RELATIONSHIPS

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OBJECTIVES:

01 Identifying Relationships

1.1: Definition
1.2: Matrix Diagram
1.3: Optionality
1.4: Cardinality
1.5: Conclusion

02 How to Speak Proper ERDish

2.1: Definition
2.2: Parts of ERDish
2.3: ERD Drawing Conventions
2.4: Conclusion

1.1 Definition

Relationship

- It is the way in which two or more people or things are connected.

1.1 Definition

Relationships in Data Models

- Represent something of significance or importance to business
- Show how entities are related to each other

1.1 Definition

Relationships in Data Models

- Your relationship between you and your brother/sister is "sibling"
- If each and every one of you is a "child" entity, can instances also have relations?

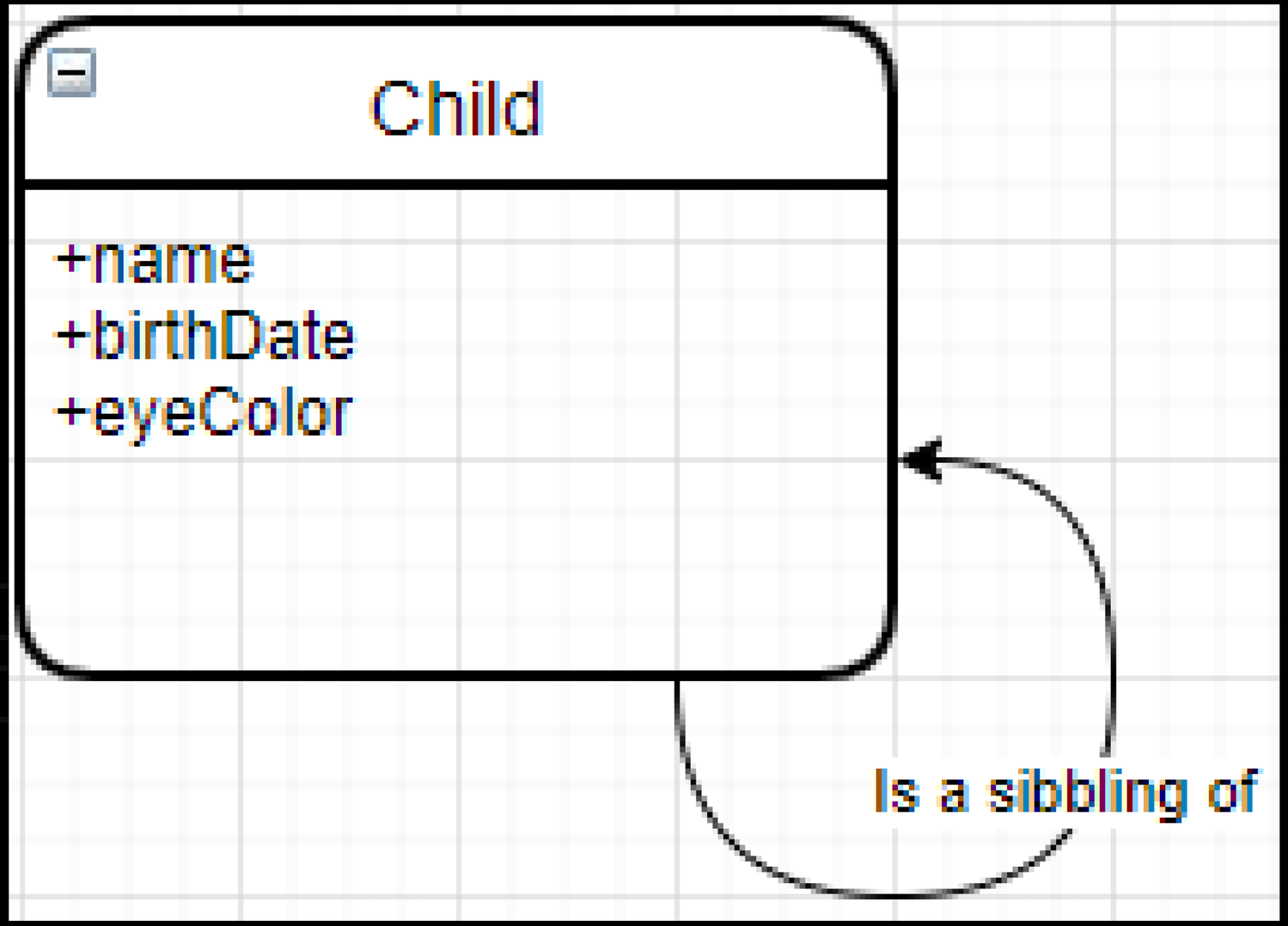
1.1 Definition

Relationships in Data Models

- Exist only between entities (or one entity and itself)
- Are bi-directional
- Are named at both ends

