

Tutorial 3: Logical Database Design

Mapping ER Diagrams to the Relational Model

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1. 1:1

We choose to merge the relation to X side:

X_R(K1, A1, **K2**)

UNIQUE(K2)

K2 REFERENCES Y

Y(K2, A2)

2. 1:M

X(K1, A1)

Y_R(K2, A2, **K1**)

K1 REFERENCES X

3. M:N(Binary Relationship)

X(K1, A1)

Y(K2, A2)

R(**K1**, **K2**, A3)

K1 REFERENCES X,

K2 REFERENCES Y

4. M:N(Ternary Relationship)

X(K1, A1)

s Y(K2, A2)

Z(K3, A3)

R(K1, K2, K3, A4)

K1 REFERENCES X,

K2 REFERENCES Y,

K3 REFERENCES Z

5. 1:M Strong Entity with Total Participation

X(K1, A1)

Y R(K2, A2, **K1**)

K1 REFERENCES X, K1 cannot be null

6. 1:M Weak Entity with Total Participation (assume that A2 is the partial key)

X(K1, A1)

Y(A2, **K1**, A3)

K1 REFERENCES X, ON DELETE CASCADE, ON UPDATE CASCADE

7. 1:1 and 1:M Unary Relationship

X(K1, A1, **RK1**)

RK1 REFERENCES X(K1)

8. M:N Unary Relationship

X(K1, A1)

R(R1K1, R2K1)

R1K1 REFERENCES X(K1),

R2K1 REFERENCES X(K1)

9. ISA 1

Assumption: not disjoint and not covering

X(K1, A1)

Y(K1, A2, A3)

K1 REFERENCES X

$Z(\underline{\mathbf{K1}}, A4, A5)$
 $\mathbf{K1}$ REFERENCES X

10. ISA 2 (the "d" means disjoint)
 Assumption: disjoint and covering

$Y(\underline{\mathbf{K1}}, A1, A2, A3)$

$Z(\underline{\mathbf{K1}}, A1, A4, A5)$