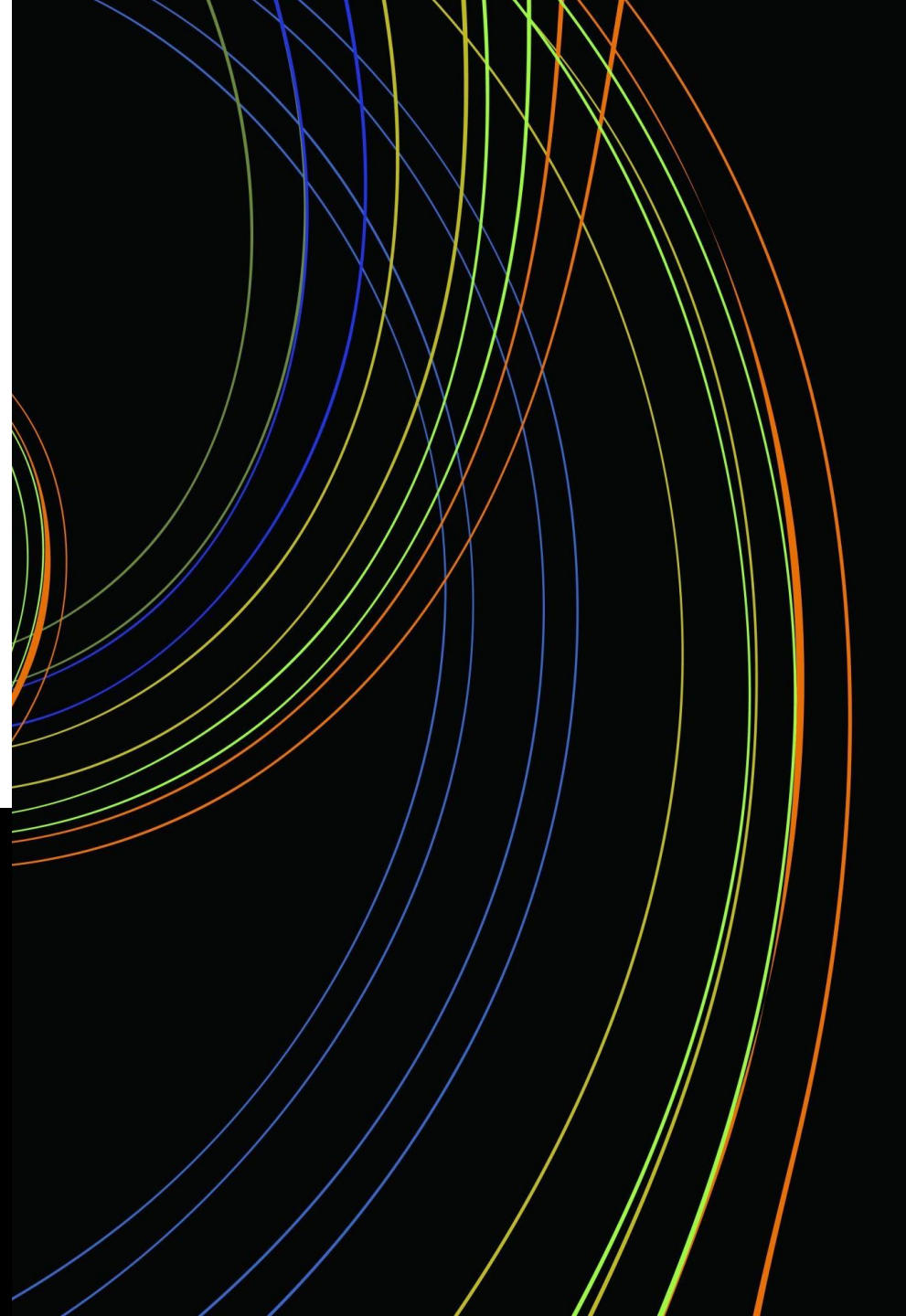
ER DIAGRAMS AND CARDINALITY RELATIONS



Team 3: DevBirds

ENTITY-RELATIONSHIP MODEL (ER MODEL)

- An entity is an object that exists and is distinguishable from other Objects.

