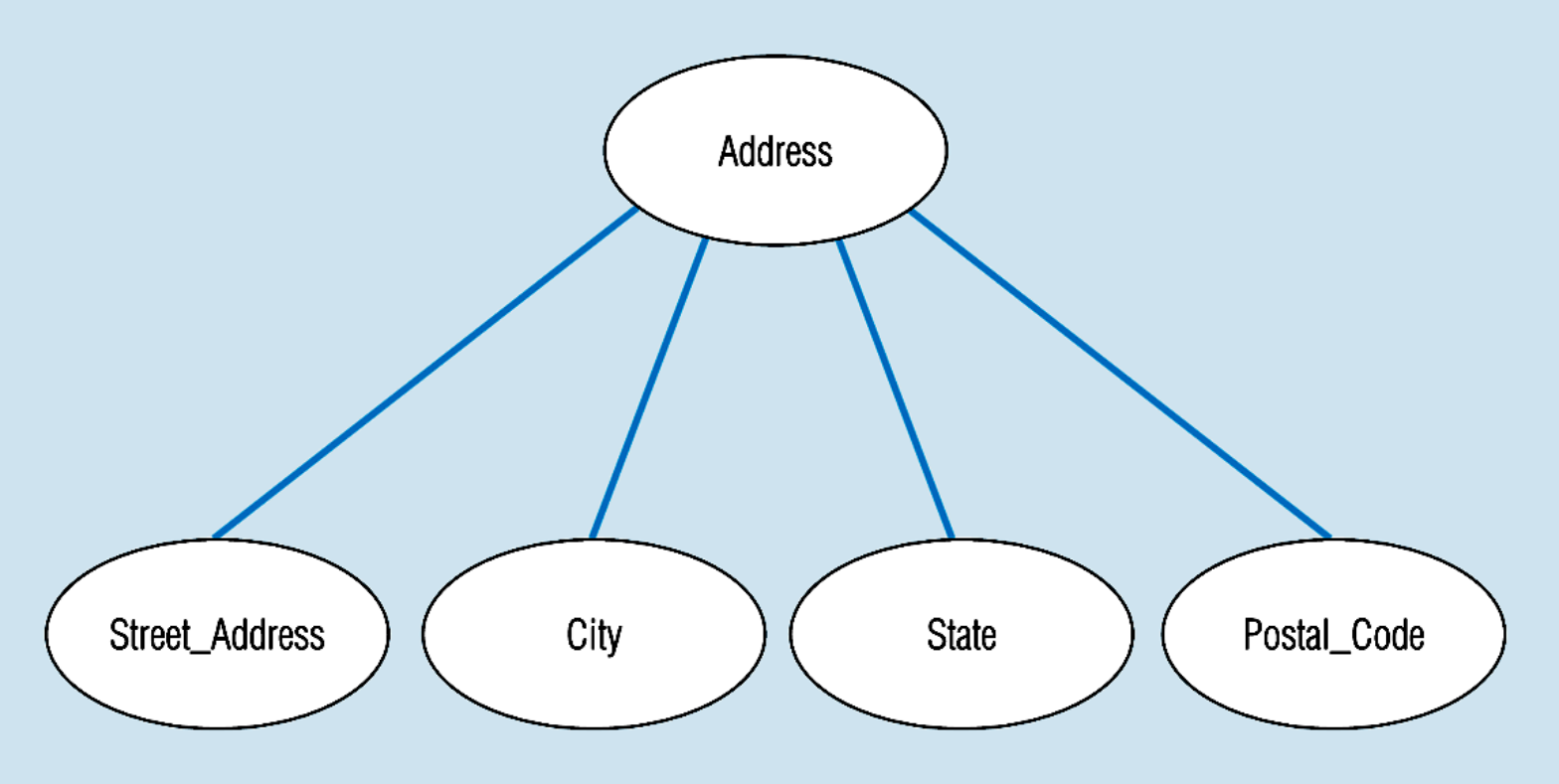


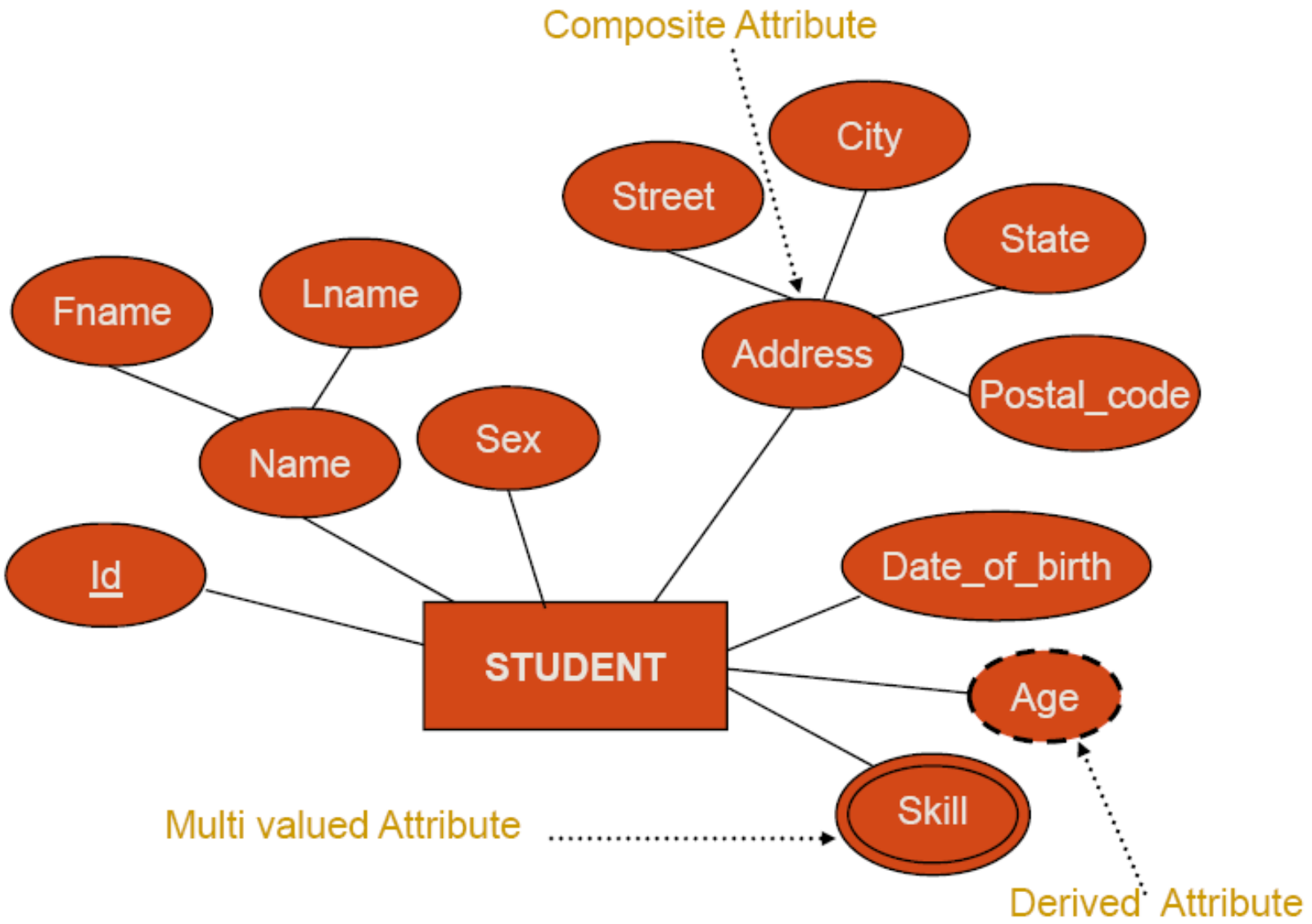
Attributes

- Composite Attribute: address (street no., street, district, province, country)
- Derived Attribute: age (derived from date of birth)
- Single Valued Attribute: first name, last name
- Multi Valued Attribute: Telephone no., hobbies, skills



