

Worksheet 21 - writing SQL queries

Monday, April 21, 2025

DS 002R - Jo Hardin

Name: _____

Names of people you worked with: _____

What class are you most excited about for spring semester?

Task:

The airlines SQL database contains information on 18 million flights from the Bureau of Transportation Statistics (you have worked with a small subset of this data in the `nycflights13` package). Information from the database can be obtained through SQL queries. For example, the `flights` table contains the following variables:

1. How many domestic flights flew into Dallas-Fort Worth DFW on May 14, 2014?
2. Find all flights between JFK and SFO in 2015 How many were cancelled? What percentage of the total number of flights were cancelled? (Assume that `cancelled` is a binary variable with values 0 and 1, so you can do arithmetic on it.)
3. Of all the destinations from Chicago O'Hare (ORD), which were the most common in 2013?
4. Which airport had the highest average arrival delay time in 2015?
5. How many domestic flights came into or flew out of Bradley Airport (BDL) in 2013?
6. List the airline and flight number for all flights between LAX and JFK on September 26th, 2014.

```
DESCRIBE flights;
```

	Field	Type	Null	Key	Default	Extra
1	year	smallint(4)	YES		<NA>	
2	month	smallint(2)	YES		<NA>	
3	day	smallint(2)	YES		<NA>	
4	dep_time	smallint(4)	YES		<NA>	
5	sched_dep_time	smallint(4)	YES		<NA>	
6	dep_delay	smallint(4)	YES		<NA>	
7	arr_time	smallint(4)	YES		<NA>	
8	sched_arr_time	smallint(4)	YES		<NA>	
9	arr_delay	smallint(4)	YES		<NA>	
10	carrier	varchar(2)	NO			
11	tailnum	varchar(6)	YES	MUL	<NA>	
12	flight	smallint(4)	YES		<NA>	
13	origin	varchar(3)	NO	MUL		
14	dest	varchar(3)	NO	MUL		
15	air_time	smallint(4)	YES		<NA>	
16	distance	smallint(4)	YES		<NA>	
17	cancelled	tinyint(1)	YES		<NA>	
18	diverted	tinyint(1)	YES		<NA>	
19	hour	smallint(2)	YES		<NA>	
20	minute	smallint(2)	YES		<NA>	
21	time_hour	datetime	YES		<NA>	

Solution:

1. How many domestic flights flew into Dallas-Fort Worth DFW on May 14, 2014?

```
SELECT sum(1) as N
FROM flights
WHERE year = 2014 AND Month = 5 AND day = 14
      AND dest = 'DFW';
```

Table 1: 1 records

N
786

2. Find all flights between JFK and SFO in 2015 How many were cancelled? What percentage of the total number of flights were cancelled?

```
SELECT
  sum(1) as numFlights,
  sum(cancelled) as numCancelled,
  avg(cancelled) as pctCancelled
FROM flights
WHERE year = 2015
      AND dest IN ('JFK', 'SFO') AND origin IN ('JFK', 'SFO')
LIMIT 0,6;
```

Table 2: 1 records

numFlights	numCancelled	pctCancelled
18559	230	0.0124

3. Of all the destinations from Chicago O'Hare (ORD), which were the most common in 2013?

```
SELECT
  dest,
  sum(1) as numFlights
FROM flights
WHERE year = 2013
      AND origin = 'ORD'
```

```
GROUP BY dest
ORDER BY numFlights desc
LIMIT 0,6;
```

Table 3: 6 records

dest	numFlights
LGA	8876
SFO	7950
LAX	7799
DFW	7613
ATL	7584
BOS	6969

4. Which airport had the highest average arrival delay time in 2015?

```
SELECT
  dest,
  sum(1) as numFlights,
  avg(arr_delay) as avg_arr_delay
FROM flights
WHERE year = 2015
GROUP BY dest
ORDER BY avg_arr_delay desc
LIMIT 0,6;
```

Table 4: 6 records

dest	numFlights	avg_arr_delay
STC	82	21.6220
ILG	98	21.3163
OTH	311	17.0868
TTN	3113	15.7600
PBG	295	15.3559
GUM	365	14.3671

5. How many domestic flights came into or flew out of Bradley Airport (BDL) in 2013?

```
SELECT COUNT(*) as numFlights
FROM flights
WHERE Year = 2013
      AND (Dest = 'BDL' OR Origin = 'BDL');
```

Table 5: 1 records

numFlights
44516

- List the airline and flight number for all flights between LAX and JFK on September 26th, 2014.

```
SELECT carrier, flight
FROM flights
WHERE Year = 2014 AND Month = 9 AND day = 26
      AND Origin IN ('LAX', 'JFK')
      AND Dest IN ('LAX', 'JFK')
LIMIT 0,6;
```

Table 6: 6 records

carrier	flight
VX	420
AA	292
UA	212
DL	476
AA	118
B6	24