Entity/Relationship Model

Sławek Staworko

Univ. Lille 3

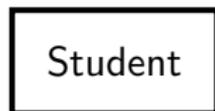September 27, 2017

Entity/Relationship model

ER

1. Conceptual, high-level data model
2. Aimed mainly to represent relational data (RDBMs)
3. Graphical language
4. Instrumental in good database design

Building blocks

Entity
What classes of objects are there?

Student
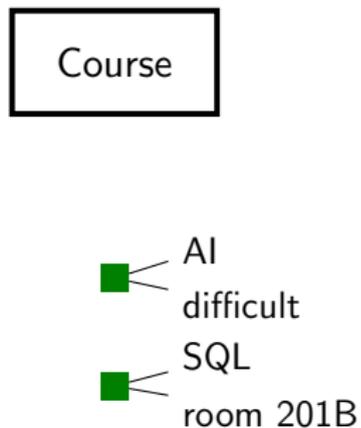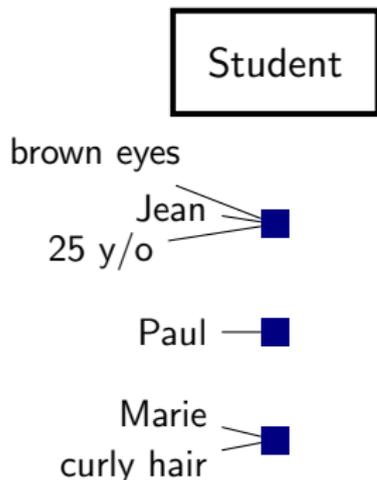
Relationship
How do they relate to each other?
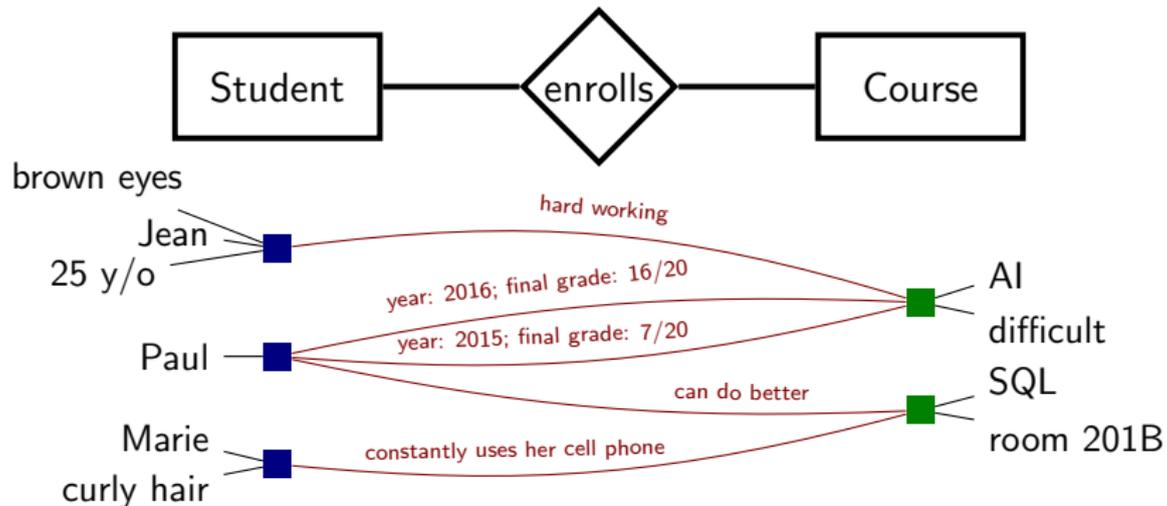
Likes

Attributes
What relevant data is there?