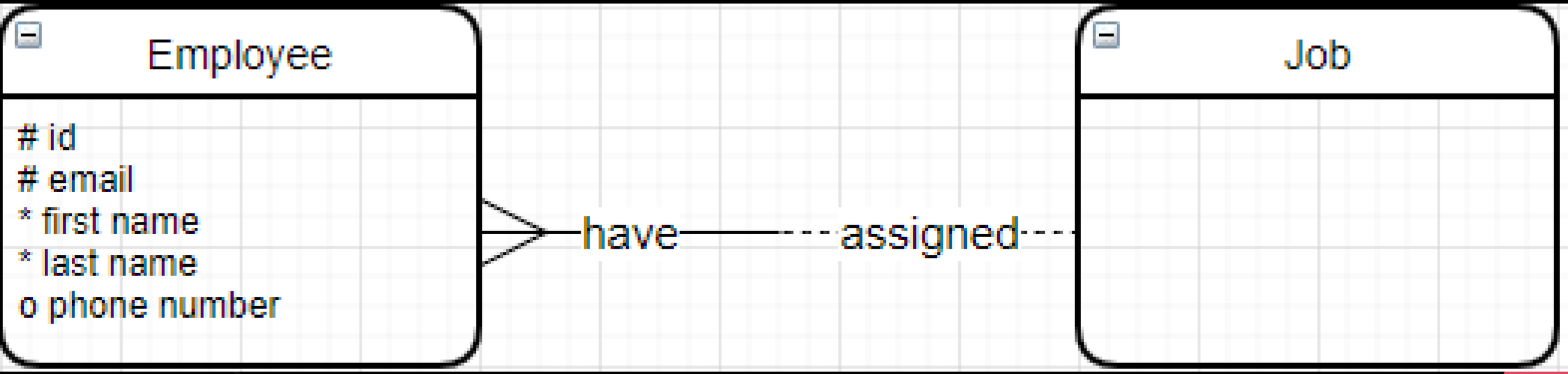
1.1 Definition

Relationships in Data Models



1.1 Definition

Relationships in Data Models



Matrix Diagram

- We can use the matrix diagram to uncover relationships.
- It is a table where the left-most column and the top-most row has a list of the entities.
- Those at the intersection of entites are blacked out

1.2 Matrix Diagram

Matrix Diagram

	Employee	Job
Employee		
Job		

Matrix Diagram

	Employee	Job
Employee		has
Job	assigned	

Matrix Diagram

- Though good for identifying relationships, it does not help in identifying cardinality and optionality

1.2 Matrix Diagram

Relationships in Data Models

- Have optionality
- Have cardinality

Optionality

- In famous terms, **"label"**

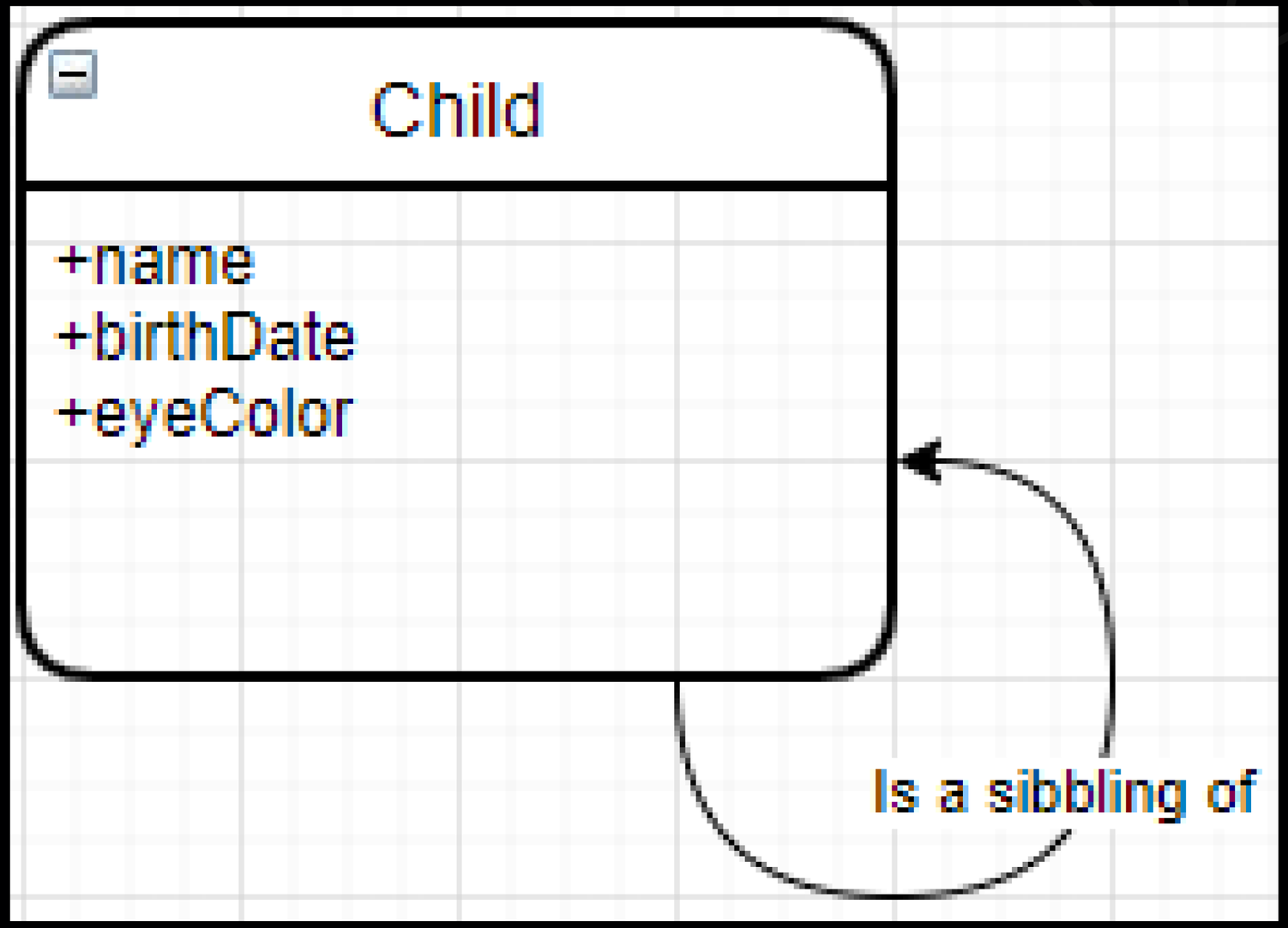
Optionality

- Relationships are either mandatory or optional.

