Exam/Flights database

Here is a list of independent questions of varying difficulty. Each question is assigned a number of credits that measures its difficulty. You aren't asked to answer ALL the questions, but to answer enough questions for (at least) a total credit of

70 (out of 250)

Some questions are really tough and you are strongly advised to start with a few (relatively) more easy ones.

Exercise	Credits
Exercise 1	5
Exercise 2	7
Exercise 3	10
Exercise 4	12
Exercise 5	15
Exercise 6	15
Exercise 7	20
Exercise 8	12
Exercise 9	12
Exercise 10	15
Exercise 11	7
Exercise 12	15
Exercise 13	30
Exercise 14	25
Exercise 15	50
TOTAL	**250**

1. Write a query to compute the number of airports per country in the database. **Credit: 5**

2. Write a query to compute the number of airports per continent in the database. **Credit: 7**

3. Write the query that returns the names of the various airlines with which Delta (code DL) practices code sharing - carrier different from the airline that sells the ticket. **Credit: 10**

I expect most people to forget that Delta can be the carrier.

4. Write a query that returns (on two lines) the average duration in minutes of flights between Paris Charles-de-Gaulle (code CDG) and New York John Kennedy (JFK) , as well as the average duration of flights in the opposite direction (from JFK to CDG) **Credit: 12**

5. Write a query that displays code, city, name and state for US airports to which there is (in the database) no flight from JFK (New York - John Kennedy). Exclude the other New York airports from the result of the query. **Credit : 15**

6. How many flights in the database land the day before the day when they took off? (crossing the international date line). **Credit: 15**

7. Write a query that returns the names of the countries between which is the longest flight in the database (by "longest" it is meant longest in time, not in distance). **Credit: 20**

8. Return the name of the airline (and its number of flights) for which we have the biggest number of flights in the database (we don't care whether the airline is actually operating the flight or sharing the code with a partner airline). **Credit: 12**

9. You have just boarded the daily Francfort-Shanghai flight LH0728 that takes off from Francfort at 17:50. The boarding pass of some other passengers will indicate LH0728 like yours. Write a query to find out which other flight number(s) can be found on the boarding passes of other passengers of the same plane. **Credit : 12**

10. With your "Frequent Flyer" card you have accumulated enough miles and you are entitled to two free round-trip tickets to a destination no more than 600km from Paris (you can compute the distance between two airports of known latitude and longitude with the supplied function fn_flying_dist(latitude1, longitude1, latitude2, longitude2, 'km') – the last parameter provides the unit for distances (km or mi). Write the query that lists the cities where you can go from Paris, by increasing distance. **Credit: 15**

11. The built-in function dayofweek(date) returns 1 for Sunday, 2 for Monday, 3 for Wednesday and so forth up to 7 for Saturday. Write an expression that transforms what dayofweek() returns into a value compatible with the codes used in column day_op of table flights, namely 1 for Monday, 2 for Tuesday and so forth up to 7 for Sunday (you can compare your expression to what returns the provided function fn_dofw()).

You can test your expression with the following dates:
'1989-11-6' => 1 (Monday)
'1989-11-9' => 4 (Thursday)
'1989-11-12' => 7 (Sunday) **Credit :7**

12. Write the query that lists all the flights leaving today Paris Charles-de-Gaulle (code CDG, UTC offset: +1). It will return:
1) destination (city name followed by the airport code)
2) flight number (airline code concatenated to the number proper)
3) departure time
4) arrival time at destination (you will use the supplied function fn_arrival_time() that takes as parameters the departure time, the UTC offset of the departure airport, the flying time in minutes and the UTC offset of the arrival airport)

You will sort by departure time and destination.
To find the day, you can use the provided function fn_dofw(current_date) that returns a number compatible with the day numbering convention used in table flights. **Credit: 15**

Several variants are possible for the condition on the day

```
   and f.day_op like '%' || fn_dow(current_date) || '%'
```
(the function can be cast as a string too ...)

13. Write the query that displays the city name, the airport name, the country code, the number of incoming flights and the number of outgoing flights for the most active airport in the database (highest number of incoming + outgoing flights). **Credit: 30**

14. You wish to go, from Paris, to Collaborate 14, the International Oracle User Group conference (http://www.ioug.org) that takes place in Las Vegas from Apr 7 ,2014 to Apr 11, 2014. We are just interested in this question by the flight from Paris to Las Vegas; we want to make the trip on Apr 6th (written as '2014-4-6' in queries), and we want a direct flight. Write the query that displays the name of the departure airport (Charles-de-Gaulle or Orly), the flight number, the times of departure and of arrival in Las Vegas (using the supplied function fn_arrival_time()).
To find the day, you can use the provided function fn_dofw() that returns a number compatible with the day numbering convention used in table flights. **Credit : 25**

15. For the same Las Vegas conference as in question 14 we want to check if there aren't other possibilities with a connecting flight (without a change of airport). We want all flights to take place the same day (in practice, the length of what function fn_arrival_time() returns must be 5). We won't worry about the time to run from the arrival gate to the departure gate, but we'll check that the second flight takes off AFTER the first one has landed ...
You will display the name of the departure airport (Charles-de-Gaulle or Orly), the number of the first flight (airline code + number), the time of departure for the first flight, its time of arrival, the name of the connecting city, the number of the second flight, its time of departure and the time of arrival in Las Vegas, sorted by time of arrival in Las Vegas and time of departure from Paris.

You'll need the supplied function fn_arrival_time(), and to find the day, you can use the provided function fn_dofw() that returns a number compatible with the day numbering convention used in table flights. **Credit : 50**