Name

Entities

Entity

- a class of objects of the same kind
- can be concrete or abstract

Student		Course

brown eyes
Jean
25 y/o ■

Paul ■

Marie
curly hair ■

■ AI
difficult
■ SQL
room 201B

Relationships

Relationship

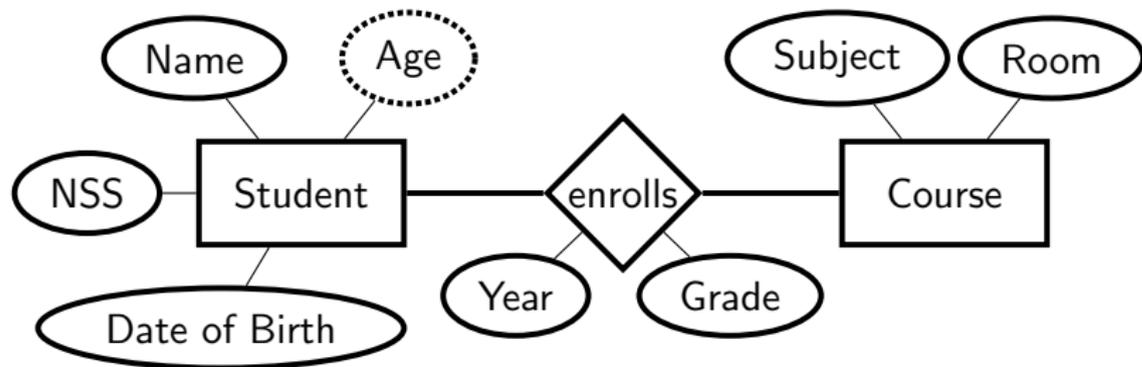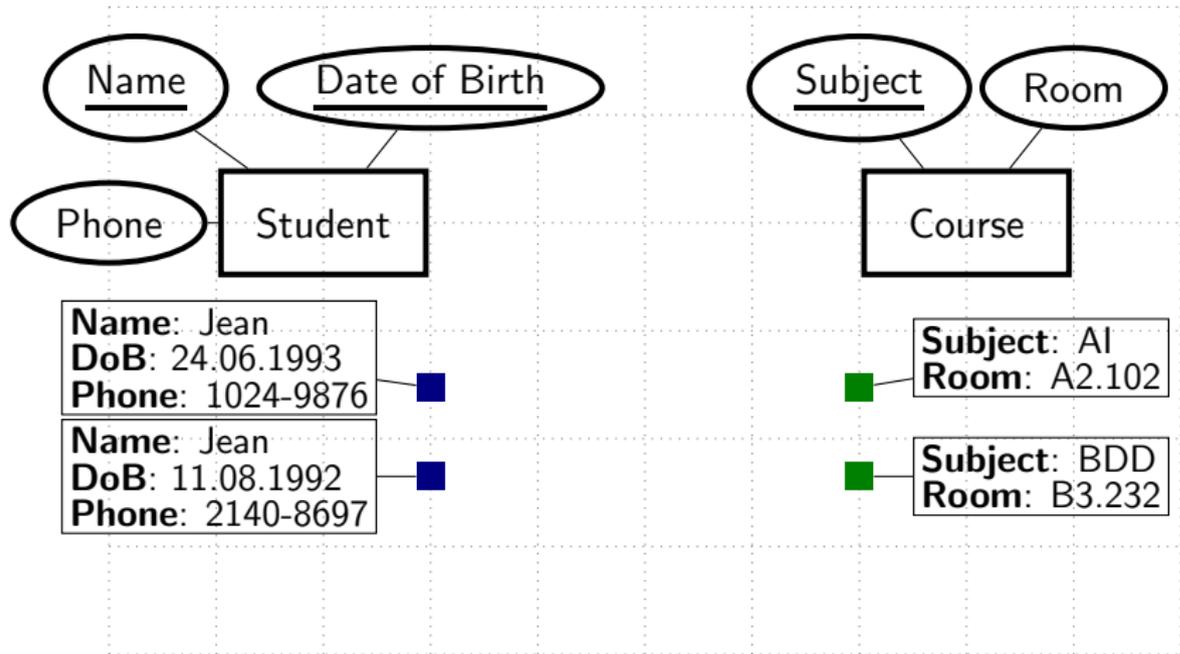- connects one, two, or more entities