- Must every entity have a relation with another entity?

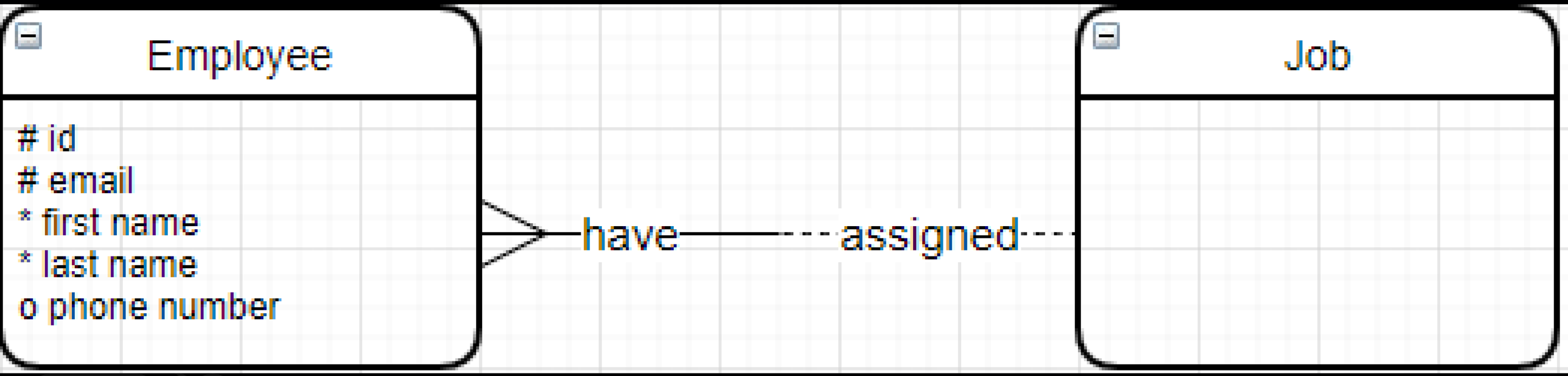
Optionality

- does each child have a sibbling?



Optionality

- does each employee require a job?
- does each job require an employee?

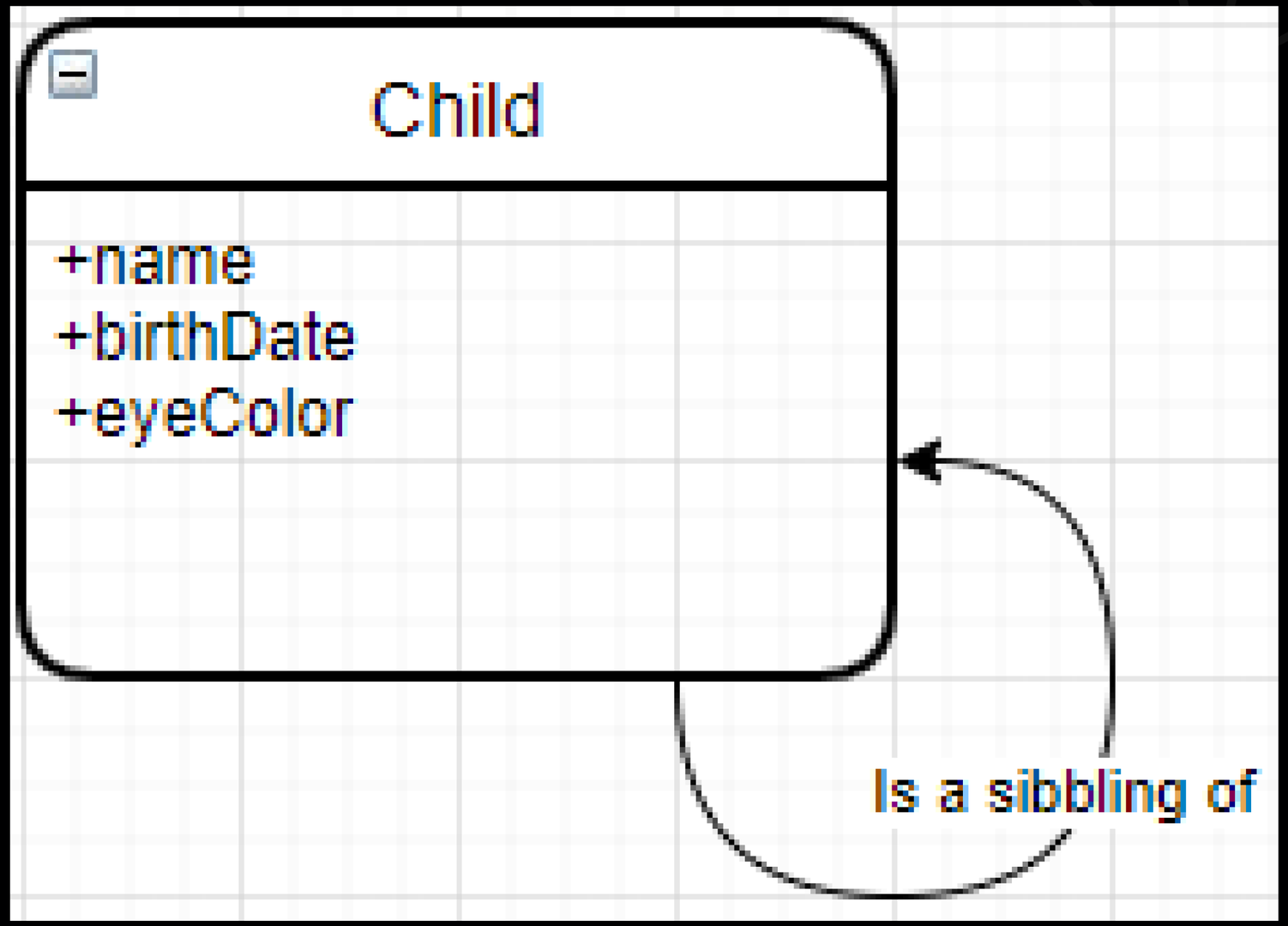


Cardinality

- It measures the quantity of something
- In a relationship, it determines the degree to which one entity is related to another by answering the question, “How many?”

