343 Assignment 2

Instructions In this assignment, we are providing you with a set of table definitions for an airline database. You will need to write a set of queries on this database.

Updated instructions (Feb 4, 2008). Your solutions may not have any insert (or update) statements.

For each query, if you create any intermediate views (or any DDL artifacts) you must drop the view statements at the end of the query as well. For example,

create view helpForQ2 ....
select company, ... from....
drop view helpForQ2

You will lose marks for not following the output schema for each query (including the order of attributes and for not dropping views).

Database Description Consider an airline database describing the following information. The database contains tables describing airports (identified by an airport identifier, `apid`) and aircrafts (identified by an aircraft identifier, `acid`). An aircraft may have an aircraftType (indicated in the `type` field) which describes the aircraft's average and maximum speed.

Employees: Employees all have a unique id. In addition, each employee has a name and company. All pilots and all flight attendants are employees. All pilots have a rank (which must be one of the values Captain, Navigator, or First Officer). Pilots may have expertise in flying different types of aircrafts. Only pilots have flight expertise, and their expertise must be in aircraftTypes in the database. For every flight attendant, a primary language is recorded. In addition, each flight attendant may (optionally) have a second language in which the attendant is fluent.

Flights: A flight is identified by a company code (for example, 'AC') and a flight number (for example, 567). For every flight, the database stores the origin and the destination airports, and the arrival and departure times. All of these values are required. There should be no flight that originates and ends in the same airport.

Flight Implementation: is the implementation of a flight on a specific date (for example, AC 567 on the 1st of July 2002). The flight implementation refers to a flight, and an aircraft both of which must be present in the database. A flight implementation has a main pilot. In addition, a set of employees (the crew) are assigned to each flight implementation. The employees must be present in the database. An employee cannot be assigned multiple times to the same flight implementation. A flight implementation may have a set of employees on its crew.

We are providing you with a set of DDL statement defining the table structures. You many not change anything in the DDL.

1. For each company return and the total number of employees who have expertise in at least three different types of aircraft. Return the two-character company code and the total (use the `as` statement to name the latter `numemployees`).

2. Find all the airports (airport code and name) that one can reach on the same day if one departs from Toronto (apid is 'YYZ') and is willing to take at most 3 flights. Assume that one needs at least 30 minutes to make a connection.

3. Find all flightImplementations on which no flight attendants speak French (as either a first or second language). Return the company, flightNo, and date of the flightImplementation along with the total number of flight attendants. Of course, flightImplementations with no flight attendants satisfy the condition and should be returned as well.

4. Find all pairs of employees who only work together. An employee works on a flightImplementation if they are on the crew or the mainPilot. For example, you should return a pair of employees 1 and 2 if employee 1 only works on flightImplementations on which employee 2 also works and vice verse. Return only the employee identifiers, and of course, you should only return a set of two employees once. The employees you return must work on at least one flightImplementation.

5. Find all employees (just their identifiers) who are scheduled to work on two or more overlapping flightImplementations. To give employees time to make their connections, you should consider flightImplementations to overlap if they are on the same date and their flying time overlaps or is within 30mins of each other.

6. Find all pilots who have expertise in all aircraftTypes. Return the pilot's employee id and rank.

7. Find the company (or companies) with the most intra-Canada flights (the origin and destination of the flight is within Canada). *Return the two-character company code(s).*

8. For every airport, return the number of different aircraft types (based on the information in flightImplementation) that can land (arrive) at the airport. Return the name of the airport, its city and the number of different aircraft types.

9. For every company, return the total number of flightImplementations on which the mainPilot does not have expertise in the aircraftType of the plane. Return the two-character company code and the total (use the `as` statement to name the latter `numflights`).

10. Find the set of all employees (their employee ids) who are trained as both a flight attendant and pilot, and who with speak French as a second language or have expertise in an aircraft with maximum speed over 1000.