Example COMPANY Database

requirements

- **We need to create a database schema design based on the following (simplified) requirements of the COMPANY Database:**
  - The company is organized into DEPARTMENTs.
  - Each department has a name, number and an employee who *manages* the department.
  - We keep track of the start date of the department manager.
  - A department may have several locations.
  - Each department *controls* a number of PROJECTs. Each project has a unique name, unique number and is located at a single location.

Example COMPANY Database (Continued)

- The database will store each EMPLOYEE's social security number, address, salary, sex, and birthdate.
  - Each employee *works for* one department but may *work on* several projects.
  - The DB will keep track of the number of hours per week that an employee currently works on each project.
  - It is required to keep track of the *direct supervisor* of each employee.
- Each employee may *have* a number of DEPENDENTs.
  - For each dependent, the DB keeps a record of name, sex, birthdate, and relationship to the employee.

Example COMPANY Database (Continued)

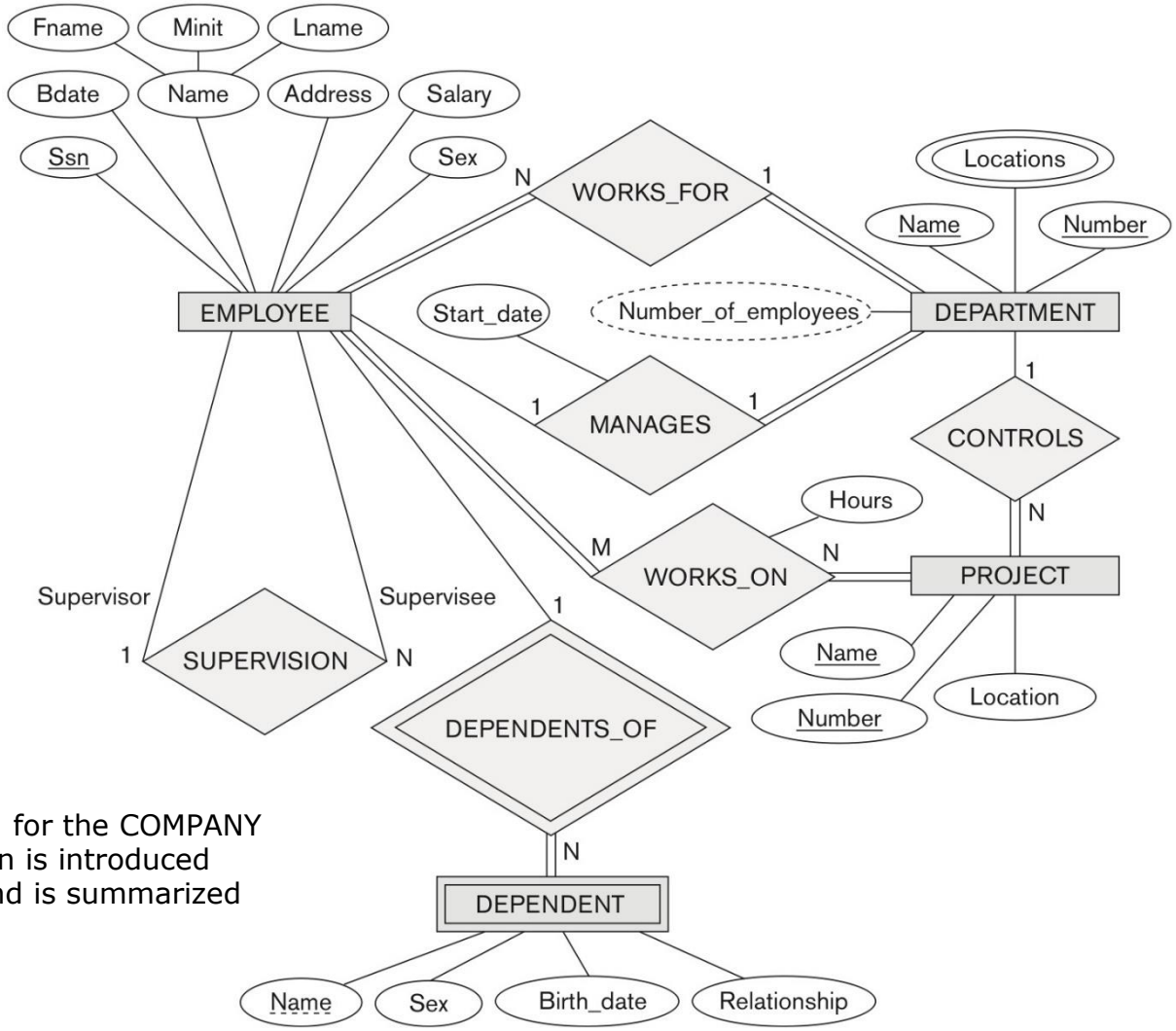
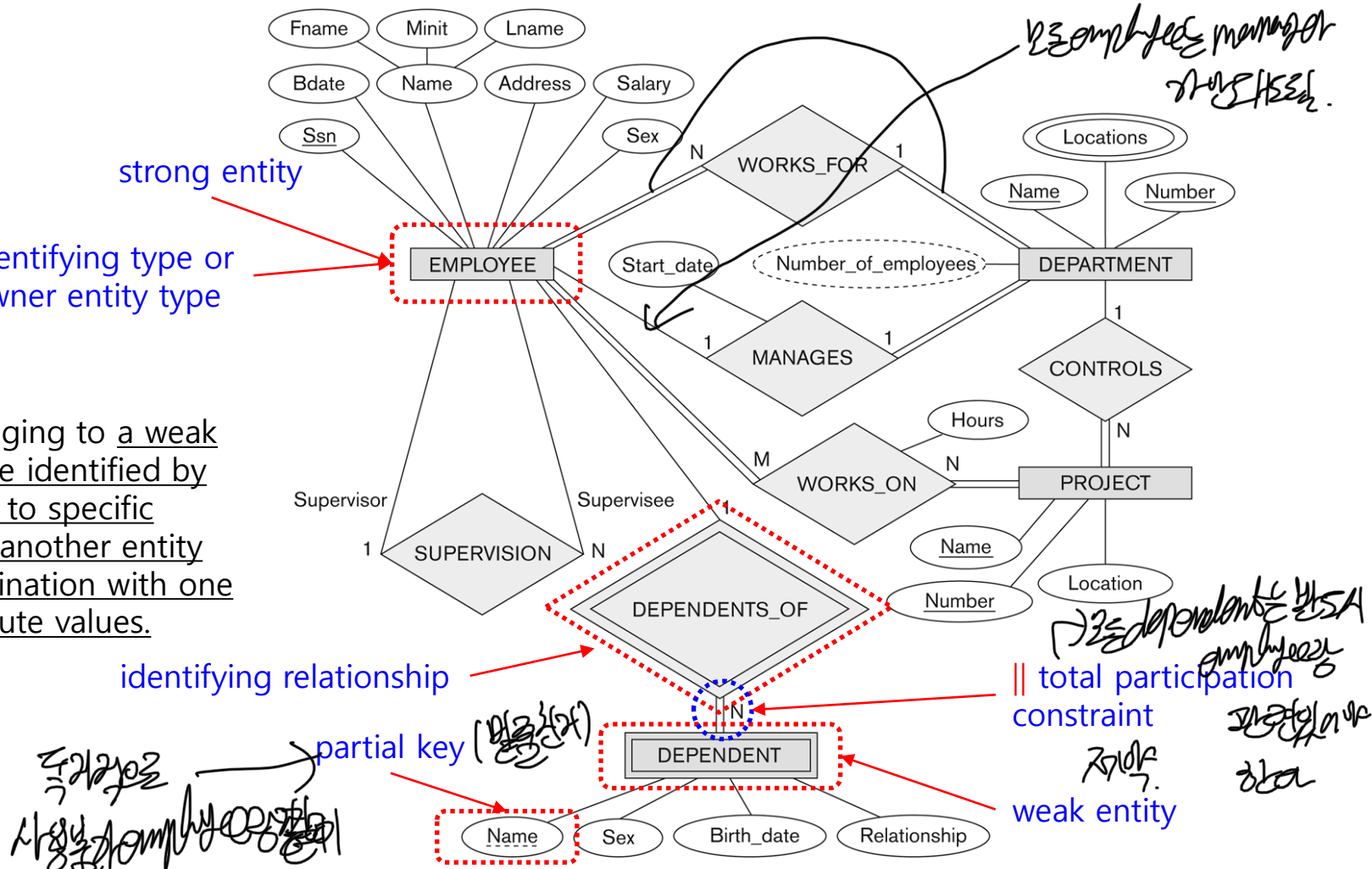


Figure 3.2 An ER schema diagram for the COMPANY database. The diagrammatic notation is introduced gradually throughout this chapter and is summarized in Figure 3.14.