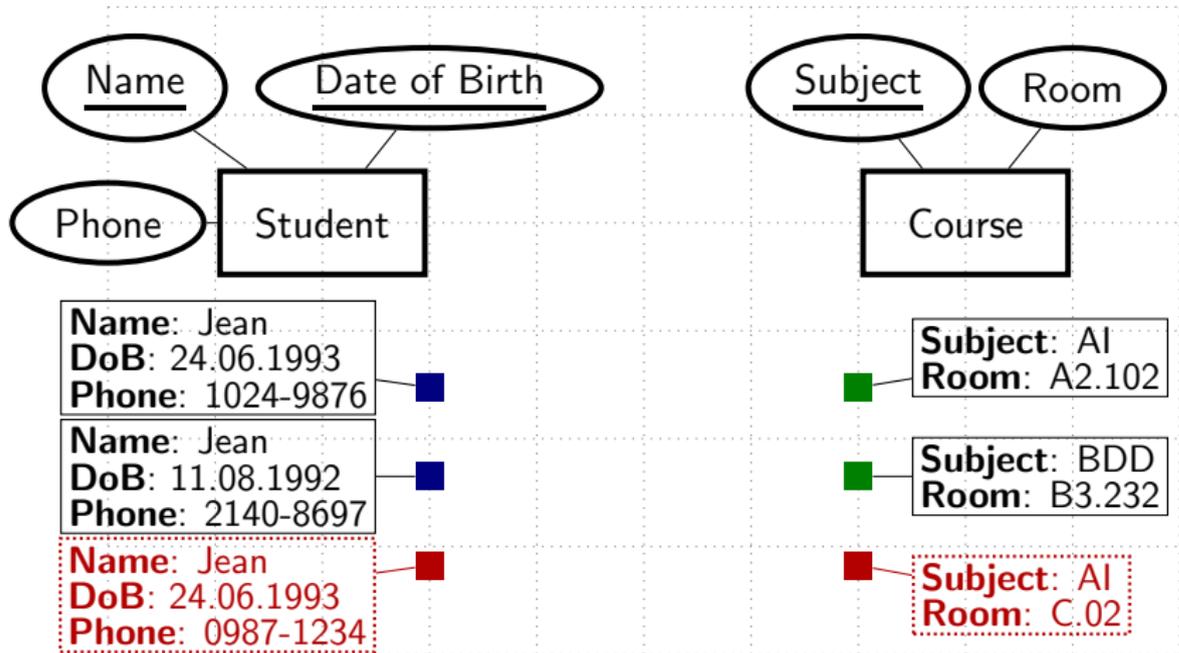# Attributes

Attribute

- the relevant pieces of information

Key of an Entity

Key is a set of attributes that identifies an object with its class.

