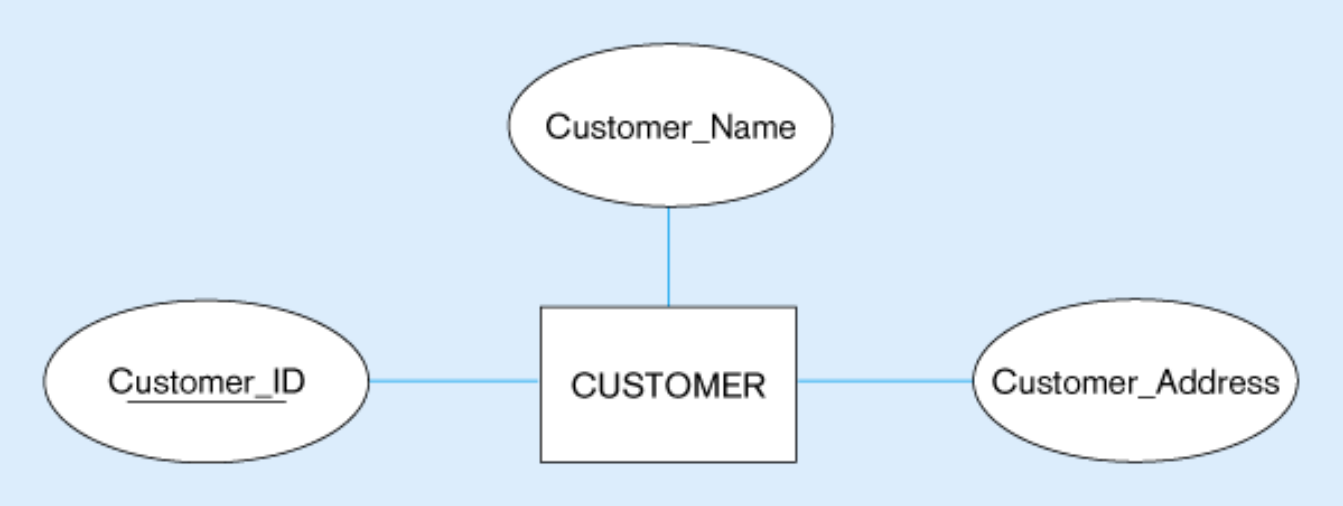
Transforming ERD into Relations

Mapping a regular entity

CUSTOMER entity type with simple attributes



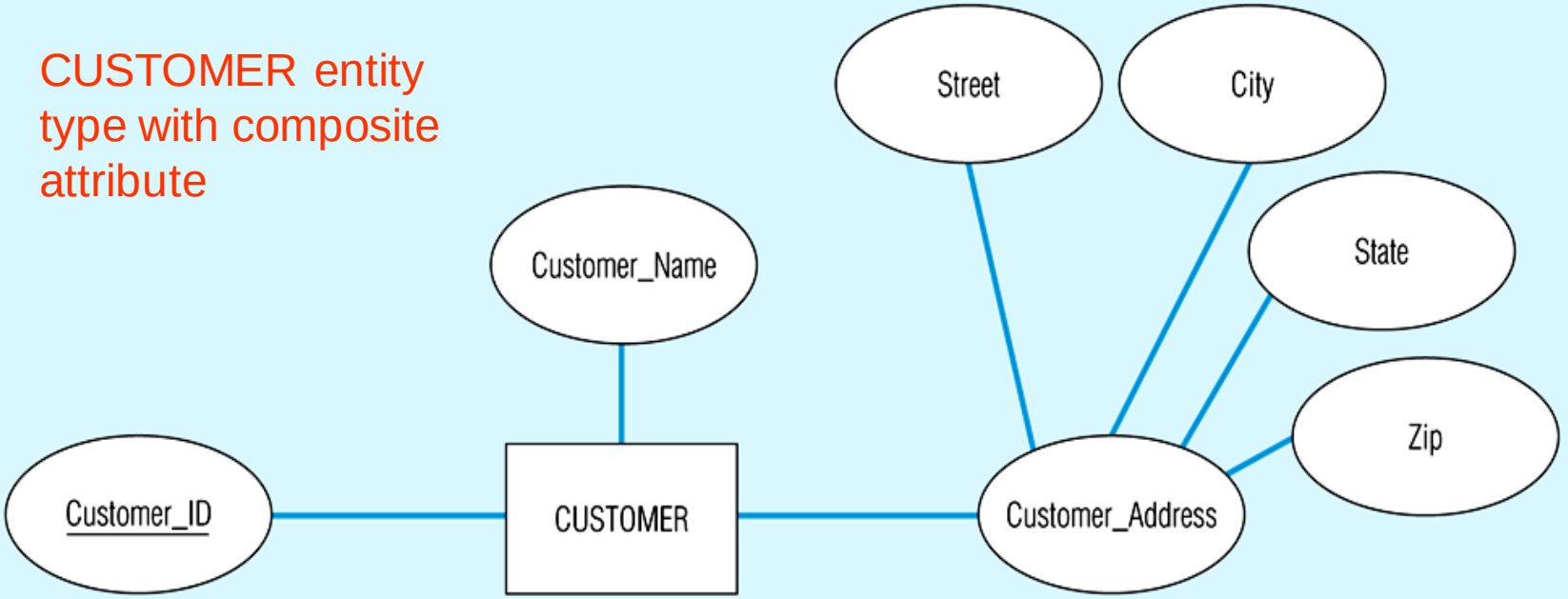
CUSTOMER relation

CUSTOMER

Customer_ID	Customer_Name	Customer_Address

Mapping a composite attribute

CUSTOMER entity type with composite attribute