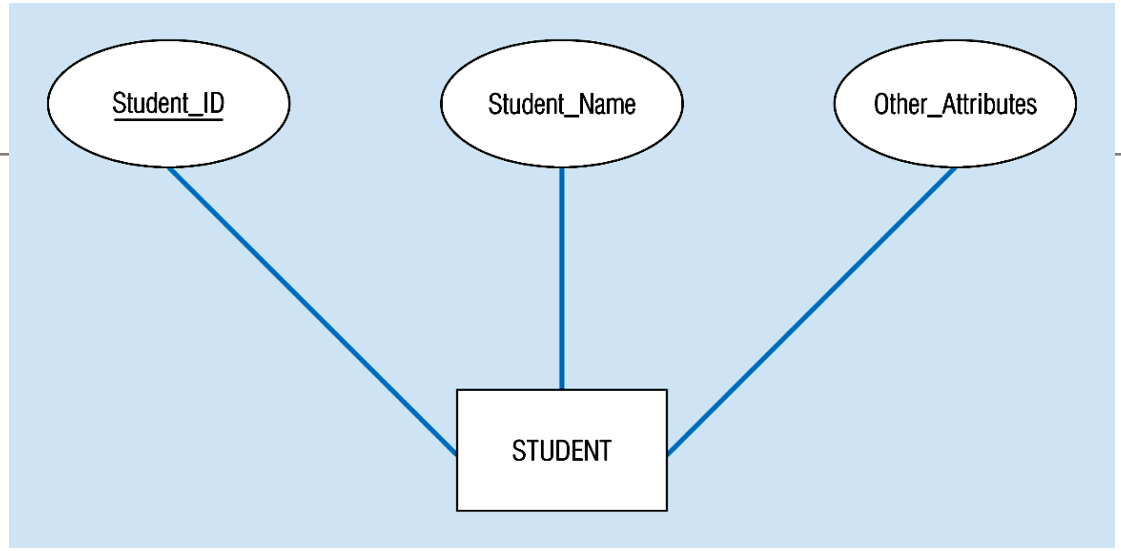
Composite Attribute



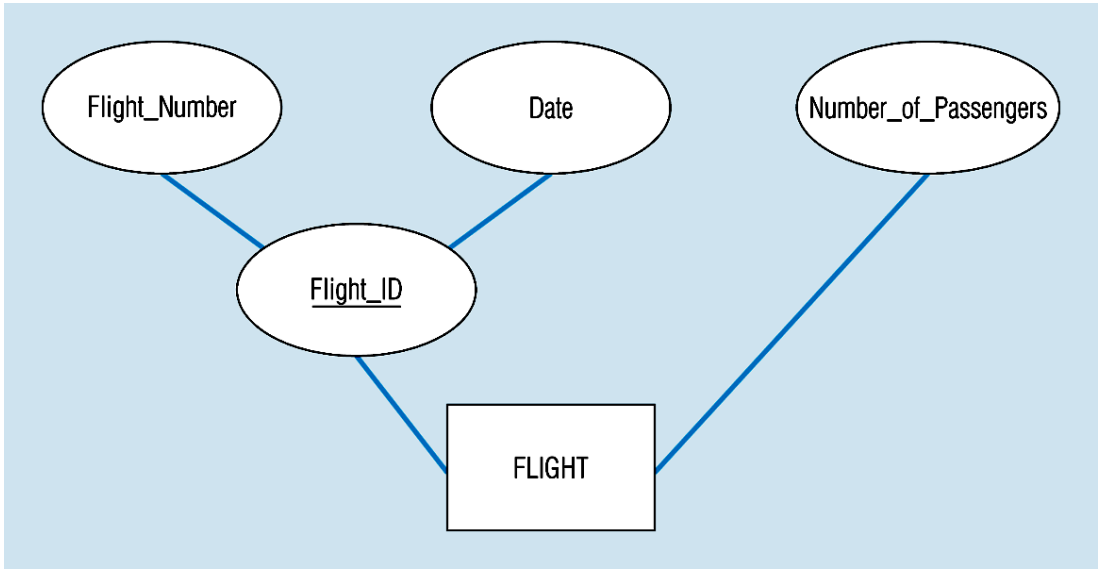

Composite Attribute
City
Street
State
Fname
Lname
Address
Postal_code
Name
Sex
Id
Date_of_birth
STUDENT
Age
Skill
Multi valued Attribute
Derived Attribute

Key Attribute

Simple Key Attribute



Composite Key Attribute

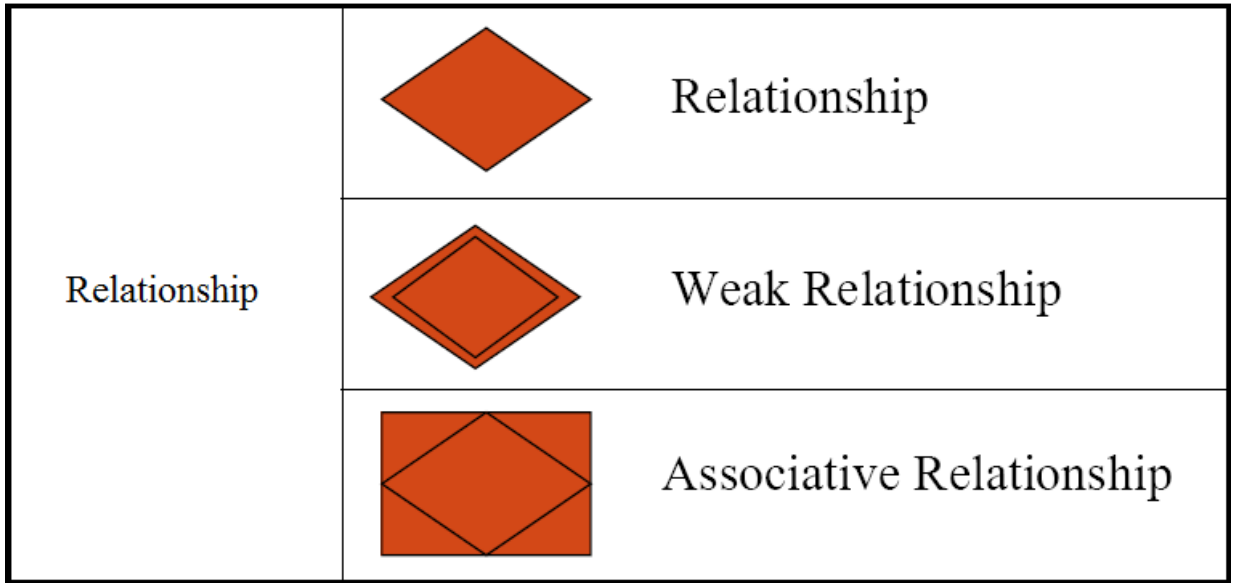


Relationships

Relationship

Identifying or Weak Relationship(mostly this is the relationship between strong and weak entities)

