CSC 350

ER MODELS

How do we design a database schema?

DESIGN PHASES

- Conceptual Design
- Logical Design
- Physical Design

CONCEPTUAL DESIGN

What are the users' needs?

What types of transactions will take place?

What reporting will need to happen?

What business rules should the data reflect?

LOGICAL DESIGN

What relations will exist?

Do these relations contain natural keys?

What attributes need to be stored?

What are the domains (and therefore datatypes) of those attributes?

Which relations reference other relations?

PHYSICAL DESIGN

Create tables and columns.

Add necessary constraints for data integrity, such as primary and foreign keys.

Implement custom functions and triggers.

Decide on appropriate indexes.

Consider hardware-related questions.

ER MODELS

Entity-Relationship (ER) Models can help with database design.

Entity: A thing or object we want to store data about.

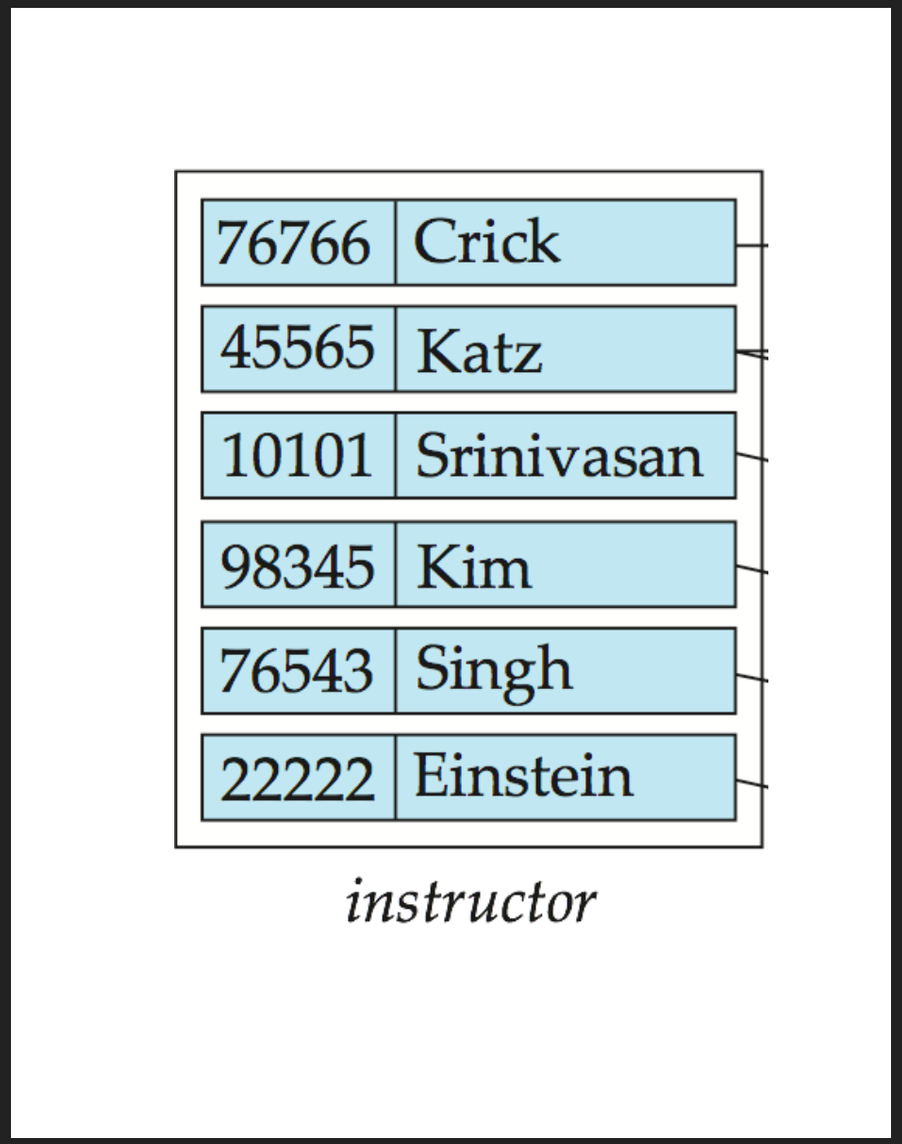
Entity Set: A set of entities of the same type.

Relationship: An association between entities.

Relationship Set: A set of relationships.