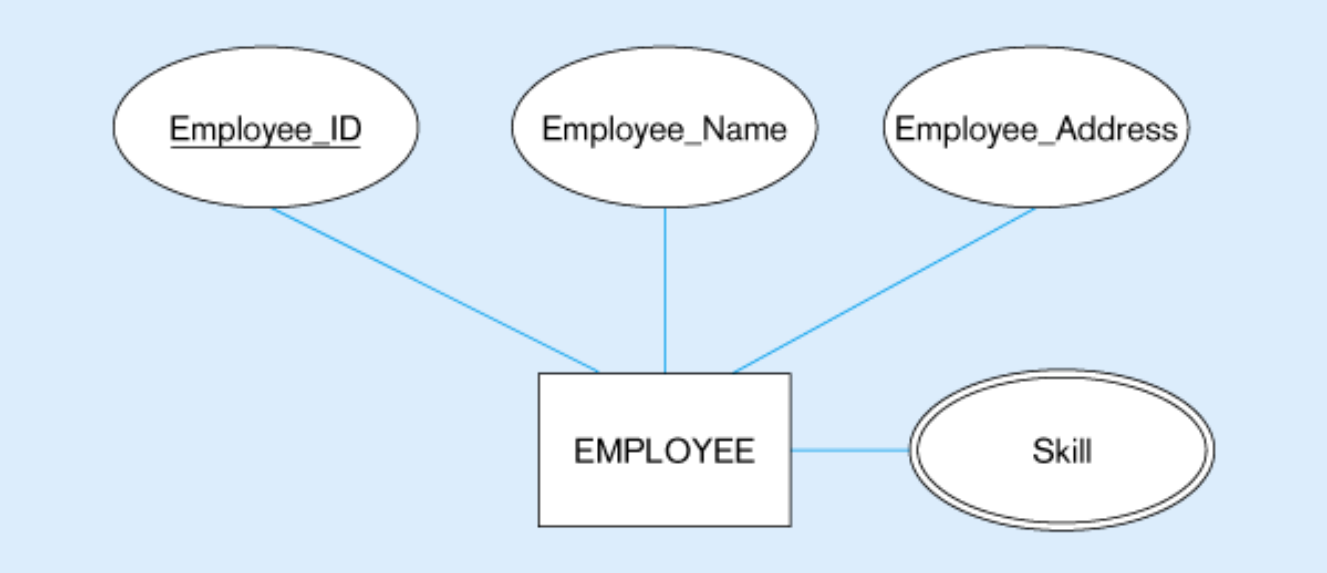


CUSTOMER relation with address detail

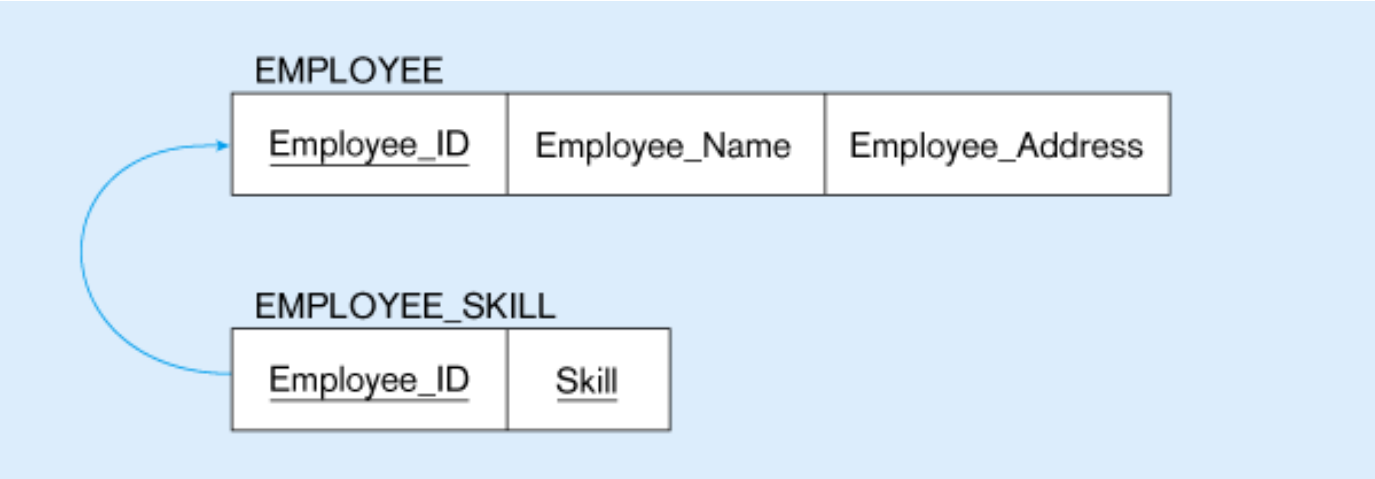
CUSTOMER

Customer_ID	Customer_Name	Street	City	State	Zip

Mapping a multivalued attribute



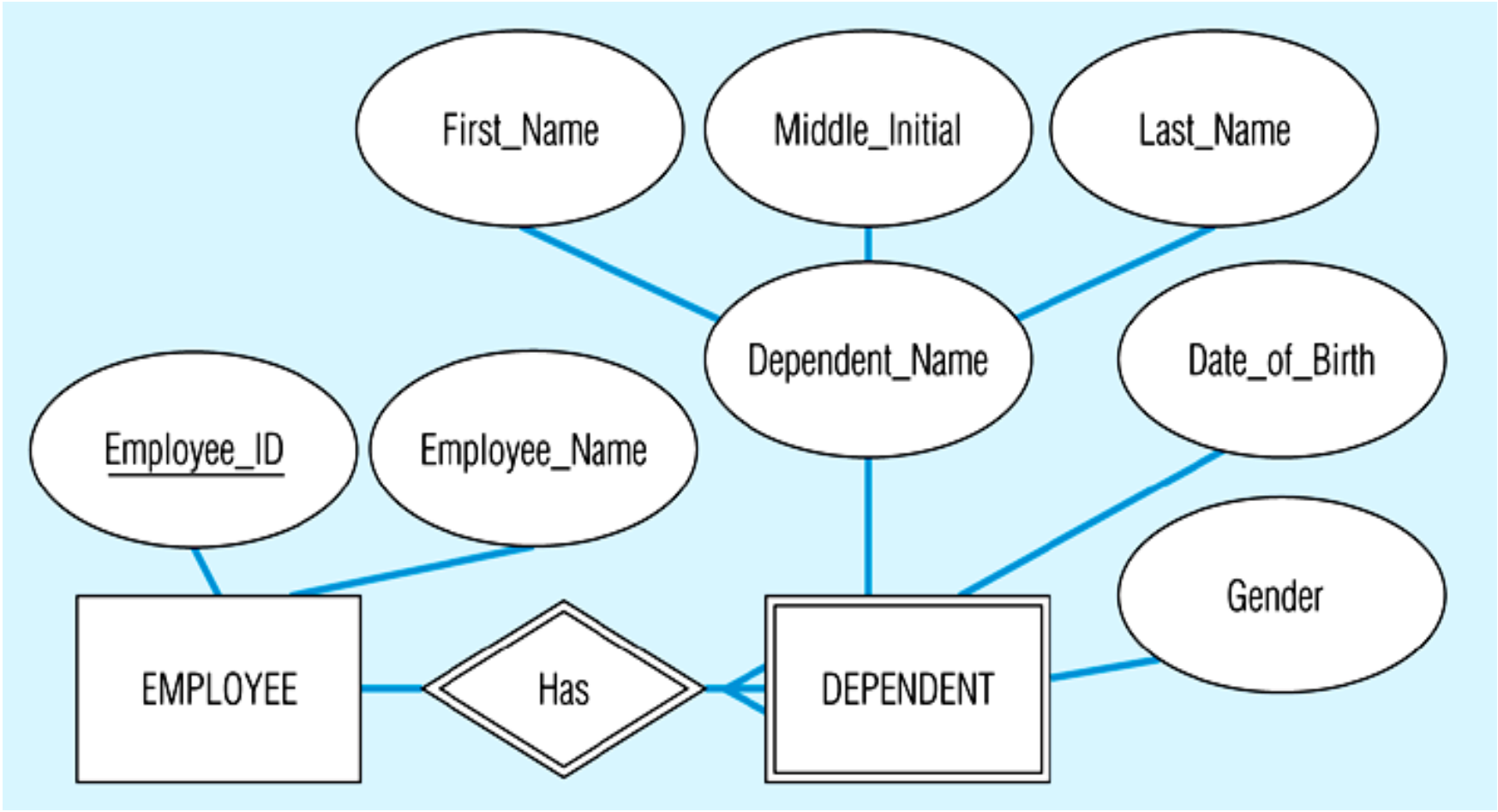
Multivalued attribute becomes a separate relation with foreign key