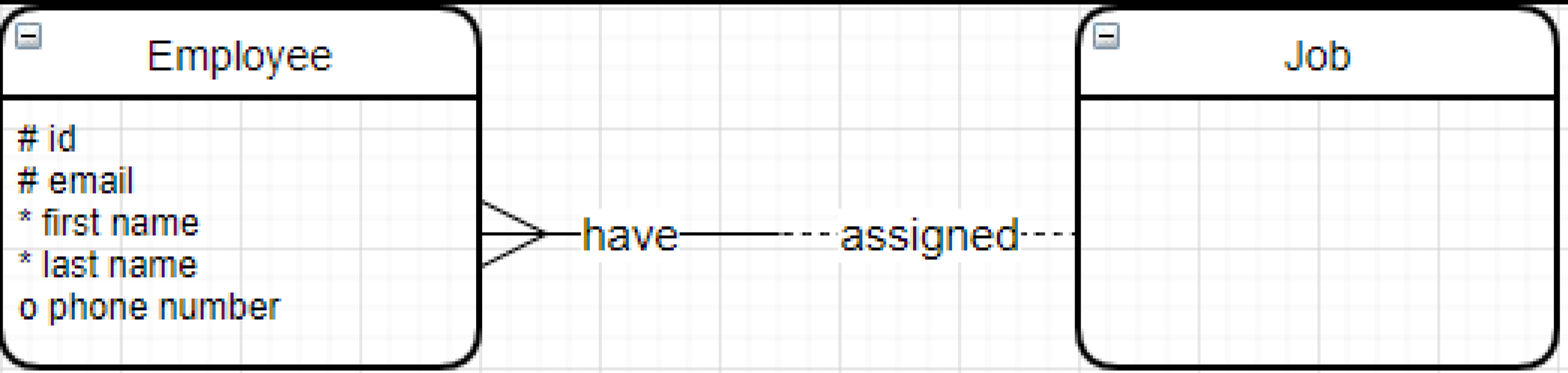
Cardinality

- how many sibblings can a child have?



Cardinality

- how many employees can a job be assigned to?
- how many jobs can an employee have?



Conclusion

- For Optionality, we ask if an entity "must have a relationship with another entity or may not be in some cases"
- For Cardinality, we ask "if an entity does have relations with another, how many can be related?

Conclusion

- For Optionality, must or may
- For Cardinality, one and at least one; or one to many

2.1 Definition

ERDish

- ERDish is the language we use to state relationships between entities in an ERD
- You have already been speaking it, when you identified relationships and specified optionality and cardinality

2.1 Definition

ERDish

- We're basically translating drawings to words

Parts of ERDish

- EACH
- Entity A
- OPTIONALITY (must be/may be)
- RELATIONSHIP NAME
- CARDINALITY (one and only one/one or more)
- Entity B

Syntax:

EACH <Entity A> <must be/may be> <relationship> <one and only one/one or more> <Entity B>

Syntax Example:

EACH <Entity A> <must be/may be> <relationship> <one and only one/one or more> <Entity B>

EACH Child may be sibblings with one or more Children

Syntax Example:

EACH <Entity A> <must be/may be> <relationship> <one and only one/one or more> <Entity B>

