
Week 9, Lec 17

Database Systems -

Introduction to Databases and Data Warehouses

CHAPTER 2 - Database Requirements and ER

Modeling

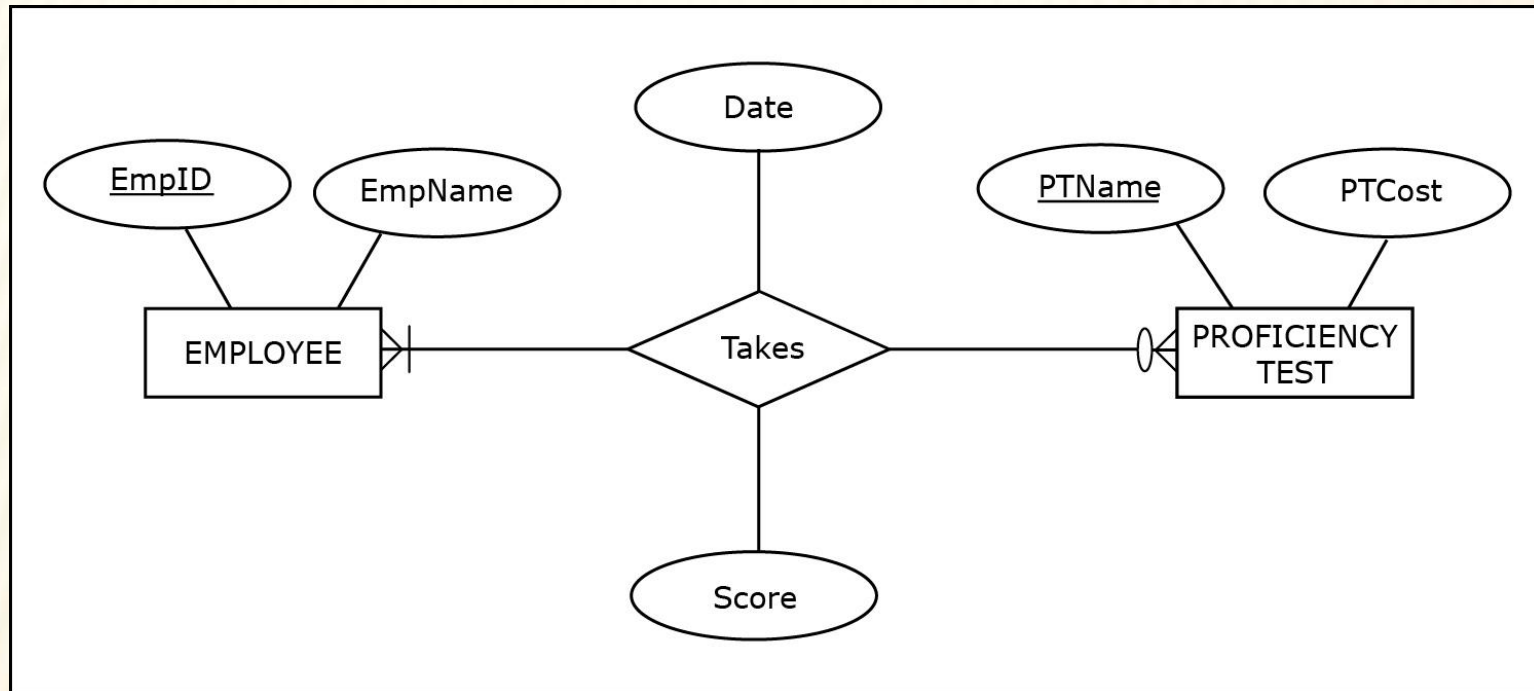
(Part 4)

MAIN TOPICS

- M:N RELATIONSHIPS WITH MULTIPLE INSTANCES BETWEEN THE SAME ENTITIES
 - Revisit
- Reduce the number of attributes
- ERD Modeling Case Study

