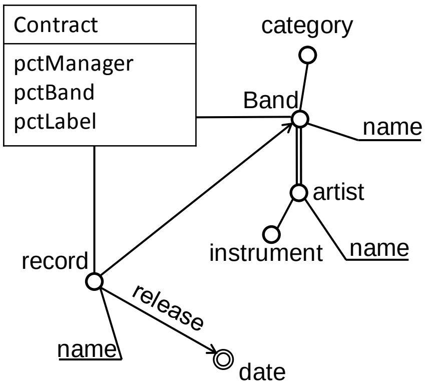
Exercises Data Warehousing
Bridge Tables and Changing Dimensions

1. SASS (and most similar tools of other vendors as well) natively supports bridge tables. In SSAS bridge tables are considered to be measureless fact tables. Hence, when creating the cube you need to mark the bridge table as a fact table ("measurement group"). Then, in the "Dimension Usage" tab of the cube explorer you can indicate how the dimension that is connected to the fact table through the bridge, has to be used. The relationship type is "Many-to-Many" and the intermediate measure group (=fact table) will be your bridge table.

   Connect to the database "M2MDB" in BIDS. You will need all tables except Cust_Acc_Bridge. Connect the Customer dimension ("dimCustomer") to your data cube (measurement group "factTransactions").

2. Consider the following DFM schema.



   Design a relational schema that implements this model. Ensure that your schema can accommodate the following changes:

   (a) Band name
   (b) Band members
   (c) Instrument

3. Consider the database we worked with last week, Simple_NW_DW. Suppose now that the following dimensional changes need to be accommodated for:

   (a) What changes do we need to make to the schema in order to be able to accommodate the following changes?
   - The company name and city of a customer may change.
   - The name of a product and of a category may be corrected.
   - The title of an employee may change.

   (b) What updates to the database are needed (DELETE, INSERT, UPDATE statements) in order to encode the following changes:
   - Product name "Flotemysost" is corrected to "Flotemisost." (product ID 71)
   - The company with ID "GREAL" changes its name back to "Great Lakes Food Market".
   - The first name of employee with ID 1 (Nancy Davolio) is misspelled. Her first name should be "Nancera" instead of "Nancy."
   - After Andrew Fuller resigns, Steven Buchanan becomes the new CEO.

4. What changes do we need to make to our data warehouse if we retrospectively learn that for one of the dimensions there was an update on one or more values of one of the tuples? Consider for instance the database of question 2. We learn now that customer "HUNGO" changed location on September 20th, 2009 (day with ID 264) and moved from Cork (GID 19) to Charleroi in Belgium (GID 18) on that day. What changes should we make to the data warehouse in order to retrospectively bring the content of the data warehouse up to date?

5. Consider and model the following situation: we are storing all transactions of a bank. Every transaction is for an account, done by a customer, at a certain date. Furthermore we keep the amount. An account is associated to multiple customers. A bank account has attributes accountNr (=OLTP key) and a policy ("can go below zero but bounded", "can go below zero but unbounded", "cannot go below zero"). A customer is identified by his or her passport number, has a name, and is or is not a VIP customer.

- Model this in the DFM, and translate to the relational model. Do not yet consider SCDs at this point.
- Now consider the following changes that may take place:
  - The policy of an account may change;
  - A customer's status may change from non-VIP to VIP or vice-versa;
  - The owners of an account may change.

  How would you change your model such that these changes can be accommodated?