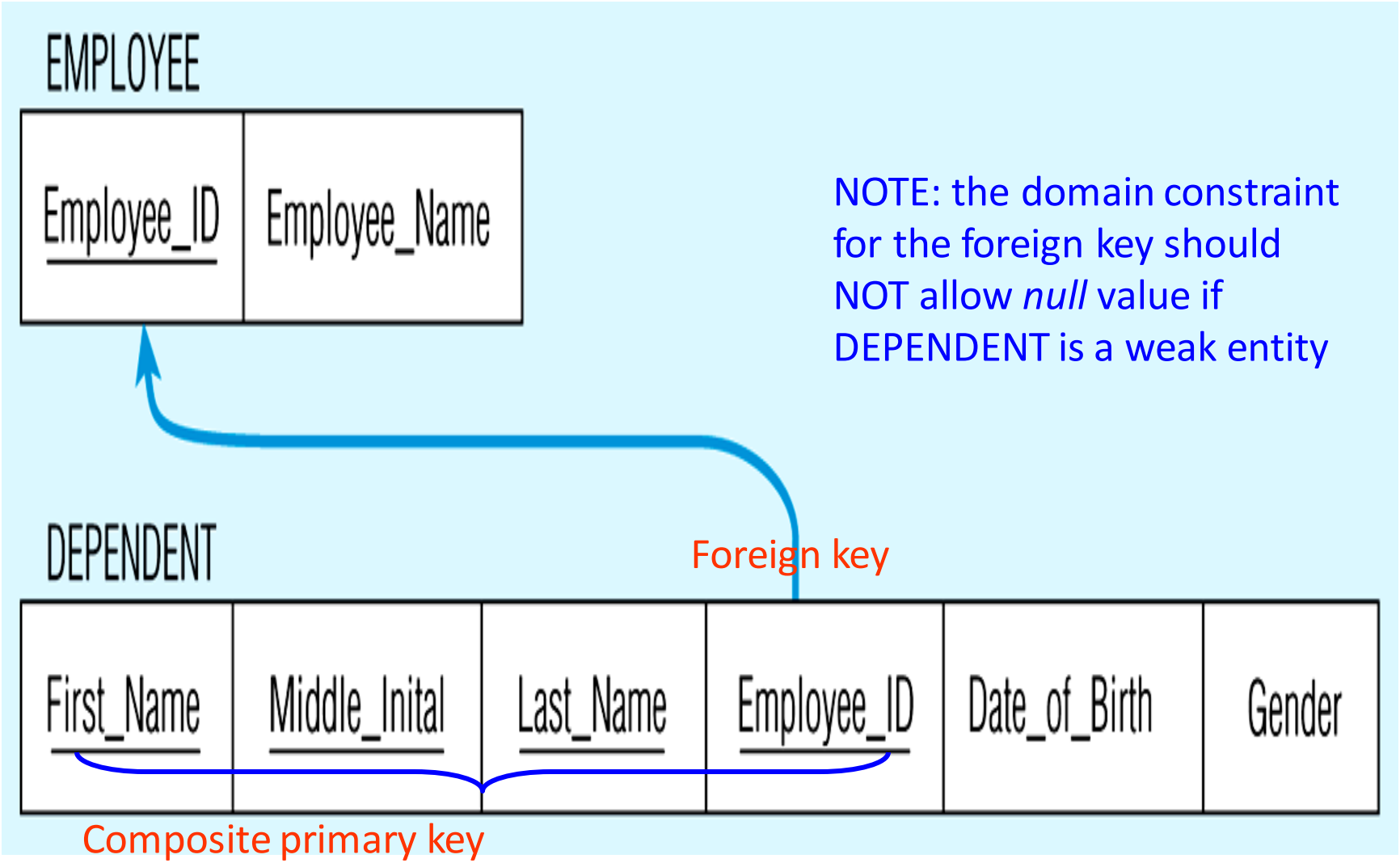
1 – to – many relationship between original entity and new relation