Key of an Entity

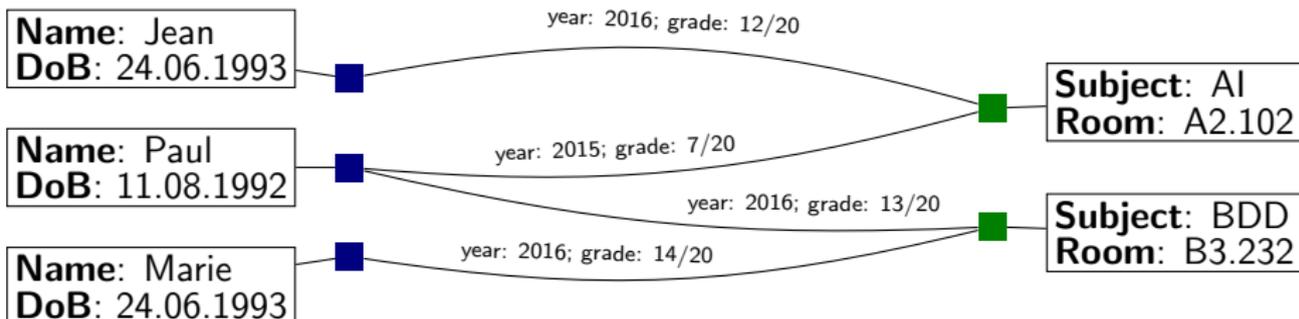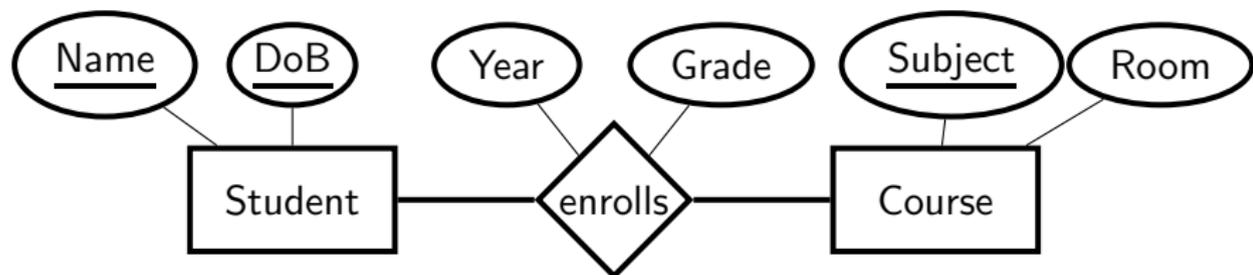Key is a set of attributes that identifies an object with its class.

Forbidden: two students with
the same name and the same date of birth
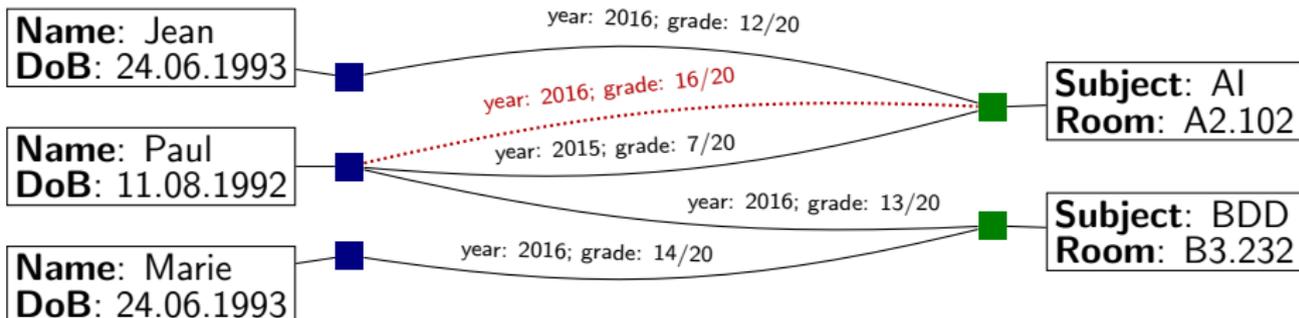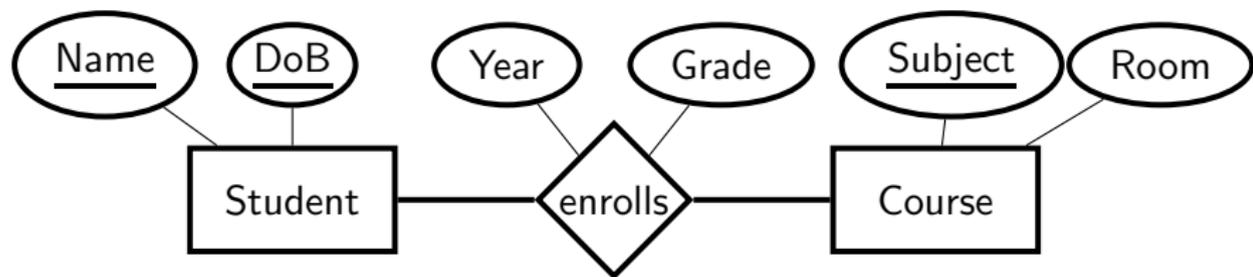
Forbidden: two courses with
the same subject