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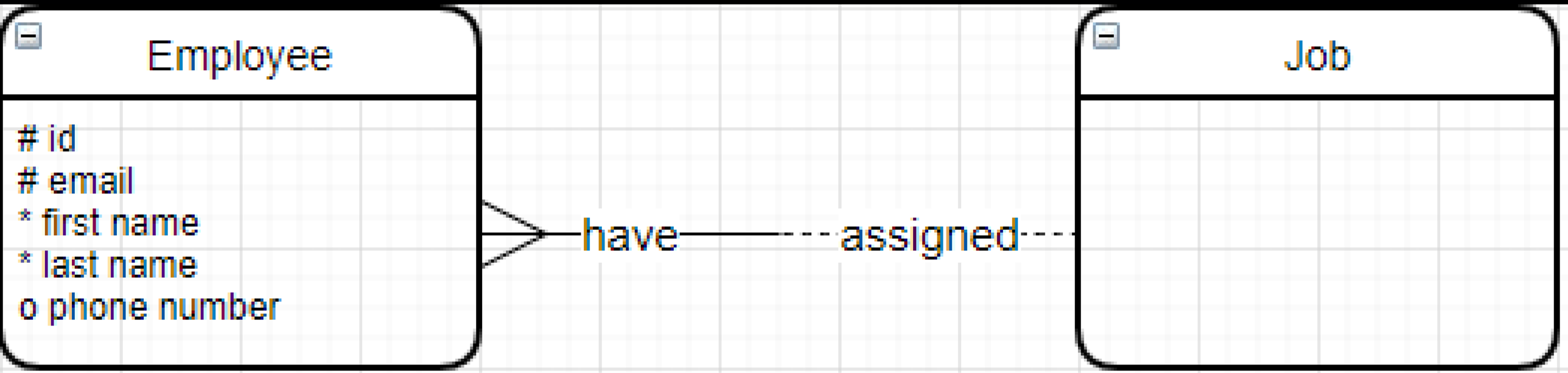
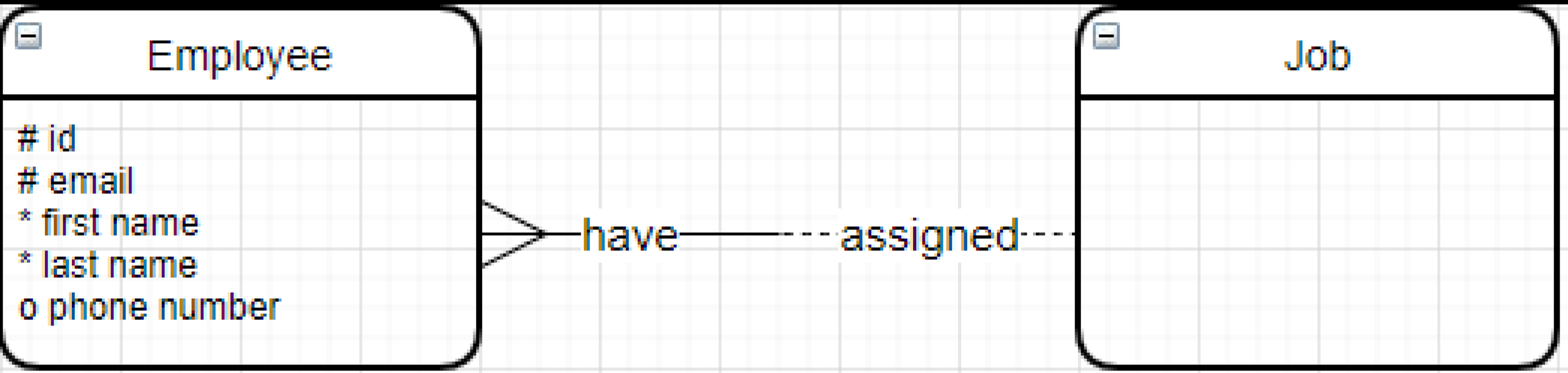


Syntax Example:

EACH Employee must have one Job.

EACH Job is assigned one or many Employees



ERD Drawing Conventions

It is efficient to communicate information in a way that can easily understood by many people.

ERD Drawing Conventions

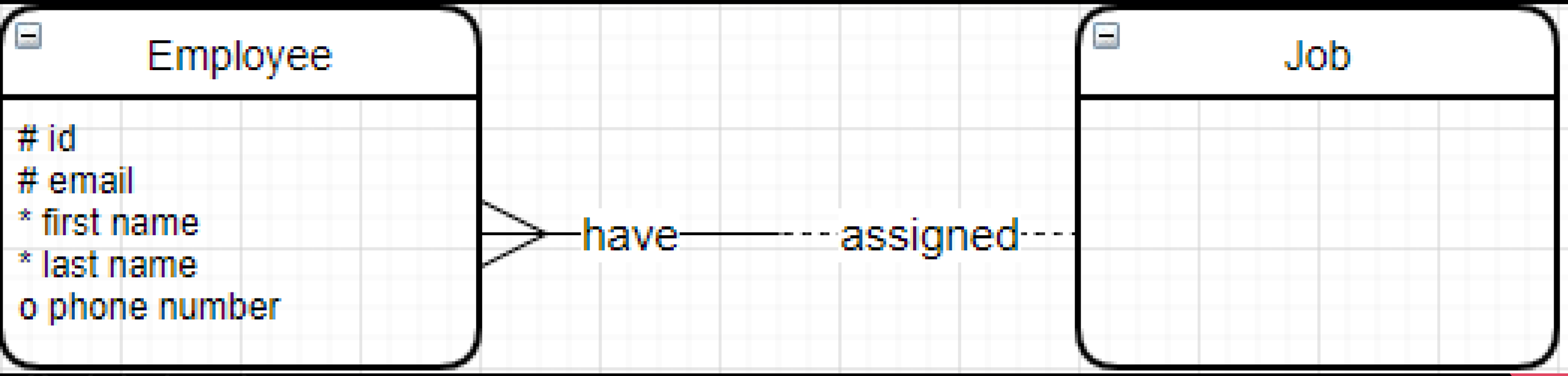
- The following are set rules
- They are international standards so that databases are understood by all who manage them

