Relationships Pt II

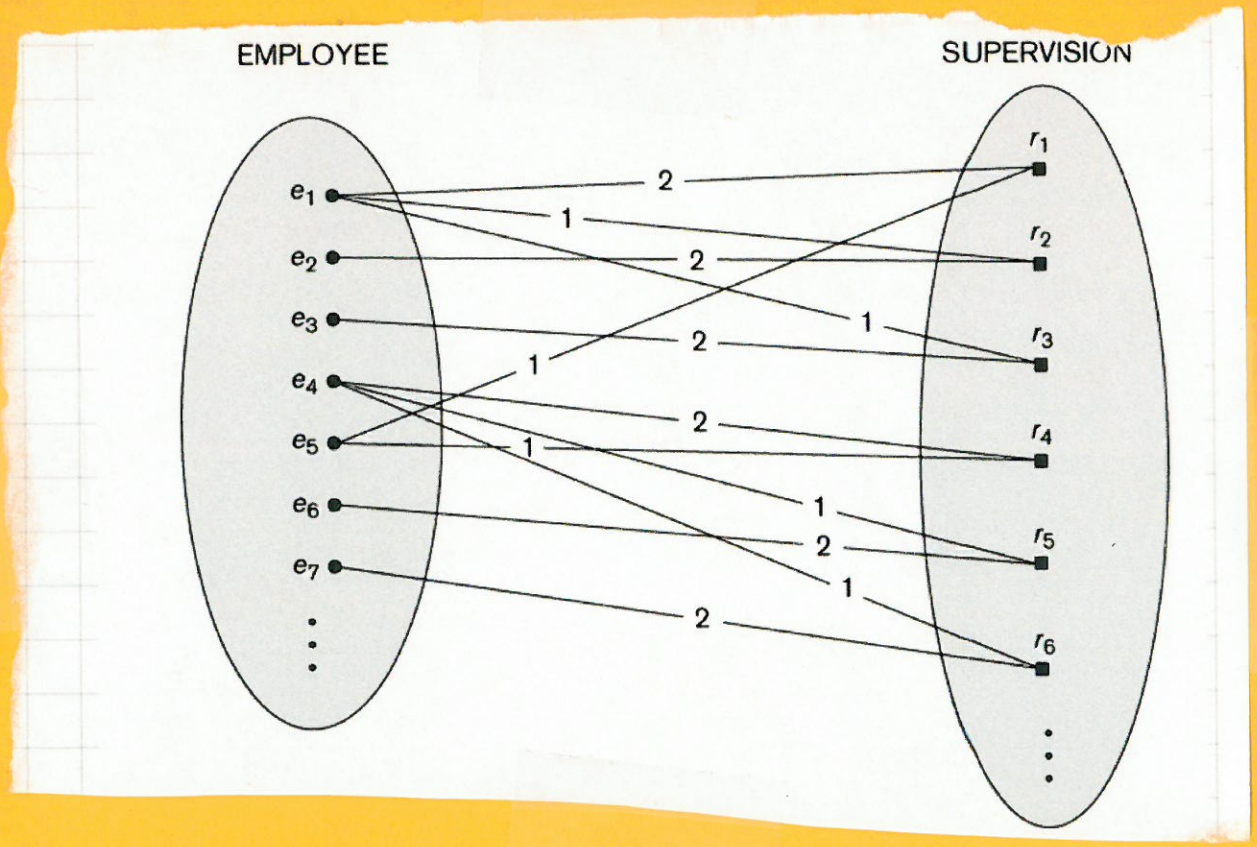
9/12

Relationships as attributes

Recursive Relationships

- relationship that is self referencing
  Eg. SUPERVISION

- role names to differentiate
  Supervisor (1) Supervisee (2)



Constraints on relationships

cardinality ratio: max number of relationship instances an entity can participat in

Eg: WORKS_FOR

DEPARTMENT : EMPLOYEE

employee may have 1 department → 1 : N ← department may have N employees

possible ratios:

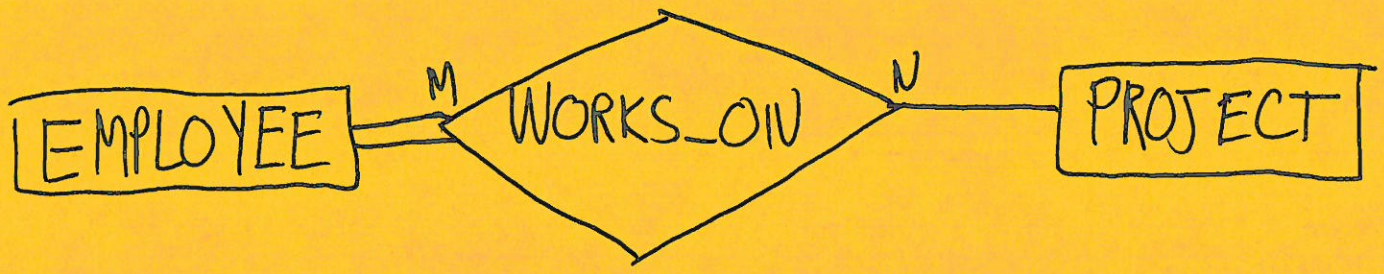
- 1 : 1
- 1 : N
- N : 1
- M : N

Participation constraints

- total: every entity must participate in relationship (e.g. works for)
- partial: some entities participate (e.g. manages)

In ER:

- total participation: double line
- partial participation: single line



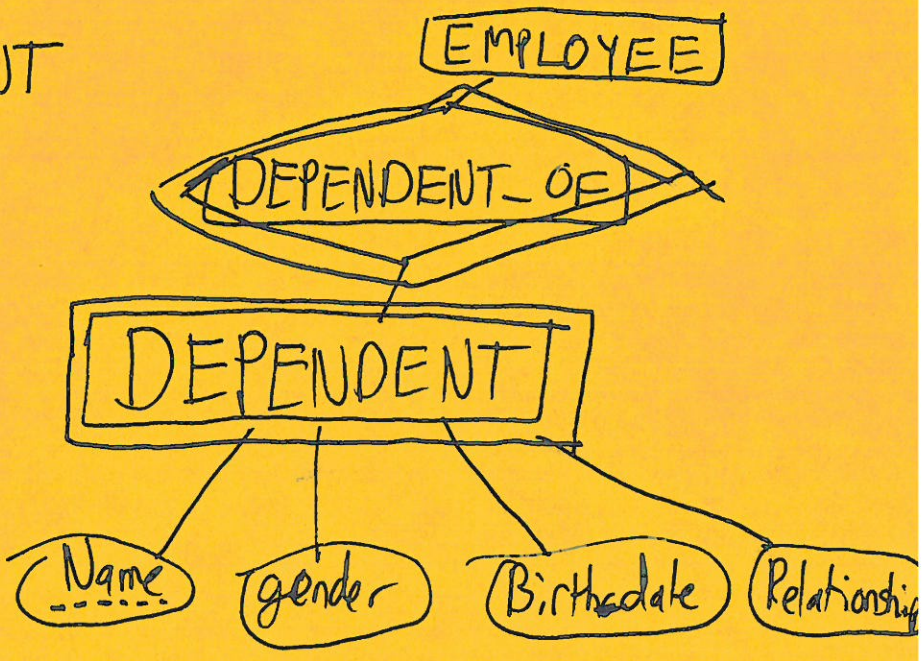
Weak Entity Types

Strong entity types: w/ key

Weak entity types: w/o a key

- identified from another entity type
- other entity is "owner"
- relationship is called identifying relationship
- always a total participation constraint w/ identifying relationship

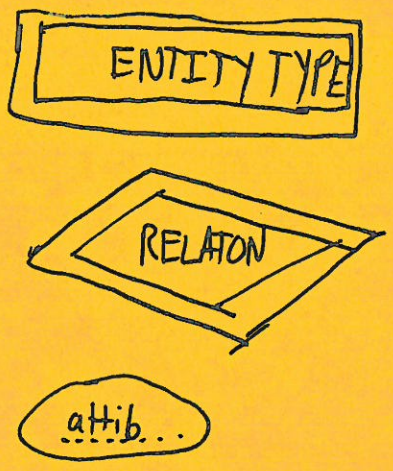
Ex DEPENDENT



partial key (discriminator): attribute that can uniquely identify a weak entity owned by same entity

ER diagram:

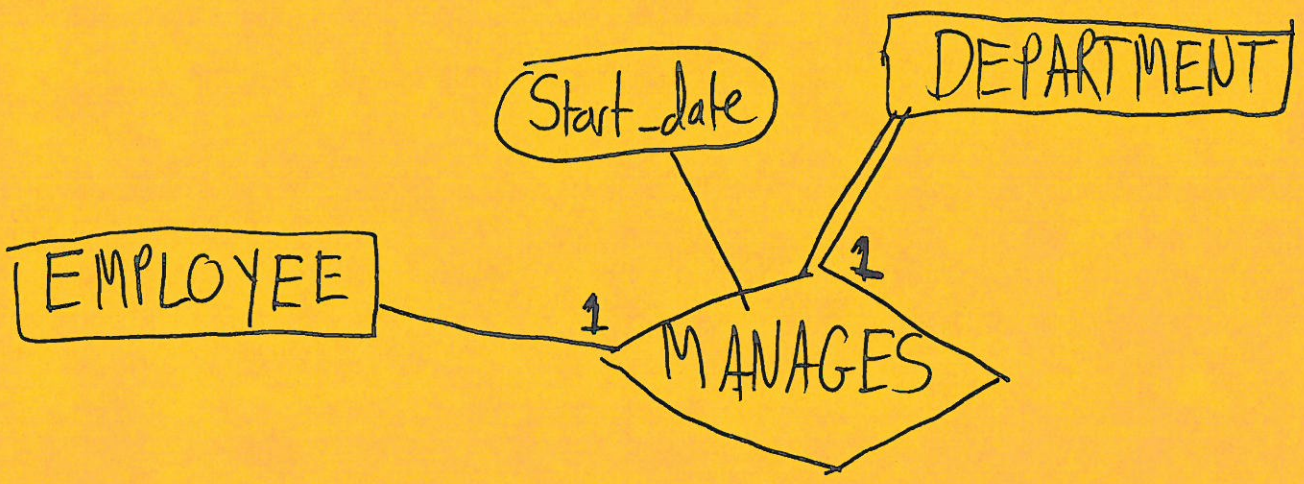
- weak entity type
- identify relationship
- partial key



Refine ER of Company DB

Manages :

- 1:1 EMPLOYEE:DEPARTMENT
- find out departments always have managers



Relationships to diagram

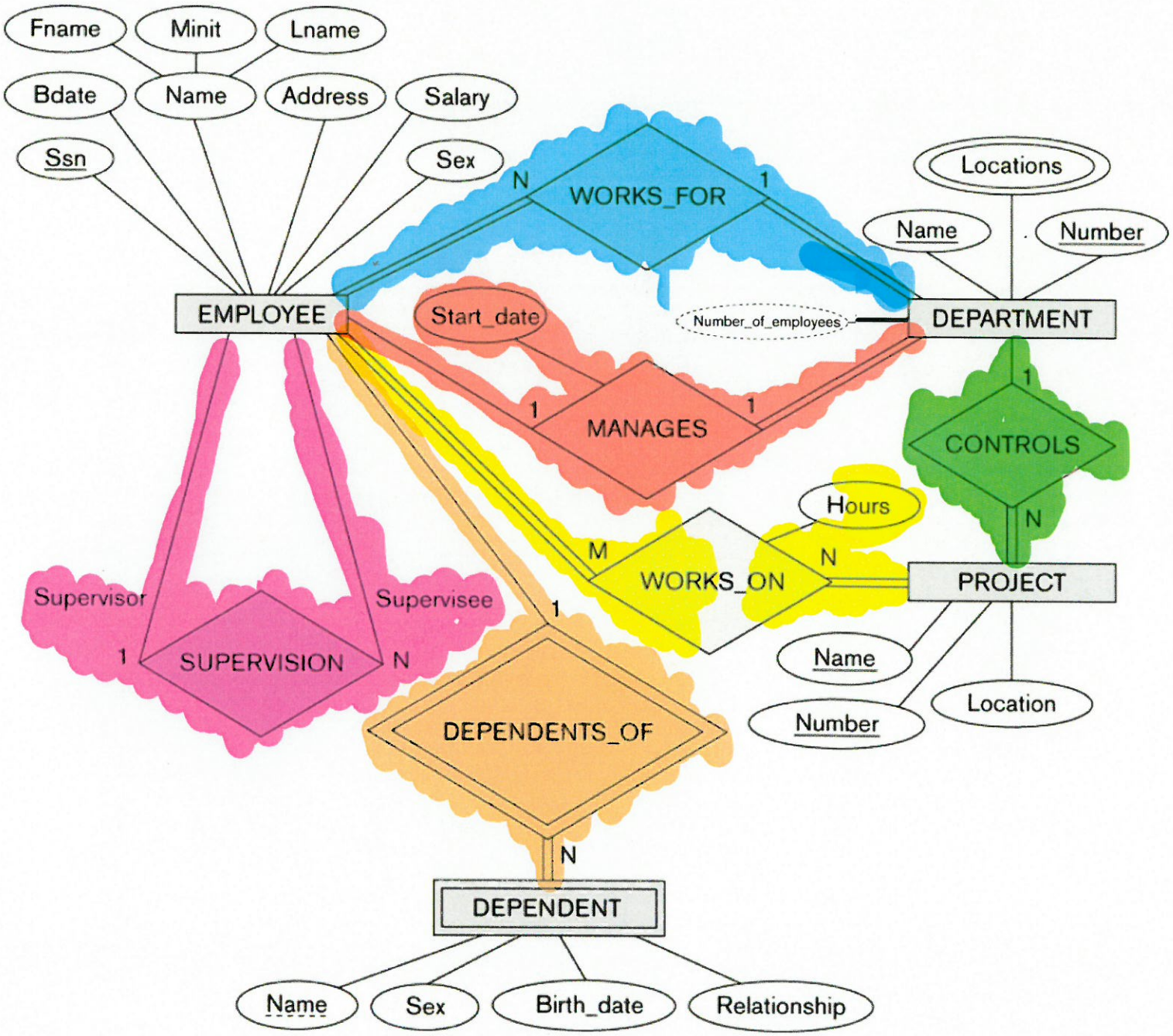
WORKS_FOR (DEPARTMENT & EMPLOYEE)
CONTROLS (PROJECT & DEPARTMENT)
SUPERVISION (EMPLOYEE & EMPLOYEE)
WORKS_ON (EMPLOYEE & PROJECT)
DEPENDENTS_OF (EMPLOYEE & DEPENDENT)