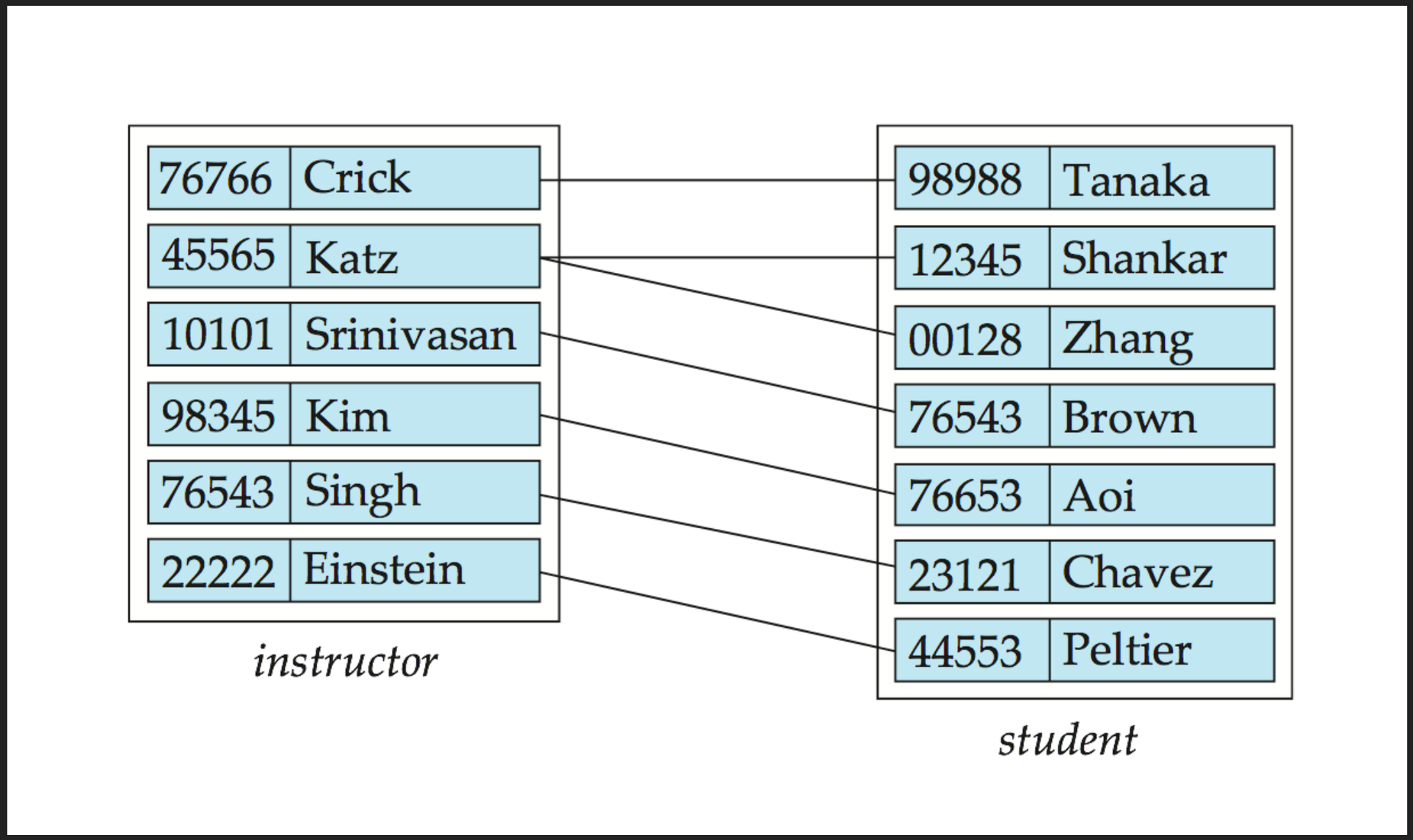
Entity: Instructor Crick

Entity Set: Instructors



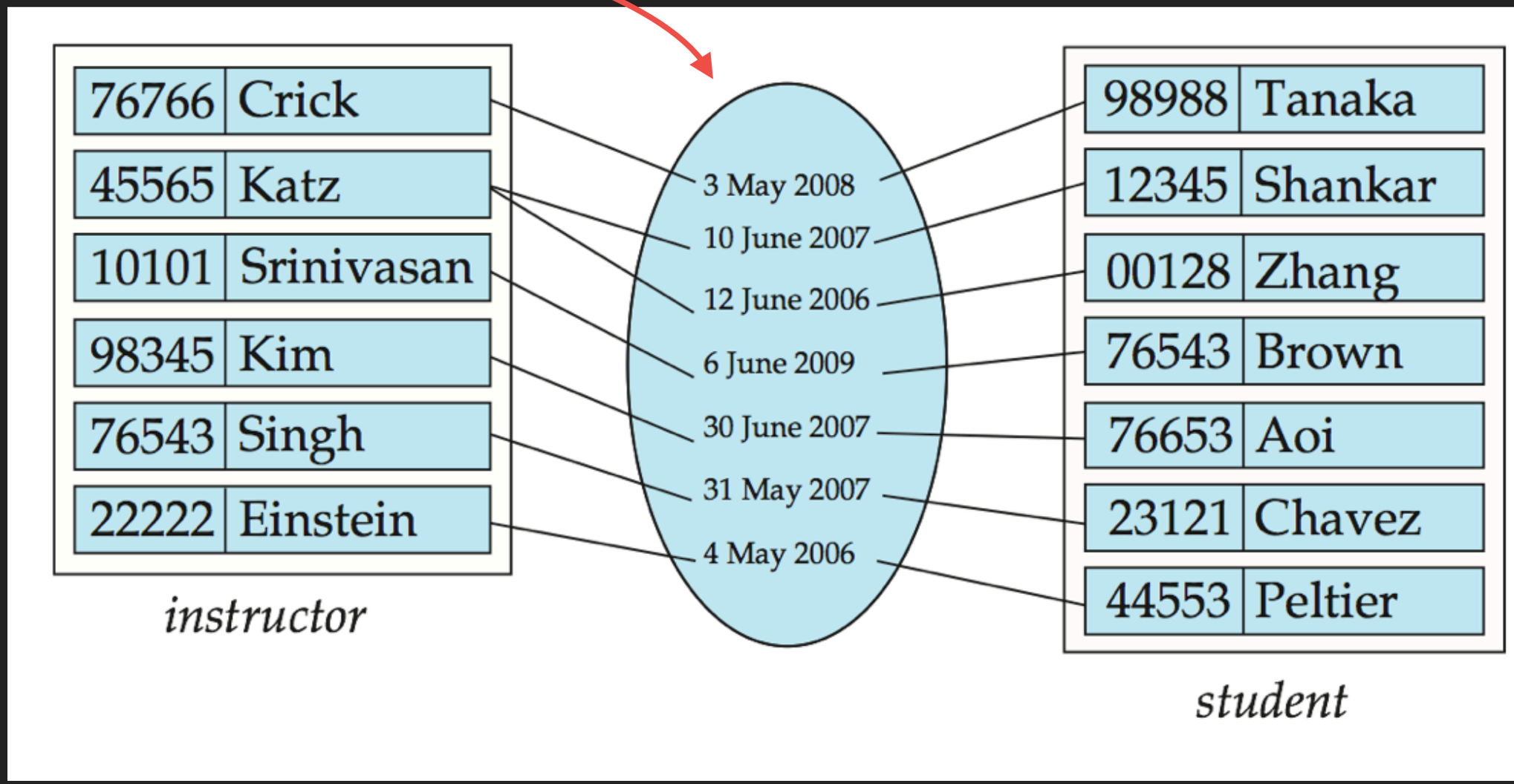
Relationship: Professor Crick is Tanaka's advisor