ERD Drawing Conventions

- Entities
- Attributes
- Optionality
- Cardinality

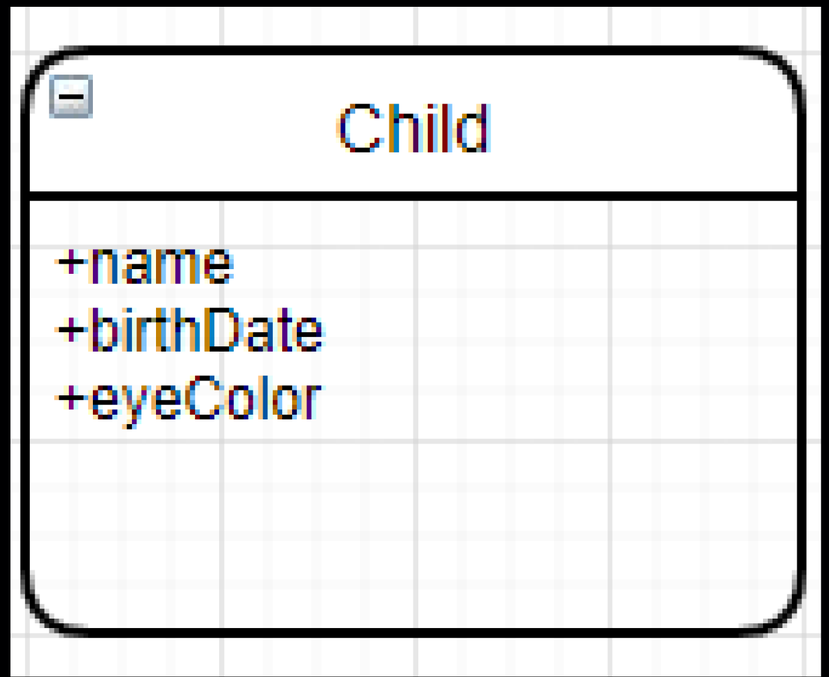
ERD Drawing Conventions

- Example:



Entities

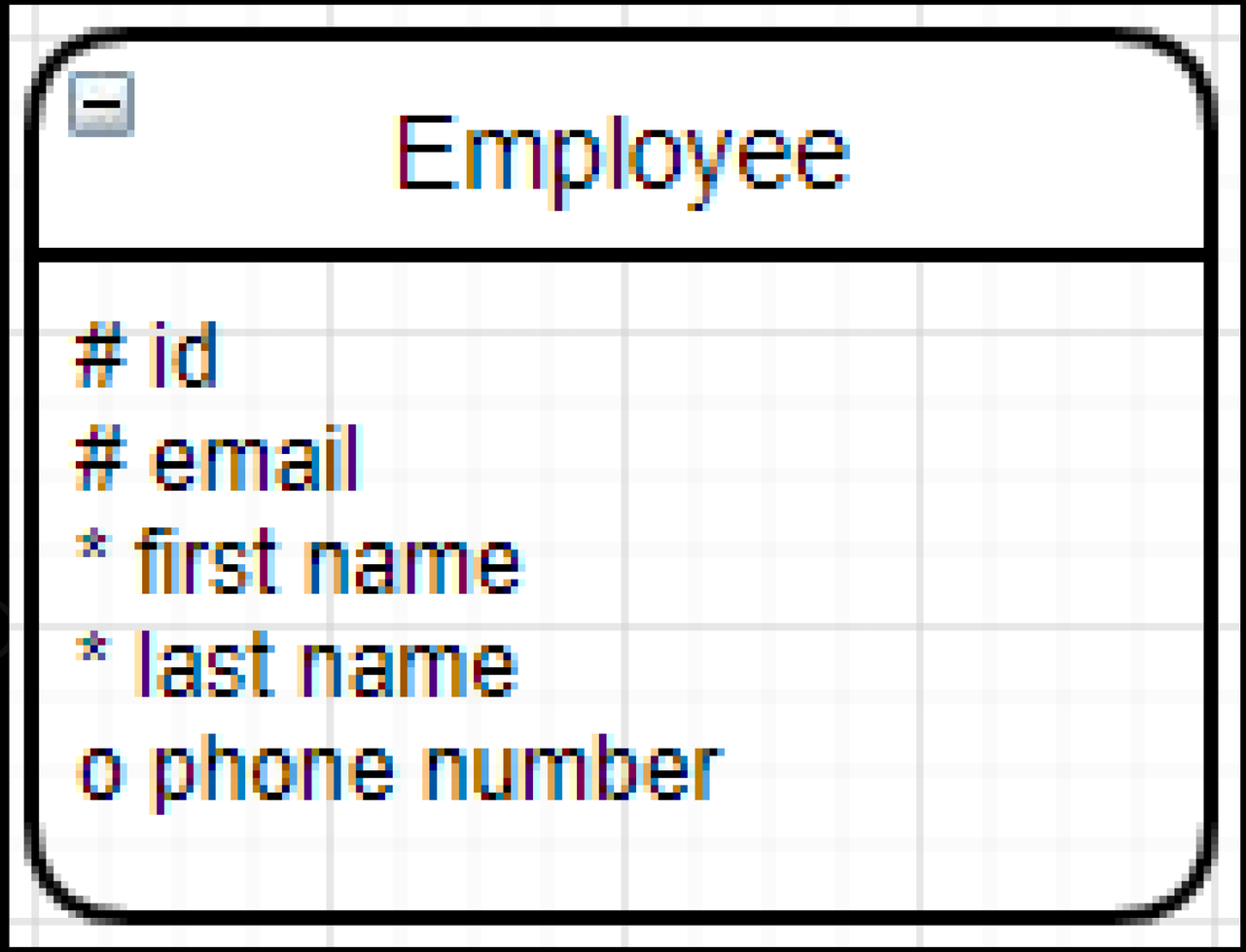
- Use Soft Boxes
- These are rectangles with round corners



Attributes

- Mandatory attributes are marked with an asterisk: *
- Optional attributes are marked with circles: o
- Unique identifiers are marked with a hash sign: #

