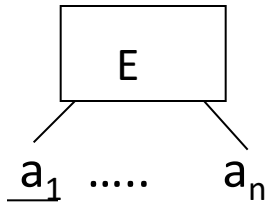
ER to Relational Mapping (Part II)

What We have Learned?

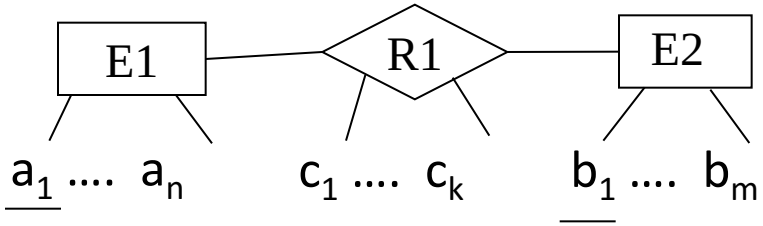
E/R diagram

Relational schema, e.g.

account=(bname, acct_no, bal)



E = (a_1, …, a_n)

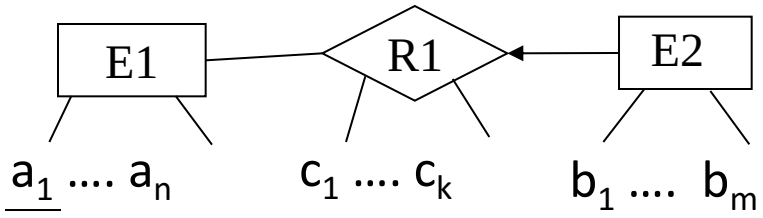


Many-to-many relationship:

R1= (a_1, b_1, c_1, …, c_k)

More on relationships

- 1-many relationship:

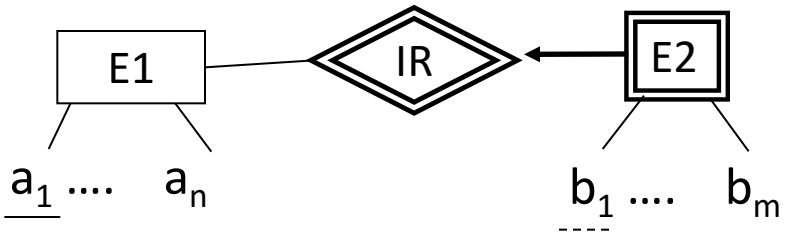


- Could have : R1= (a_1, $\underline{b_1}$, c_1, …, c_k)

- Usual strategy:
  - Don't construct a table for R1
  - Add a1, c1, …., ck to E2 instead, i.e.
  - E2= ($\underline{b_1}$, …., b_m, a_1, c_1, …, c_k)

