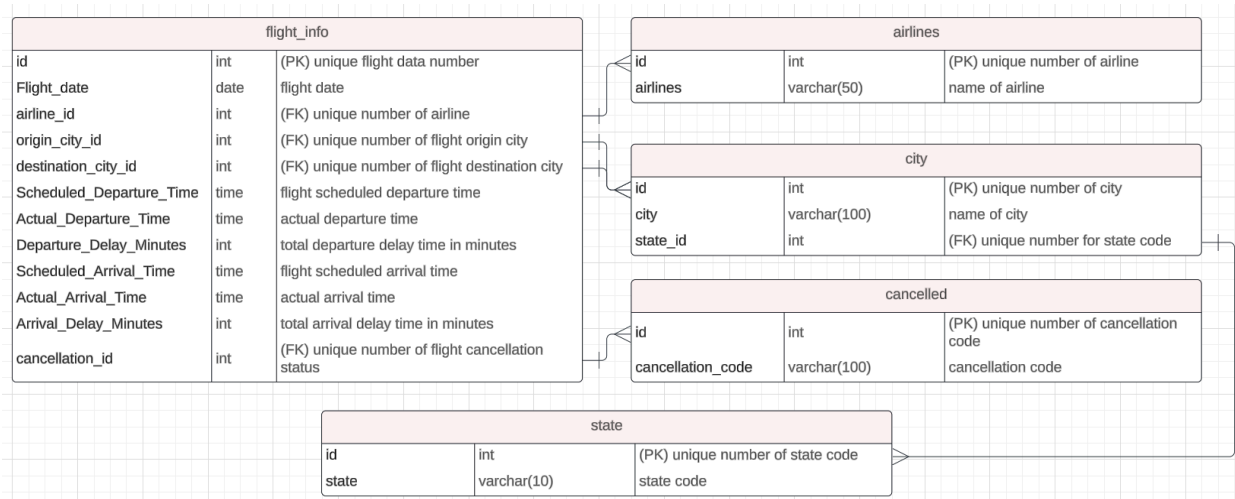


From: Frederick Kusumo

To: Raj

Hi Raj,

I have gladly looked up flight data for the US. I have made a database under the name 'finalproj' which consists of 5 tables of flight information. The ERD below provides a better view of the database that I created.



1. Which airline has the longest and shortest average delay time of departure and arrival?

```
mysql> select airline, avg(Departure_Delay_Minutes) avg_departure_delay_minutes, avg(Arrival_Delay_Minutes) avg_arrival_delay_minutes from flight_info
fi join airlines a on fi.airline_id = a.id group by airline_id order by avg(Departure_Delay_Minutes), avg(Arrival_Delay_Minutes);
```

airline	avg_departure_delay_minutes	avg_arrival_delay_minutes
Alaska Airlines Inc.	3.0890	-0.0693
Endeavor Air Inc.	4.6813	-2.2487
Horizon Air	4.8564	2.1519
Hawaiian Airlines Inc.	5.2346	3.9577
Republic Airline	5.4254	-0.6996
Envoy Air	6.3254	2.6019
PSA Airlines Inc.	7.6659	3.5179
SkyWest Airlines Inc.	7.7836	2.1915
Delta Air Lines Inc.	8.7654	1.4235
Southwest Airlines Co.	10.3544	2.8983
United Air Lines Inc.	11.6585	5.7399
Mesa Airlines Inc.	11.6684	6.2895
American Airlines Inc.	13.6698	8.0103
ExpressJet Airlines LLC d/b/a aha!	13.8553	12.0932
Allegiant Air	14.7488	15.0407
Spirit Air Lines	15.2826	9.8697
Frontier Airlines Inc.	16.3369	10.4654
JetBlue Airways	17.1004	11.2851

18 rows in set (0.25 sec)

Based on the query, it can be seen that Alaska Airlines has the shortest average delay time of departure. Though Alaska doesn't have the shortest arrival delay time, it is still in the negatives in the average which means that Alaska Airlines flights typically arrive earlier than scheduled.

Meanwhile, the longest average delay departure time is Jetblue Airways, and Allegiant Air has the longest average arrival delay time.

2. Which top 5 cities see the longest and shortest average departure delay time?

```
mysql> select concat(city, ',', states) origin_city, avg(Departure_Delay_Minutes) from city c join flight_info fi on c.id = fi.origin_city_id join states s on c.states_id = s.id group by c.id order by avg(Departure_Delay_Minutes) desc limit 5;
```

origin_city	avg(Departure_Delay_Minutes)
Hyannis, MA	117.5000
Greenville, NC	117.0000
Eagle, CO	82.2500
Hays, KS	65.1429
Grand Island, NE	56.4286

5 rows in set (0.26 sec)

```
mysql> select concat(city, ',', states) origin_city, avg(Departure_Delay_Minutes) from city c join flight_info fi on c.id = fi.origin_city_id join states s on c.states_id = s.id group by c.id order by avg(Departure_Delay_Minutes) limit 5;
```

origin_city	avg(Departure_Delay_Minutes)
Gustavus, AK	-26.0000
Hattiesburg/Laurel, MS	-22.0000
Lewisburg, WV	-20.3333
Dodge City, KS	-13.0000
Deadhorse, AK	-12.3750

5 rows in set (0.22 sec)

The top 5 cities that have the longest average departure delay time are Hyannis, Greenville, Eagle, Hays, and Grand Island. Surprisingly, these are relatively small cities except for Greenville.

The top 5 cities with the shortest average departure delay time are Gustavus, Hattiesburg/Laurel, Lewisburg, Dodge City, and Deadhorse.

3. Which airline has the lowest chance of cancellation?

```
mysql> select airline, avg(case when cancellation_code != 'Not Cancelled' then 100.0 else 0 end) chance_of_cancellation from flight_info fi join cancelled c on fi.cancellation_id = c.id join airlines a on fi.airline_id = a.id group by airline_id order by chance_of_cancellation;
```

airline	chance_of_cancellation
Horizon Air	1.38122
Hawaiian Airlines Inc.	1.53846
Delta Air Lines Inc.	1.67775
Alaska Airlines Inc.	1.85075
United Air Lines Inc.	2.19570
Envoy Air	2.34180
Spirit Air Lines	2.38532
SkyWest Airlines Inc.	2.47362
JetBlue Airways	2.66951
Endeavor Air Inc.	2.67765
PSA Airlines Inc.	2.69058
Frontier Airlines Inc.	2.82376
American Airlines Inc.	3.11012
Southwest Airlines Co.	3.15559
Republic Airline	3.17797
Mesa Airlines Inc.	3.42105
Allegiant Air	5.11628
ExpressJet Airlines LLC d/b/a aha!	5.46624

18 rows in set (0.29 sec)

The airline with the lowest chance of cancellation is Horizon Air, which is a subsidiary owned by Alaska Airlines. The next most reliable airline is Hawaiian Airlines.

4. Which day of the week has the highest average departure delay?

```
mysql> select dayofweek(Flight_Date) day_of_week, avg(Departure_Delay_Minutes) from flight_info group by dayofweek(Flight_Date) order by dayofweek(Flight_Date);
```

day_of_week	avg(Departure_Delay_Minutes)
1	12.1109
2	8.9270
3	8.0932
4	7.9462
5	11.0097
6	11.5673
7	10.1351

```
7 rows in set (0.08 sec)
```

It is not surprising that the day with the highest average departure delay time is Monday.

I hope these will help you plan for future business trips. Please let me know if there is anything I can do to help or if you have more questions regarding flights or airlines.

Best,

Frederick