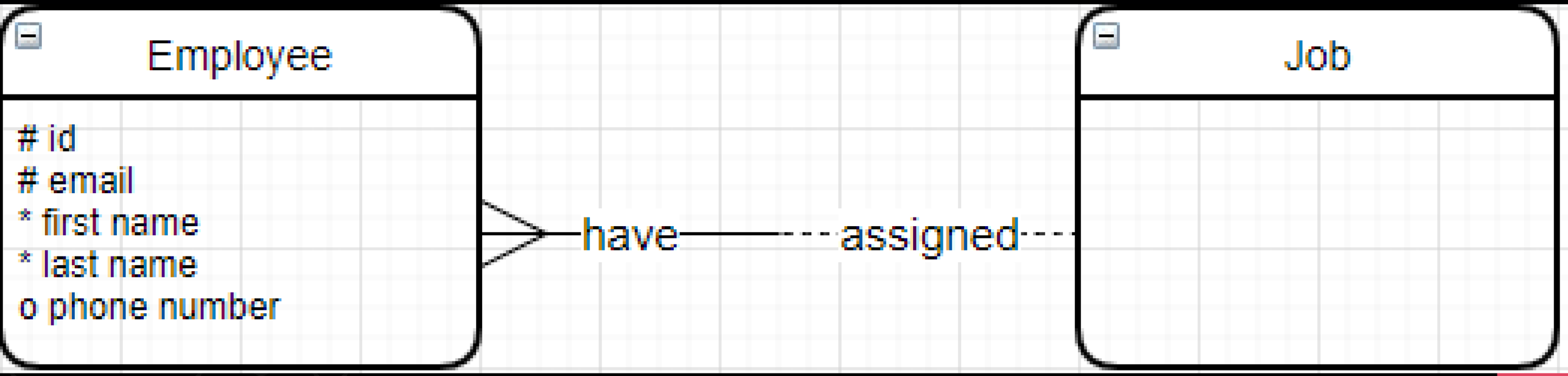
Attributes



Optionality

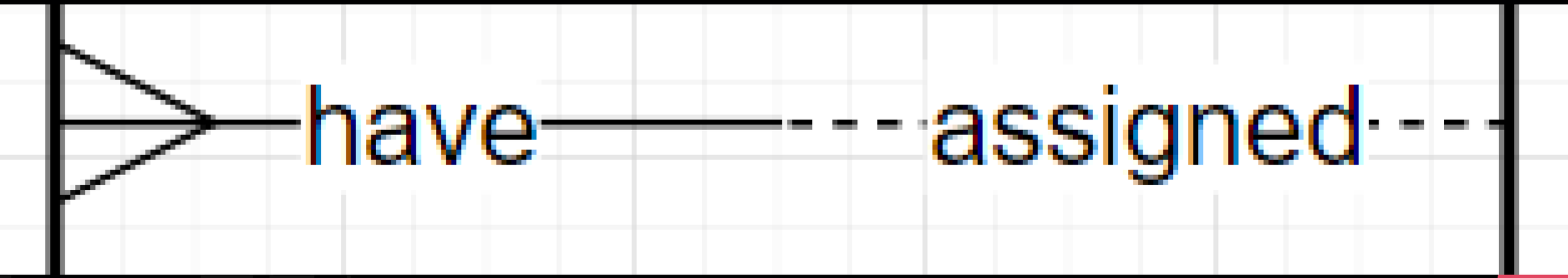
- mandatory relationships are denoted by a solid line
- optional relationships are denoted by broken lines