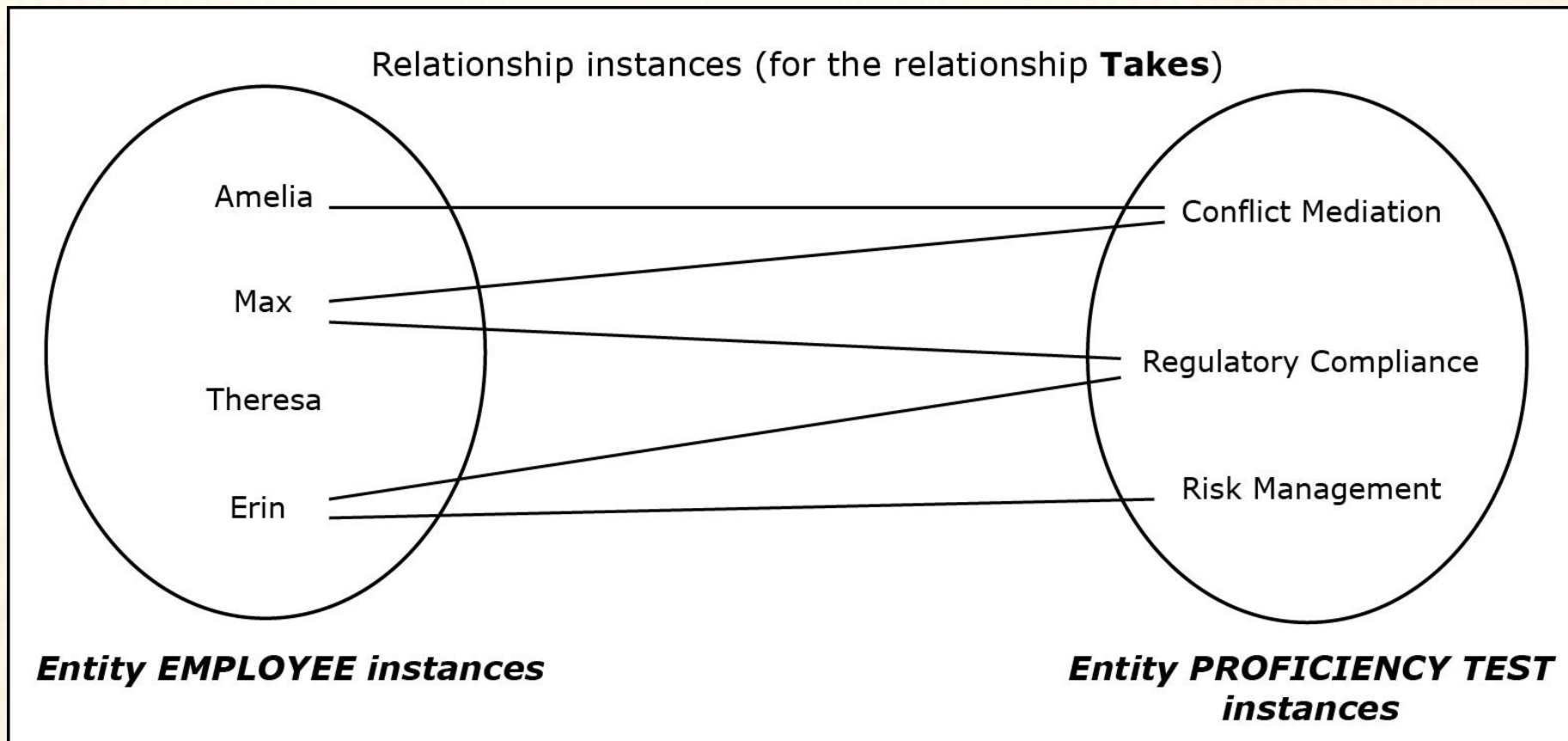
M:N RELATIONSHIPS WITH MULTIPLE INSTANCES BETWEEN THE SAME ENTITIES

An ER diagram for an M:N relationship depicting students completing classes



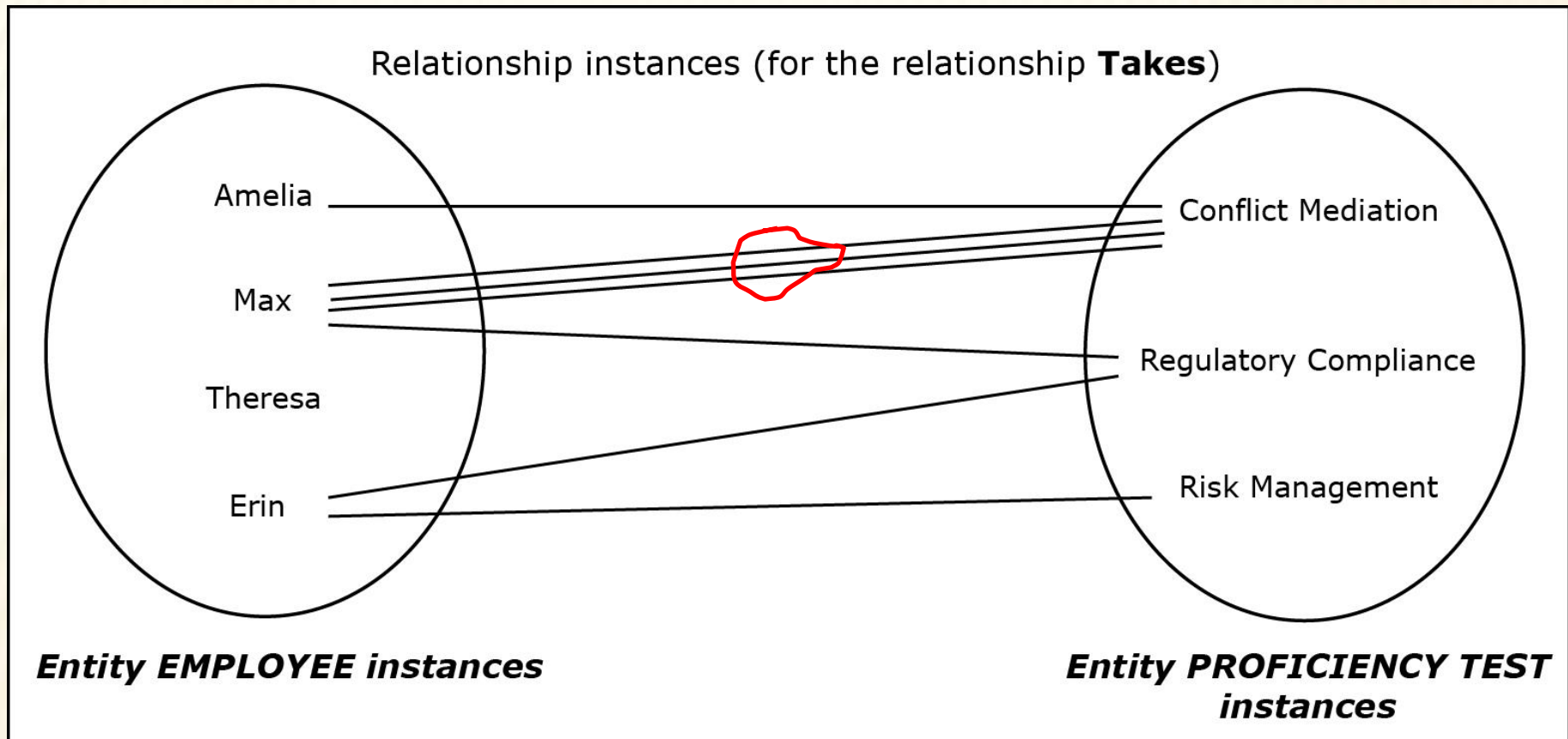
M:N RELATIONSHIPS WITH MULTIPLE INSTANCES BETWEEN THE SAME ENTITIES

Instances of the M:N relationship Completes



M:N RELATIONSHIPS WITH MULTIPLE INSTANCES BETWEEN THE SAME ENTITIES

Instances of the M:N relationship **Takes** completes with an additional requirement