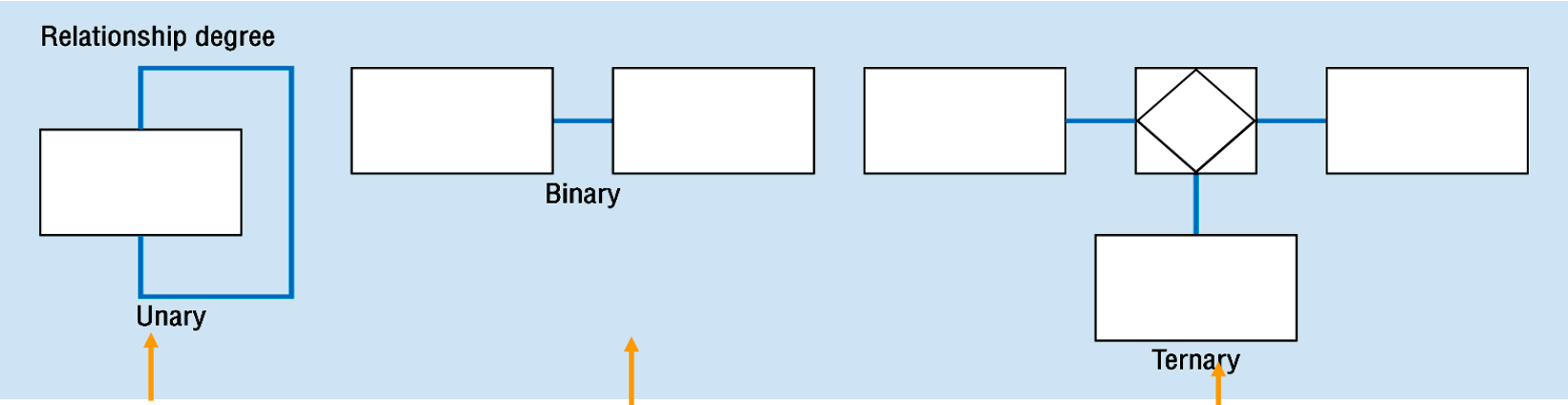
Associative Relationship (the relationship among three entities)

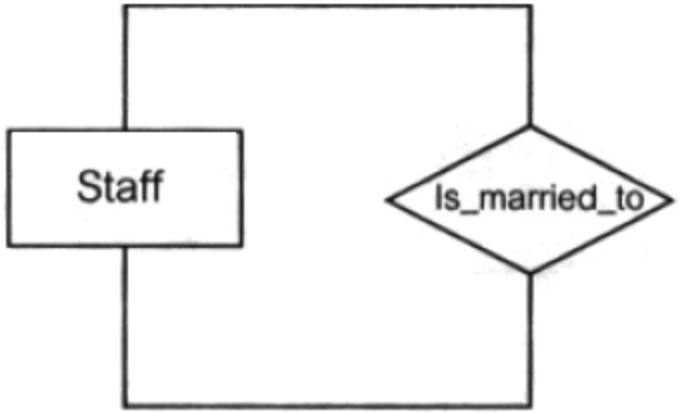


Degree of Relationships

Degree of a Relationship is the number of entity types that participate in it

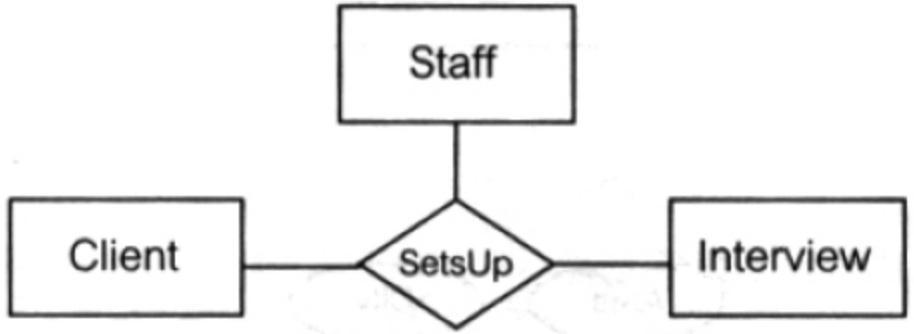
- Unary Relationship
- Binary Relationship
- Ternary Relationship



