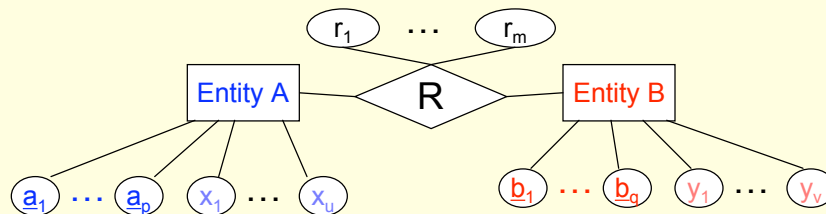


ER model to relational model

Clarifying null values and foreign keys

For Basic Paradigm (binary relationship)

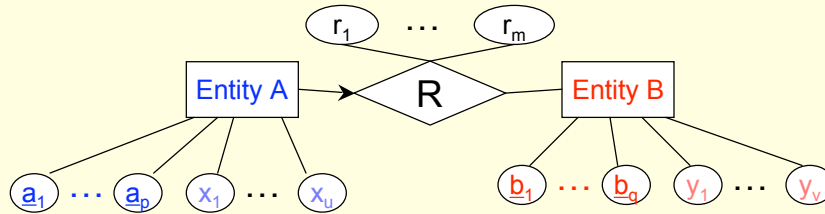


- Each entity becomes a relation with same attributes
- Relationship becomes

$$R: \{ (\underline{a_1}, \dots, \underline{a_p}, \underline{b_1}, \dots, \underline{b_q}, r_1, \dots, r_m) \\ (\underline{a_1}, \dots, \underline{a_p}) \text{ is a foreign key referencing } A, \\ (\underline{b_1}, \dots, \underline{b_q}) \text{ is a foreign key referencing } B \}$$

can be no null values among a_i and b_j in tuple of R
make up R's primary key

When one entity (e.g. Entity A) has key constraint and fold R into it

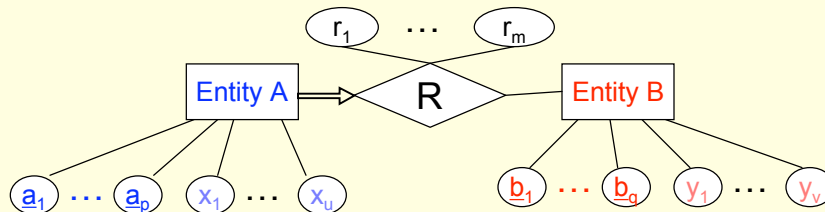


- Entity B becomes a relation with same attributes
- Relationship R becomes *part* of relation for Entity A:

$$A: \{ (\underline{a}_1, \dots, \underline{a}_p, x_1, \dots, x_u, b_1, \dots, b_q, r_1, \dots, r_m) \\ (b_1, \dots, b_q) \text{ is a foreign key referencing B} \}$$

now need to allow null values for $b_1 \dots b_q$ in A
not every entity in A is related to an entity in B

When have key constraint *and total participation* and fold R in



- Entity B becomes a relation with same attributes
- Relationship R becomes *part* of relation for Entity A:

$$A: \{ (\underline{a}_1, \dots, \underline{a}_p, x_1, \dots, x_u, b_1, \dots, b_q, r_1, \dots, r_m) \\ (b_1, \dots, b_q) \text{ is a foreign key referencing B} \\ b_1 \text{ not null, } \dots, b_q \text{ not null} \}$$

now prohibit null values for $b_1 \dots b_q$ in A
every entity in A is related to an entity in B