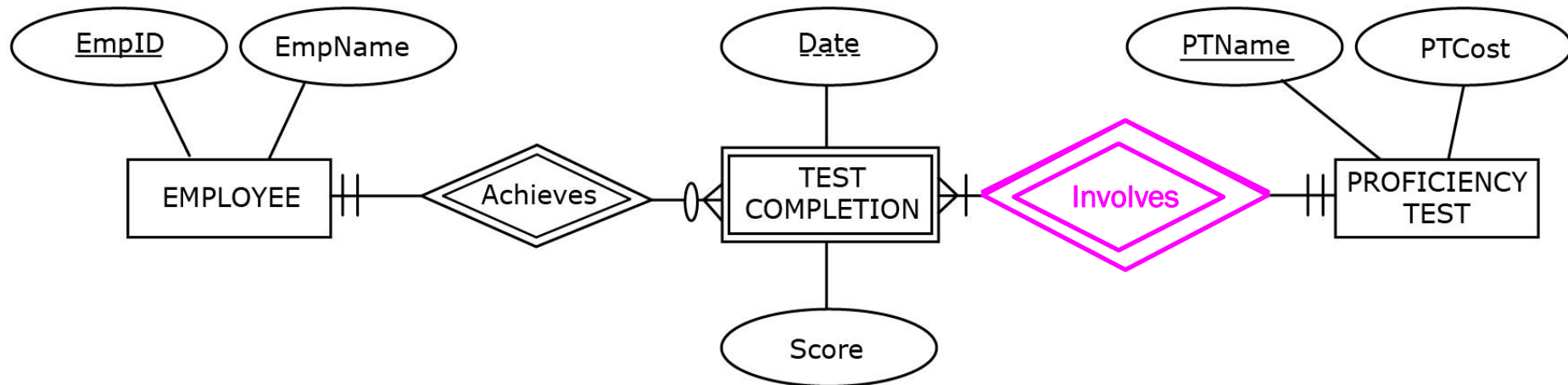


M:N RELATIONSHIPS WITH MULTIPLE INSTANCES BETWEEN THE SAME ENTITIES

An ER diagram for an M:N relationship represented as a weak entity

Each employee:

- **Completes a given test at most one time on a given day.**

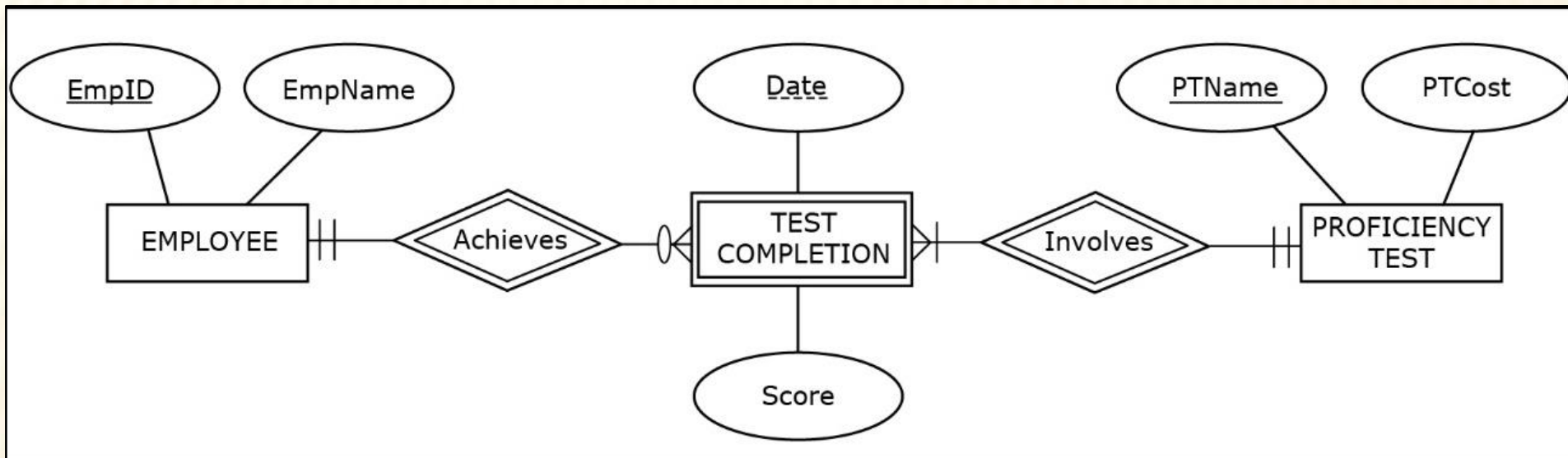


M:N RELATIONSHIPS WITH MULTIPLE INSTANCES BETWEEN THE SAME ENTITIES

An ER diagram for an M:N relationship represented as a weak entity

Each employee:

- Ok to have more than one test completion per day.
- But not multiple completions of the same test on same day.