Relationships with no key

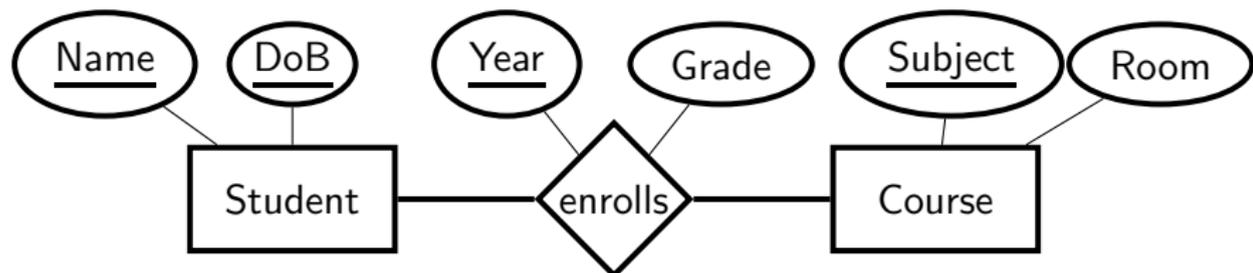Only one link between the same objects is allowed

Relationships with no key

Only one link between the same objects is allowed

Name | DoB | Year | Grade | Subject | Room

Student — enrolls — **Course**

Name: Jean
DoB: 24.06.1993

Name: Paul
DoB: 11.08.1992

Name: Marie
DoB: 24.06.1993

Subject: AI
Room: A2.102

Subject: BDD
Room: B3.232

year: 2016; grade: 12/20
year: 2016; grade: 16/20
year: 2015; grade: 7/20
year: 2016; grade: 13/20
year: 2016; grade: 14/20

Forbidden: two links between Paul and AI

Keys of a Relationship

Only one link between the same objects with the same key value

Keys of a Relationship
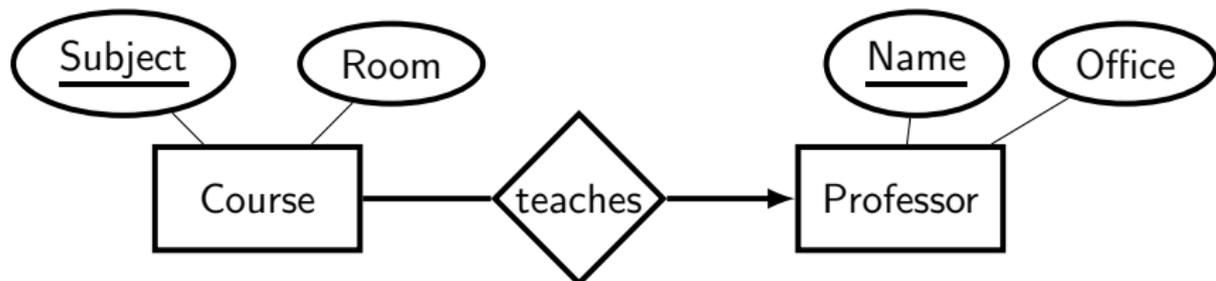
Only one link between the same objects with the same key value
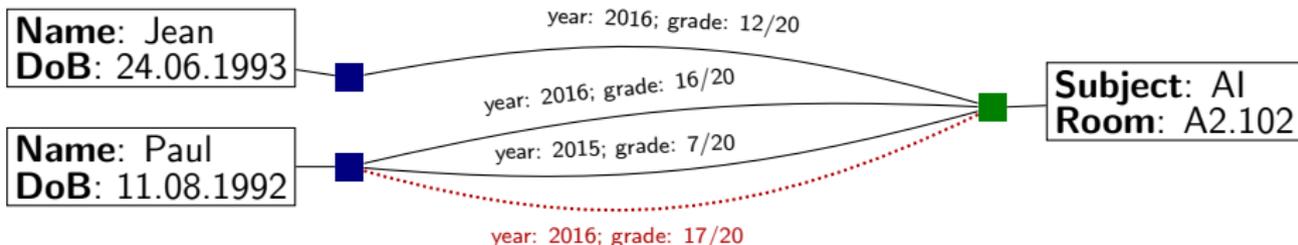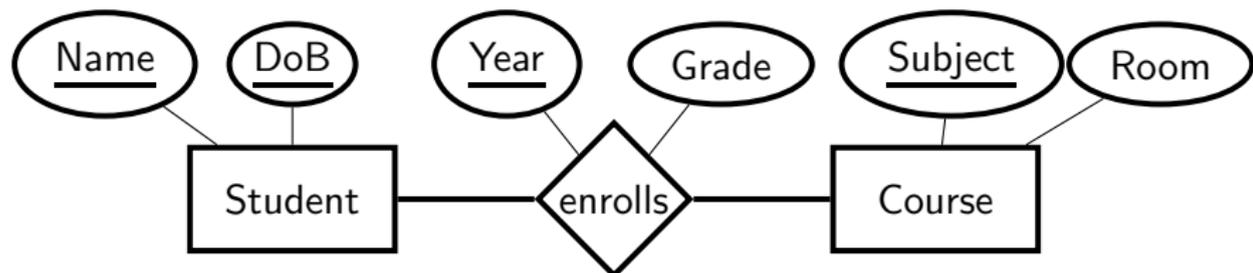
Forbidden: two links between Paul and AI for year 2016