Relationship Set: Advisors



Relationships aren't necessarily joins, since they can have attributes too.

start_date: Date when the instructor became the student's advisor.

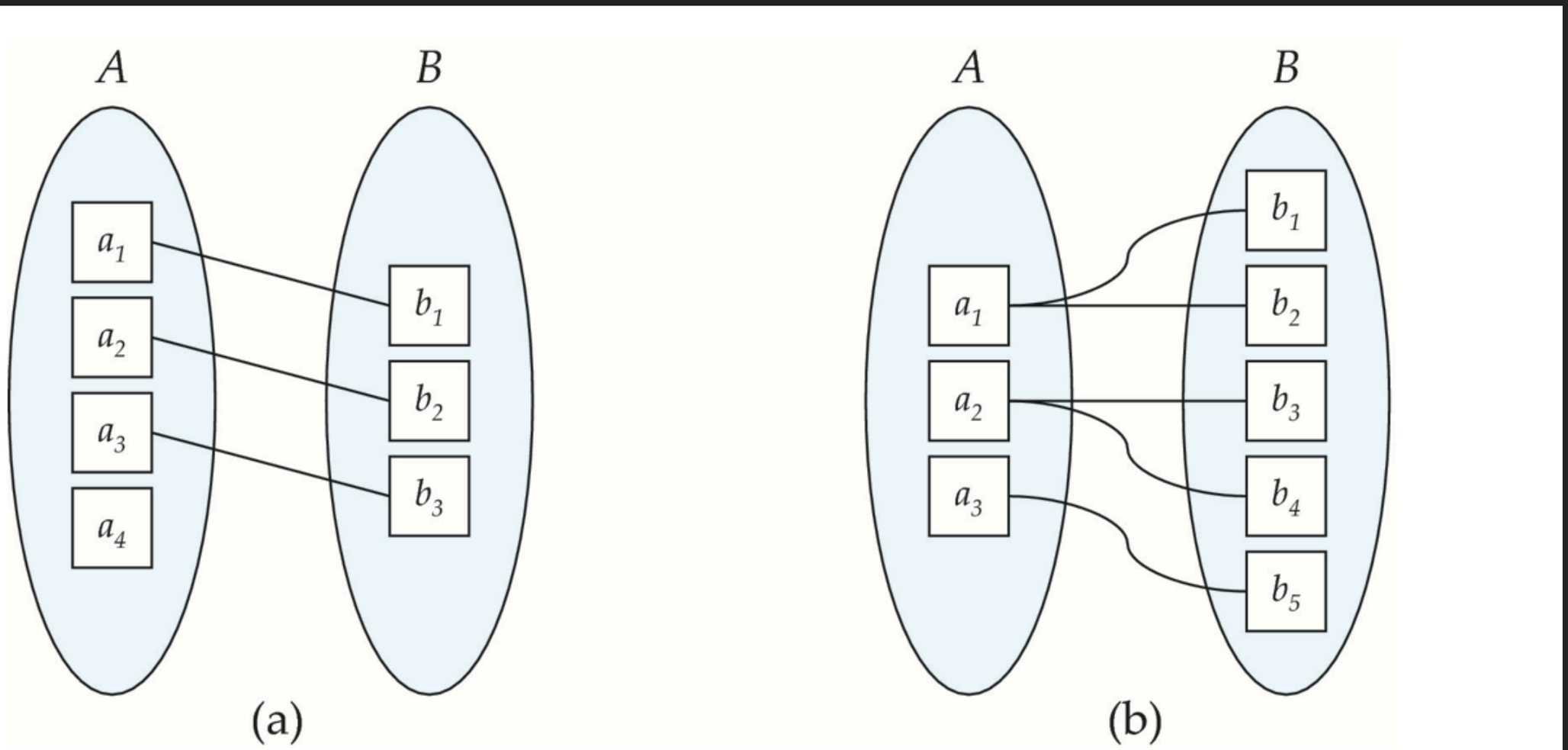


MAPPING CARDINALITY

What is the number of entities that another entity can be associated with?