  Example: Student, Teacher, Course, etc.

- Entities have attributes
  - Example: Students have name, Roll, Sec, etc.

ATTRIBUTES

- An entity is represented by a set of attributes, that is descriptive properties possessed by all members of an entity set.
  - Example:

    Instructor = (ID, name, city, salary)

    Course = (course_id, start_date, end_date, title, etc.)

- Attributes type
  - Simple attributes
  - Composite attributes
  - Multivalued attributes
  - Derived attributes
  - Key attribute

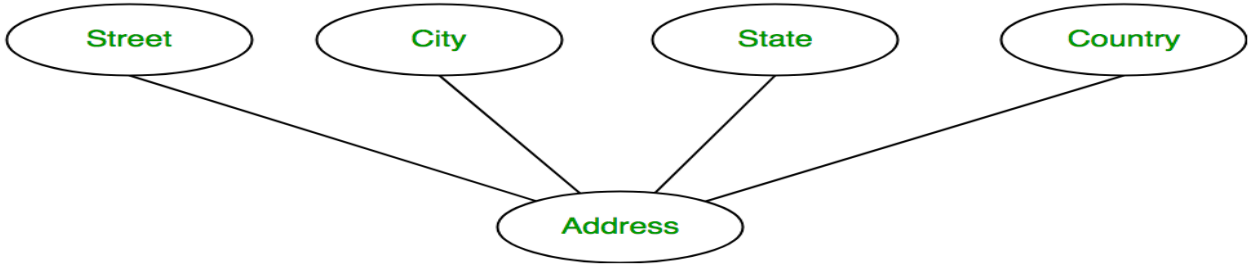
TYPES OF ATTRIBUTES

- **Simple Attribute** : Attributes that contain single Atomic value
  - Example: Department, Salary, etc.
  - Representation:

- **Composite Attribute** : Attributes having their own attributes
  - Example:

    Name(first, middle, last name)

    Address(Street No. , city, state)
  - Representation:

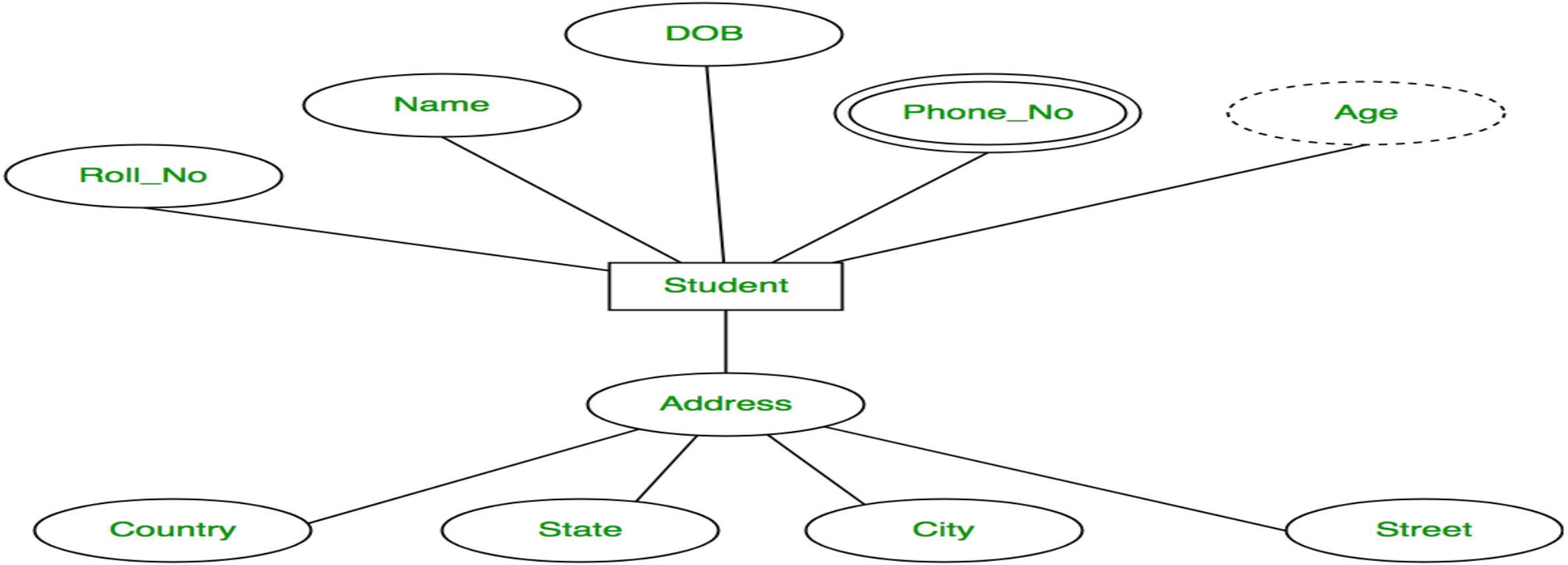


- **Multivalued** : An attribute consisting **more than one value** for a given entity
  - Example: Mobile number
  - Representation:

- **Derived** : An attribute which can be **derived from other attributes** of the entity
  - Example: Age (can be derived from DOB)
  - Representation:

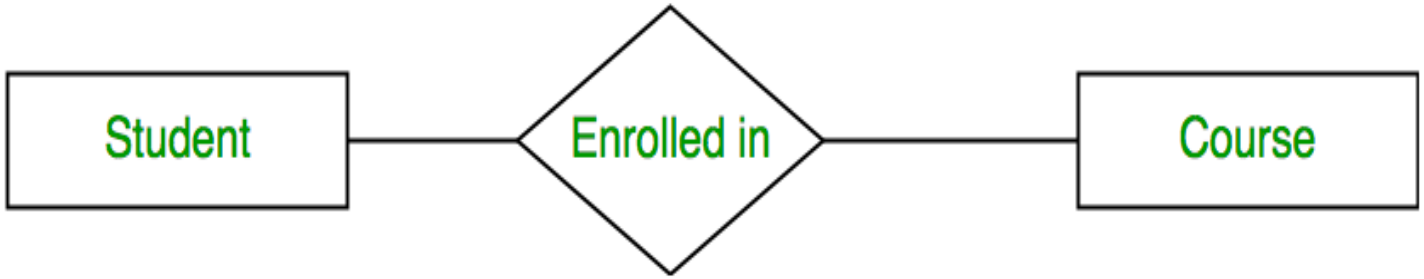
- **Key Attribute** : The attribute which **uniquely identifies each entity** in the entity set.
  - Example: Roll_No will be unique for each student
  - Representation:

ENTITY DIAGRAM

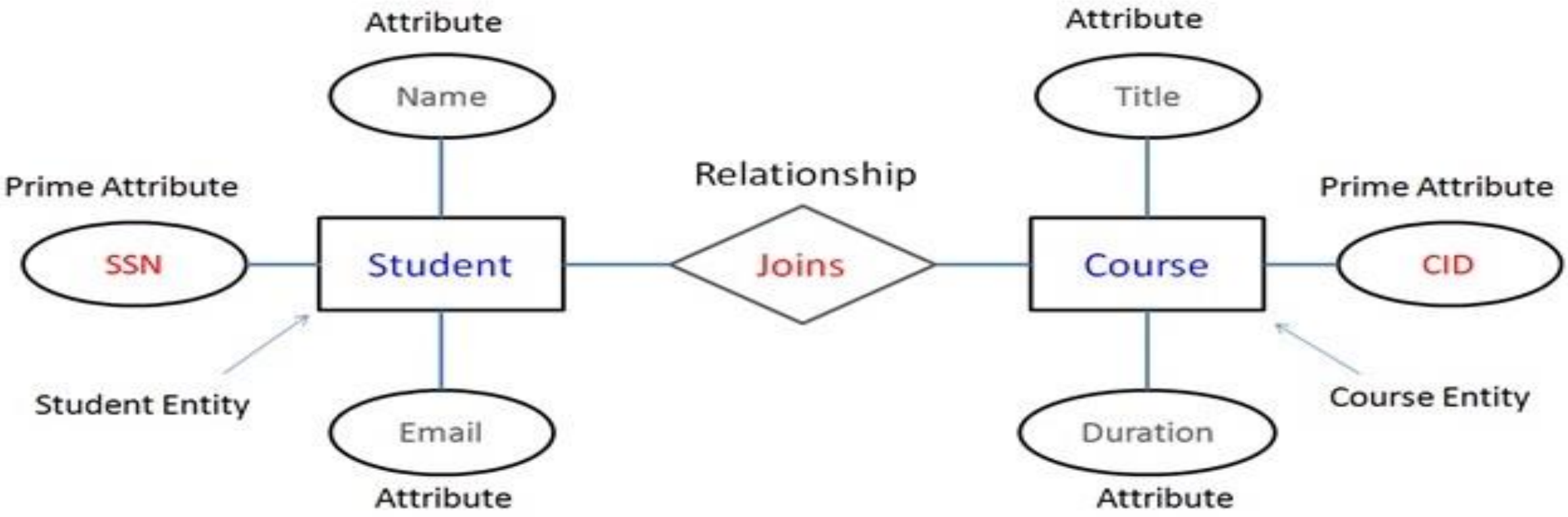


RELATIONSHIP SET

- A Relationship is association among several entities.
  - Example:
    1) Teacher teaches Students.
    2) Student enrolled in a Course.
  - Representation: In ER diagram, relationship type is represented by a diamond and connecting the entities with lines.



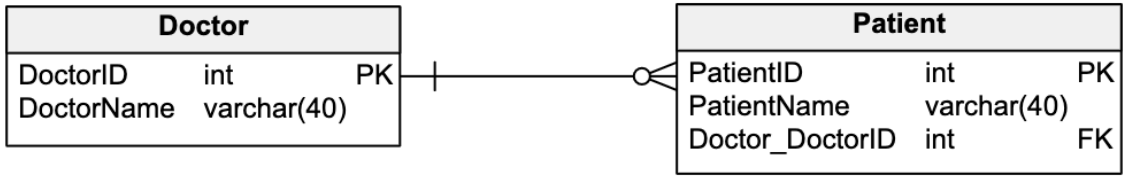
ER DIAGRAM


Attribute
Name
Attribute
Title
Relationship
Prime Attribute
SSN
Student
Joins
Course
CID
Prime Attribute
Student Entity
Email
Duration
Course Entity
Attribute
Attribute

CARDINALITY

Cardinality is the number of relationships or instances one entity has with another

Optionality Within Cardinality



TYPES OF RELATIONSHIPS

There are three types of relationships between entities (tables):

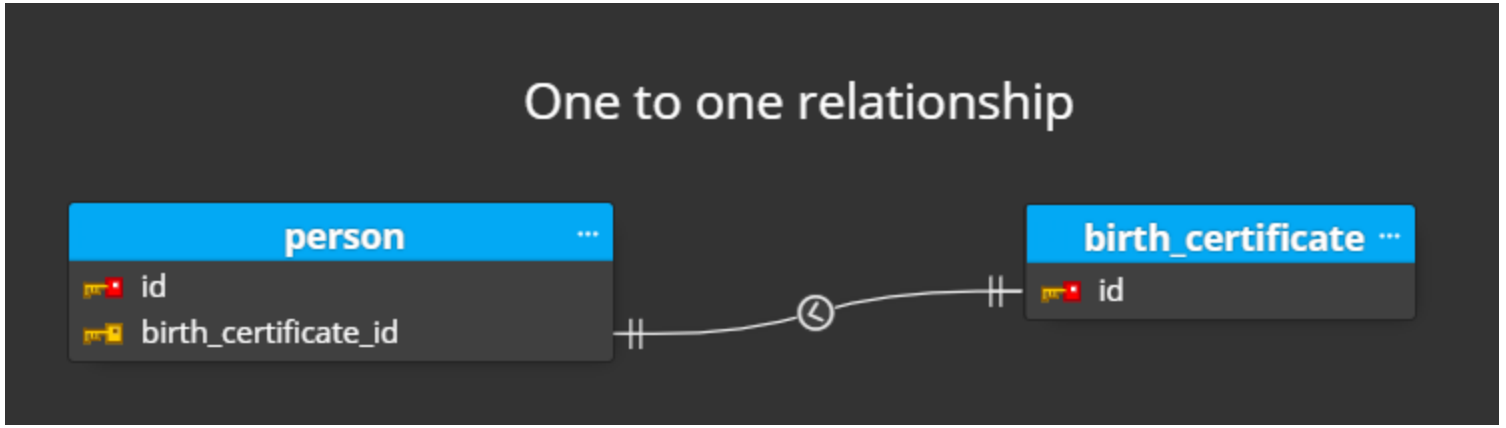
- One-to-one relationships (1:1)
- One-to-many relationships (also denoted as 1:N)
- Many-to-many relationships (M:N)