Functional Relationship

The arrow points at entity that is uniquely identified
through the relationship

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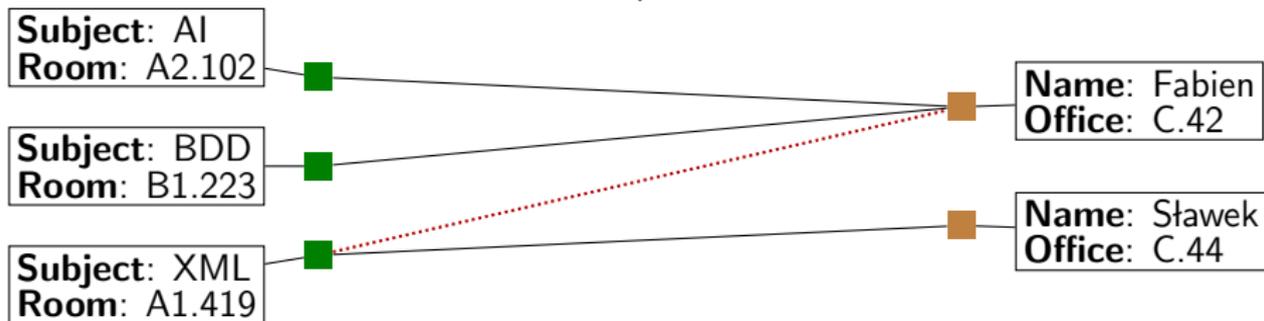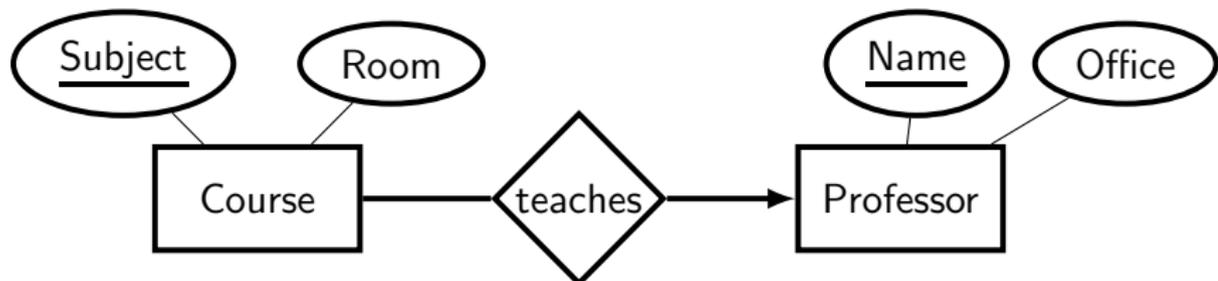
Forbidden: two professors teaching the XML course

