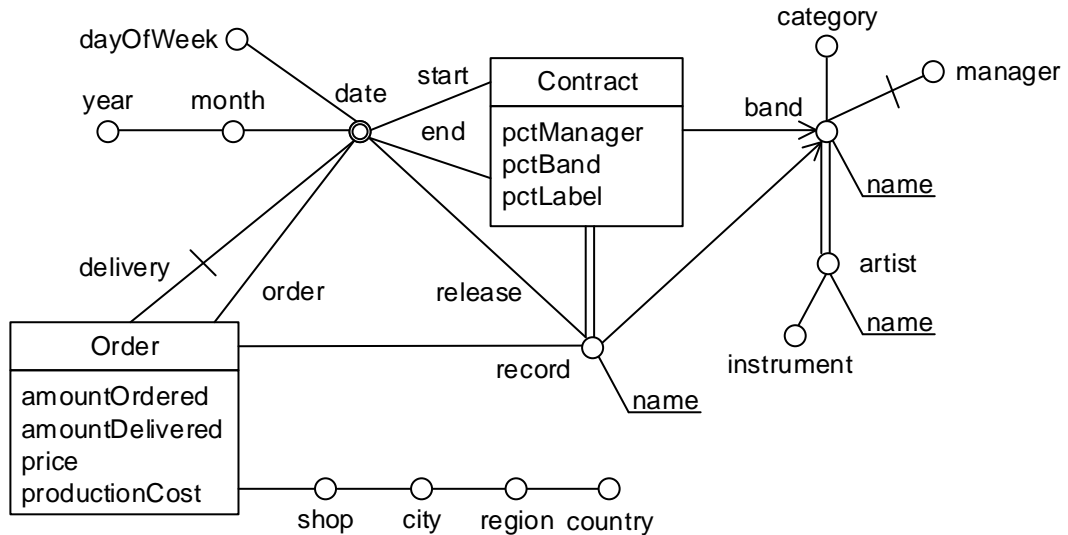# Exercises Data Warehousing
ROLAP

Solutions

1. Consider the following dimensional fact model for the record label of the last exercise session.

Create a relational model (star or snowflake schema) for this model.

Solution
The relational tables are given in Figure 1. The attributes that together form the primary key have been underlined. The foreign keys are indicated by (FK).
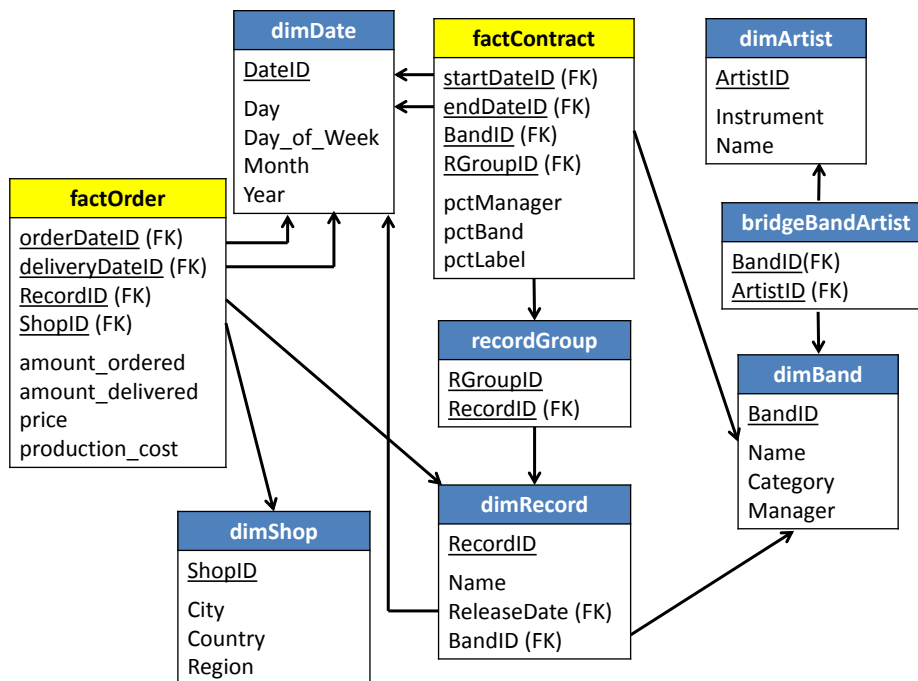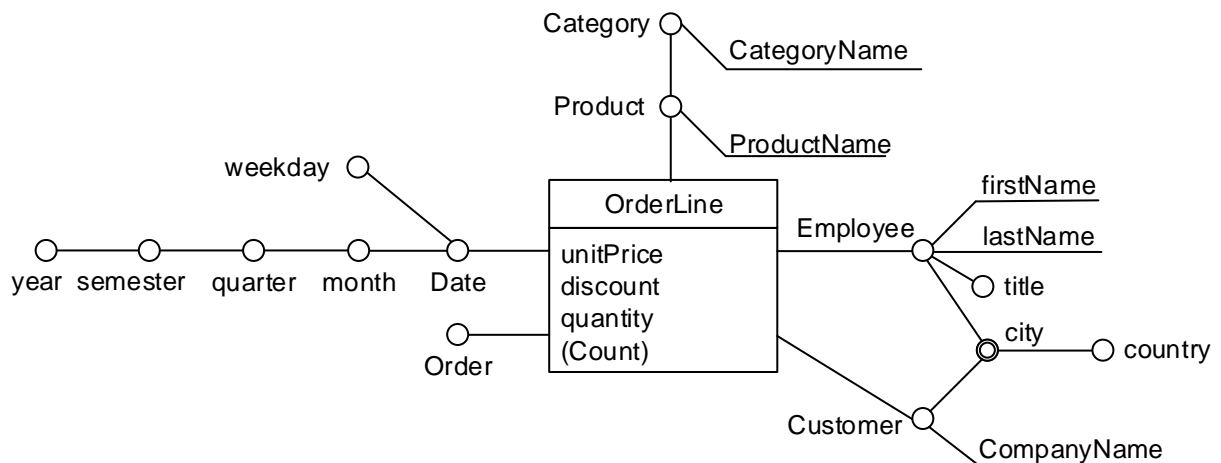

