TestStar DB on JRS

Schema:

InvoiceLines(FkInvoiceNo*, LineNo, FkProduct*, Qty, Price)

Invoices(PkInvoiceNo, Date, FkCustomer*)

Customers(PkCustomer, CustomerName, CustomerType, FkCountry*)

Countries(PkCountry, Nation, Continent)

Products(PkProduct, ProductID, ProductName, Category, UnitPrice)

EXERCISES: WRITE RELATIONAL EXPRESSIONS / LOGICAL TREES

- *Revenue is Qty*Price*

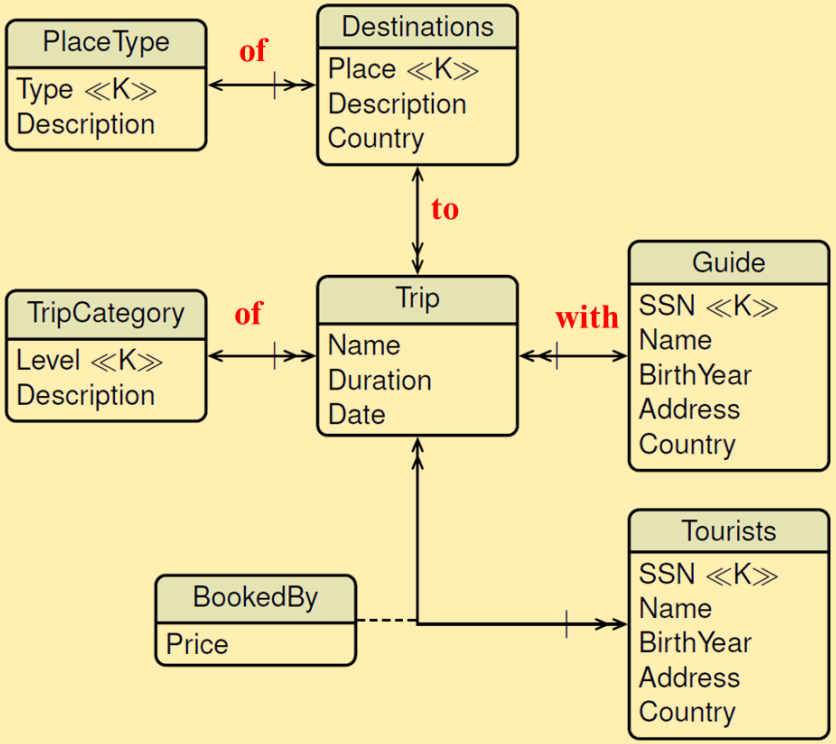
1. Find the revenue of every invoice line
2. Find the invoice lines with revenue > 5000
3. Find the FkProduct's sold in at least one invoice line
4. Find the total revenue by FkProduct
5. Find the total revenue by FkProduct for invoice lines with Price > 2000
6. Find the total revenue by FkProduct with at least 10 pieces of total quantity sold