E/R to Relational

- Weak entity sets

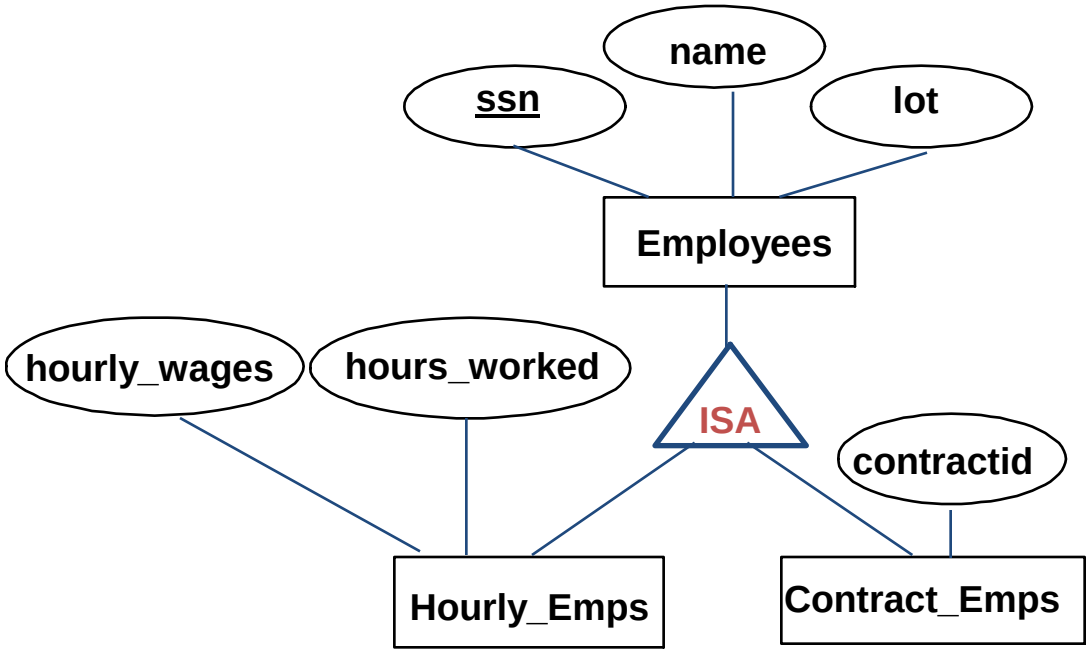


E1 = ($\underline{a_1}$, …, a_n)

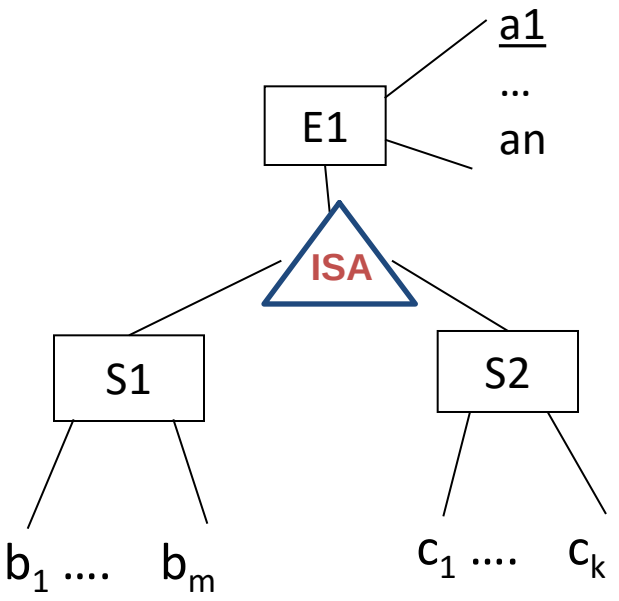
E2 = ($\underline{a_1}$, $\underline{b_1}$, …, b_m)

Review: ISA Hierarchies

- As in C++, or other PLs, attributes are inherited.
- If we declare A **ISA** B, every A entity is also considered to be a B entity.