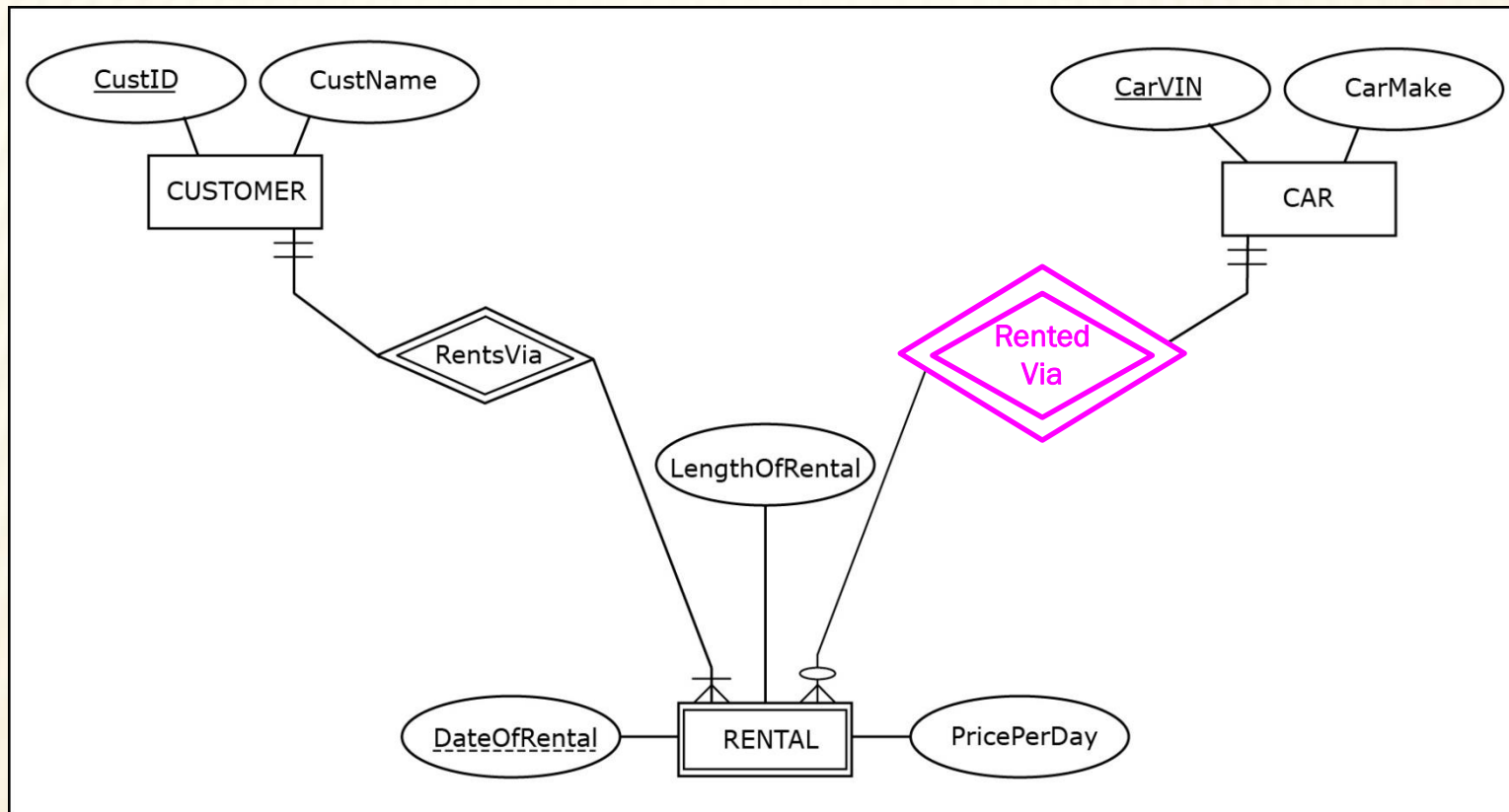


M:N RELATIONSHIPS WITH MULTIPLE INSTANCES BETWEEN THE SAME ENTITIES

Another M:N relationship represented as a weak entity

Each customer:

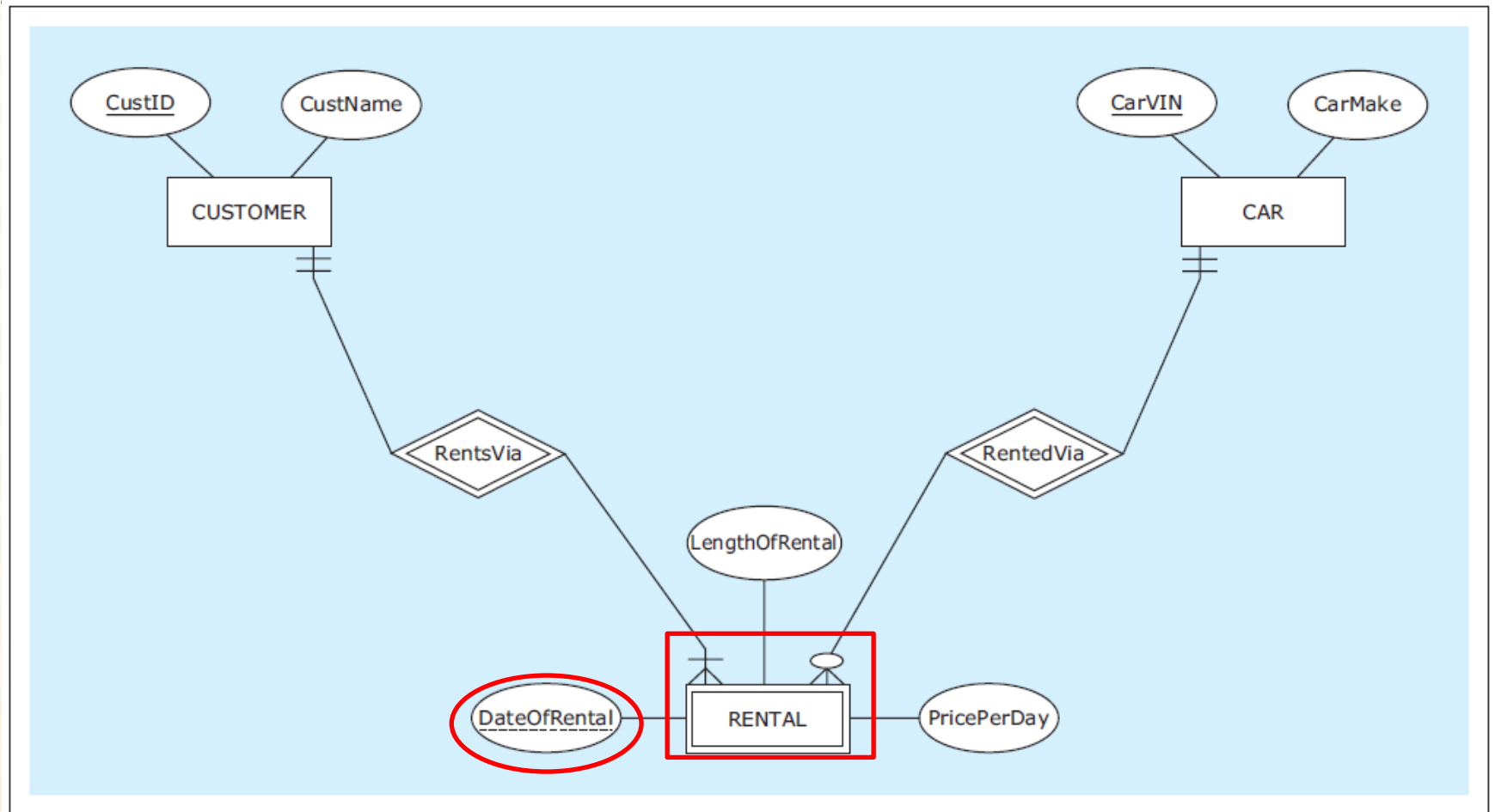
- Rents a given car at most one time on a given day.