EXERCISES: WRITE RELATIONAL EXPRESSIONS / LOGICAL TREES

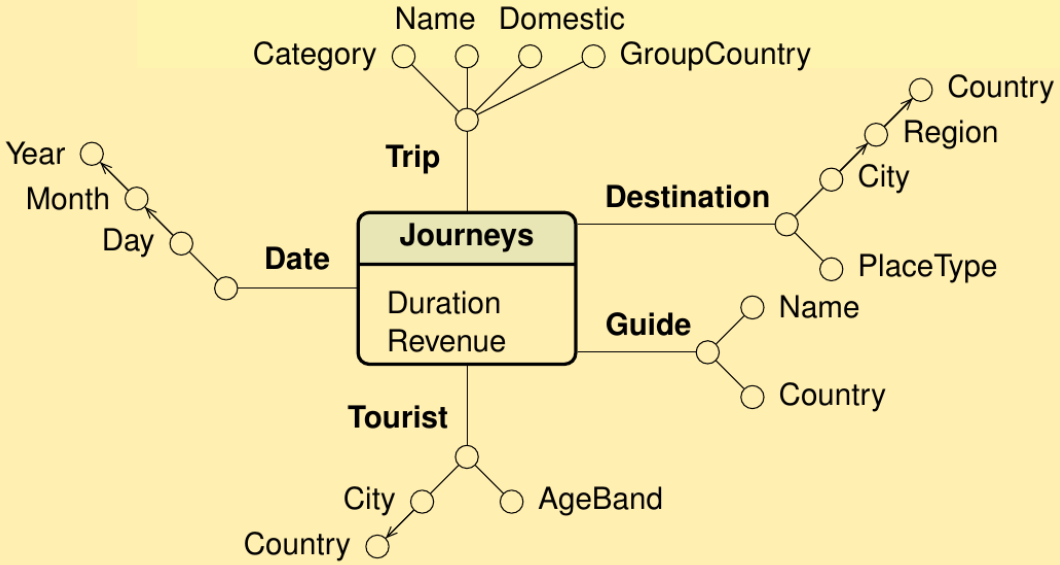
- *Revenue is Qty*Price*

1. Find the total revenue by product category
2. Find the total revenue by customer nation for sales of product category 'Cat01'
3. Sort the customer names by total revenue descending
4. Find the total revenue of sales to customers from Finland of products from category 'Cat01'
5. Find customers with no sales