Translating ISA Hierarchies to Relations



Method 1: $E = (\underline{a_1}, \ldots, a_n)$

$S1 = (\underline{a_1}, b_1, \ldots, b_m)$

$S2 = (\underline{a_1}, c_1 \ldots, c_k)$

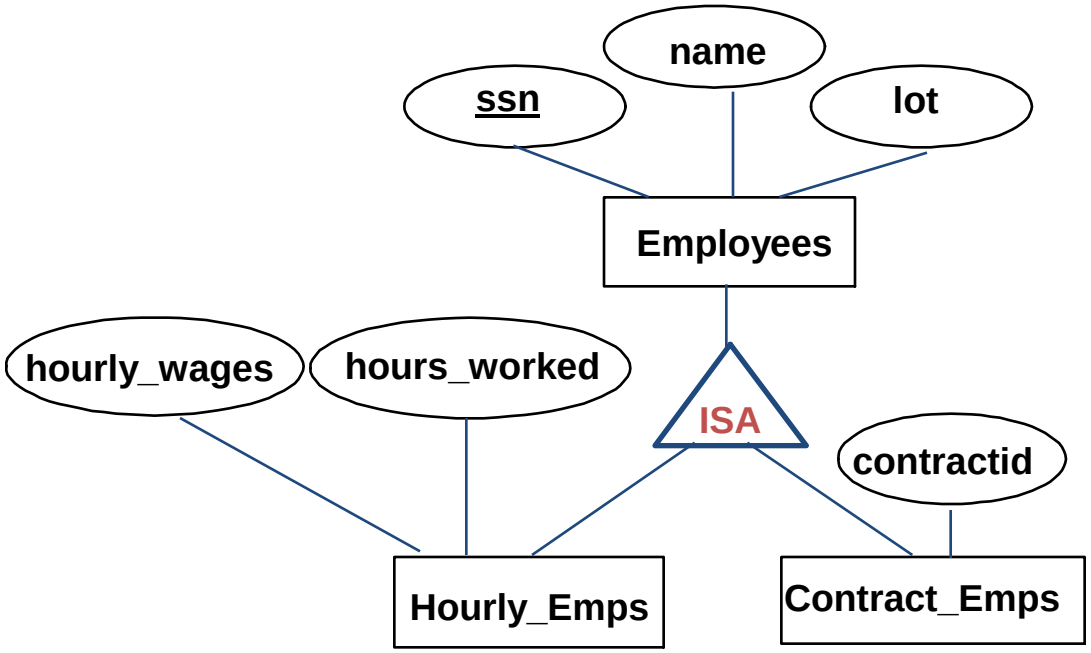
Method 2:

$S1 = (\underline{a_1}, \ldots, a_n, b_1, \ldots, b_m)$

$S2 = (\underline{a_1}, \ldots, a_n, c_1 \ldots, c_k)$

Q: When method 2 is wrong?
(tip: think about the covering constraint)

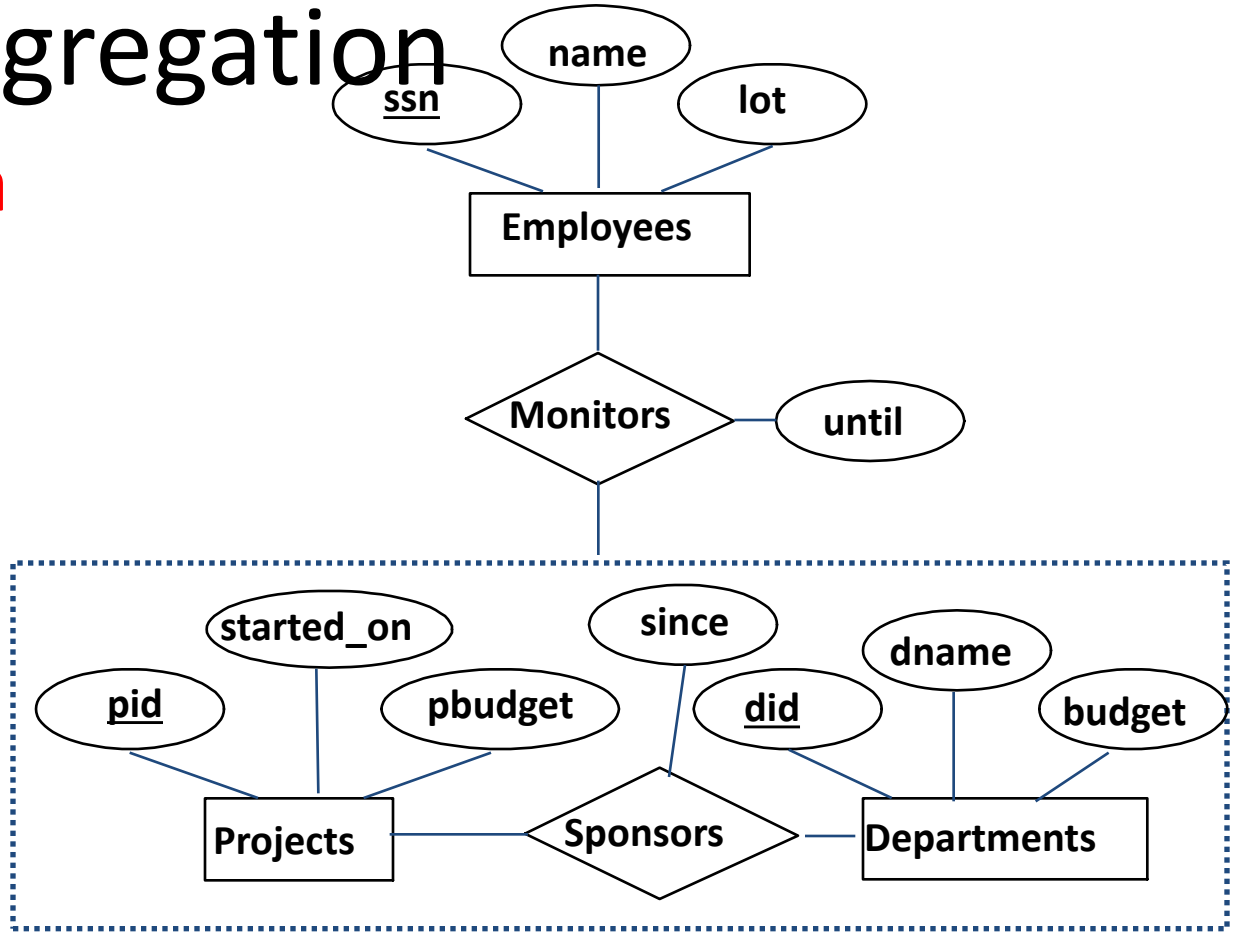
Example: Translating ISA Hierarchies to Relations