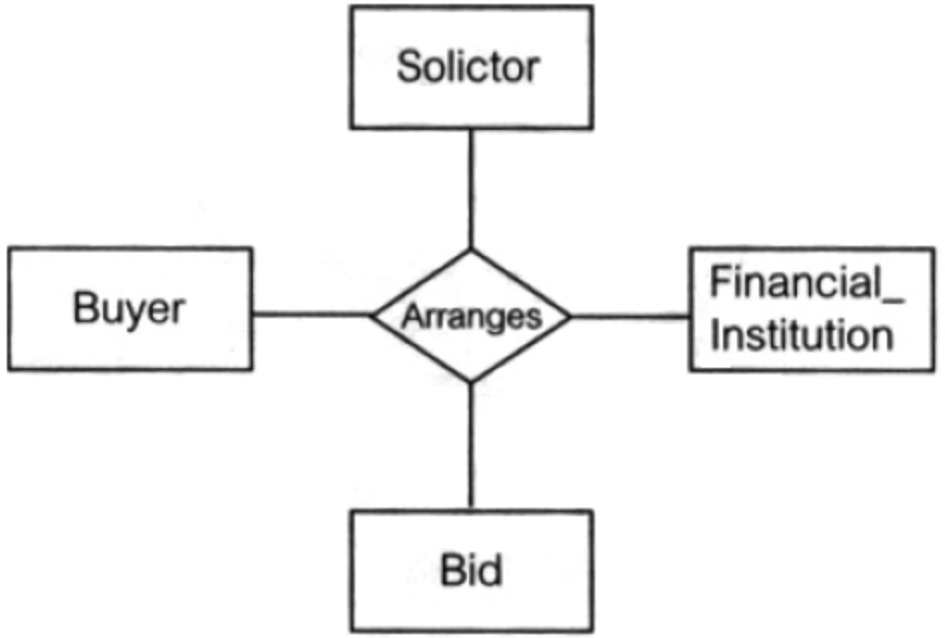


(a) Unary Relationship

(a) Binary Relationship

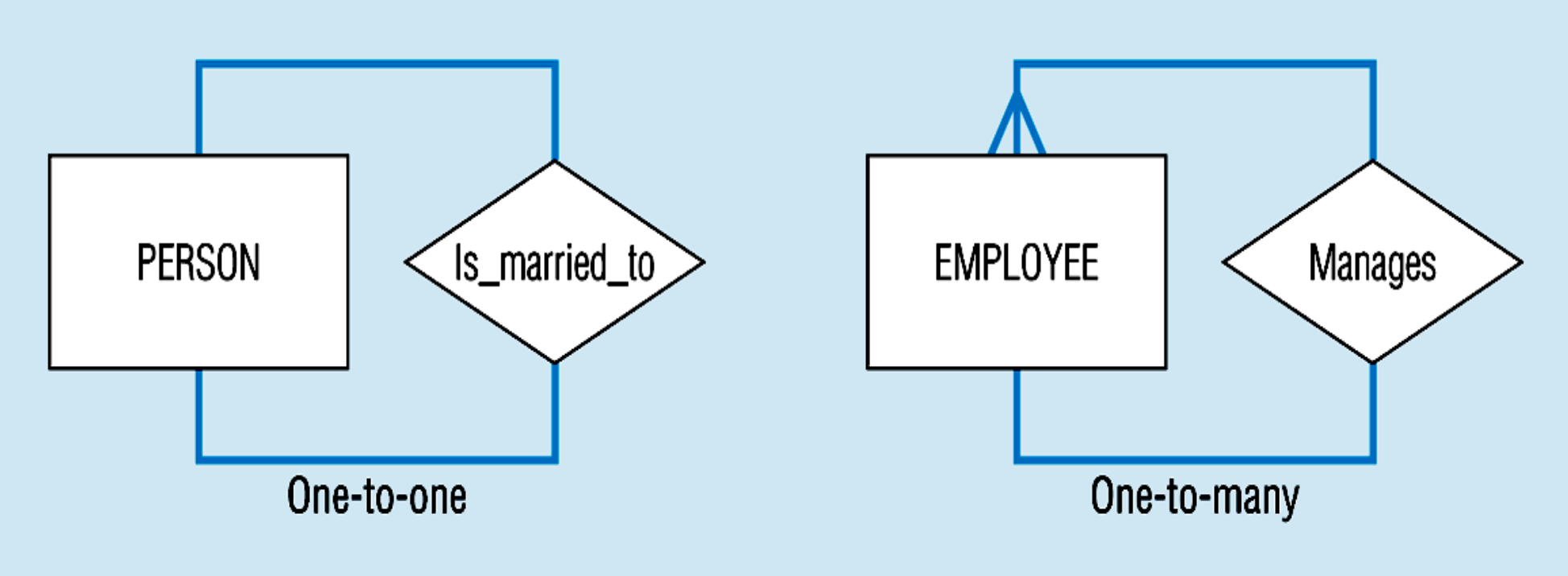


(b) Ternary Relationship

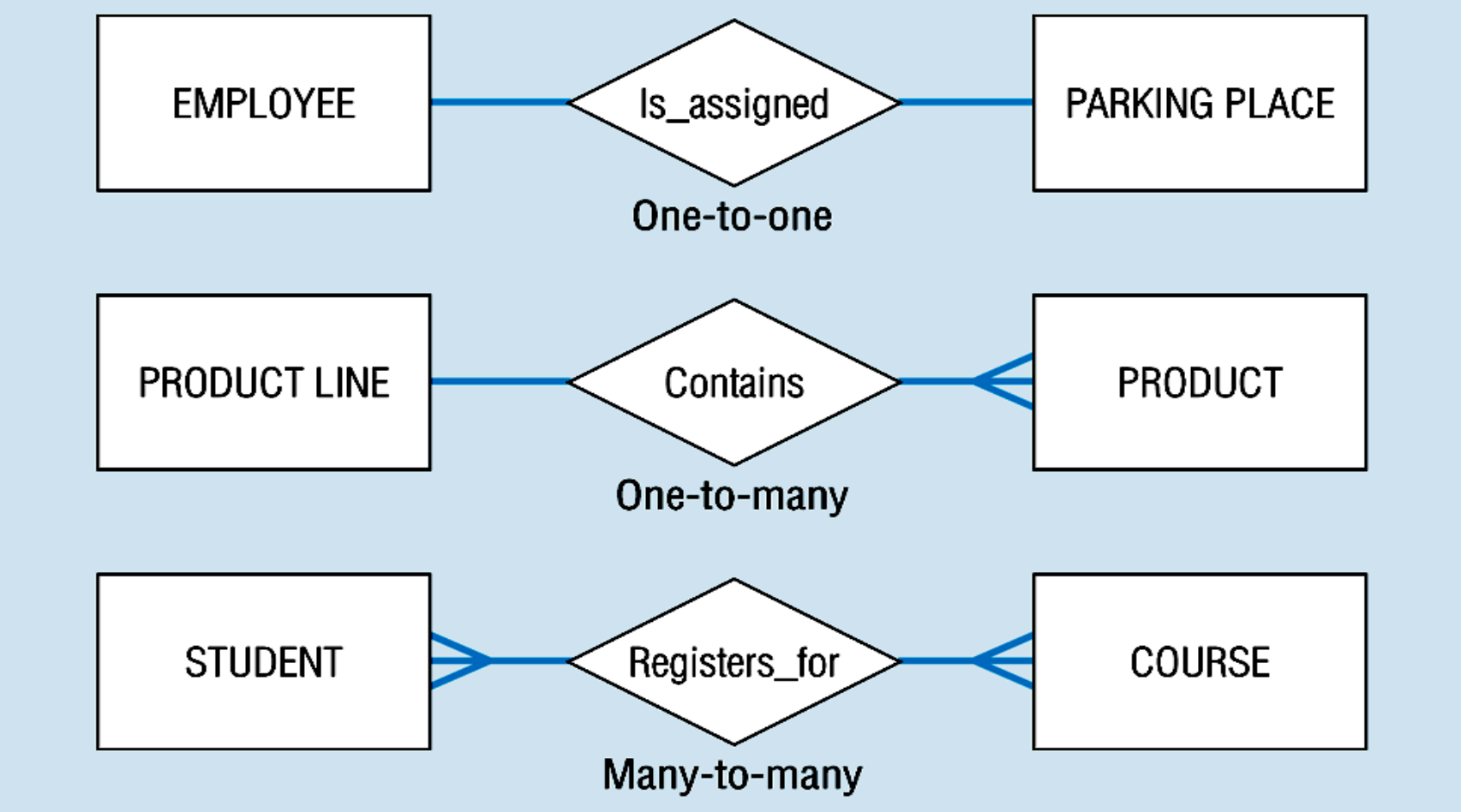


(c) Quaternary Relationship