Example of mapping a weak entity

Weak entity DEPENDENT

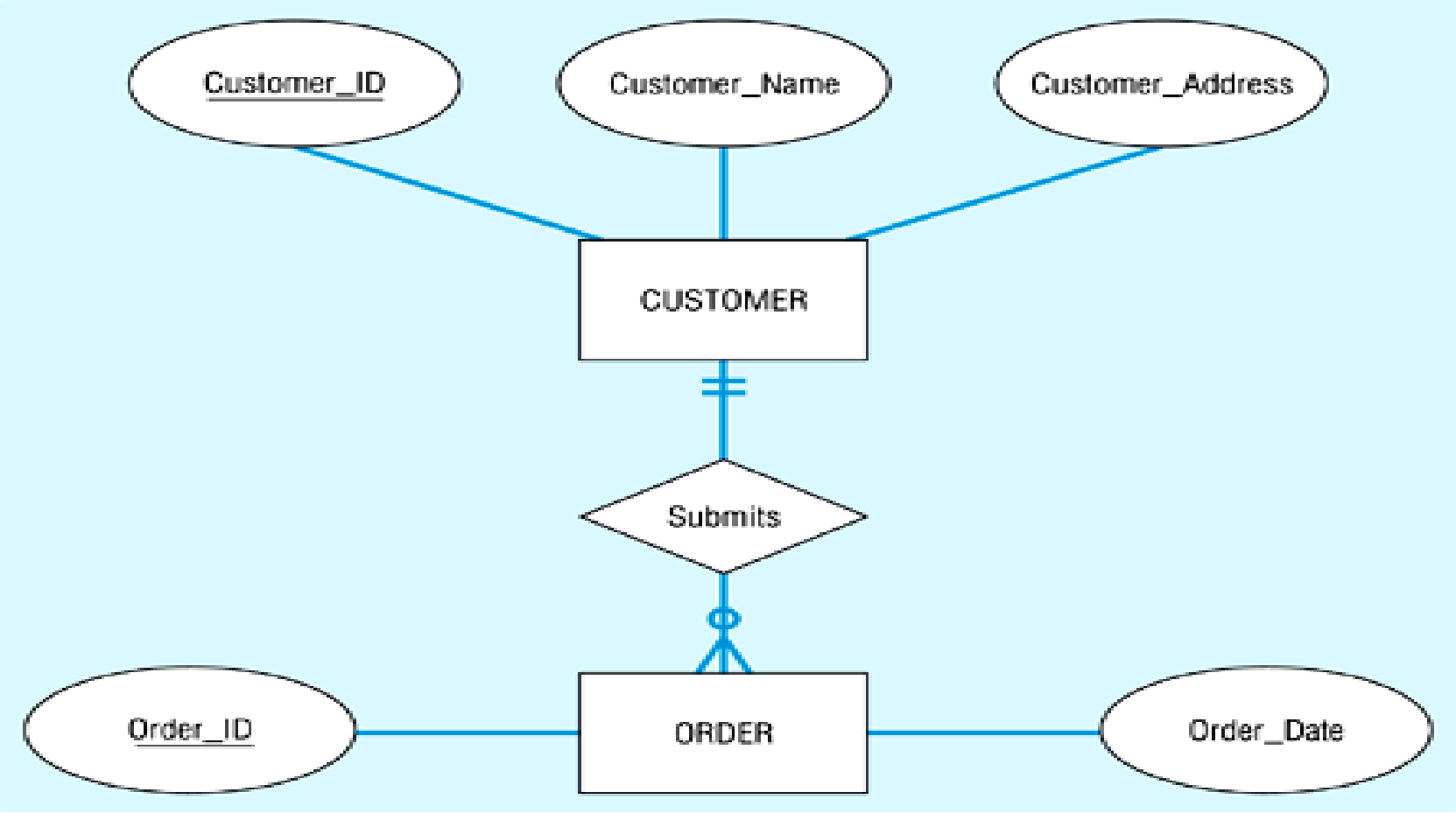


Relations resulting from weak entity

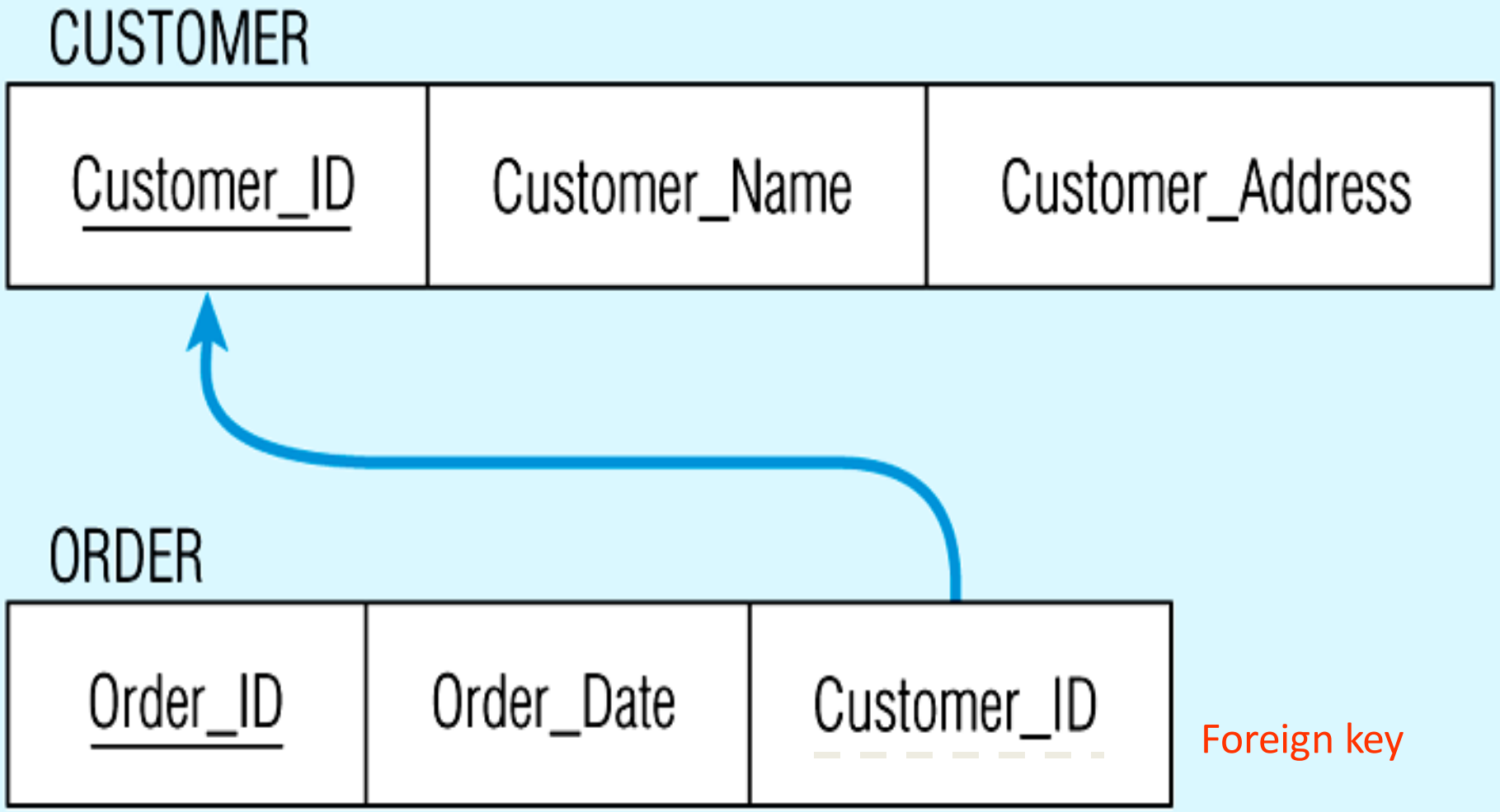


Example of mapping a 1:M relationship

Relationship between customers and orders

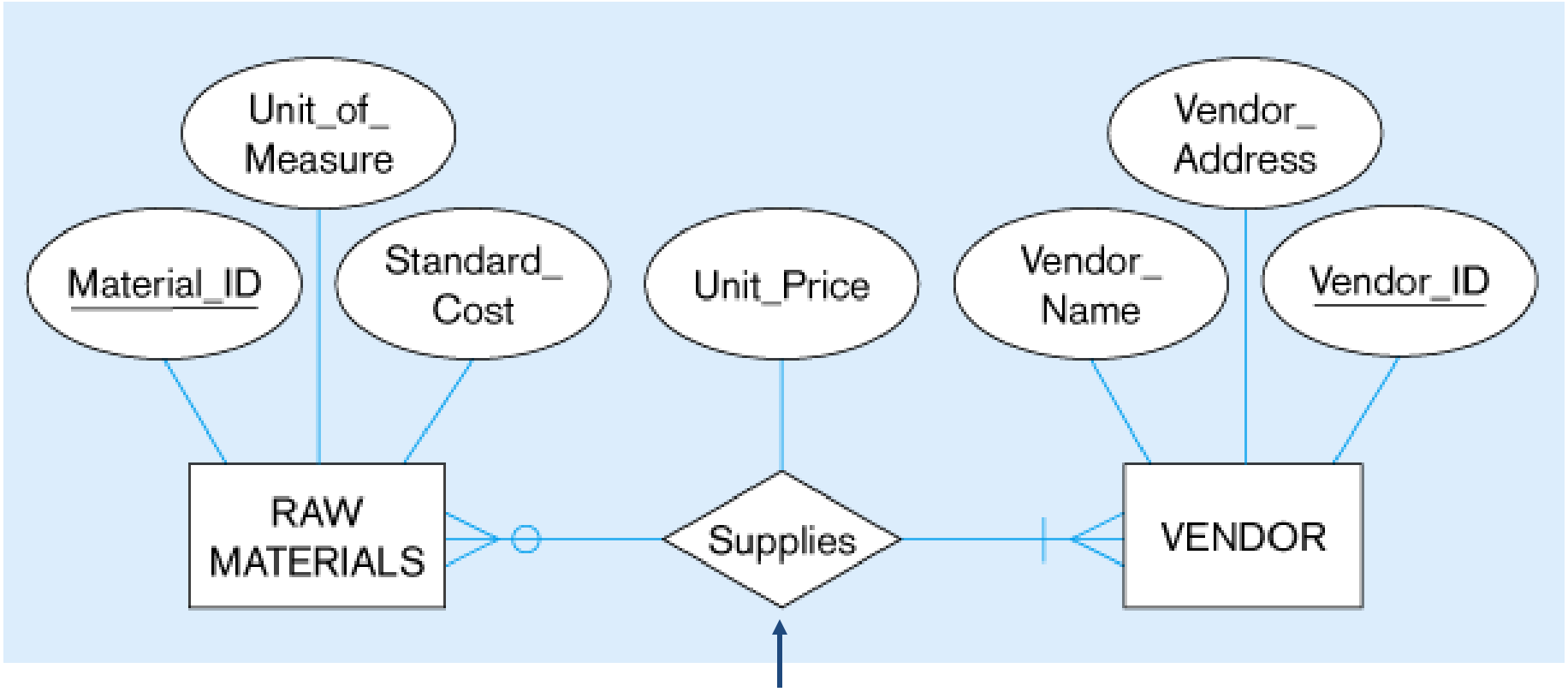