- *Approach 1:*
  - 3 relations: Employees, Hourly_Emps and Contract_Emps.
- Approach 2: Just Hourly_Emps and Contract_Emps.

Review: Aggregation

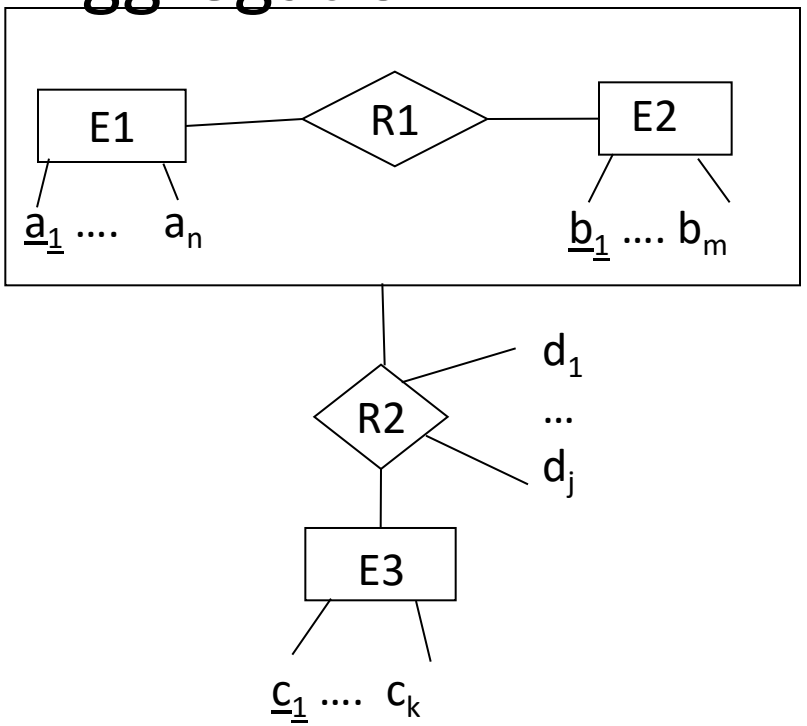
Allows us to treat a relationship set as an entity set for purposes of participation in (other) relationships.



