## Tutorial 3: Logical Database Design Mapping ER Diagrams to the Relational Model

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1. <u>1:1</u>

We choose to merge the relation to X side:

 $X_{-}R(\underline{K1}, A1, \mathbf{K2})$ 

UNIQUE(K2)

K2 REFERENCES Y

 $Y(\underline{K2}, A2)$ 

2. 1:M

 $X(\underline{K1}, A1)$ 

 $Y\_R(\underline{K2}, A2, \mathbf{K1})$  K1 REFERENCES X

3. M:N(Binary Relationship)

 $X(\underline{K1}, A1)$ 

 $Y(\underline{K2}, A2)$ 

R(K1, K2, A3)

K1 REFERENCES X,

K2 REFERENCES Y

4. M:N(Ternary Relationship)

 $X(\underline{K1}, A1)$ 

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Y(\underline{K2}, A2)
   Z(\underline{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(\underline{K1}, A1)
   Y_{-}R(\underline{K2}, A2, \mathbf{K1})
   K1 REFERENCES X, K1 cannot be null
6. 1:M Weak Entity with Total Participation (assume that A2 is the partial key)
   X(\underline{K1}, A1)
   Y(A2, K1, A3)
   K1 REFERENCES X, ON DELETE CASCADE, ON UPDATE CASCADE
7. 1:1 and 1:M Unary Relationship
   X(\underline{K1}, A1, \mathbf{RK1})
   RK1 REFERENCES X(K1)
8. M:N Unary Relationship
   X(\underline{K1}, A1)
   R(R1K1, R2K1)
   R1K1 REFERENCES X(K1),
   R2K1 REFERENCES X(K1)
9. <u>ISA 1</u>
   Assumption: not disjoint and not covering
   X(\underline{K1}, A1)
   Y(\underline{K1}, A2, A3)
   K1 REFERENCES X
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## $Z(\underline{\mathbf{K1}},\, \mathrm{A4},\, \mathrm{A5})$ K1 REFERENCES X

 $\frac{10. \ \, \text{ISA 2 (the "d" means disjoint)}}{\text{Assumption: disjoint and covering}}$ 

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

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