Weak Entity Types



Entities belonging to a weak entity type are identified by being related to specific entities from another entity type in combination with one of their attribute values.

Figure 3.2
An ER schema diagram for the COMPANY database. The diagrammatic notation is introduced gradually throughout this chapter.

Attributes of Relationship types

- **A relationship type can have attributes:**
  - For example, HoursPerWeek of WORKS_ON
  - Its value for each relationship instance describes the number of hours per week that an EMPLOYEE works on a PROJECT.
    - A value of HoursPerWeek depends on a particular (employee, project) combination
  - Most relationship attributes are used with M:N relationships
    - In 1:N relationships, they can be transferred to the entity type on the N-side of the relationship

Example Attribute of a Relationship Type: Hours of WORKS_ON

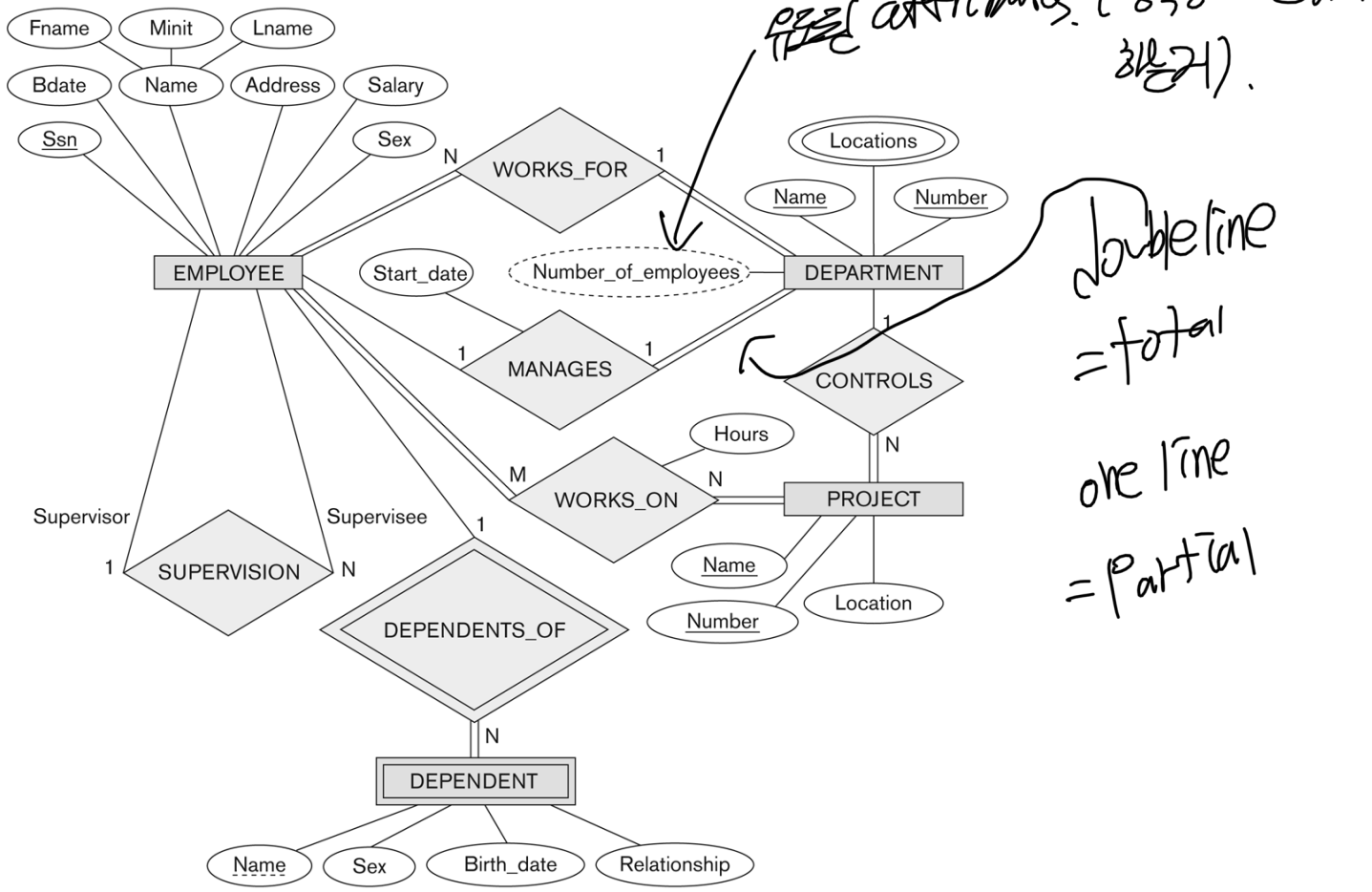
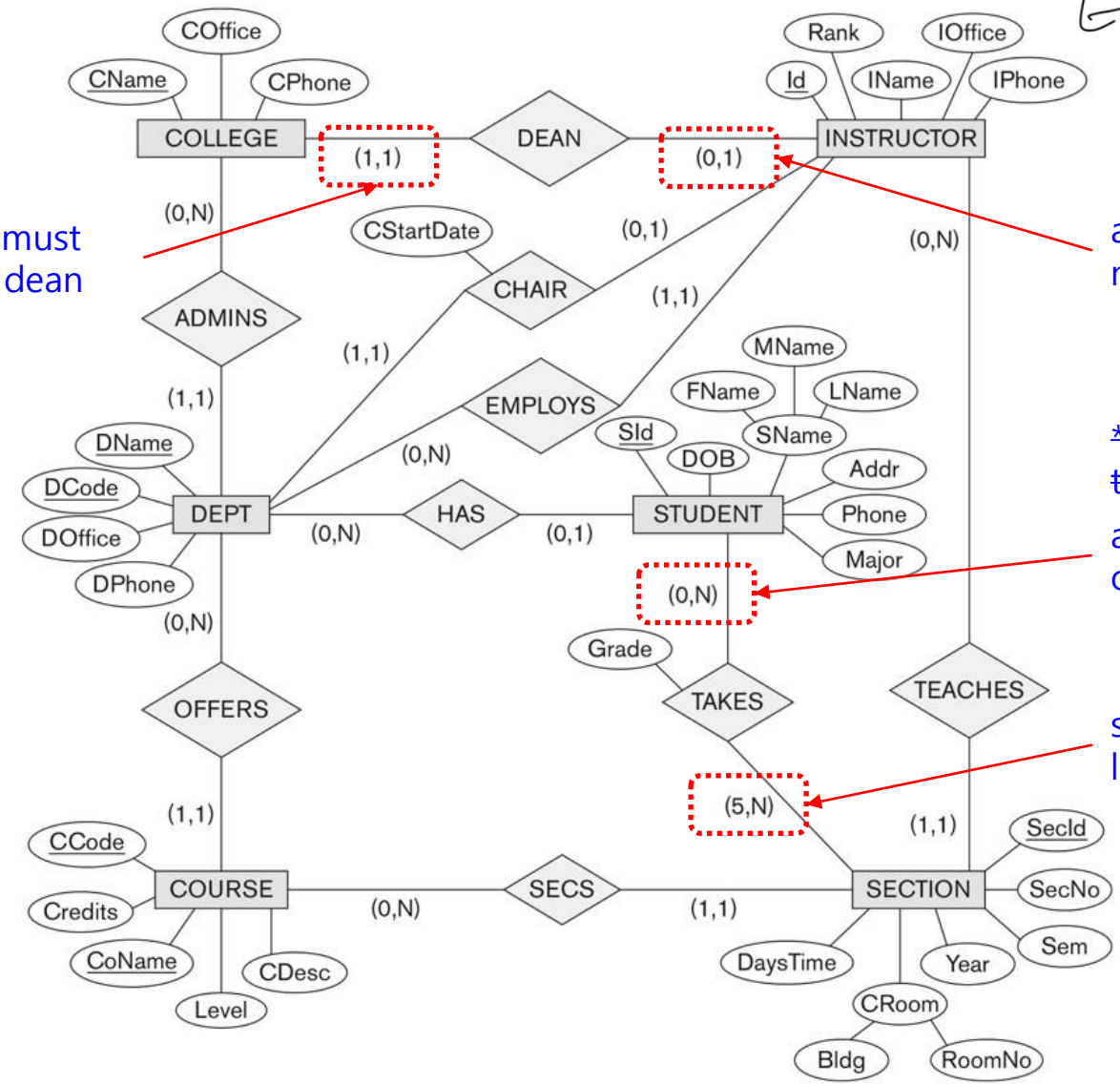


Figure 3.2
An ER schema diagram for the COMPANY database. The diagrammatic notation is introduced gradually throughout this chapter.

UNIVERSITY database conceptual schema

ER diagram



a college must have one dean

an instructor may or may not be a dean of a college

~~*(zero or more) students take section~~

a students takes *(zero or more) sections

section must have at least 5 students