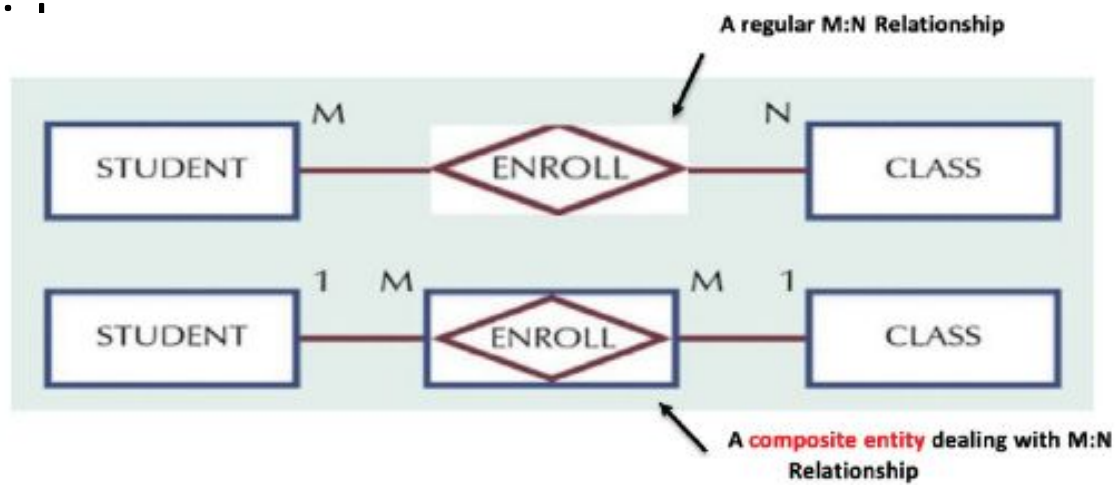
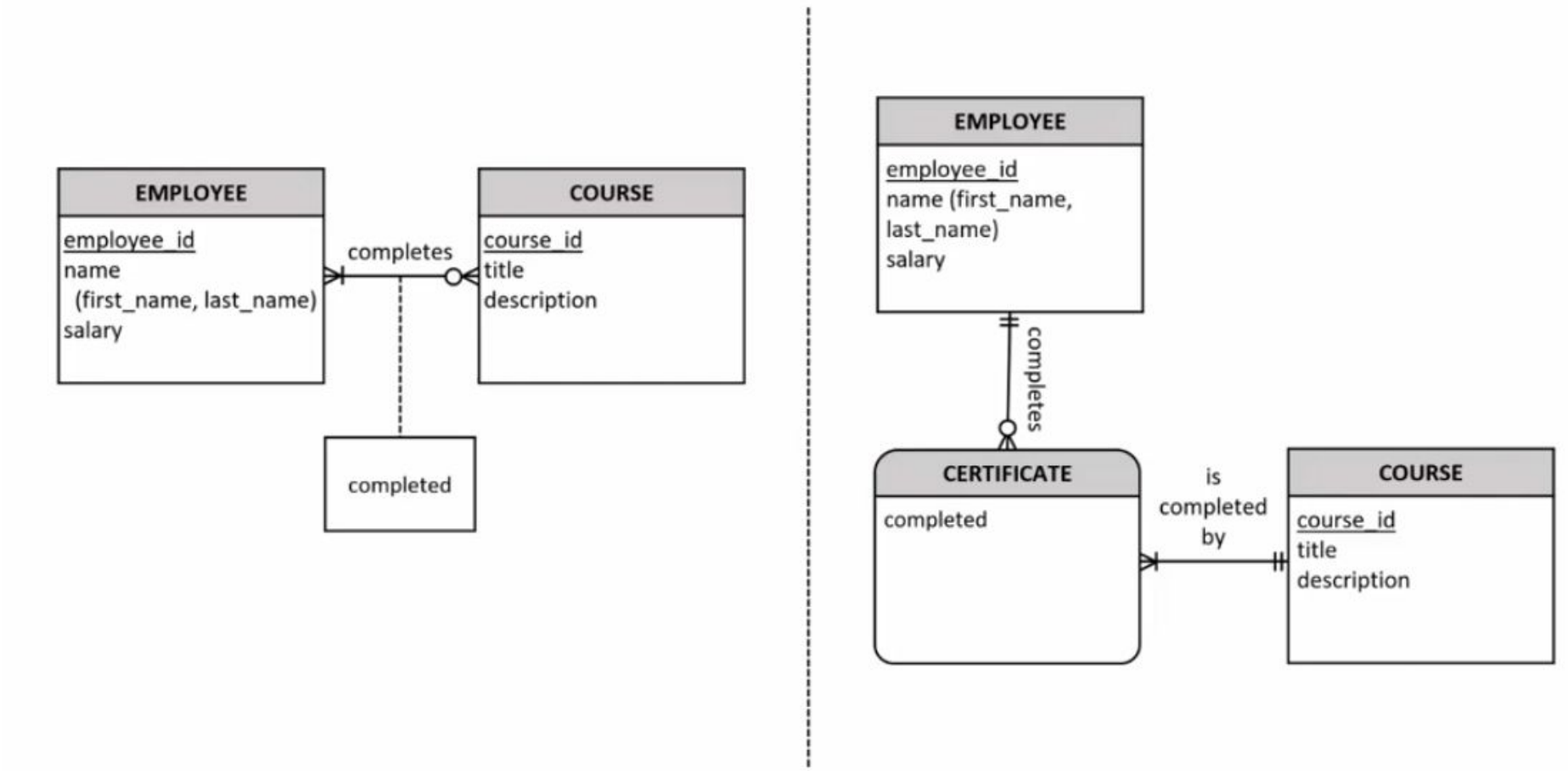
Associative or Composite Entity (Chen notation)

