



RELATIONAL DATABASES

BSc IoT



Objectives

- Define the rule of Second Normal Form in the normalisation process
- Identify transitive dependencies in a data model
- Examine a non normalised entity and determine which rule or rules of normalisation are being violated
- Apply the rule of third normal form to resolve a violation in the model

Third Normal Form

- The rule of Third Normal Form (3NF) states that no non-UID attributed can be dependent on another non-UID attribute
- Third Normal Form prohibits transitive dependencies
- A transitive dependency exists when any attribute in an entity is dependent on any other non-UID attribute in that entity
- This rule investigates non key attributes to make sure they are each dependent on the key, the whole key and nothing but the key...

Third Normal Form

- Think of the kind of information you'd like to store about CDs
- Does information about the store where you bought it belong in the same entity?
- If the store address changed you would need to change that information on all the CDs bought in that store

CD

id

* title

* producer

* year

o store name

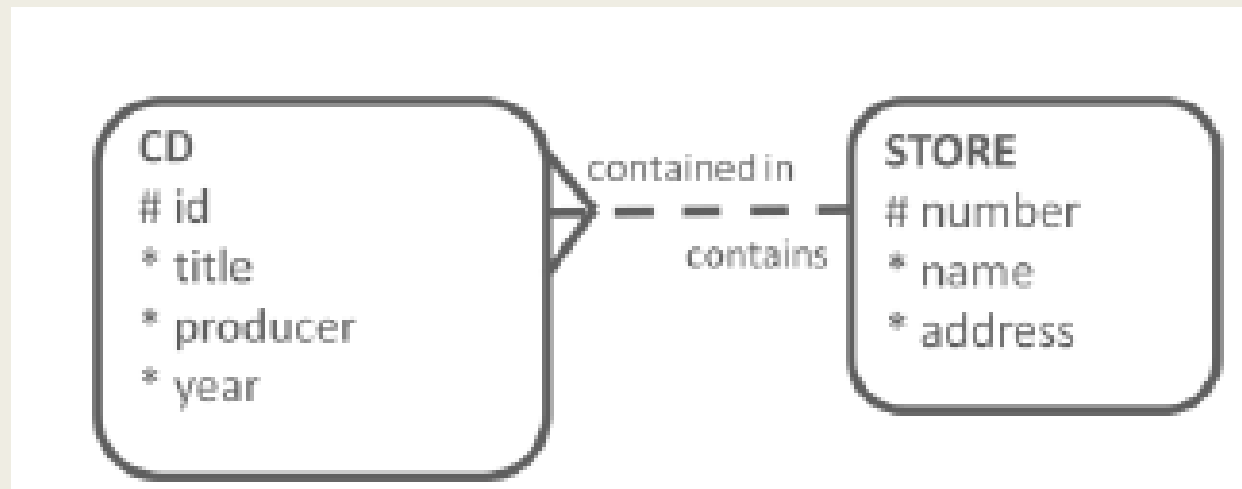
o store address

Third Normal Form

- To check if an entity is in Third Normal Form, examine each non-UID attribute to check for transitive dependency with other non-UID attributes
- In the above example the store name is dependent on the CD number.
- Store address is dependent on the CD number but it is also dependent on the store name which is a non-UID attribute.
- This is an example of a transitive dependency

Third Normal Form

- To resolve a Third Normal Form (3NF) violation, you create a new entity, move the attributes that were causing the violation to the new entity (adding a UID), and draw the relationship to the original entity.
- For an entity to be in Third Normal Form it must also already be in Second Normal Form



Third Normal Form

- Consider a system that tracks information about cities – size, population, mayor and so on
- The model shows an entity that includes state information
- Although state is a property of city id, state flower is really a property of state.

CITY

id

* name

* size

* population

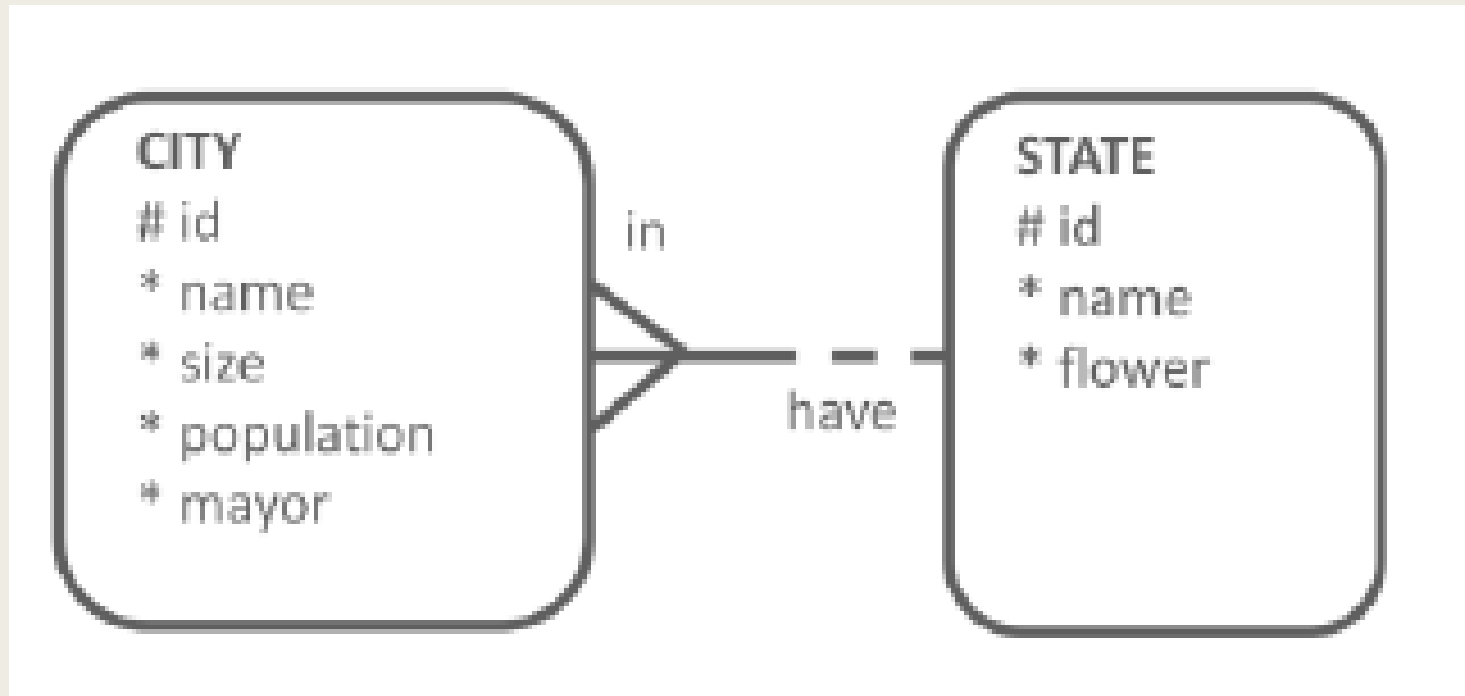
* mayor

* state

* state flower

Solution

- The following entities are in 3NF with the new entity STATE



Third Normal Form

- In this example assume the following business rule: each employee can have one partner
- How do you resolve this?