Mapping the relationship



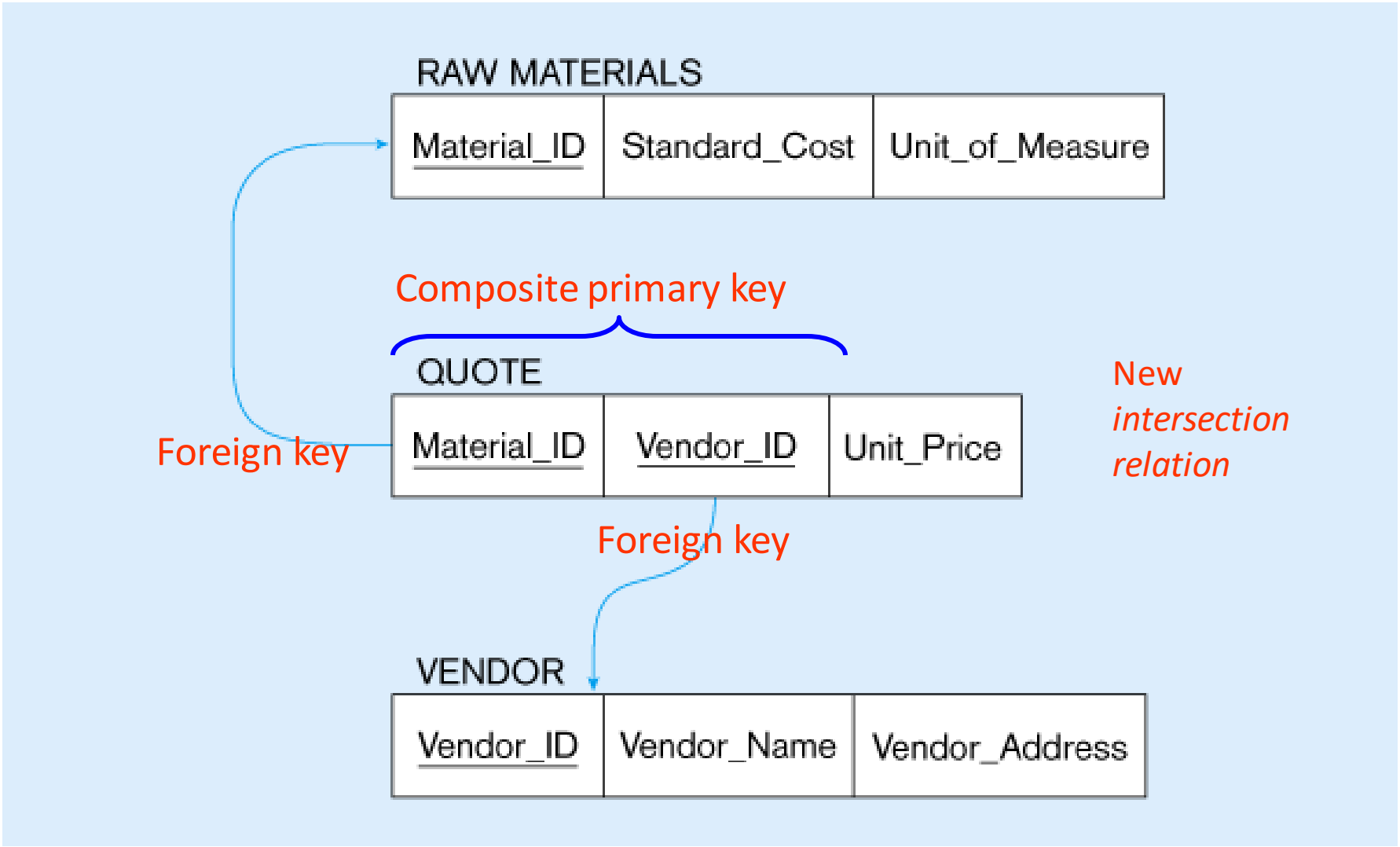
Example of mapping an M:N relationship

ER diagram (M:N)

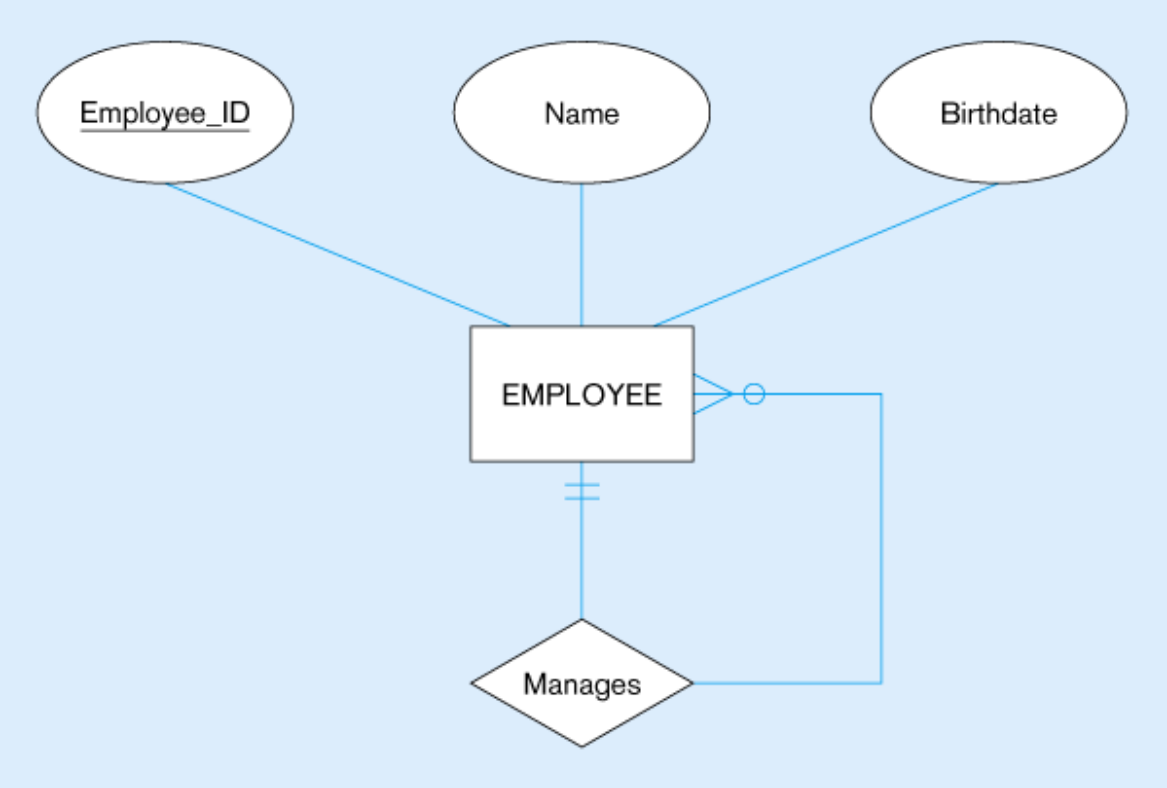


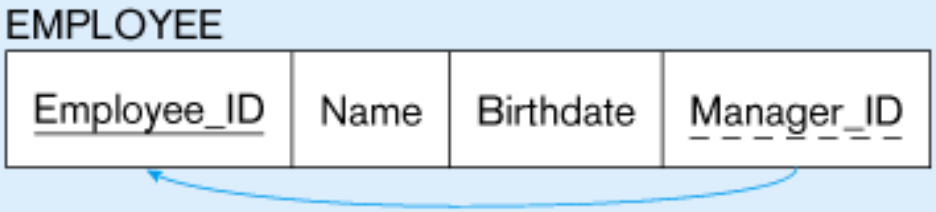
The *Supplies* relationship will need to become a separate relation