- One to One
- One to Many
- Many to One
- Many to Many

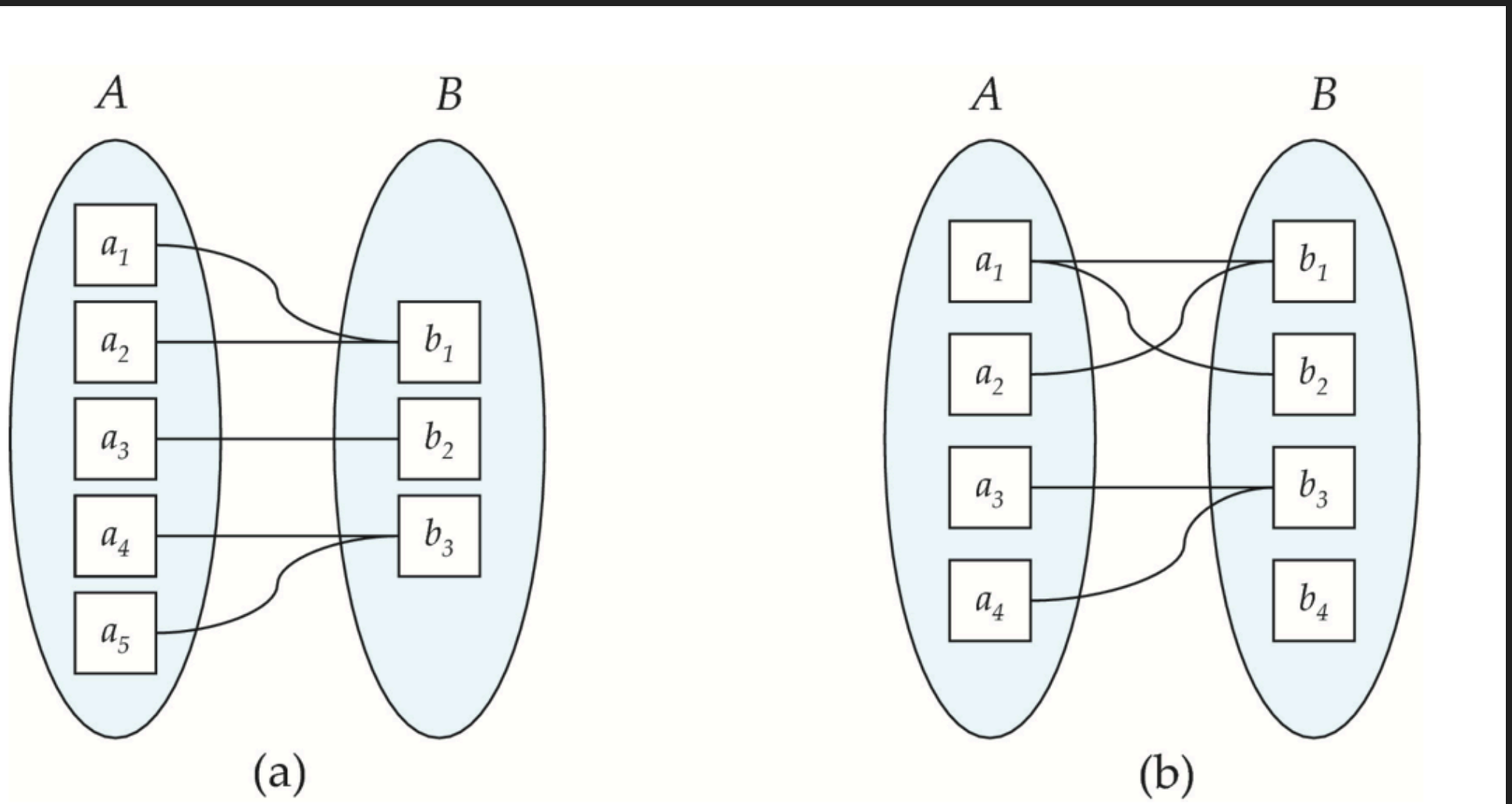
MAPPING CARDINALITY



One to one

One to many

MAPPING CARDINALITY

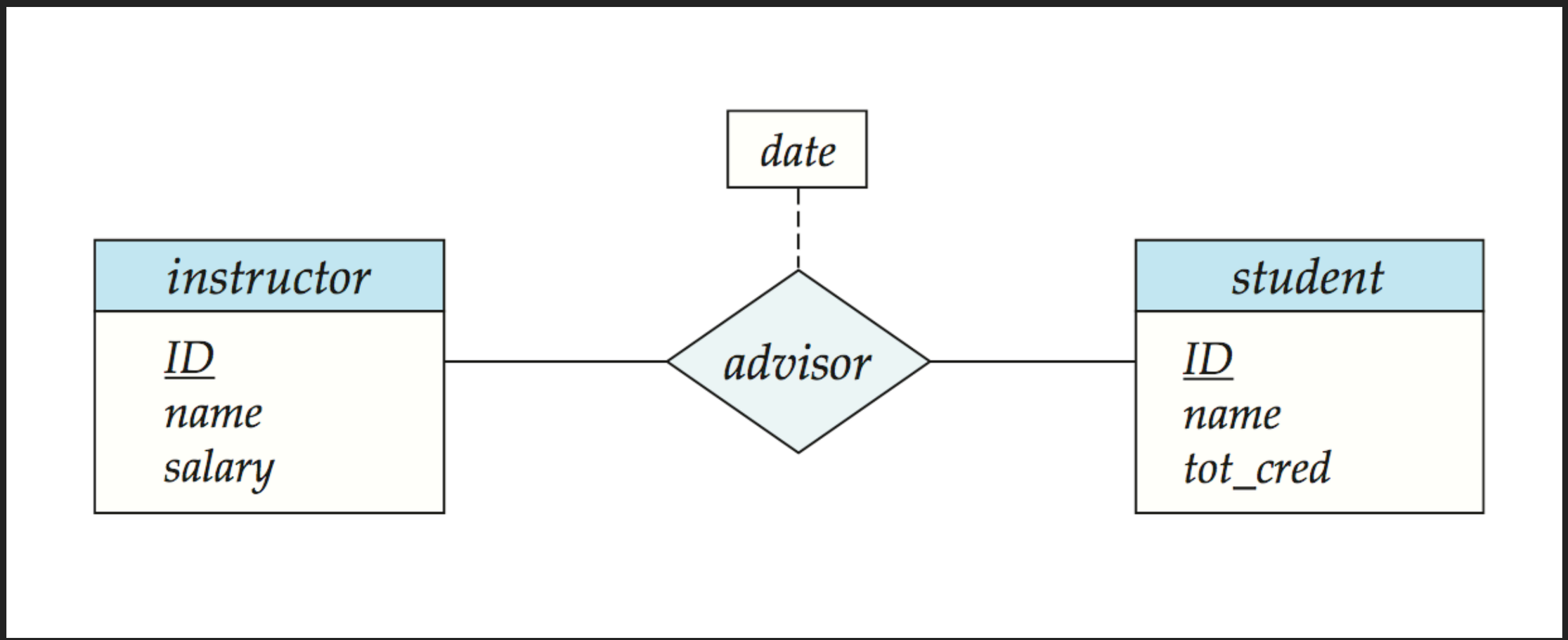


Many to one

Many to many

ER DIAGRAMS

ER Models can be represented by ER Diagrams, there are a few different notations used for ER Diagrams.



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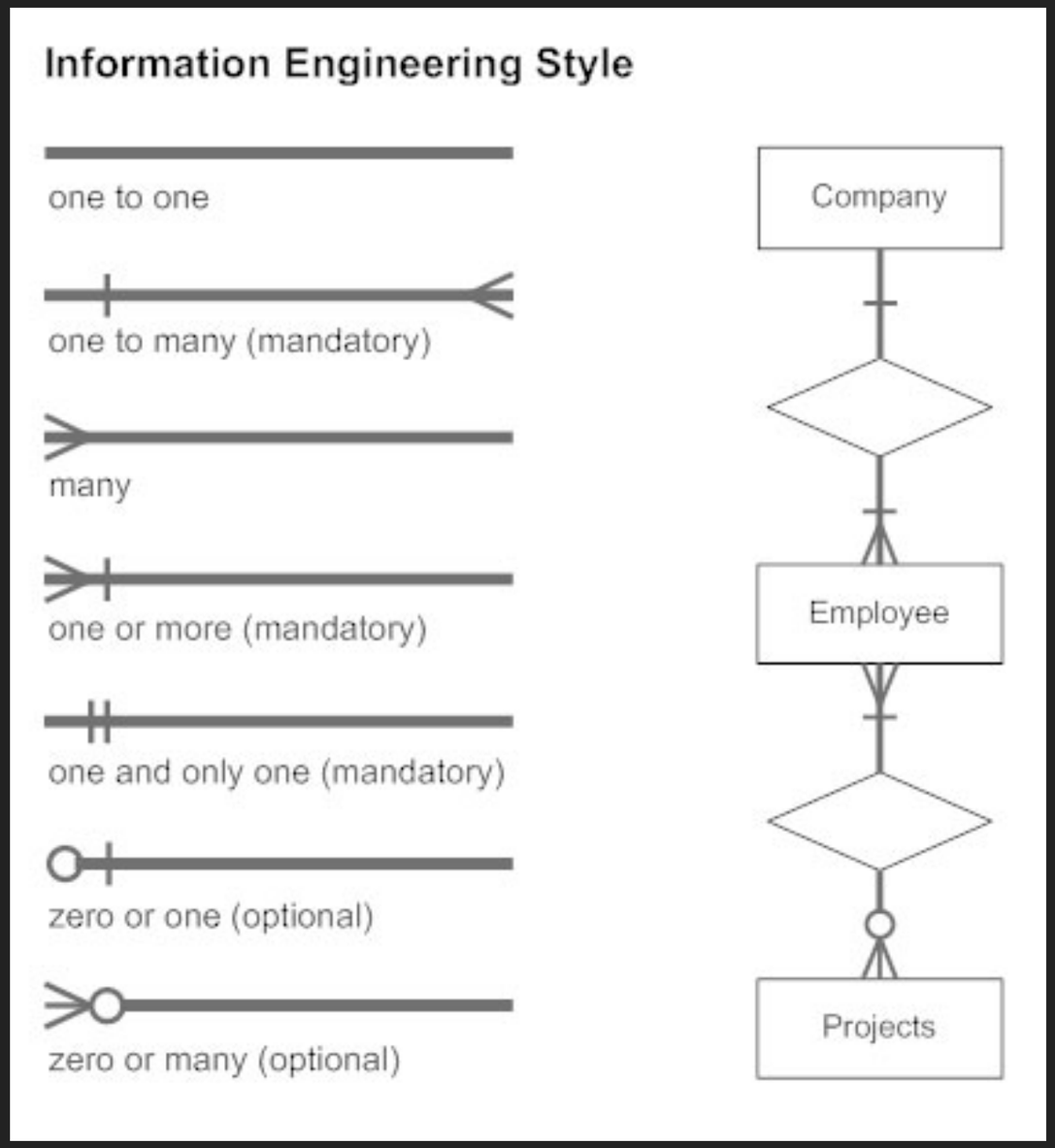

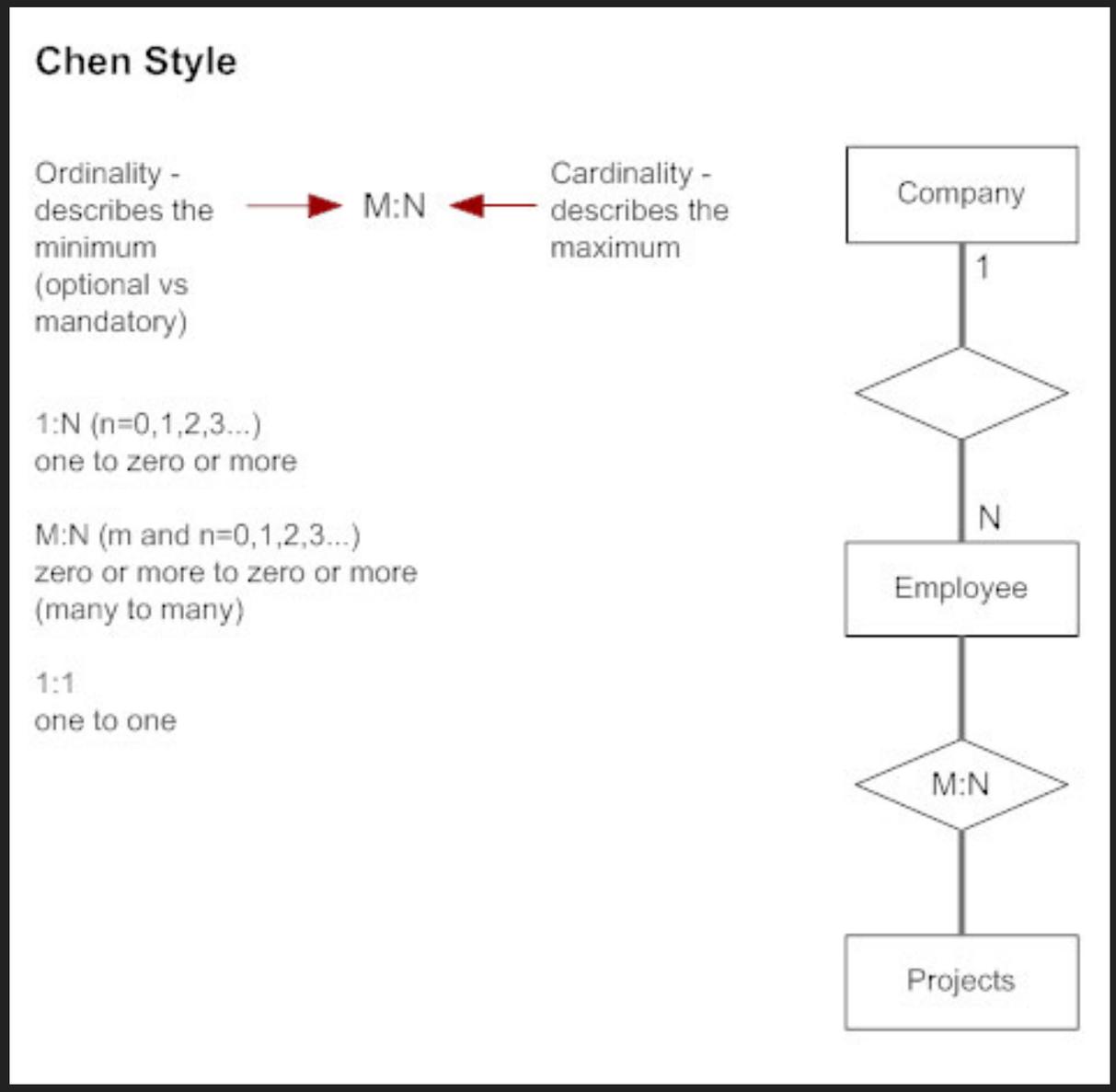

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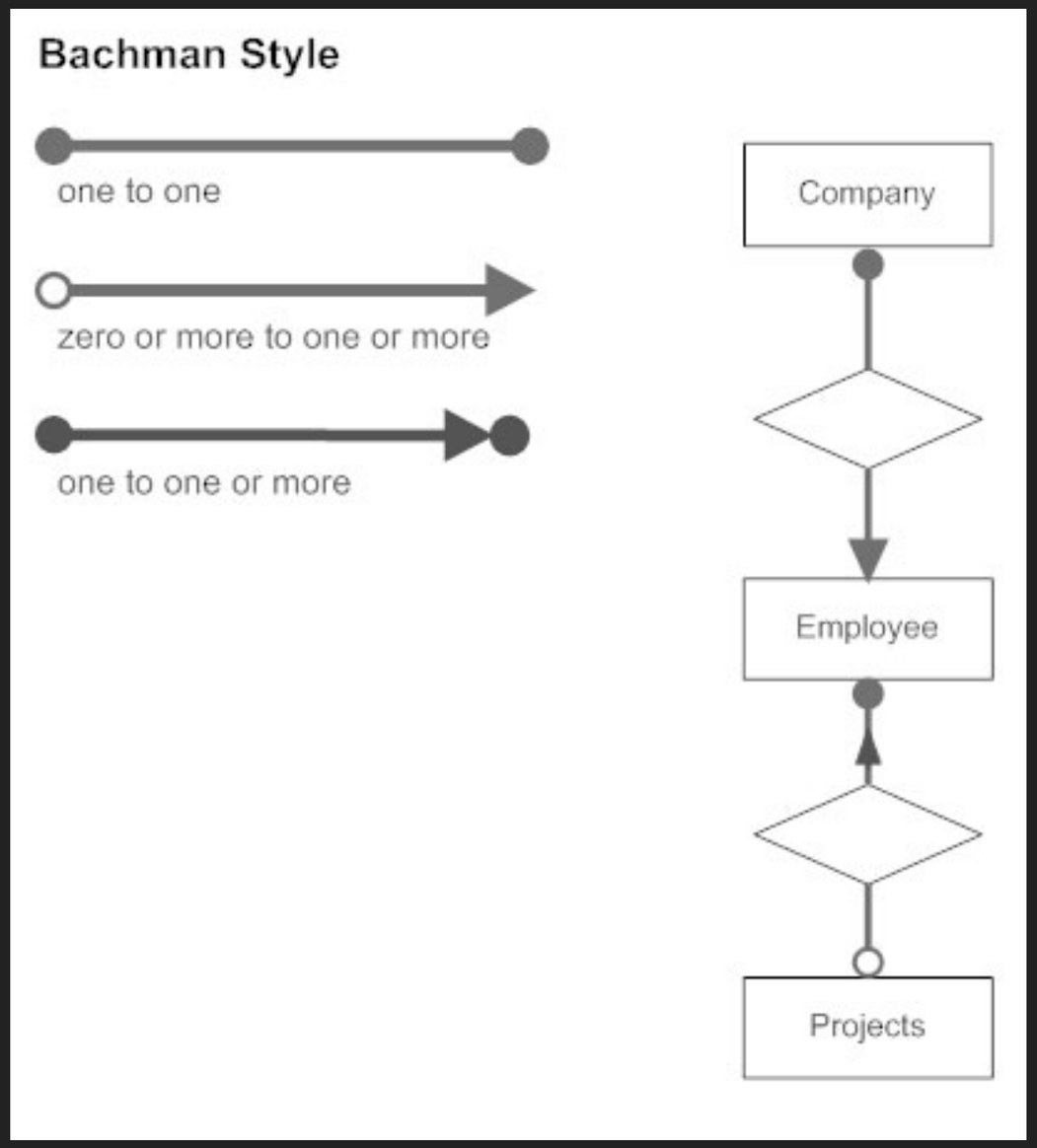

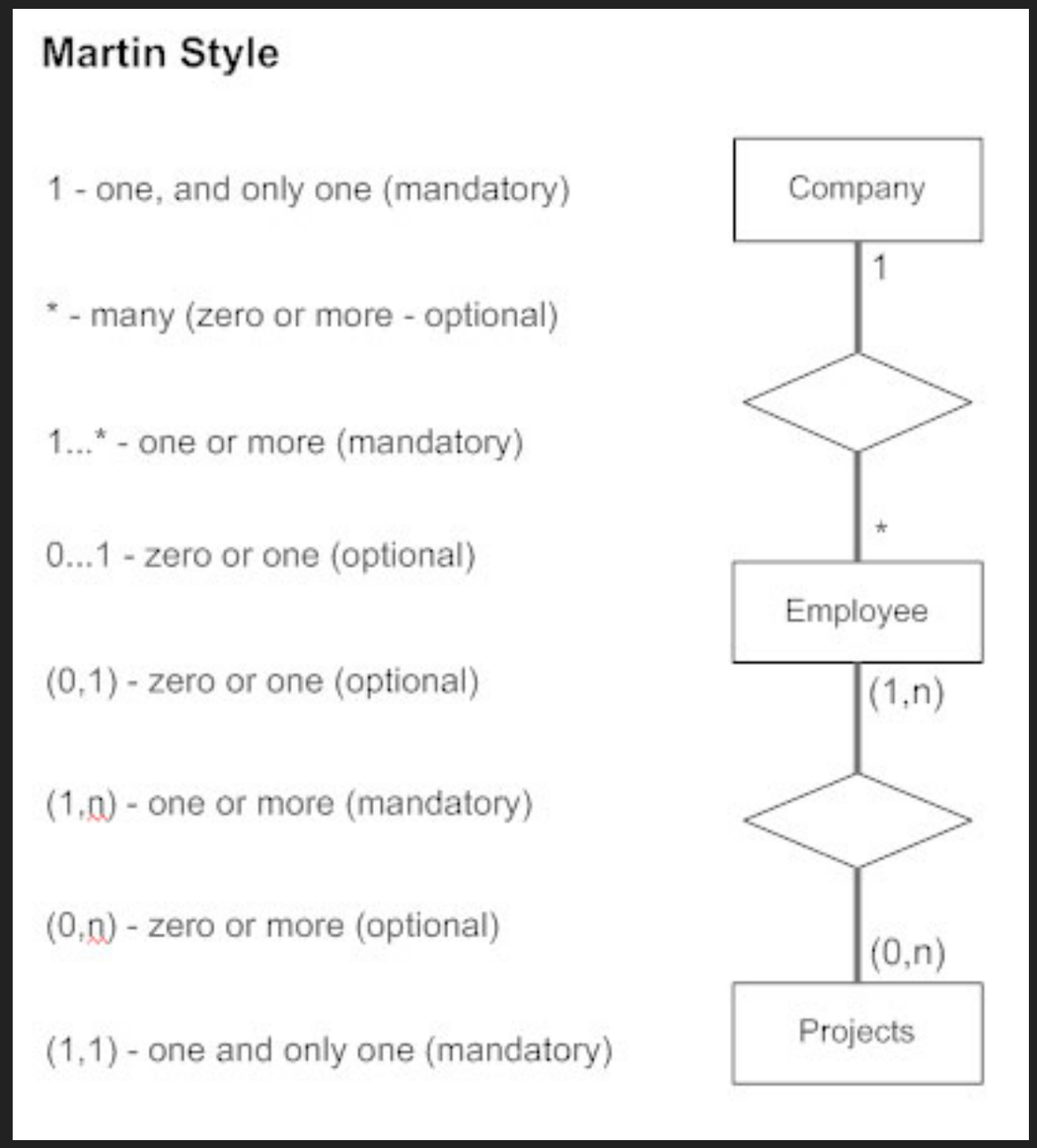

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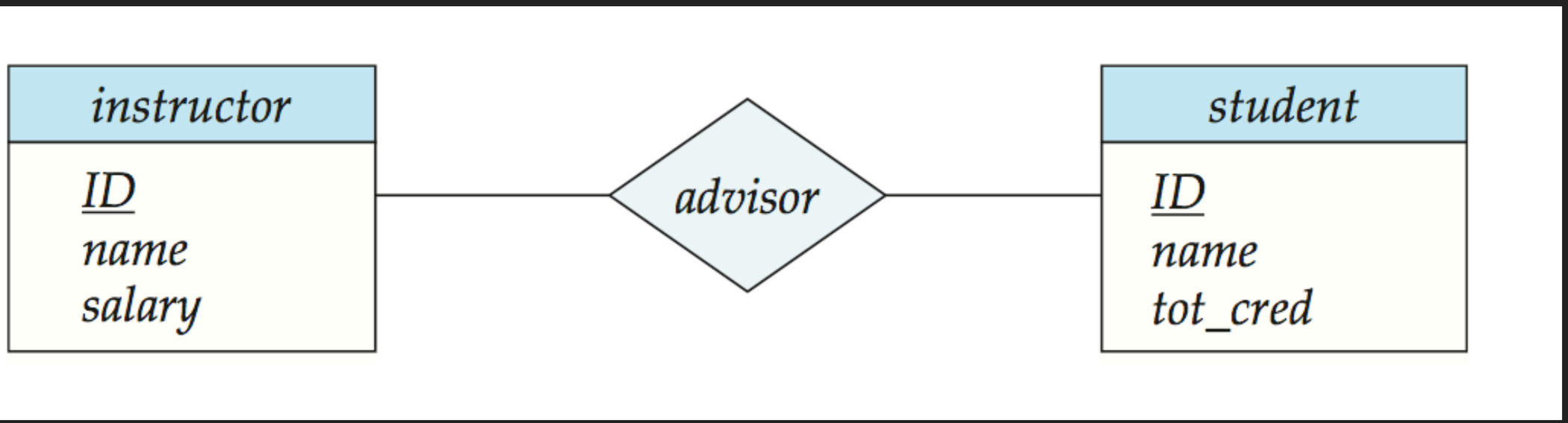
ER Models can be *reduced* to schemas.



instructor(ID, name, salary)

student(ID, name, tot_cred)

advisor(student_id, instructor_id)

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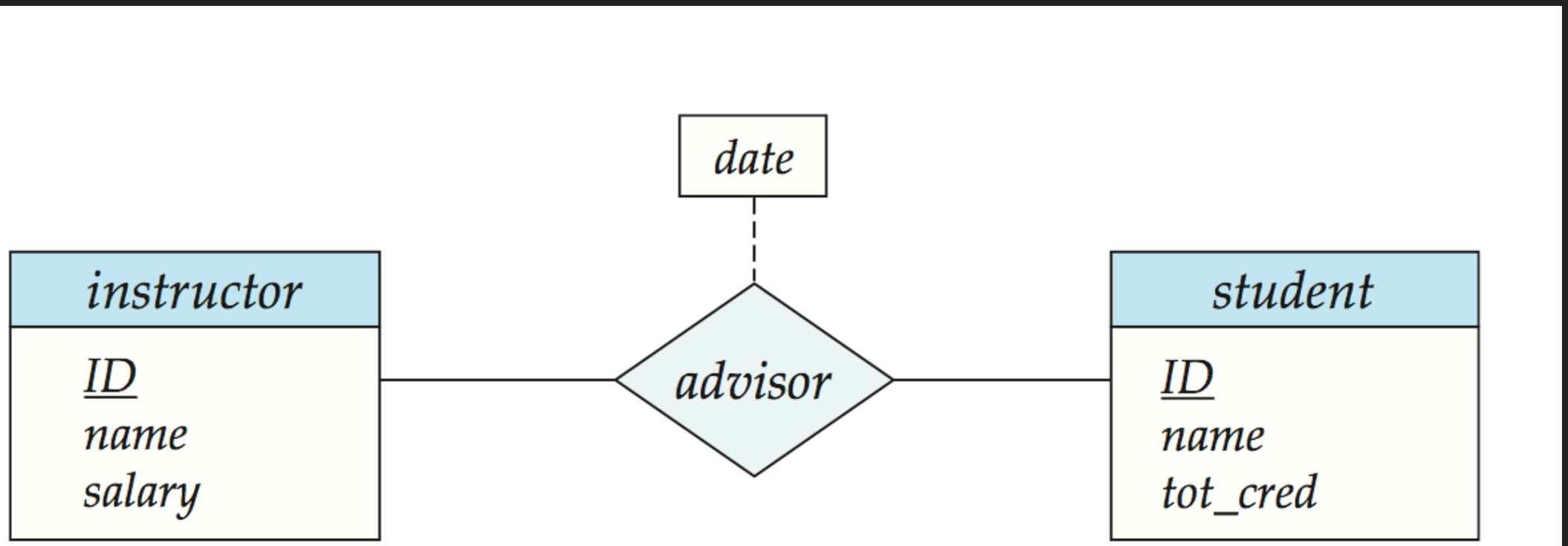

instructor(ID, name, salary)

student(ID, name, tot_cred)

advisor(ID, student_id, instructor_id, date)