Airline Database Management System

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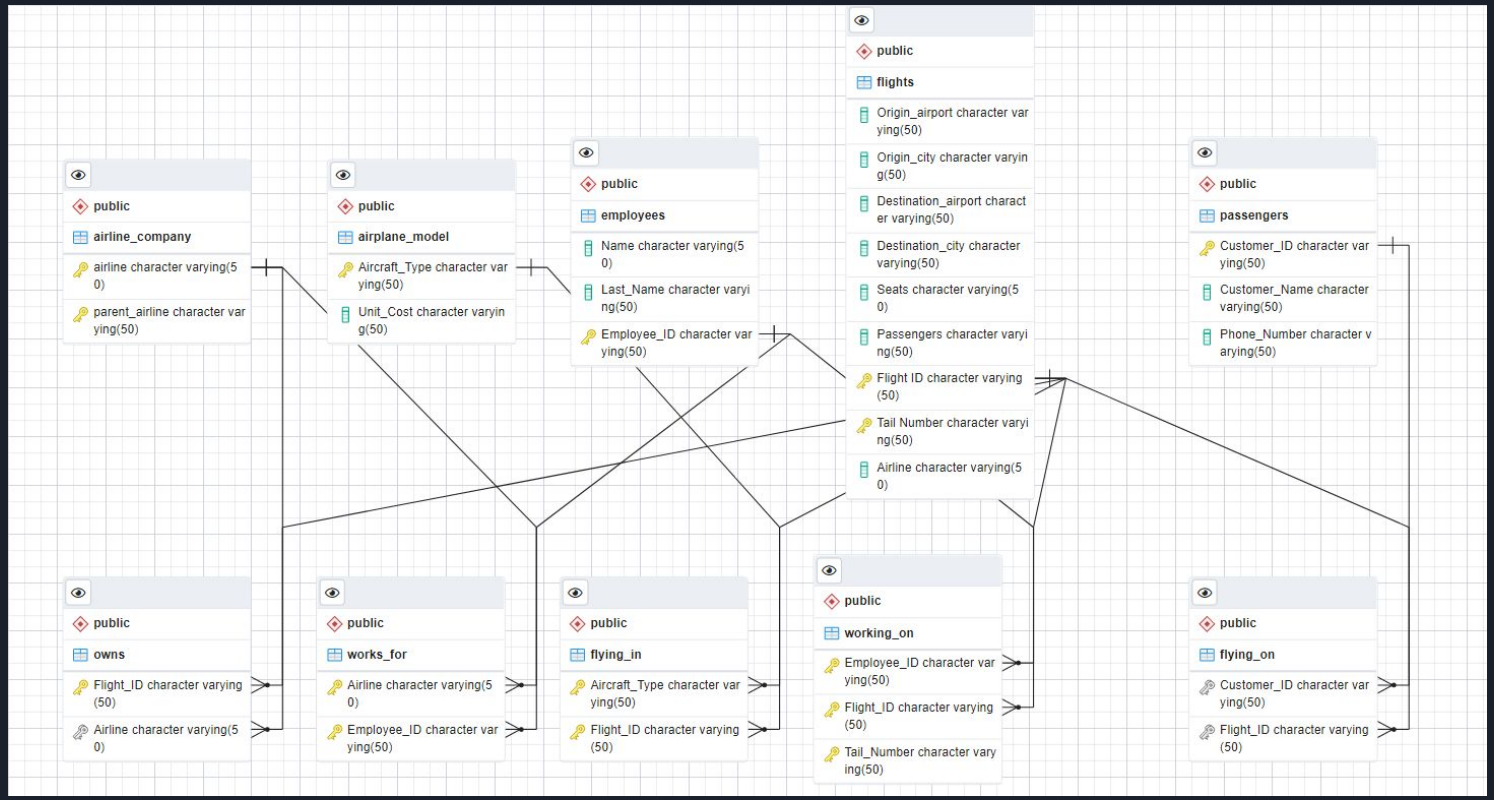
Motivation

We wanted to build a database that could provide an airport with relevant metrics that would help them analyze business needs and make improvements in efficiency and logistics.