Three resulting relations

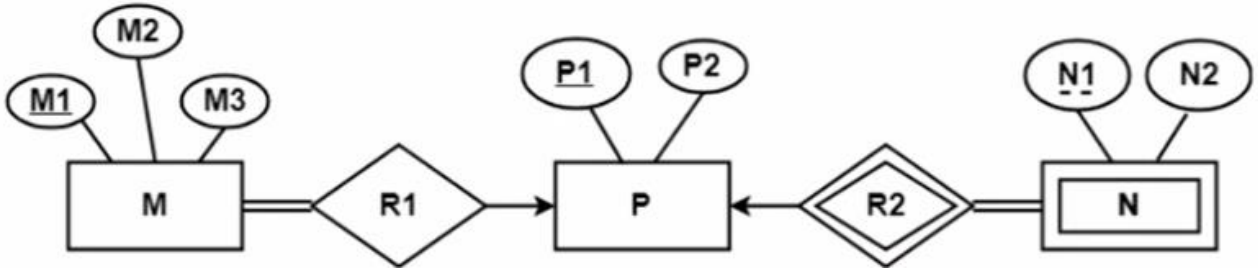


Mapping a unary 1:N relationship





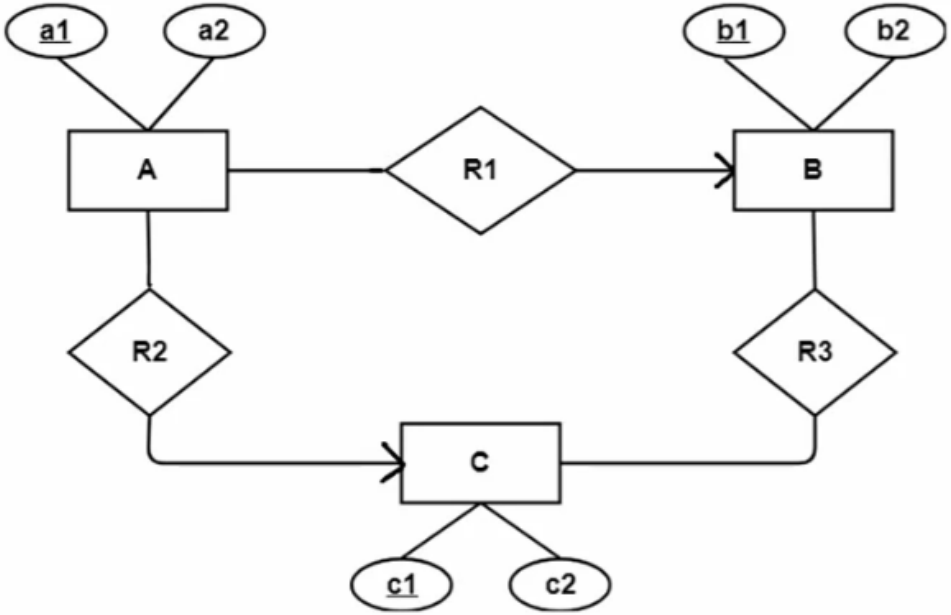
Find the minimum number of tables required for the following ER diagram in relational model



Minimum 3 tables will be required-

1. MR1 (M1 , M2 , M3 , P1)
2. P (P1 , P2)
3. NR2 (P1 , N1 , N2)

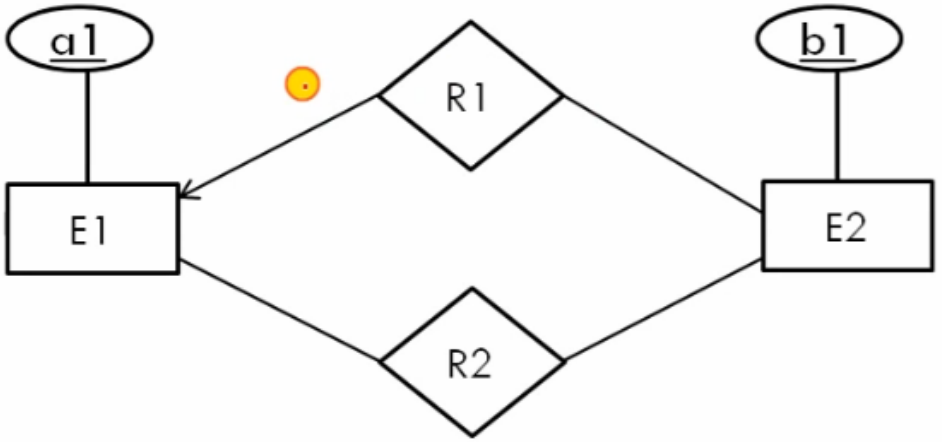
Find the minimum number of tables required for the following ER diagram in relational model



Minimum 4 tables will be required:

1. AR1R2 (a1 , a2 , b1 , c1)
2. B (b1 , b2)
3. C (c1 , c2)
4. R3 (b1 , c1)

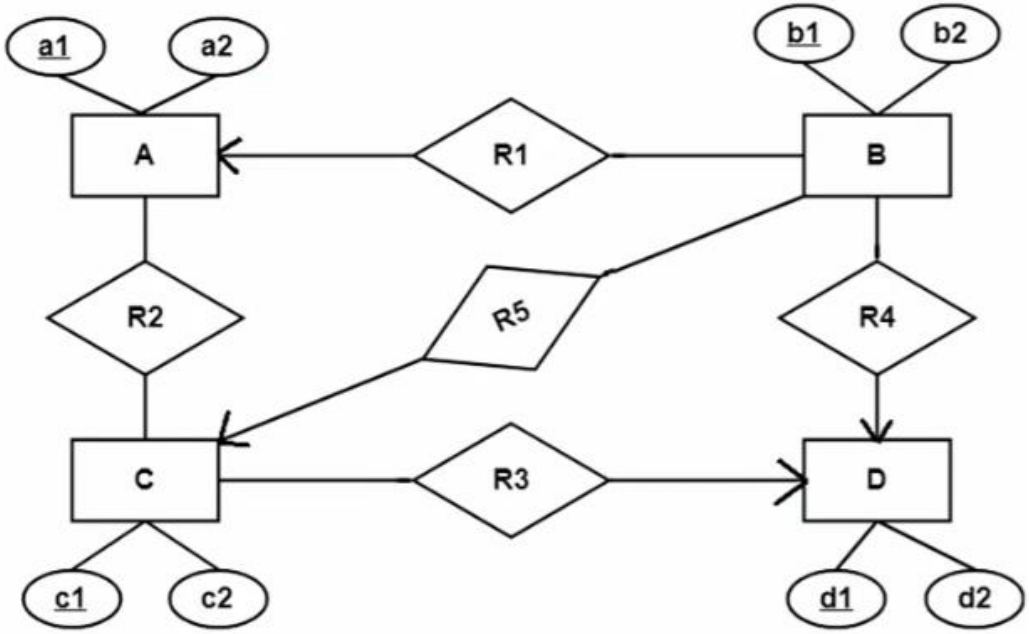
Find the minimum number of tables required for the following ER diagram in relational model



Three tables will be formed

1. E1(a1)
2. E2R1 (b1, a1)
3. R2 (a1, b1)

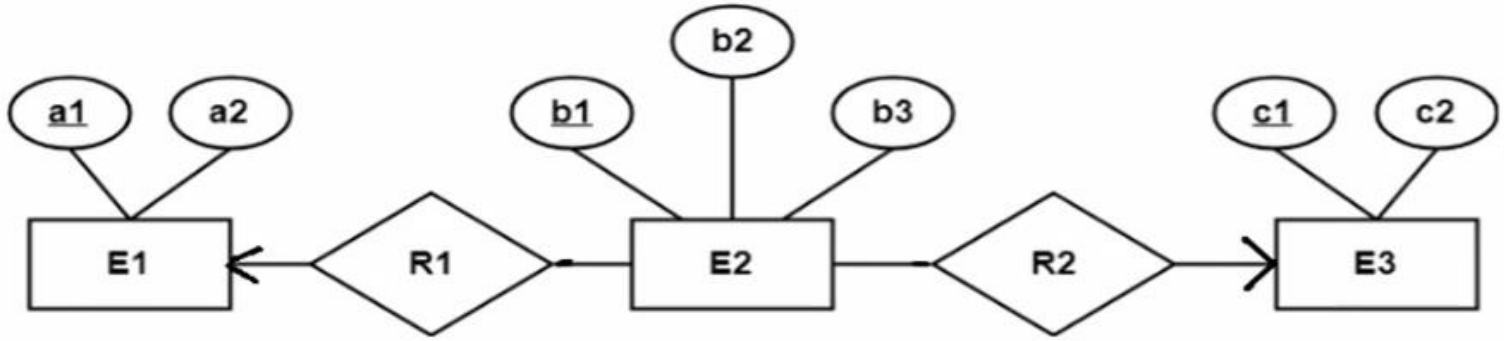
Find the minimum number of tables required for the following ER diagram in relational model



Minimum 5 tables will be required:

1. BR1R4R5 (b1 , b2 , a1 , c1 , d1)
2. A (a1 , a2)
3. R2 (a1 , c1)
4. CR3 (c1 , c2 , d1)
5. D (d1 , d2)

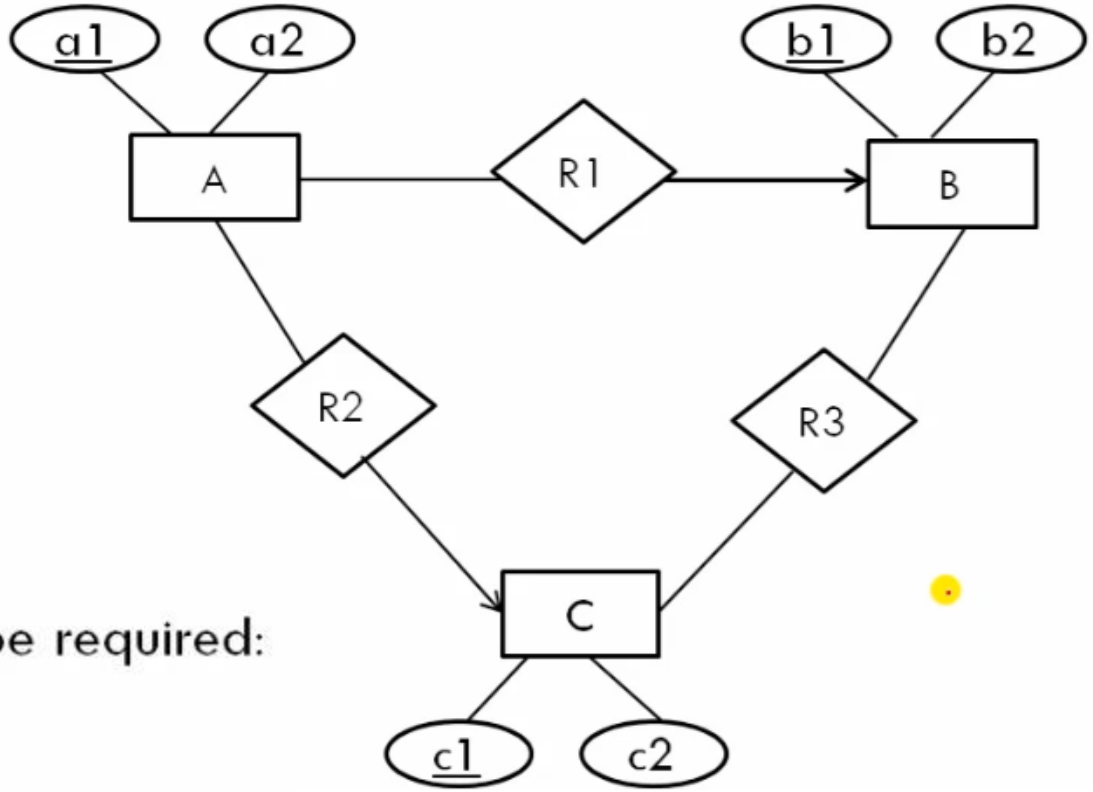
Find the minimum number of tables required for the following ER diagram in relational model



Minimum 3 tables will be required:

1. E1 (a1 , a2)
2. E2R1R2 (b1 , b2 , b3, a1 , c1)
3. E3 (c1 , c2)

Find the minimum number of tables required for the following ER diagram in relational model



Minimum 4 tables will be required:

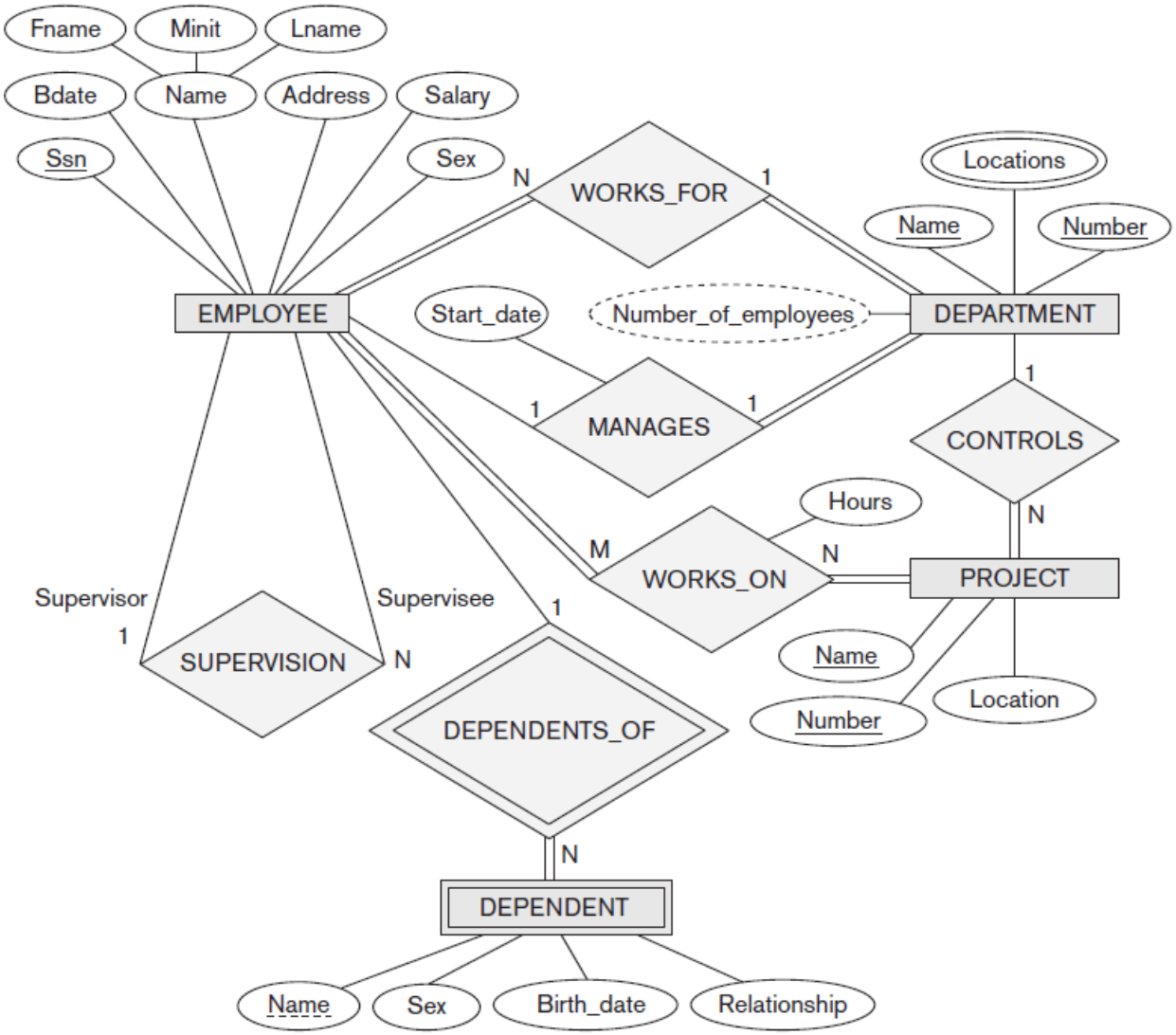
1. B (b1 , b2)
2. C (c1 , c2)
3. R3(b1, c1)
4. AR1R2 (a1 , a2, b1, c1)