Unary Relationships

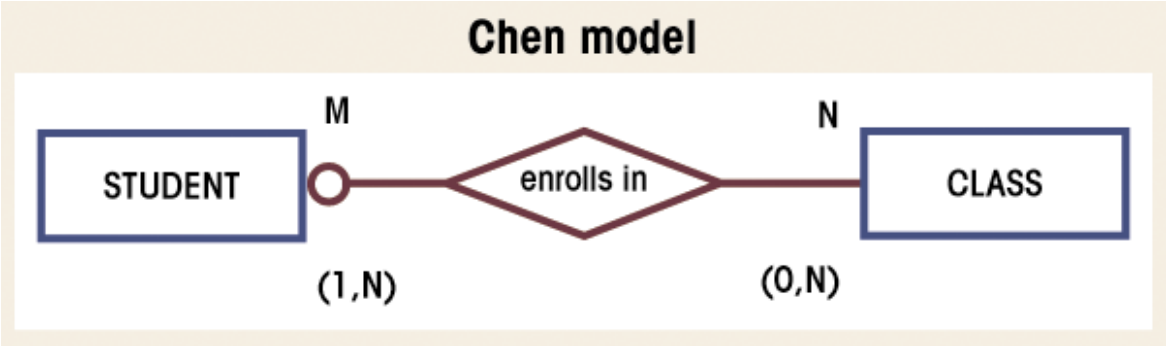


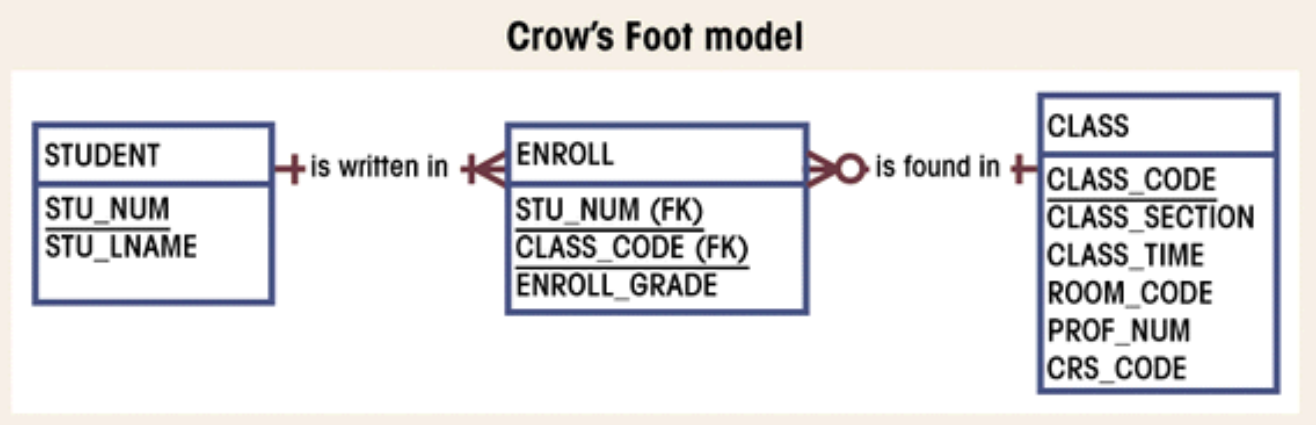
Binary Relationships



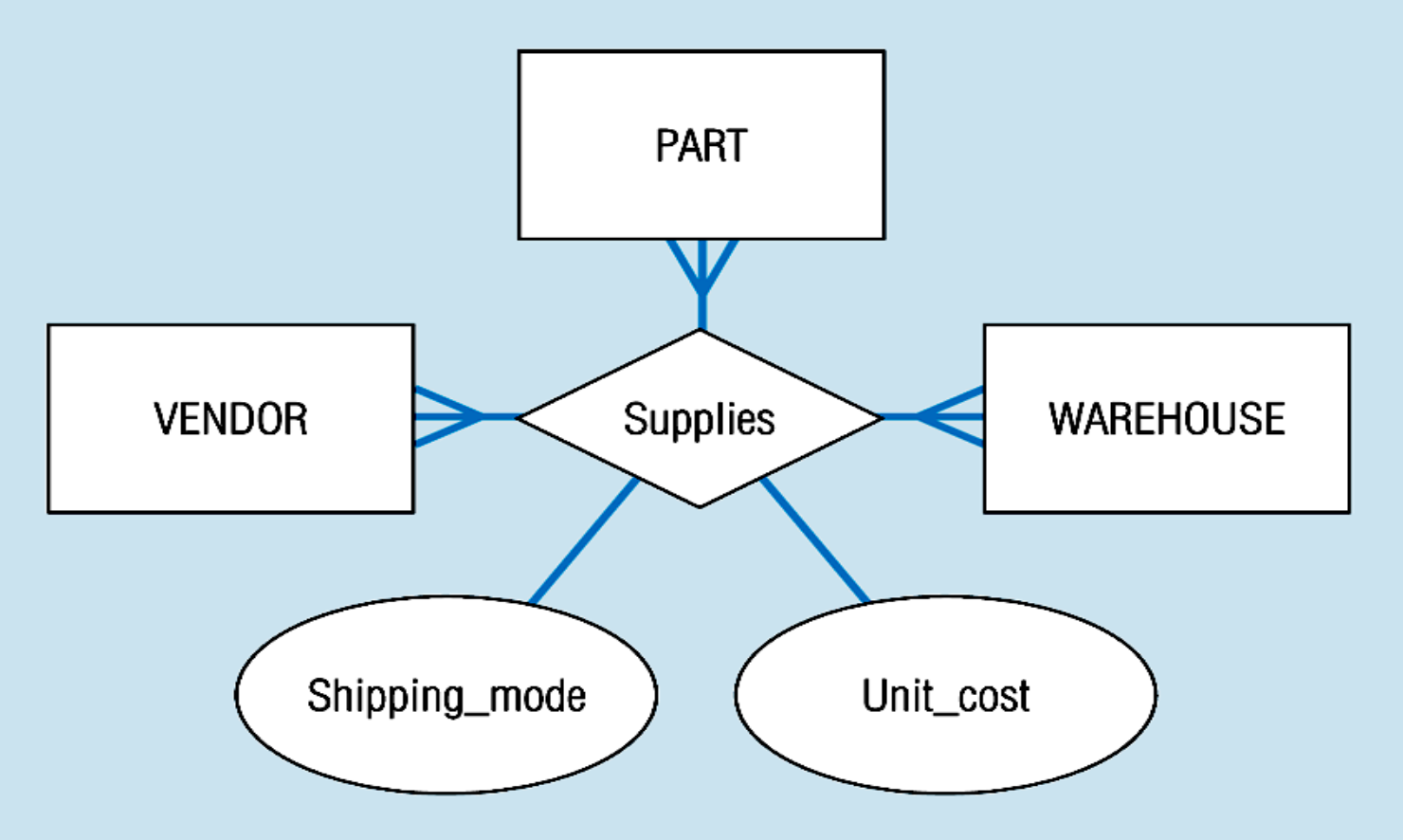
Composite Entities

- Used to ‘bridge’ between M:N relationships