TRAVEL AGENCY: CONCEPTUAL DESIGN

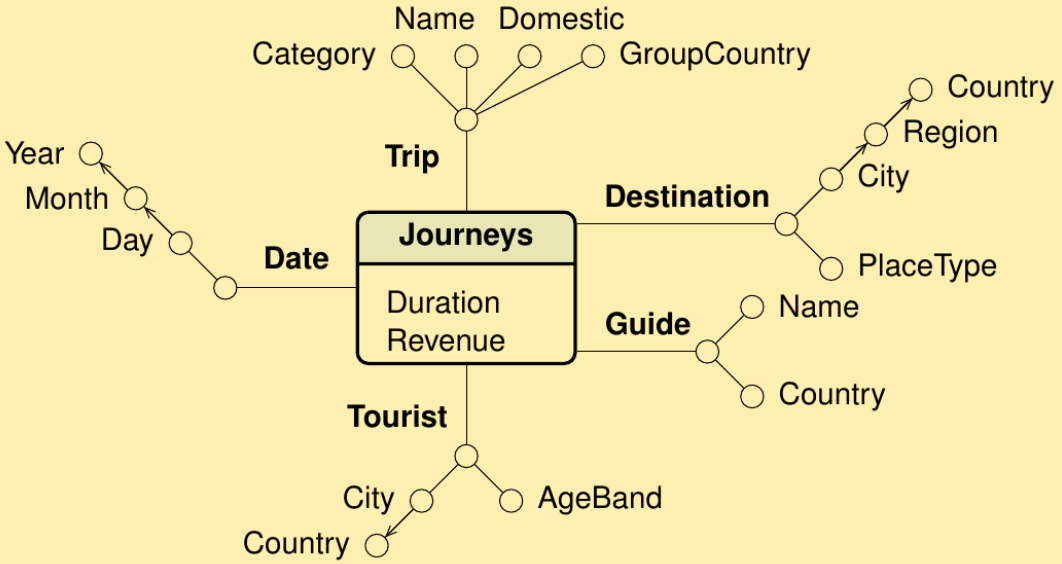


DATA BASE



DATA MART

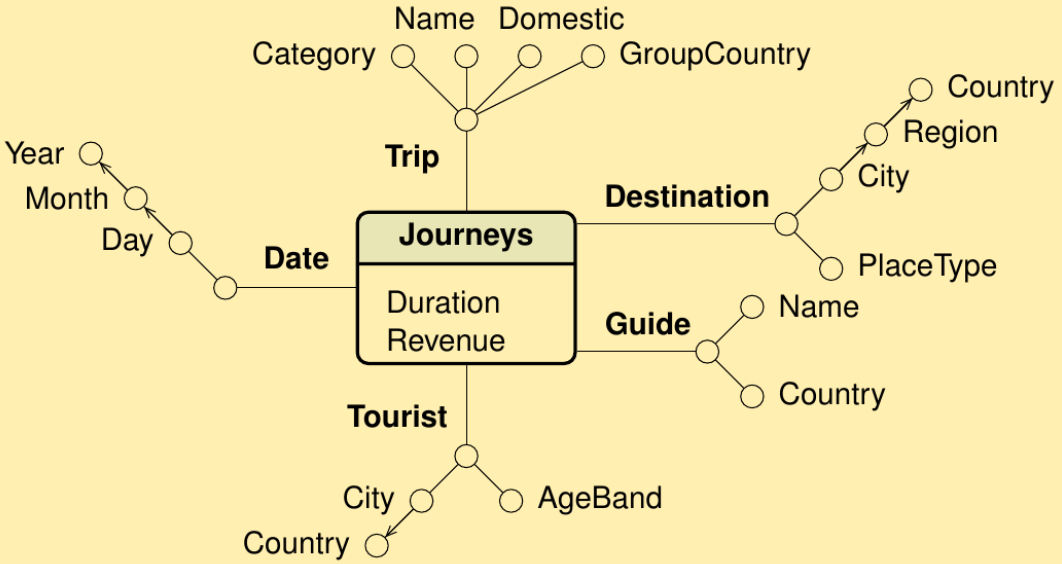
EXERCISE: DESIGN LOGICAL SCHEMA!



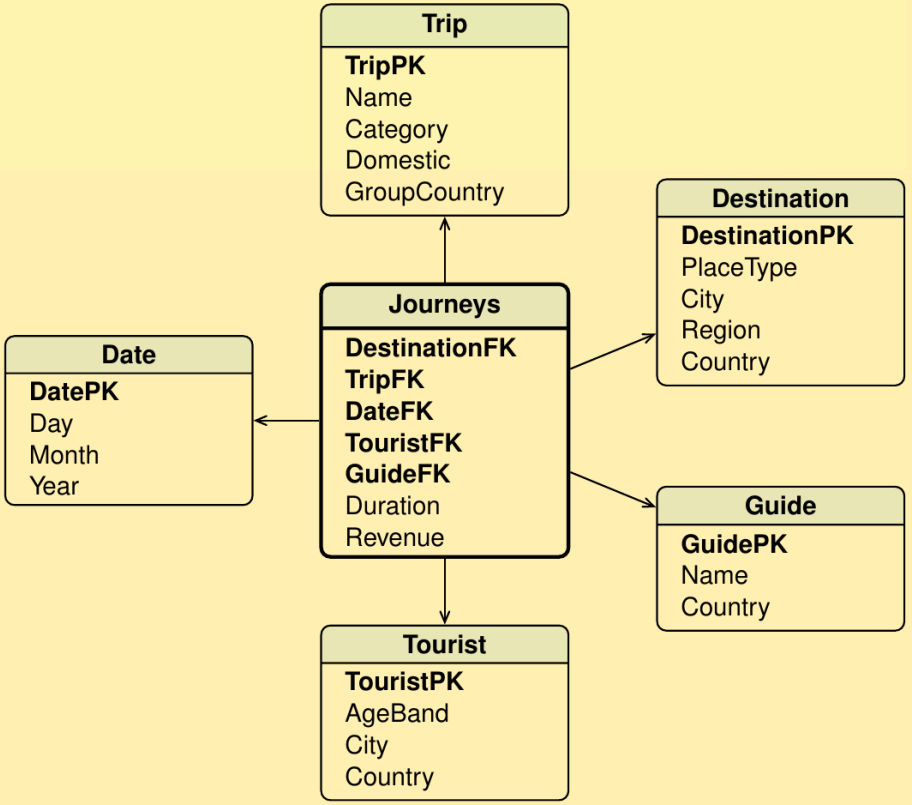
DFM SCHEMA

STAR SCHEMA

EXERCISE: DESIGN LOGICAL SCHEMA!



DFM SCHEMA



STAR SCHEMA

TRAVEL AGENCY: SOLVE BUSINESS QUESTIONS WITH SQL

The travel agency is interested in a DM for analyzing the travel behavior of tourists.

1. Total number of tourists and average trip duration for Florence, **by** age band

2. Total number of tourists for domestic trips, **by** age band, **by** country.

3. Total number of tourists, **by** trip name and category, **by** group country (alternative: age band, guide, country).