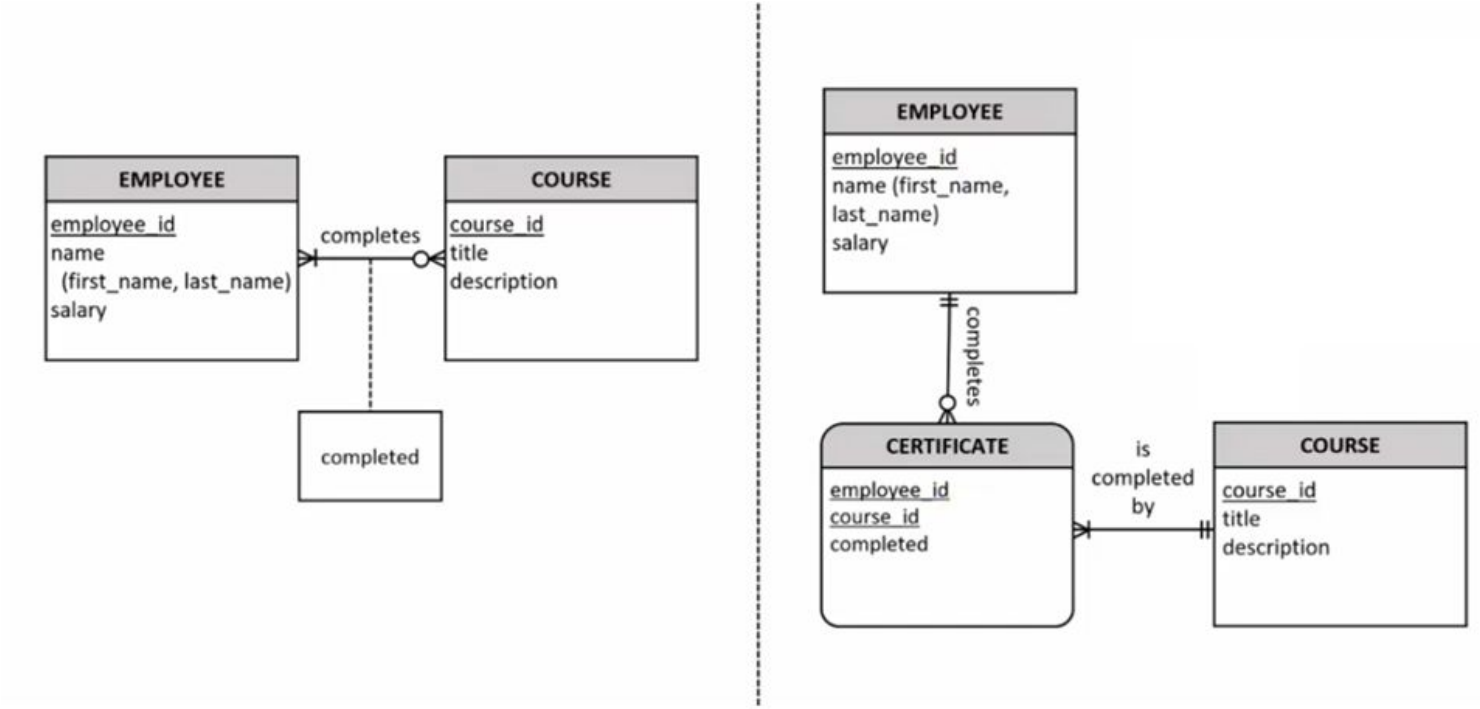
- Associative entity (bridge entity, Composite entity) is an entity type that associates the instances of one or more entity types. It contains attributes specific to the relationship between original entity types instances
  - It builds a bridge between the original entity types
  - It is composed of the Keys of the original entity types
  - It may contain additional attributes
  - It is specific type of a weak entity. It is depicted as a rectangle with a diamond



