

The Entity-Relationship Model

Time representation

1

Time in E-R models

- ▷ Time is needed to represent:
 - Events
 - Temporal changes in values and/or relationships
- ▷ Time can be modelled using:
 - Temporal attributes
 - Binary relationships
 - Ternary relationships
 - Entity historicization

2

2

Temporal attributes

- ▷ Temporal information related to a single entity or relationship
- ▷ Unique events for each entity instance
 - Example: birth date, film release date

3

3

Binary relationship

- ▷ Multiple events connected to a single entity
- ▷ TIME entity
 - Identified by the initial timestamp (timestamp, date, date and time)
 - The duration or final timestamp are attributes of the relationship
- ▷ EVENT entity
 - weak entity identified by all the attributes that represent the time at which the event starts/occurs
 - Events characteristics are associated with attributes of the weak entity

4

4

Binary relationship

5

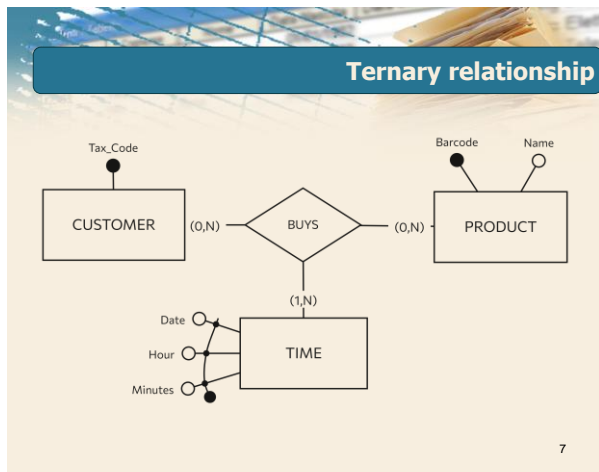
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Ternary relationship

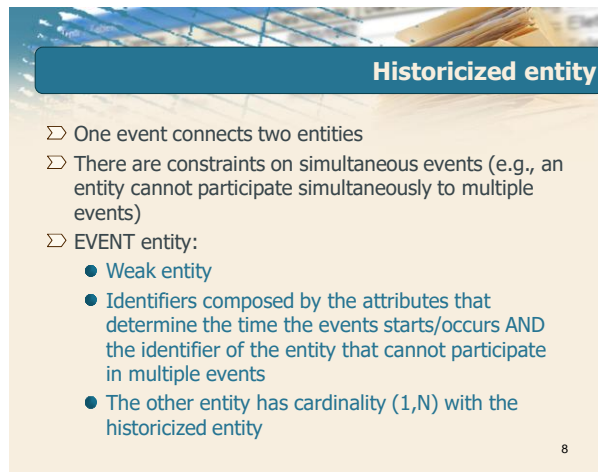
- ▷ One event connects two entities
- ▷ The relationship between the two entities can occur multiple times; participation is optional
- ▷ Information related to the event (e.g., duration or final timestamp) are attributes of the relationship
- ▷ TIME entity:
 - Identifiers composed by the attributes that determine the time the events starts/occurs

6

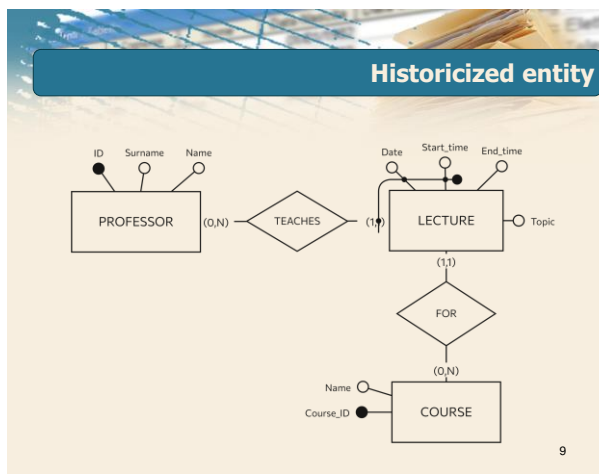
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9