

Assignment 4

Data Management (INFO125)

Deadline: Friday, 25.10.2024 at 13:00

INSTRUCTIONS: To be completed in groups of 1-3 students. The assignment is mandatory for all students of INFO125 and should be submitted on Mitt UiB. Please note that questions about the assignments or group seminars should be directed to your seminar leader (TA).

Consider the relations in the AIRLINE relational database schema in the following figure:

AIRPORT

<u>Airport_code</u>	Name	City	State
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FLIGHT

<u>Flight_number</u>	Airline	Weekdays
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FLIGHT_LEG

<u>Flight_number</u>	<u>Leg_number</u>	Departure_airport_code	Scheduled_departure_time
		Arrival_airport_code	Scheduled_arrival_time

LEG_INSTANCE

<u>Flight_number</u>	<u>Leg_number</u>	<u>Date</u>	Number_of_available_seats	Airplane_id		
			Departure_airport_code	Departure_time	Arrival_airport_code	Arrival_time

FARE

<u>Flight_number</u>	<u>Fare_code</u>	Amount	Restrictions
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AIRPLANE_TYPE

<u>Airplane_type_name</u>	Max_seats	Company
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CAN_LAND

<u>Airplane_type_name</u>	<u>Airport_code</u>
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AIRPLANE

<u>Airplane_id</u>	Total_number_of_seats	Airplane_type
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SEAT_RESERVATION

<u>Flight_number</u>	<u>Leg_number</u>	<u>Date</u>	<u>Seat_number</u>	Customer_name	Customer_phone
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Question 1

Fill in the blanks in the following Relational Algebra queries according to the requested descriptions:

- a) Return all airports in Oslo.

$\sigma_{\text{City} = 'Oslo'}(\text{Airport})$

- b) Return all Airlines.

$\pi_{\text{Airline}}(\text{Flight})$

- c) Return all Airlines that have a flight on Saturday

$\pi_{\text{Airline}}(\sigma_{\text{Weekdays} = 'Saturday'}(\text{Flight}))$

Question 2

Consider the AIRLINE relational database schema, provided in the previous question:

- a) Fill in the blanks in the following SQL script that creates the table “Can_land”. Assume that all the other tables have been already created. The airport code contains 3 characters (letters) while the airplane type name contains maximum 13 characters.

```
CREATE TABLE Can_land
(
  Airport CHAR(3),
  Airplane_type_name VARCHAR(13),
  PRIMARY KEY (Airport),
  FOREIGN KEY (Airplane_type_name) REFERENCES Airplane_Type_Name;

```

- b) Find all cities in which an airplane type with name ‘Boeing 747’ can land.

```
SELECT City
FROM Airport, Can_land
WHERE Airport = 'Oslo' AND Airplane_type_name = 'Boeing 747';

```

Question 3

Consider the following tables representing information of **Workers**, **Location** of their departments and **Countries**, and answer the given questions:

DEPT_LOCATION

Loc_Code	Address	Post_Code	City	State	Reg
2700	Schwanthalerstr. 703	80925	Munich	Bavaria	DE
2800	Rua Frei Caneca 1360	01307-002	Sao Paulo	Sao Paulo	BR
2900	20 Rue des Corps-Sai	1730	Geneva	Geneve	CH
3000	Murtenstrasse 921	3095	Bern	BE	CH

WORKER

ID	Fname	Lname	Hire_Date	Job_ID	Salary
100	Steven	King	1987-06-17	AD_PRES	24000.00
101	Neena	Kochhar	1987-06-18	AD_VP	17000.00
102	Lex	De Haan	1987-06-19	AD_VP	17000.00
103	Alexander	Hunold	1987-06-20	IT_PROG	9000.00
104	Bruce	Ernst	1987-06-21	IT_PROG	6000.00
105	David	Austin	1987-06-22	IT_PROG	4800.00
106	Valli	Pataballa	1987-06-23	IT_PROG	4800.00
107	Diana	Lorentz	1987-06-24	IT_PROG	4200.00

COUNTRY

Reg	Country_Name
AR	Argentina
AU	Australia
BE	Belgium
BR	Brazil
CA	Canada
CH	Switzerland
CN	China
DE	Germany
DK	Denmark

- a) Write the query to find the Location Code, Address, City, State, Country Name of all the departments.
- b) Write a query to get the number of workers with the same job.
- c) Write a query to get the maximum salary of a worker who is an IT Programmer