Associative Entity: Binary Relationship with an attribute

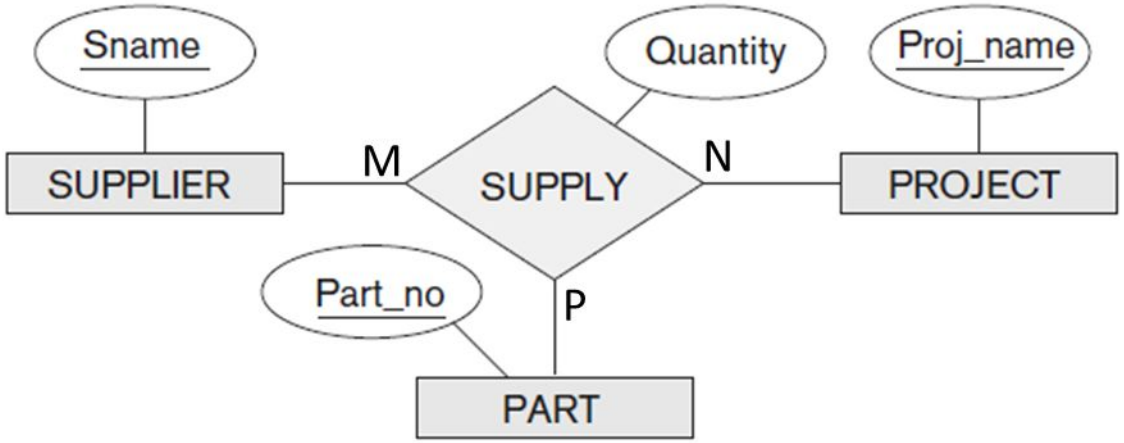


Associative Entity: Binary Relationship with an attribute



Ternary Relationship Type

- Assume that we have a situation where suppliers can supply parts for projects.
  - A supplier can supply a particular part for multiple projects.
  - A part for a particular project can be supplied by multiple suppliers.
  - A project can have a particular supplier supply multiple parts.
- The model must also include the quantity for supplying a particular product to a particular project by a particular supplier.

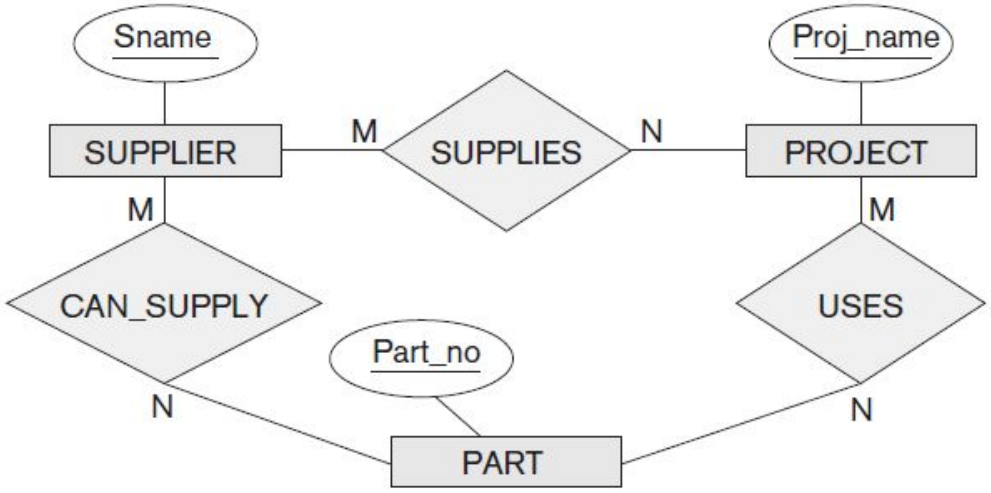


Ternary Relationship Type

- Three binary relationships not equivalent to SUPPLY.
- Say we have two projects: project 1 uses a pencil and a pen, and project 2 uses a pen. Supplier Peters supplies the pencil for project 1 and the pen for project 2, whereas supplier Johnson supplies the pen for project 1.