4. Average trip revenue for trips of category level 1 in destination region Toscana, **by** type of destination, and **by** year.

5. Number of trips **by** place type, **by** month, and **by** guide country.

SQL QUERIES ON STAR SCHEMA

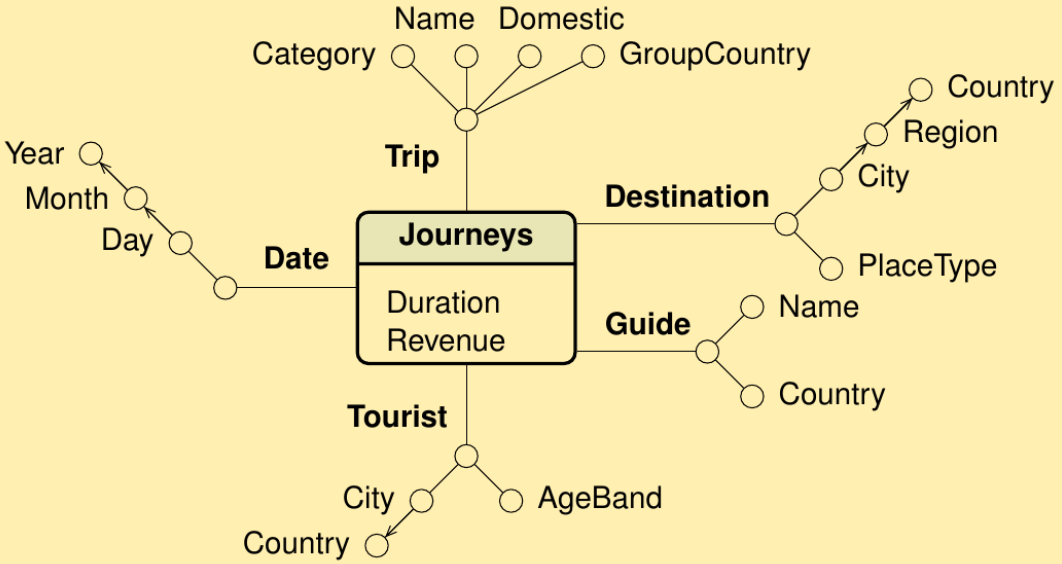
ADDITIONAL REQUIREMENTS

6. Total revenue **by** distinct tourist

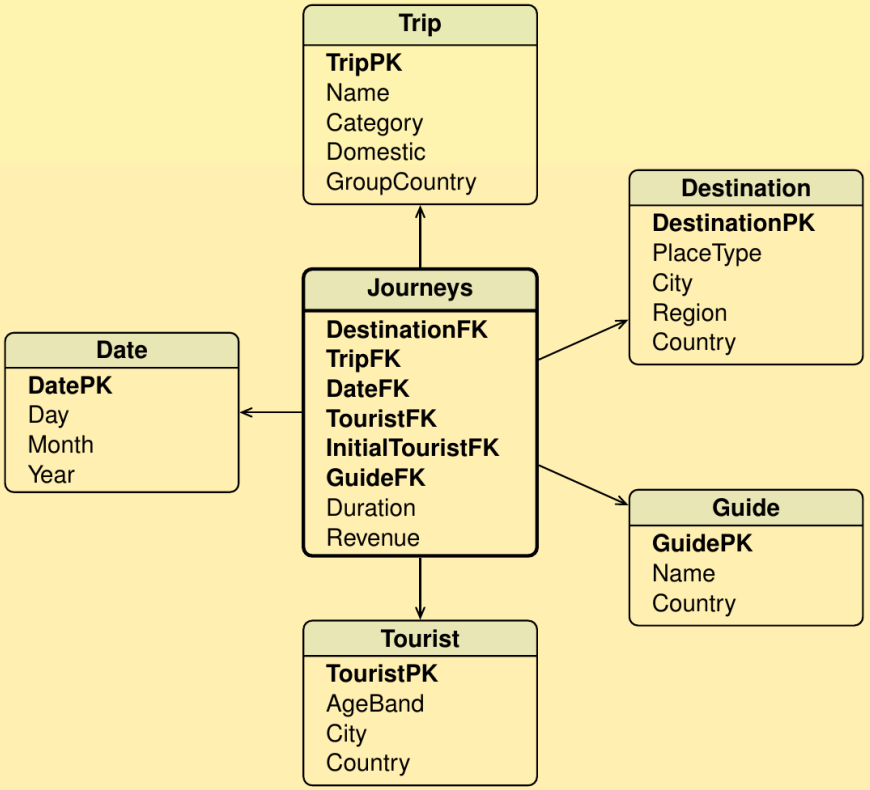
7. Total number of distinct tourists **by** year.