Describes relationship among relationships

Translating Aggregation to Relation

- Aggregation

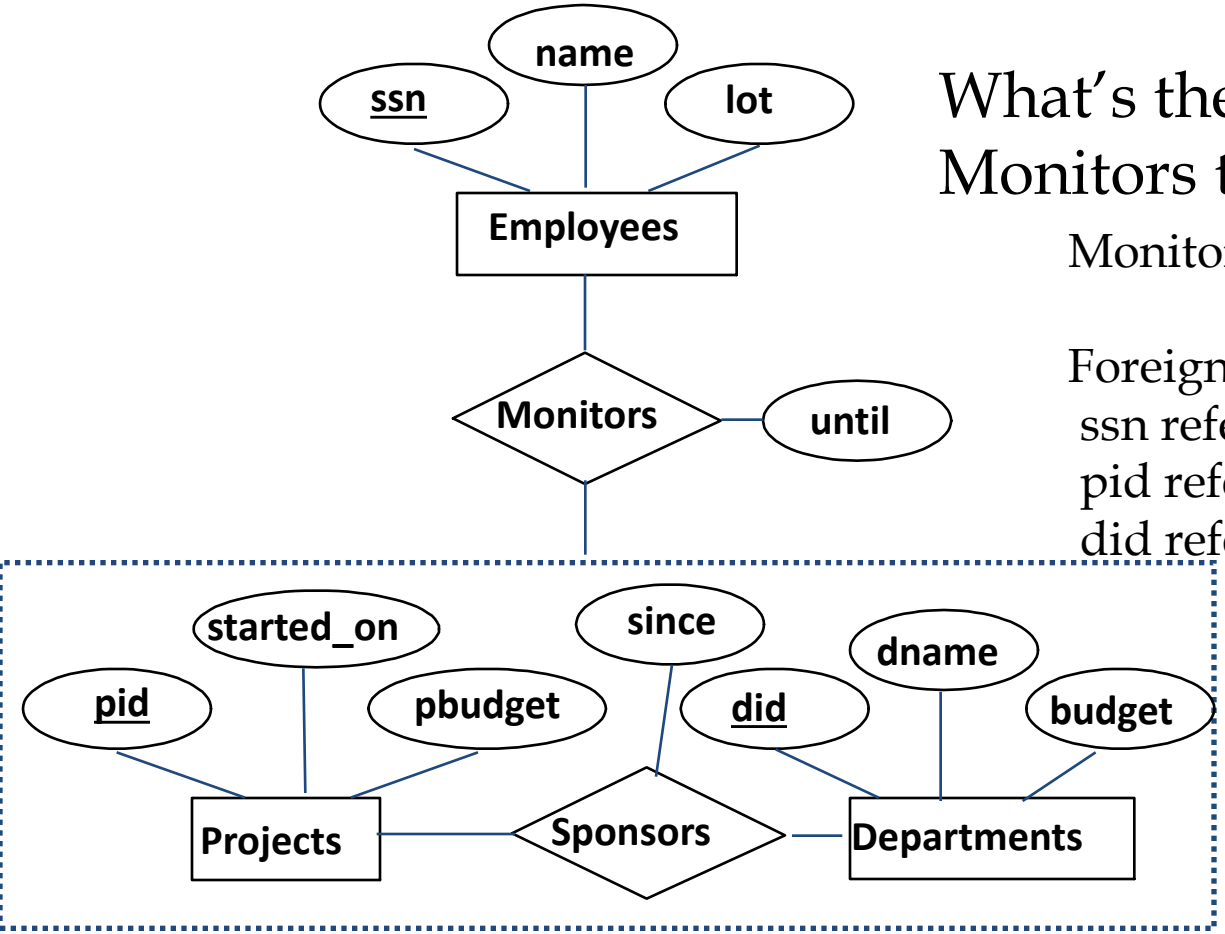


E1, R1, E2, E3 as before

R2 = ($\underline{c_1}$, $\underline{a_1}$, $\underline{b_1}$, d_1, …, d_j)

Foreign keys:
$\underline{a_1}$ (reference table E1),
$\underline{b_1}$ (reference table E2),
$\underline{c_1}$ (reference table E3).

Example: Translating Aggregation to Relation



What's the schema of the Monitors table?

Monitors (<u>pid, did, ssn</u>, until)

Foreign keys:
ssn references Employees,
pid references Projects,
did references Departments

ER to Relational
In-class Exercise
(Hand-out)