- Bridge entities composed of primary keys of each entity needing connection

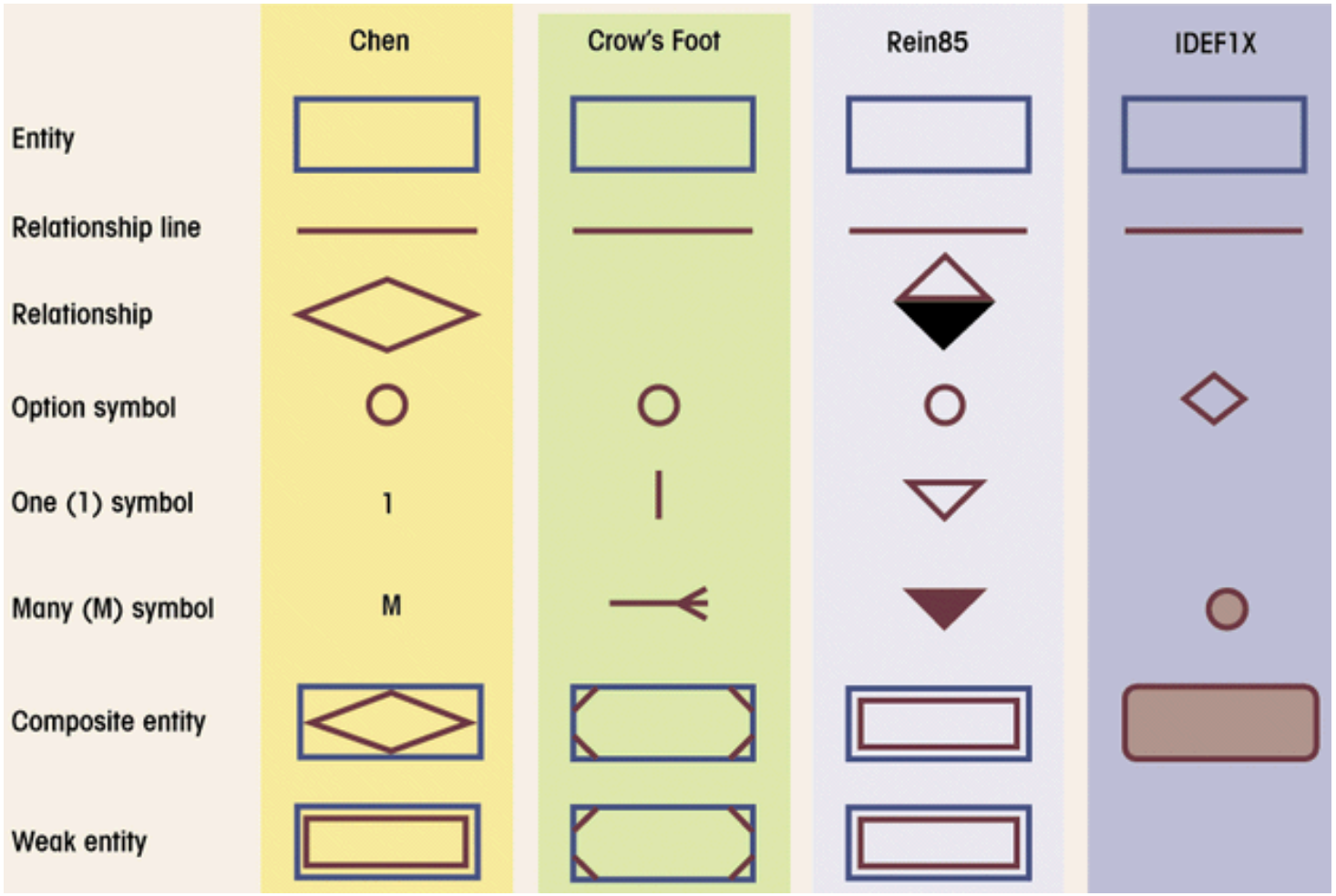




Ternary Relationship



Comparison of E-R Modeling Symbols



Reference

1. Ramakrishnan R, Gehrke J., Database management systems, 3rd ed., New York (NY): McGraw-Hill, 2003.

2. This set of slides and examples are modified from Frank Tompa, School of Computer Science, University of Waterloo, Winter 2010.