

1. Based on the above ER diagram, which of the following can be true?

A cat can own no (zero) hats.

A cat can own many hats.

A hat can be owned by no (zero) cats.

A hat can be owned by many cats.

This is because we have a key constraint and a participation constraint, that specify that each cat has exactly one hat.

2. In general, which of the following statements are true?

A relationship involving a key constraint can be one-to-many.

A 1-to-1 relationship must involve two key constraints, and vice versa.

A many-to-{1, many} relationship must involve at least one participation constraint.

A 1-to-{1, many} relationship must involve at least one key constraint

A many-to-many relationship must involve two participation constraints, and vice versa.

A relationship involving a participation constraint can be 1-to-1.

Every option here involves {1, many}-to-{1, many} relationships, which are only affected by key constraints.

Relationships involving a key constraint cannot be many-to-many.

3. We want to model the relationship that every trainer must have trained at most one cat. What kind of constraint do we have between Trainers and Trains?

key constraint with partial participation

4. We want to model the relationship that every cat has at least one trainer. What kind of constraint do we have between Trains and Cats?

No Key constraint with total participation

5. Every cat has exactly 2 parents. What type of constraint on "parent\_is" best captures this relationship?

No key constraint with total participation

6. Every cat can beget 0 or more kittens. What type of constraint on "child is" best captures this relationship?

key constraint with total participation

7. Every cat has exactly 2 parents. You decide to add an extra relationship "parent2\_is" to capture this effect. What type of constraint should "parent\_is" and "parent2\_is" now be?

Key constraint with total participation

8. It turns out that historical records for purebred cat genealogy only go back a few hundred years. As such, some cats may not have parents associated with them. Working from your answer to the last question - what types of constraint do "parent\_is" and "parent2\_is" become?

Key constraint with partial participation

9. True/False: A weak entity behaves exactly like an entity with a key constraint and total participation.

True. Recall that weak entities cannot be uniquely identified without their owner identities.