

Relational Algebra

In this assignment you will be writing **relational algebra** (not SQL) queries to select various sets of data

The following queries are based on this schema.

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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The above schema describes a database for airline flight information. Each FLIGHT is identified by a Flight_number, and consists of one or more FLIGHT_LEGs with Leg_numbers 1, 2, 3, and so on. Each FLIGHT_LEG has scheduled arrival and departure times, airports, and one or more LEG_INSTANCES—one

for each Date on which the flight travels. FAREs are kept for each FLIGHT. For each FLIGHT_LEG instance, SEAT_RESERVATIONS are kept, as are the AIRPLANE

used on the leg and the actual arrival and departure times and airports. An AIRPLANE is identified by an Airplane_id and is of a particular AIRPLANE_TYPE. CAN_LAND relates AIRPLANE_TYPES to the AIRPORTs at which they can land. An AIRPORT is identified by an Airport_code.

Specify the following queries using relational algebra

1. For each flight, list the airline, fare and departure time for the first leg of the flight.
2. For each flight list the departure airport code for the first leg of the flight and the arrival airport code for the third leg.
3. List the fare and first leg departure airport of all flights that land in Kahului (airport code PHOG)
4. For the flight 'U1181' list the total number of seats on the aircraft for leg 2 on 3/12/2014
5. Convert the following into relational algebra

```
SELECT foo.a, bar.b, baz.c FROM foo
INNER JOIN bar ON bar.id = foo.bar_id
INNER JOIN baz ON baz.id = foo.baz_id
WHERE foo.z = 50;
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