Functional Relationship with a key

The arrow points at entity that is uniquely identified
through the relationship and the key value

Functional Relationship with a key

The arrow points at entity that is uniquely identified
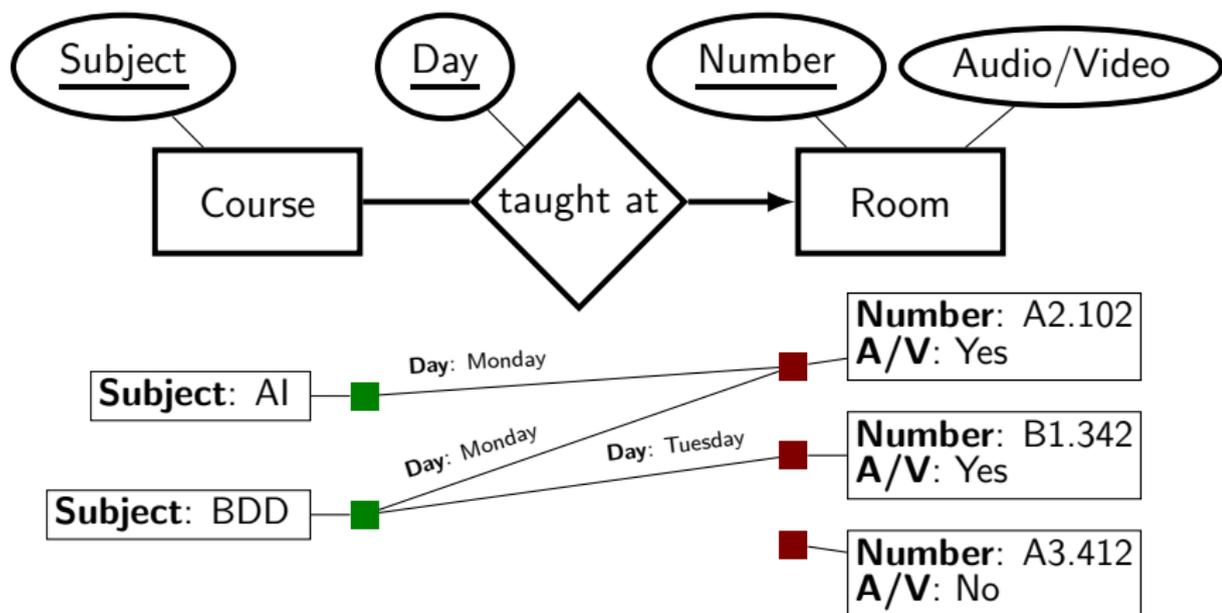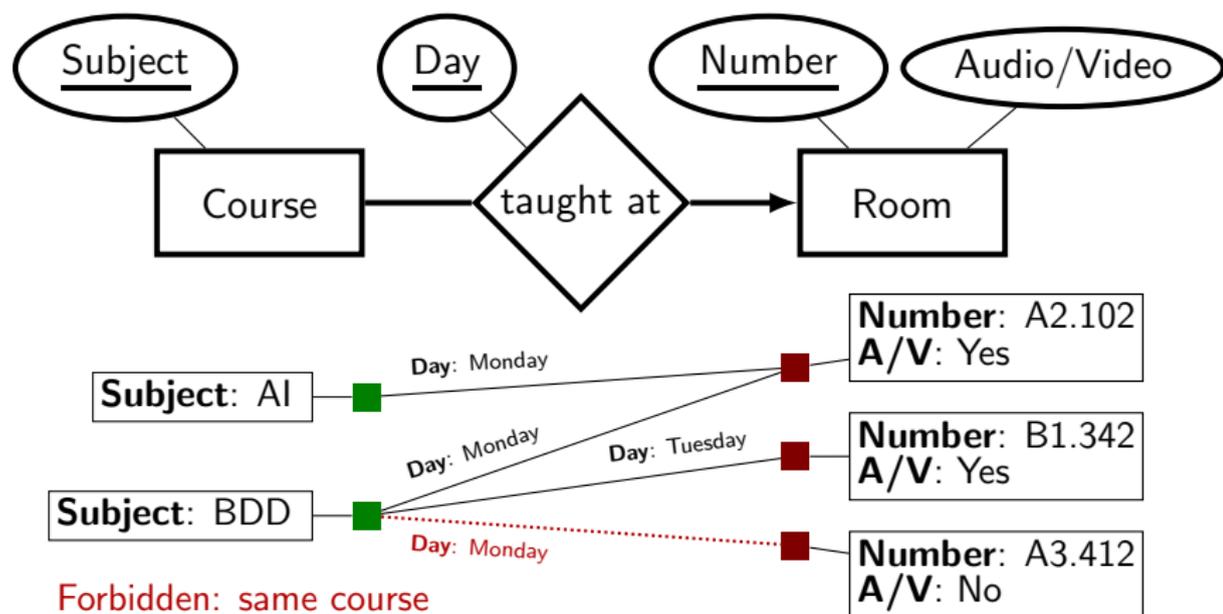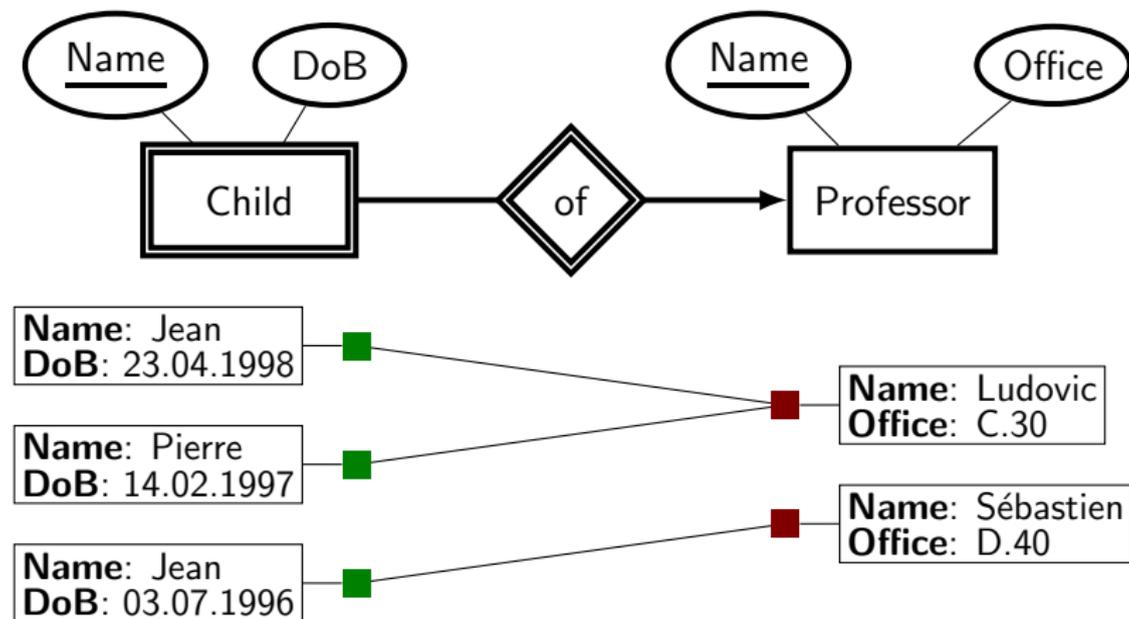through the relationship and the key value

Forbidden: same course
in two different rooms on the same day

Weak Entity (and its identifying relationship)

Key of a weak entity identifies among objects of the same parent

Weak Entity (and its identifying relationship)

Key of a weak entity identifies among objects of the same parent

Name: Jean
DoB: 23.04.1998

Name: Pierre
DoB: 14.02.1997

Name: Jean
DoB: 03.07.1996

Name: Jean
DoB: 12.07.1995

Name: Ludovic
Office: C.30

Name: Sébastien
Office: D.40

Forbidden: two children
with the same name
of the same professor