SQL QUERIES ON (MODIFIED) STAR SCHEMA

EXERCISE: DESIGN LOGICAL SCHEMA



DFM SCHEMA



STAR SCHEMA

ADDITIONAL REQUIREMENTS

6. Total revenue **by** distinct tourist

```
SELECT InitialTouristFK, SUM(Revenue) AS TotalRevenue
FROM Journeys
GROUP BY InitialTouristFK
```

7. Total number of distinct tourists **by** year.

```
SELECT Year, COUNT(DISTINCT InitialTouristFK) AS NDistinctTourists
FROM Journeys, Date
WHERE DateFK = DatePK
GROUP BY Year
```

EXERCISE AT HOME

A.2 Airline Companies

We want to analyze airline companies' flights to compare them from the point of view of their ability to fly with occupied seats and therefore to make profits.

For each flight the information of interest is the company name, the departure and the destination cities, the departure time (hour, day, month, year), the number of unoccupied seats in each class (economic, business, first), the revenue of each class.

A flight code (a combination of the *ICAO airline designator* with the flight number) identifies a flight of an airline company from a departure airport to a destination airport (e.g. AP2701 is an Alitalia flight from Malpensa to Fiumicino, available on certain days a week).

A flight is identified by the flight code and the departure time.

For each city the information of interest is the city's name, the country and the continent.

For each company the information of interest is the name and the type (private or national).

Give a conceptual and logical data mart designs assuming that the following examples of business questions have been collected during the user interviews:

1. Number of unoccupied seats in a given year, by flight code, by company name (or type), by class, by departure time (hour, day, month, year)
2. Number of unoccupied seats in a given class and year, by flight code, by company name, by class, by departure (destination) city (country, continent)
3. Number of unoccupied seats and income of the Alitalia company, by year, by month, by destination country.

Airline companies

Requirements analysis	Dimensions	Measure	Metrics
Number of unoccupied seats in a given year, by flight code, by company name (or type), by class, by departure time (time, day, month, year)			
Number of unoccupied seats in a given class and year, by flight code, by company name, by class, by departure (destination) city (country, continent).			
Number of unoccupied seats and revenue of the Alitalia company, by year, by month, by destination country.			

AIRLINE COMPANIES: REQUIREMENTS SPECIFICATION

Airline companies

Requirements analysis	Dimensions	Measure	Metrics
Number of unoccupied seats in a given year, by flight code, by company name (or type), by class, by departure time (time, day, month, year)	FlightCode, Class, Company(Name, Type), DepartureTime (Time, Day, Month, Year)	UnoccupiedSeats	Total UnoccupiedSeats
Number of unoccupied seats in a given class and year, by flight code, by company name, by class, by departure (destination) city (country, continent).	FlightCode, Class, Company(Name), DepartureCity (Country, Continent), DestinationCity (Country, Continent)	UnoccupiedSeats	Total UnoccupiedSeats
Number of unoccupied seats and revenue of the Alitalia company, by year, by month, by destination country.	Company(Name), DepartureTime (Month, Year), DepartureCity(Country)	UnoccupiedSeats Revenue	Total UnoccupiedSeats, Revenue

Fact granularity

Description	A fact is the information on the number of unoccupied seats on a flight of a class of a company
Preliminary dimensions	Class, FlightCode, Company, Departure time, Departure city, Destination city
Preliminary measures	UnoccupiedSeats, Revenue

AIRLINE COMPANIES: CONCEPTUAL AND LOGICAL DESIGN