Note questions for missing info to follow up (and make up answers)

SUPERVISION

- 1 : N EMPLOYEE (supervisor) : EMPLOYEE (supervisee)

- Question: does every employee supervise someone Ans: No .. partial participati
- Question: every employee have a supervisor? Ans: No ... partial


Fname
Minit
Lname
Bdate
Name
Address
Salary
Ssn
Sex
N
WORKS_FOR
1
Locations
Name
Number
EMPLOYEE
Start_date
Number_of_employees
DEPARTMENT
1
MANAGES
1
1
CONTROLS
N
Hours
M
N
WORKS_ON
PROJECT
Supervisor
Supervisee
1
SUPERVISION
N
1
Name
Location
Number
DEPENDENTS_OF
N
DEPENDENT
Name
Sex
Birth_date
Relationship

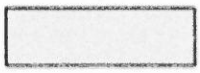
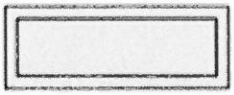
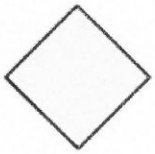
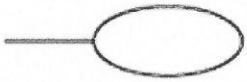
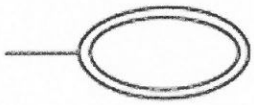
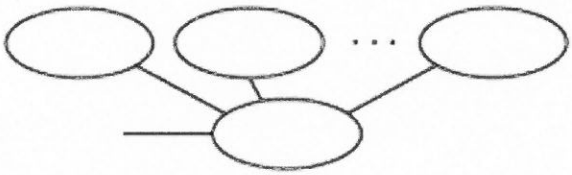
37: Summary

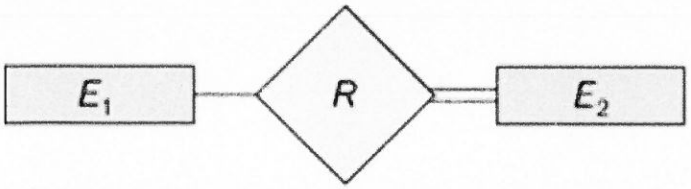
pick names that are meaningful, use consistent style

Naming (suggested by book)

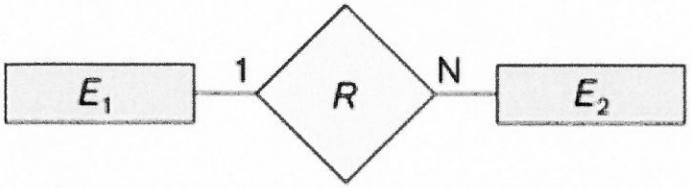
- entity types are singular
- entity and relationship types are UPPER_CASE
- attributes are Title_snake_case
- nouns for entity type names
- verbs for relationships
- nouns for attributes describing other nouns (entity types)

Notation (suggested by book, others exist as well)

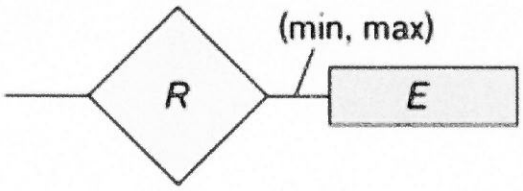
Symbol	Meaning
	Entity
	Weak Entity
	Relationship
	Indentifying Relationship
	Attribute
	Key Attribute
	Multivalued Attribute
	Composite Attribute
	Derived Attribute



Total Participation of E_2 in R



Cardinality Ratio 1: N for $E_1 : E_2$ in R



Structural Constraint (min, max) on Participation of E in R