Optionality



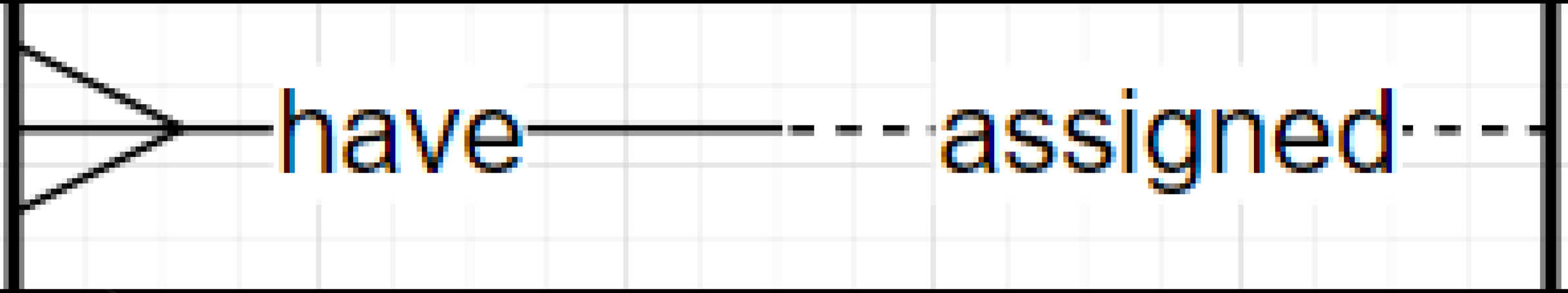
2.3 ERD Drawing Conventions

Optionality



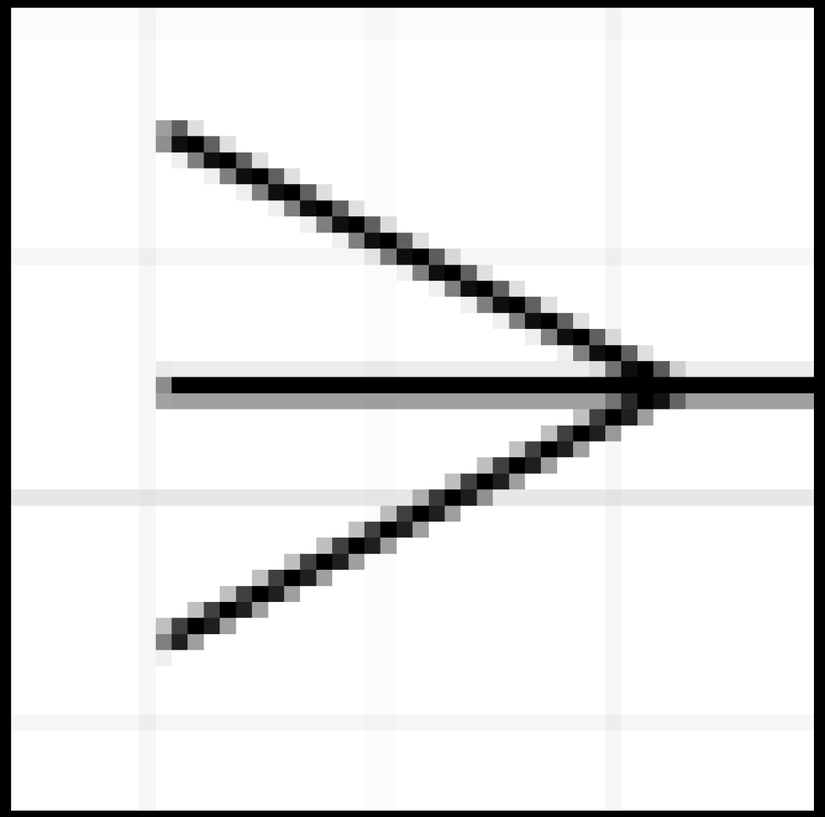
Cardinality

- a crow's foot denotes "many"
- a leaving the end of the line as it is denotes "one"



Cardinality

- This is a crow's foot:



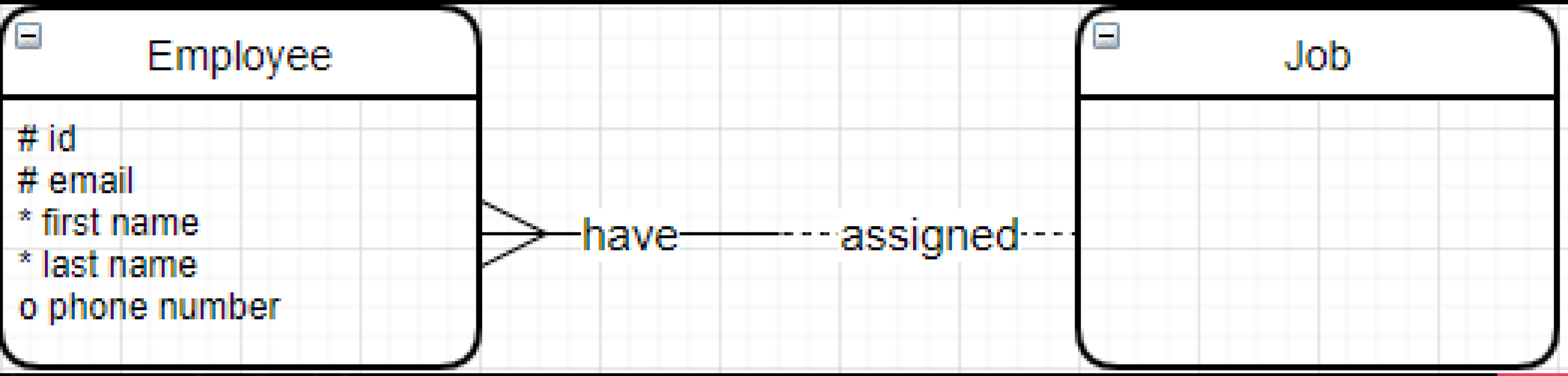
Conclusion

- ERDs are read from the entity to another entity
- The line in between them translates to their relationship

Conclusion

- We read the relationship starting with the line sticking from the entity we start with then the end of the line connected to the other

Conclusion

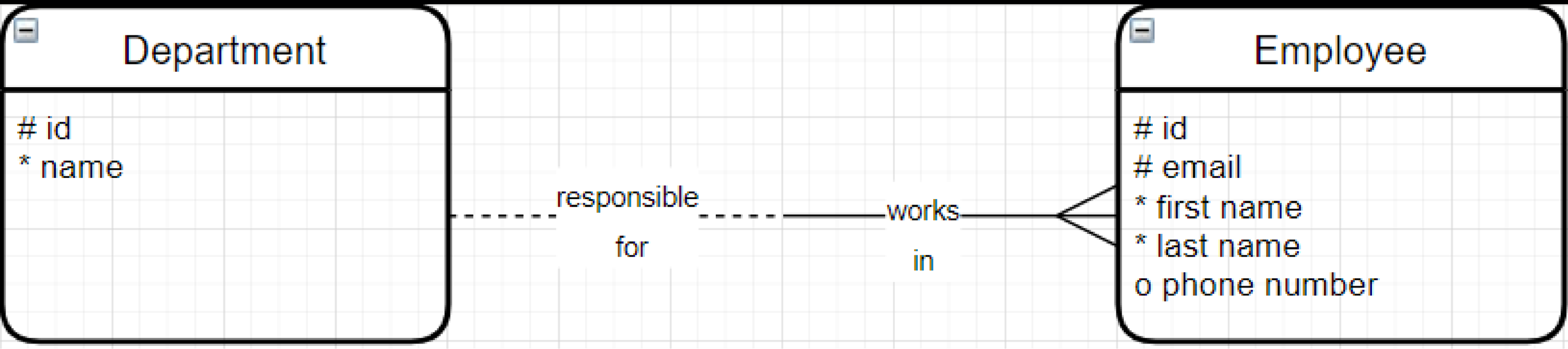

Employee
id
email
* first name
* last name
o phone number
have
assigned
Job

? Your turn!

Please bring out 1/2 Yellow paper. Write your name and section

? Practice

- Translate the ERD relationship between the two entities



? Practice

- Create an ERD on the following:

A nurse has many patients. A patient has one or multiple nurses taking care of them.