M:N RELATIONSHIPS WITH MULTIPLE INSTANCES BETWEEN THE SAME ENTITIES

Another M:N relationship represented as **a weak entity**

ER diagram for a rental company: **M rentals (different cars) per day per customer**

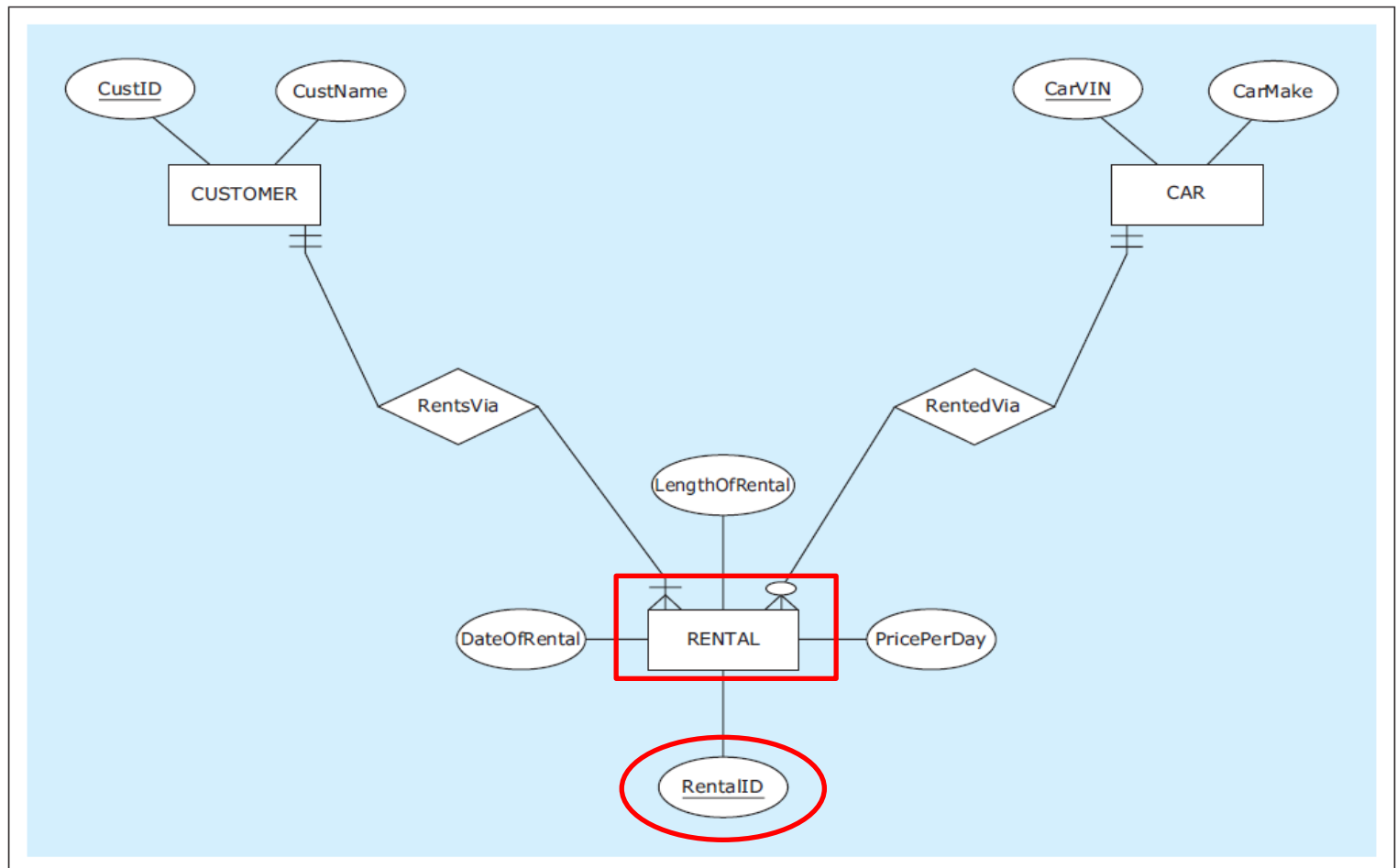


M:N RELATIONSHIPS WITH MULTIPLE INSTANCES BETWEEN THE SAME ENTITIES

Use a **regular entity with a unique attribute** for a M:N relationship with multiple instances between same entities

