Tutorial 3 – Star Schemas

PART I: The USELOG Case Study

Description

University Computer Lab's director keeps track of the lab usage, measured by the number of students using the lab. This particular function is very important for budgeting purposes. The computer lab director assigns you the task of developing a small Data Warehouse in which to keep track of the lab usage statistics. The main requirements for this database are to:

a. Show the usage numbers by different time periods (e.g. morning, afternoon, night)

b. Show the usage numbers by time period (e.g. morning, afternoon, night), by major, and by student's class

c. Compare the usage numbers for different majors and semesters (e.g. semester 1, semester 2).

Use the provided database that includes the following tables: USELOG, STUDENT, MAJOR, and CLASS

USELOG contains the student access data
USELOG (Log_Date, Log_Time, Student_ID, Act)

STUDENT is a table containing student data
STUDENT (Student_ID, Sex, Full/Part, Type, Class_ID, Major_Code)

MAJOR is a table containing major data
MAJOR (Major_Name, Major_Code)

CLASS is a table containing class data
CLASS (Class_Description, Class_ID)

Tasks

The above case study has been discussed in the lecture this week. Given the requirements above, complete the following:

1. Create a star schema for the charter data.
2. Define the dimensions and attributes for the Uselog star schema.
3. Write the SQL statements for the implementation of the star schema.
   The following operational databases have been provided for you:

   `dw.Class:` table that stores information about classification ids and descriptions
   `dw.Major:` table that stores information about major codes and descriptions
   `dw.Student:` table that stores information about students as described above
   `dw.Uselog:` table that stores information about lab usage as described above

   You do not need to copy these four tables (**`dw.Class`**, **`dw.Major`**, **`dw.Student`**, and **`dw.Uselog`**) into your account. You can just simply use these tables.

4. Write the SQL statements to produce the following reports:
    a. Show the usage numbers by different time periods (e.g. morning, afternoon, night)
    b. Show the usage numbers by time period (e.g. morning, afternoon, night), by major, and by student's class
    c. Show the usage numbers for different majors and semesters (e.g. semester 1, semester 2).

PART II: The ROBCOR Aviation Charters Case Study

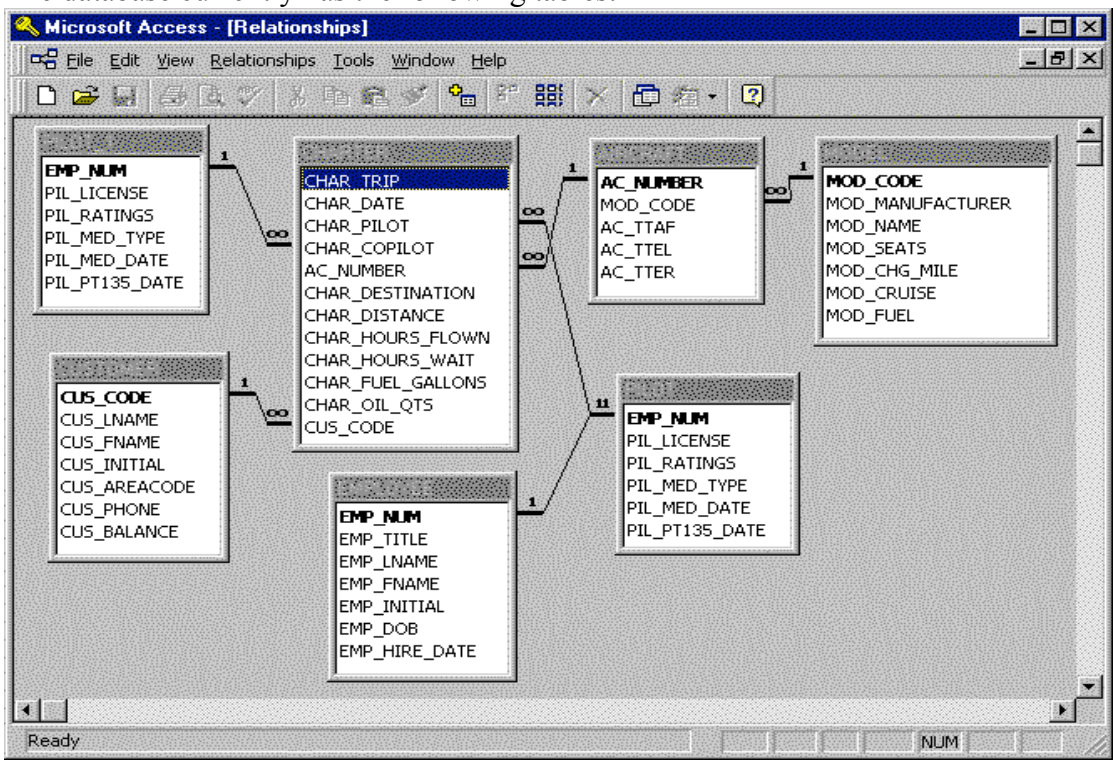
Description

ROBCOR, Inc. provides "on demand" aviation charters, using a mix of different airplane and airplane types. Because ROBCOR, Inc., has grown rapidly, it has hired you to be its first database manager. Your first and critical assignment is to develop a decision support system to analyze the charter data.

The charter operations manager wants to be able to analyze charter data such as total hours flown, total fuel used, and total revenue (charter distance x model charge per mile). She would also like to be able to drill-down by pilot, airplane model, and time periods. The main requirements for this database are to:

a. Show the total revenue each month/year
b. Show the total hours flown by each pilot
c. Show the total fuel used by each airplane model.

The database currently has the following tables:



The tables can be copied from the dw account, using:

```
Select * from dw.<table_name>;
```

Or

```
Create Table <your_table_name> As
Select …
From dw.<table_name>
Where …
```

Given these requirements, complete the following:

1. Create a star schema for the charter data.
2. Define the dimensions and attributes for the charter operation's star schema.
3. Define the SQL statements for the implementation of the star schema.
4. Write the SQL statements to produce the following reports:
    a. Show the total revenue each year
    b. Show the total hours flown by each pilot
    c. Show the total fuel used by each aircraft model