THE ONE-TO-ONE RELATIONSHIP

In an ER diagram, the one-to-one (1:1) relationship means that one entity has only one event shared with another entity.

Examples:

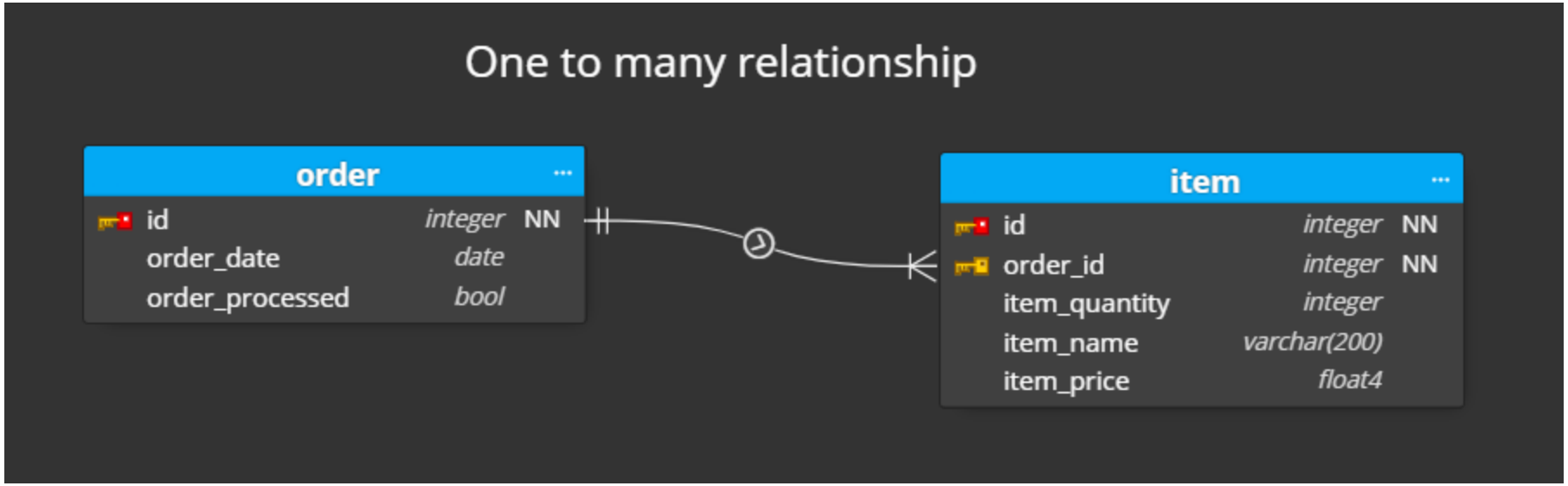
- Person – Birth Certificate
- Country – Capital
- Driver – Driver License



THE ONE-TO-MANY RELATIONSHIP

With this one-to-many (1:N), one entity has an event that occurs one time, while the other entity can have more than one repetition of the event. Example:

- Order - Item
- Car Manufacturer – Car Model

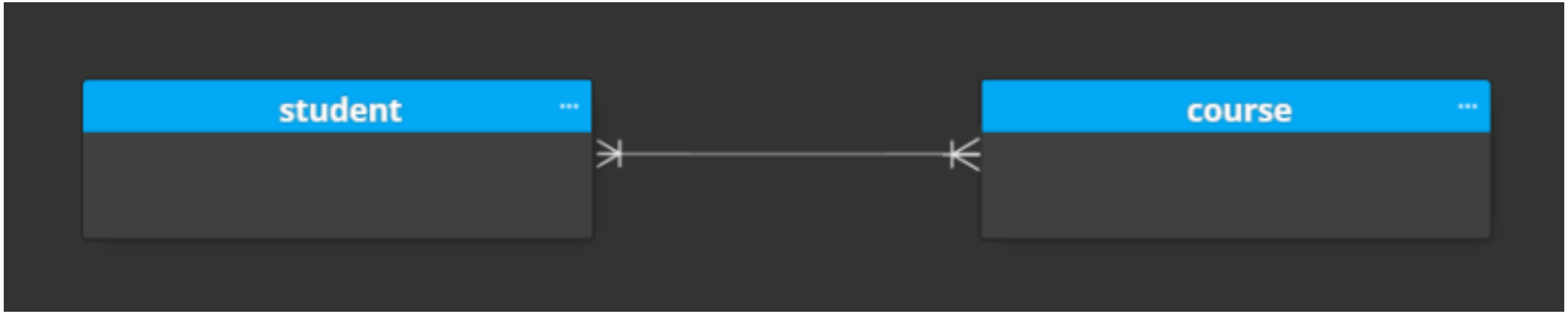


THE MANY-TO-MANY RELATIONSHIP

Many-to-many relationships are when both entities have the same event or relationship happen more than once.

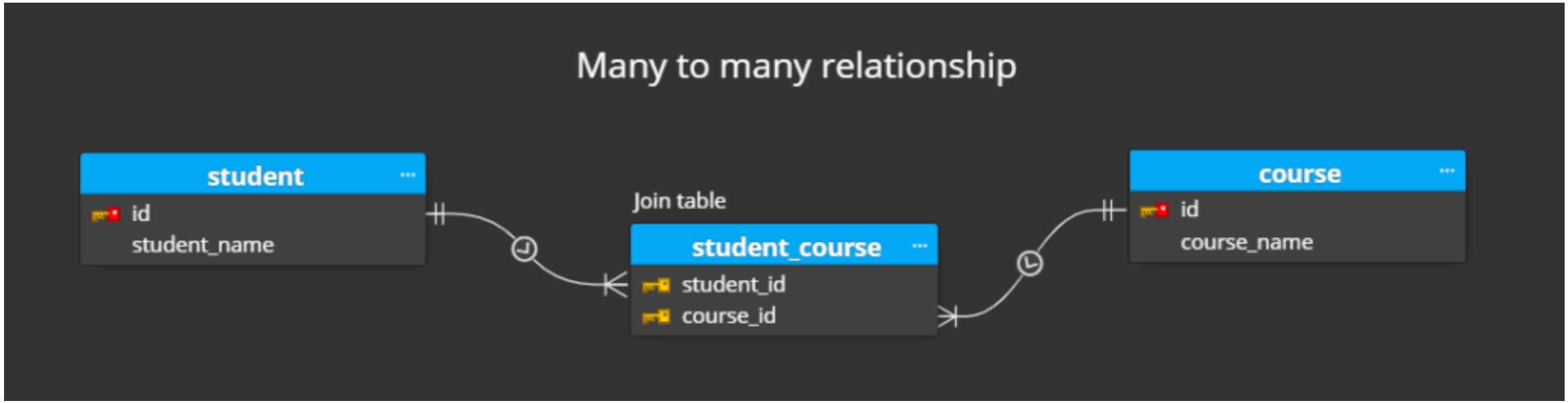
Examples:

- Student – Course
- Member - Community



THE MANY-TO-MANY RELATIONSHIP

In a relational database, this relationship is then usually implemented using a **join table**, otherwise known as a **junction** or **associative table** with **two** **one-to-many** relationships.



THANK YOU