Figure 1: Relational schema of the data warehouse for the record label.

2. Consider the following, simple, DFM schema dimensional:

This schema has been implemented in the relational model as follows:

```
CREATE TABLE [dimGeography](
[GID] [int] IDENTITY(1,1) NOT NULL PRIMARY KEY,
[city] [nvarchar](15),
[country] [nvarchar](15)
);

CREATE TABLE [dimCustomer](
[CID] [int] IDENTITY(1,1) NOT NULL PRIMARY KEY,
[CustomerID] [nvarchar](5),
[CompanyName] [nvarchar](40),
[GID] [int] FOREIGN KEY REFERENCES dimGeography(GID),
);

CREATE TABLE [dimDate](
[DateID] [int] NOT NULL PRIMARY KEY,
[Date] [date],
[Weekday] [varchar](50),
[day] [int],
[month] [int],
[monthname] [varchar](50),
[year] [int],
[semester] [int],
[quarter] [int]
);

CREATE TABLE [dimEmployee](
[EID] [int] IDENTITY(1,1) NOT NULL PRIMARY KEY,
[EmployeeID] [int],
[LastName] [nvarchar](20),
[FirstName] [nvarchar](10),
[Title] [nvarchar](30),
[GID] [int] FOREIGN KEY REFERENCES dimGeography(GID),
);

CREATE TABLE [dimProduct](
[ProductID] [int] NOT NULL PRIMARY KEY,
[ProductName] [nvarchar](40),
[CategoryID] [int],
[CategoryName] [nvarchar](15)
);

CREATE TABLE [factOrders](
[OrderID] [int],
[DateID] [int] FOREIGN KEY REFERENCES dimDate(DateID),
[CID] [int] FOREIGN KEY REFERENCES dimCustomer(CID),
[EID] [int] FOREIGN KEY REFERENCES dimEmployee(EID),
[ProductID] [int] FOREIGN KEY REFERENCES dimProduct(ProductID),
[UnitPrice] [money],
[Discount] [real],
```

```
[Quantity] [smallint]
PRIMARY KEY (OrderID,DateID,CID,EID,ProductID)
);
```

The translation from the DFM to the relational model loses some important information, including for instance the exact form of the hierarchy, what attributes together define the members of a certain level in the hierarchy, what aggregation functions we can apply, for which measures, and over which dimensions, ... Hence, before we can use an OLAP tool to deploy and browse a data cube, we need to add the necessary meta-information. Follow the step-by-step guide to start a MS Visual Studio project for defining the meta-information to be used by SSAS and processing and deploying the data cube. You will find an instantiation of a database based on this relational schema for implementing our DFM on SQL Server (database name: 2014_SimpleNW_DW).

Solution
A BIDS project defining the cube meta-data is available on course website.