Mapping of Binary 1:1 Relationship Types

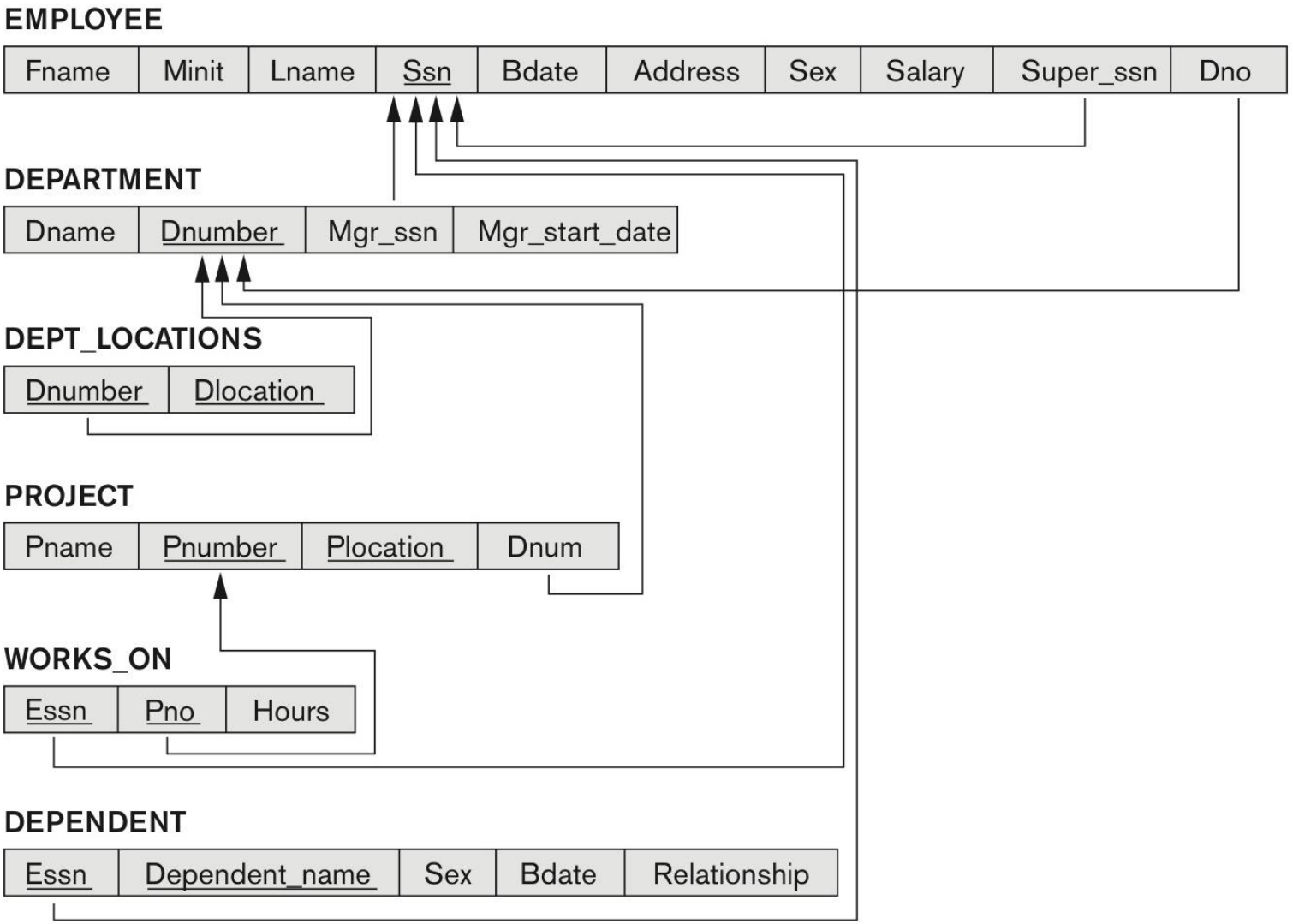
- For each binary 1:1 relationship type R in the ER schema, identify the relations S and T that correspond to the entity types participating in R.

- There are three possible approaches:
  1. **Foreign Key approach:** Choose one of the relations-say S-and include a foreign key in S the primary key of T. It is better to choose an entity type with total participation in R in the role of S.
     - Example: 1:1 relation MANAGES is mapped by choosing the participating entity type DEPARTMENT to serve in the role of S, because its participation in the MANAGES relationship type is total.
  2. **Merged relation option:** An alternate mapping of a 1:1 relationship type is possible by merging the two entity types and the relationship into a single relation. This may be appropriate when both participations are total.
  3. **Cross-reference or relationship relation option:** The third alternative is to set up a third relation R for the purpose of cross-referencing the primary keys of the two relations S and T representing the entity types.

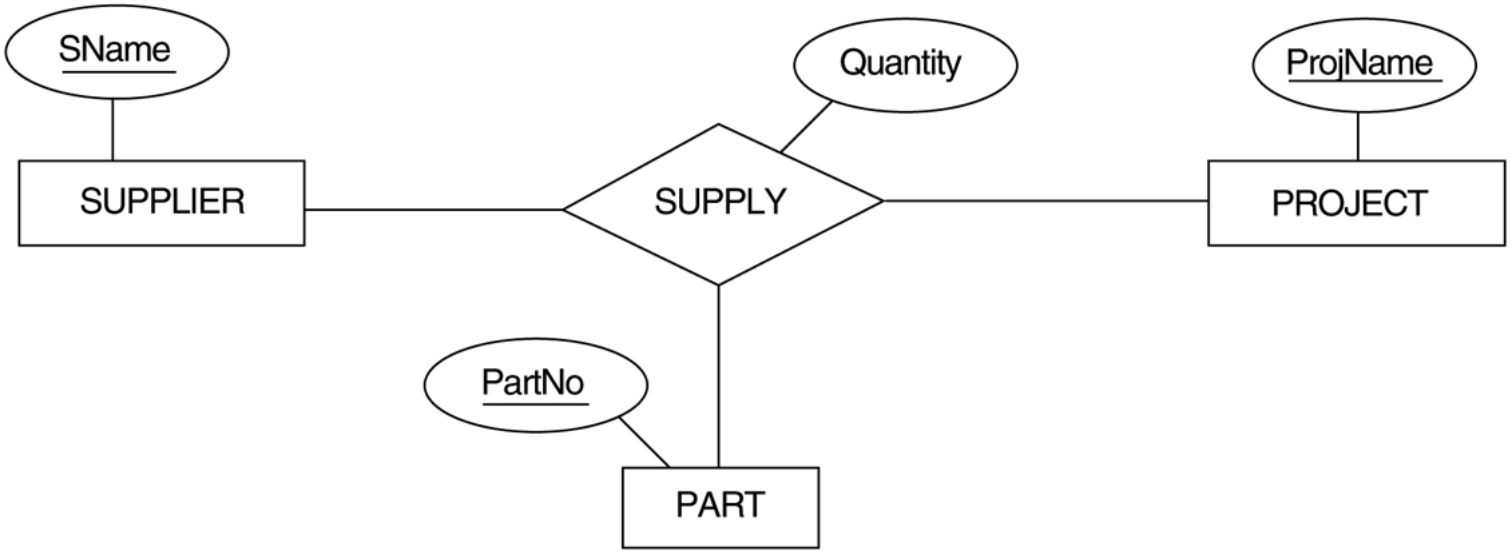
Quiz
Transform ERD into Relations



Solution


EMPLOYEE
Fname
Minit
Lname
Ssn
Bdate
Address
Sex
Salary
Super_ssn
Dno
DEPARTMENT
Dname
Dnumber
Mgr_ssn
Mgr_start_date
DEPT_LOCATIONS
Dnumber
Dlocation
PROJECT
Pname
Pnumber
Plocation
Dnum
WORKS_ON
Essn
Pno
Hours
DEPENDENT
Essn
Dependent_name
Sex
Bdate
Relationship

TERNARY RELATIONSHIP: SUPPLY



Mapping the *Ternary* relationship type SUPPLY