SUPPLY

Supplier	Part	Project
Peters	Pencil	Project 1
Peters	Pen	Project 2
Johnson	Pen	Project 1



SUPPLIES

Supplier	Project
Peters	Project 1
Peters	Project 2
Johnson	Project 1

USES

Part	Project
Pencil	Project 1
Pen	Project 1
Pen	Project 2

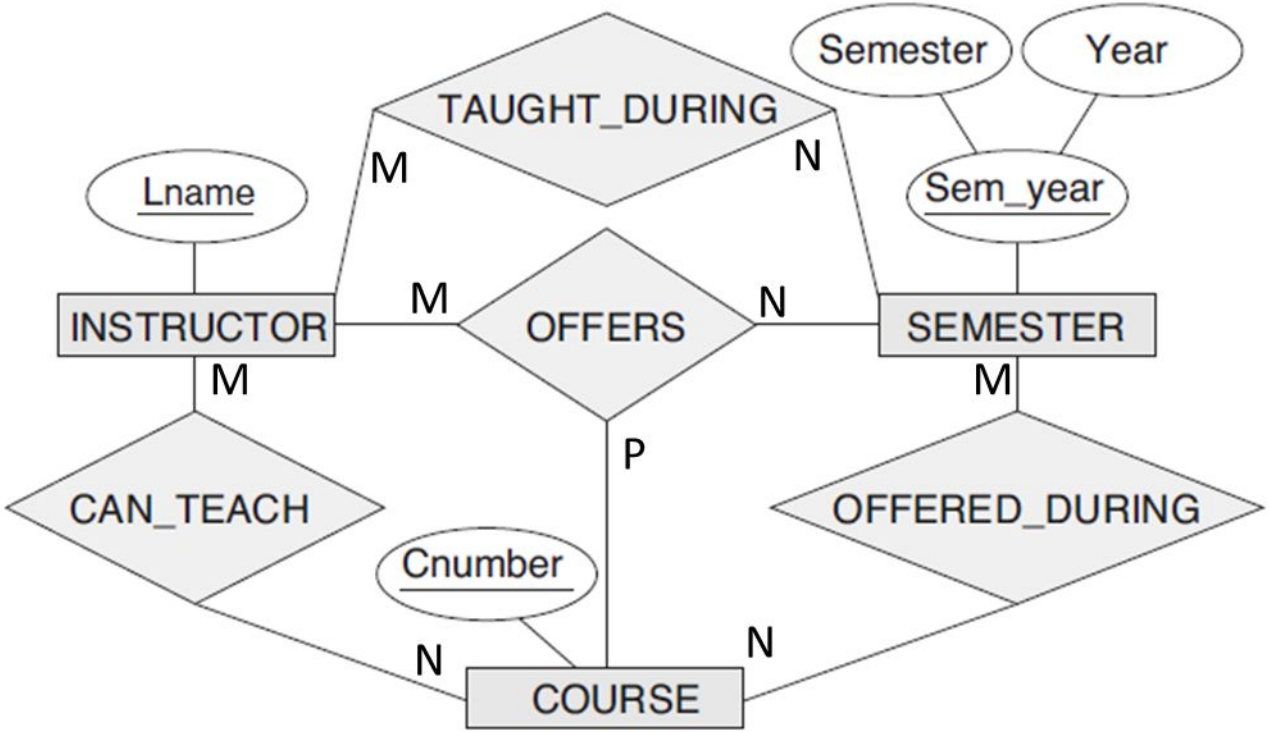
CAN_SUPPLY

Supplier	Part
Peters	Pencil
Peters	Pen
Johnson	Pen

From the binary relationship types, it is not clear who supplies the pen for project 1!

Ternary Relationship Type

- If a particular binary relationship can be derived from a higher-degree relationship at all times, then it is redundant
- We can infer the instances of TAUGHT_DURING and OFFERED_DURING from the instances in OFFERS, but we cannot infer the instances of CAN_TEACH; therefore, TAUGHT_DURING and OFFERED_DURING are redundant and can be left out.



Ternary Relationship Type

- SUPPLY can be represented as a weak entity type.
- entity in the weak entity type SUPPLY by the combination of its three owner entities from SUPPLIER, PART, and PROJECT.
- It is also possible to represent the ternary relationship as a regular entity type by introducing an artificial or surrogate key. In this example, a key attribute Supply_id could be used for the supply entity type, converting it into a regular entity type.