Common
Technique

- Add a unique attribute

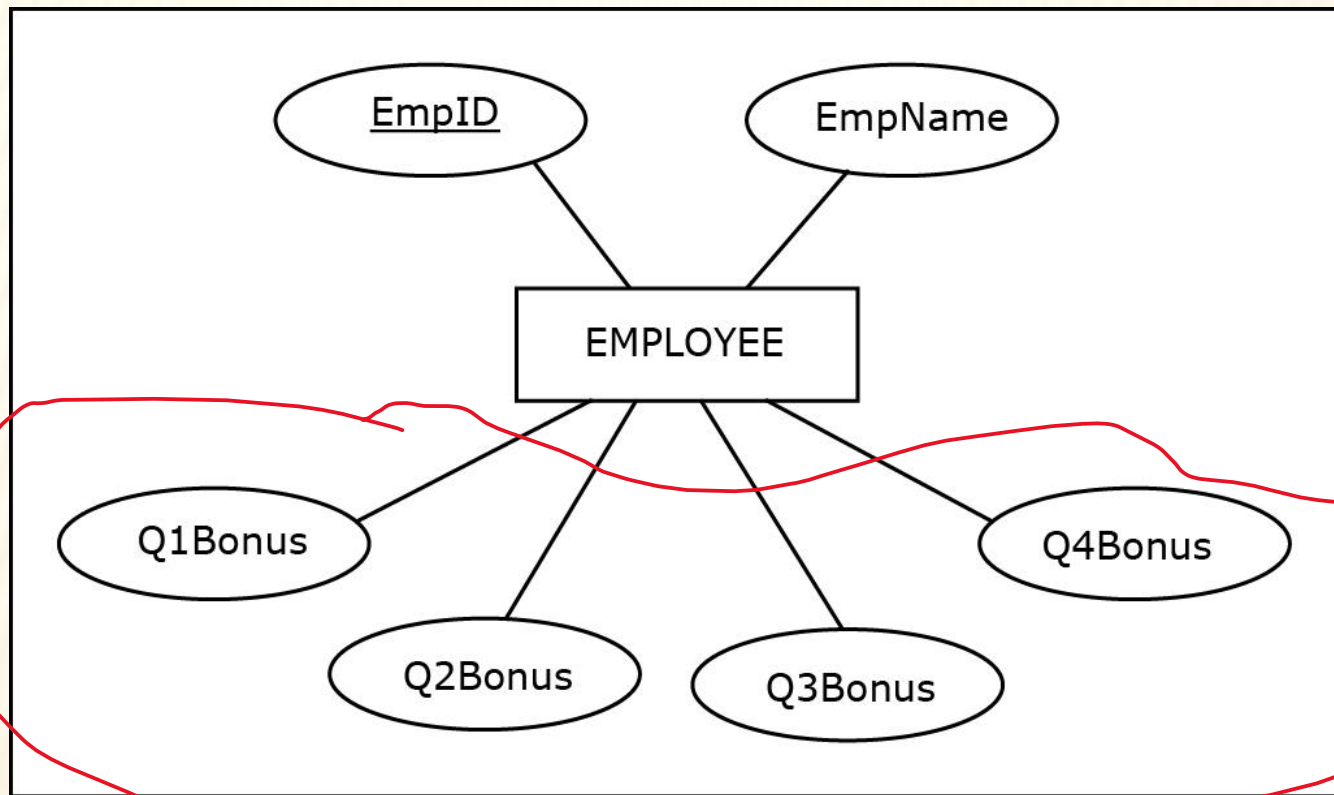


REDUCE THE NUMBER OF ATTRIBUTES

- Reduce the number of attributes by
 - Treat an originally designed attribute as an attribute value instead
 - Valid alternative in some circumstances (but not always)

REDUCE THE NUMBER OF ATTRIBUTES

- Example - treating some attributes as attribute values:



REDUCE THE NUMBER OF ATTRIBUTES

- Example - treating some attributes as attribute values:

