

Session 2-4 Minimum Cardinality

Kyunghee Lee, PhD



WAYNE STATE
Mike Ilitch School of Business

Cardinality Constraints – Minimum Cardinality

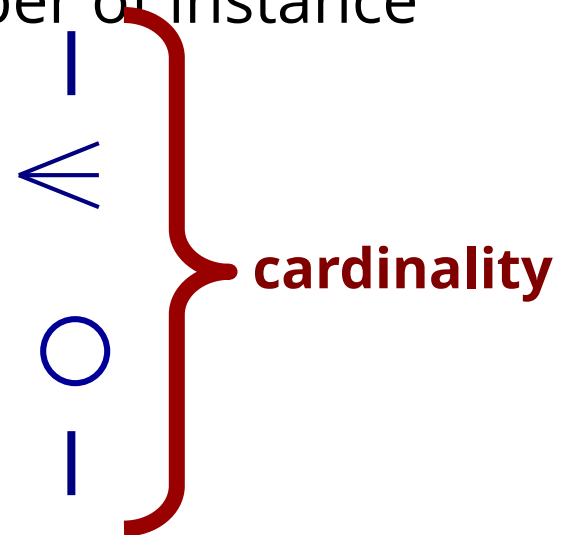
- Cardinality constraint specifies the number of instances of one entity that can be associated with an instance of another entity in a relationship

- Maximum cardinalities: Max number of instance

- Single relationship
- Multiple relationship (Crow's foot)

- Minimum cardinalities

- Optional relationship
- Mandatory relationship



WAYNE STATE

Mike Ilitch School of Business

Types of Relationships - Based on Minimum + Maximum Cardinalities

Cardinalities



Mandatory One



Optional One



Mandatory Many



Optional Many

Alternate Notation

1..1

Mandatory One

0..1

Optional One

1..*

Mandatory Many

0..*

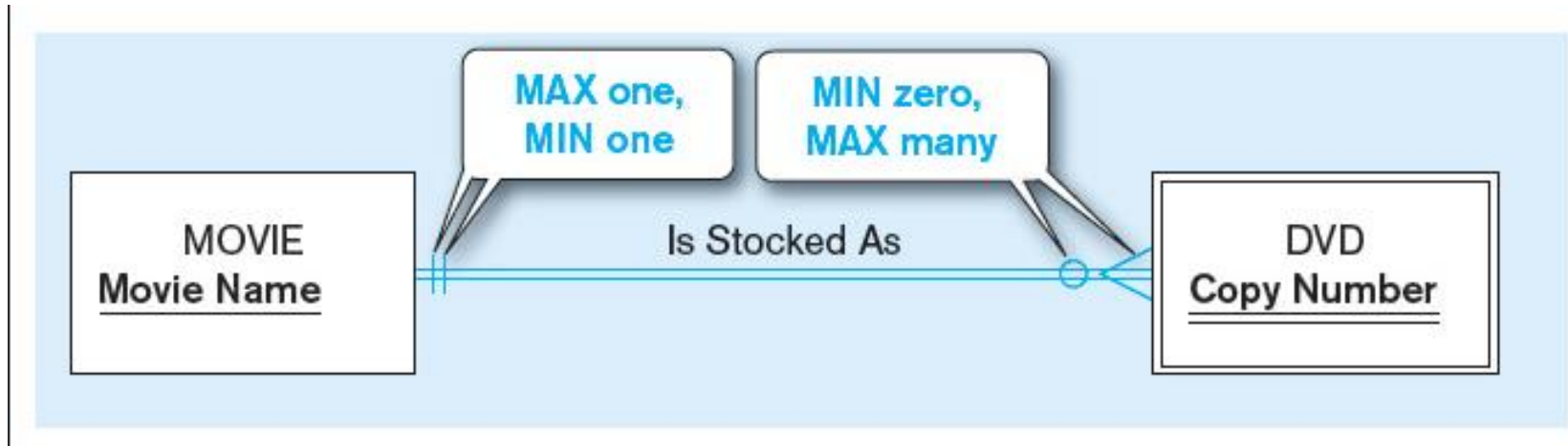
Optional Many



WAYNE STATE

Mike Ilitch School of Business

Cardinality of a Relationship



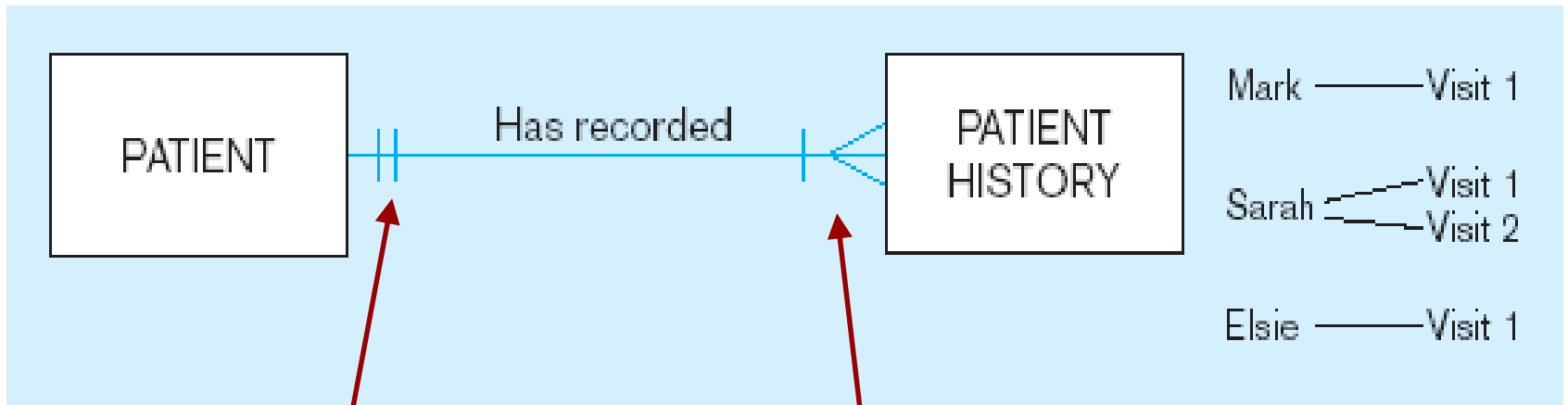
One-to-many relationship



WAYNE STATE

Mike Ilitch School of Business

One-to-many Relationship

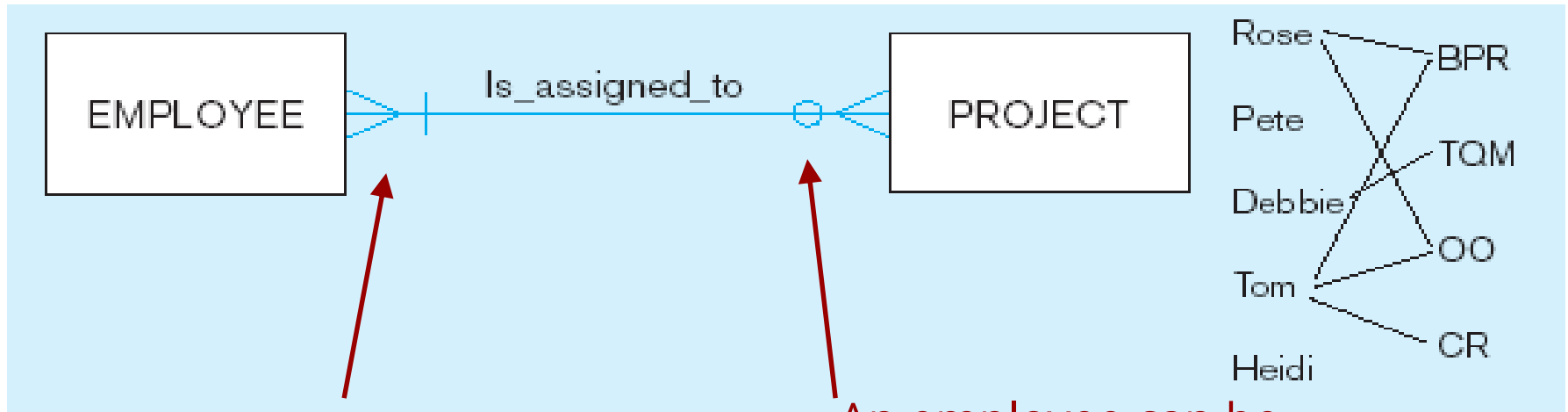


A patient history is recorded for one and only one patient

A patient must have recorded at least one history, and can have many



Many-to-many Relationship



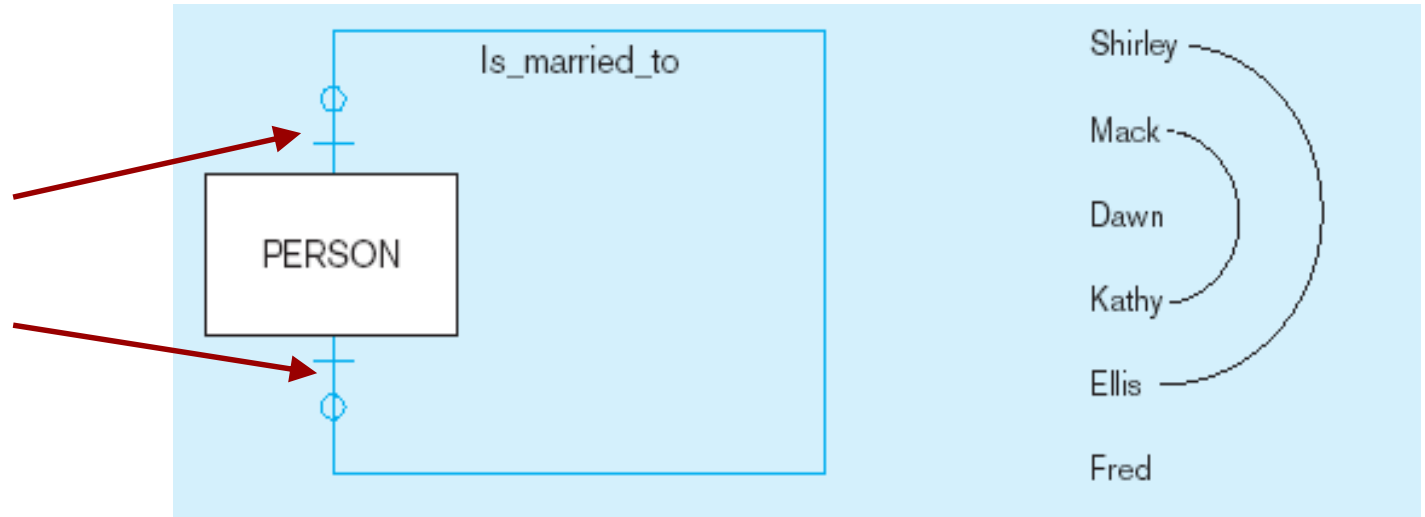
A project must be assigned to at least one employee, and may be assigned to many

An employee can be assigned to any number of projects, or may not be assigned to any at all

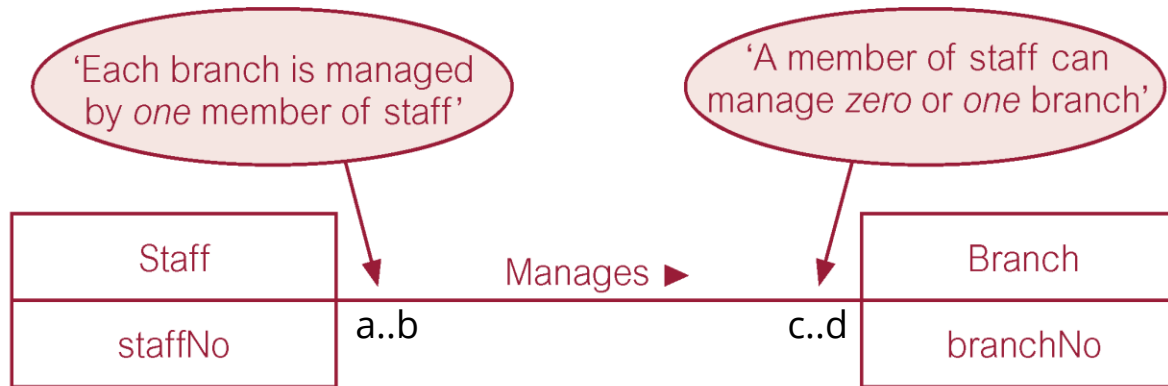


One-to-one Relationship

A person is married to at most one other person, or may not be married at all



Practice



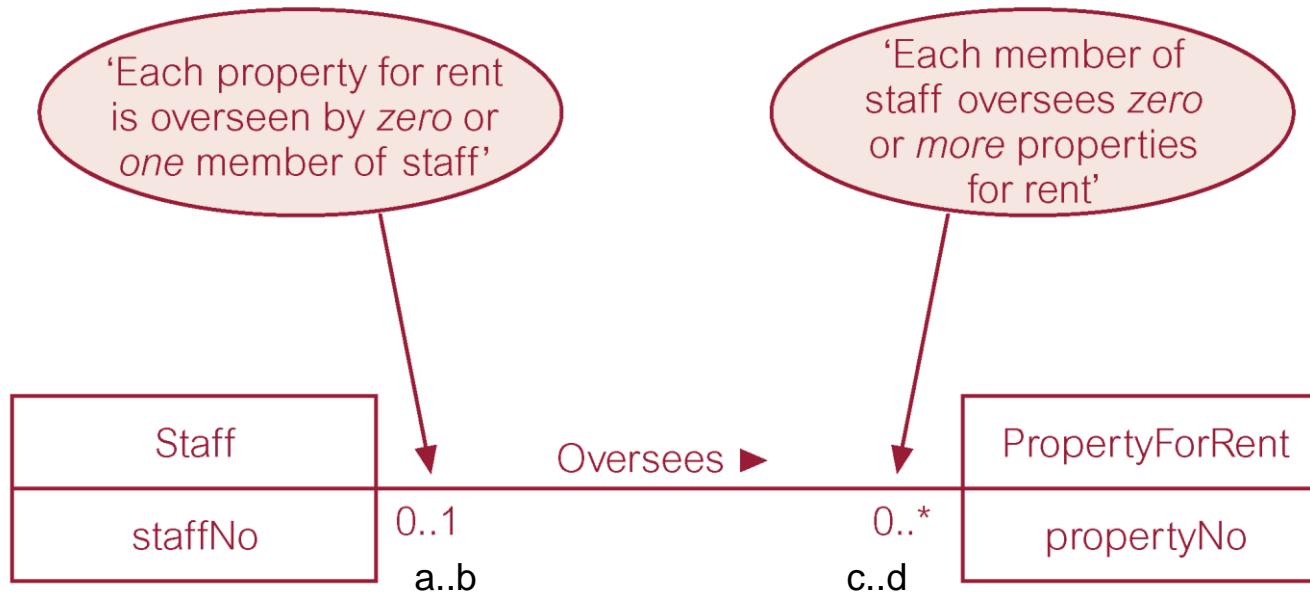
- What should be the values for a, b, c, and d?
- What is the cardinality of the “manages” relationship? (Hint: it is “b” to “d”)



WAYNE STATE

Mike Ilitch School of Business

Cardinality Constraints



- What should be the values for a, b, c, and d?
- What is the cardinality of the “oversees” relationship?
(Hint: it is “b” to “d”)



WAYNE STATE

Mike Ilitch School of Business

Note

- In many examples, we may only show the **maximum** cardinalities on ERDs
- ERDs often not provide sufficient information to specify the **minimum** cardinalities
 - It requires additional assumptions on system requirements



Wrap-up

- Maximum cardinality
- Cardinality of relationship