We are also all enthusiastic about travel and found it interesting to analyze how airlines and airports operate, as well as all of the different statistics that go into determining their business operations.

ER Diagram


public
airline_company
airline character varying(50)
parent_airline character varying(50)
public
airplane_model
Aircraft_Type character varying(50)
Unit_Cost character varying(50)
public
employees
Name character varying(50)
Last_Name character varying(50)
Employee_ID character varying(50)
public
flights
Origin_airport character varying(50)
Origin_city character varying(50)
Destination_airport character varying(50)
Destination_city character varying(50)
Seats character varying(50)
Passengers character varying(50)
Flight ID character varying(50)
Tail Number character varying(50)
Airline character varying(50)
public
passengers
Customer_ID character varying(50)
Customer_Name character varying(50)
Phone_Number character varying(50)
public
owns
Flight_ID character varying(50)
Airline character varying(50)
public
works_for
Airline character varying(50)
Employee_ID character varying(50)
public
flying_in
Aircraft_Type character varying(50)
Flight_ID character varying(50)
public
working_on
Employee_ID character varying(50)
Flight_ID character varying(50)
Tail_Number character varying(50)
public
flying_on
Customer_ID character varying(50)
Flight_ID character varying(50)

Data Summary

The majority of our data was sourced from Kaggle.com databases relating to airports, airline companies, and consumer flights data. A small portion of the data was collected from governments databases and some, primarily personal information, was randomly generated.

Our data consists of ten tables, 5 primary tables and 5 relationship tables.:

Primary Tables
- airplane_model
- flights
- airline_company
- passengers
- employees

Relationship Tables
- flying_in
- owns
- flying_on
- working_on
- works_for

Data Summary - airplane_model

Our airplane_model table consists of 2 columns, *aircraft_type* and *unit_cost*, and has 93 rows.

```
61  SELECT *
62  FROM airplane_model;
63
```

Data Output | Messages | Notifications

	aircraft_type [PK] character varying (50)	unit_cost double precision
1	ATR 42-300F/-320F	20
2	ATR 42-600	20
3	ATR 42/72	22
4	ATR 72-200F	25
5	ATR 72-600	25
6	Airbus A300	75
7	Airbus A310	75
8	Airbus A318	66
9	Airbus A319	90
10	Airbus A320	98

Data Summary - flights

Our airline_company table consists of 9 columns, *origin_airport*, *origin_city*, *destination_airport*, *destination_city*, *seats*, *passengers*, *flight_id*, *tail_number*, and *airline*, and has 100 rows.

```
61  SELECT *
62  FROM flights;
63
```

Data Output | Messages | Notifications

	origin_airport character varying (50)	origin_city character varying (50)	destination_airport character varying (50)	destination_city character varying (50)	seats integer	passengers integer	flight_id [PK] character varying (50)	tail_number [PK] character varying (50)	airline character varying (50)
1	MSY	New Orleans, LA	DFW	Dallas, TX	354	89	508	N915WN	Southwest Airlines
2	MSP	Minneapolis, MN	CID	Cedar Rapids, IA	2890	1947	15508	N302DU	Delta Air Lines
3	ATL	Atlanta, GA	TUL	Tulsa, OK	4828	3083	5869	N3059	United Airlines
4	DFW	Dallas, TX	MCO	Orlando, FL	710	664	14804	N303SY	Delta Air Lines
5	MEM	Memphis, TN	PHX	Phoenix, AZ	3844	3354	316	N278WN	Southwest Airlines
6	SLC	Salt Lake City, UT	TUS	Tucson, AZ	122	116	10228	N982AT	Delta Air Lines
7	ORD	Chicago, IL	PHL	Philadelphia, PA	3190	1401	15225	N308DN	Delta Air Lines
8	SBN	South Bend, IN	ORD	Chicago, IL	1650	1132	12125	C-FWSO	WestJet Airlines
9	RNO	Reno, NV	FAT	Fresno, CA	535	227	11889	N24MG	DHL Express (USA)
10	ABE	Allentown, PA	MYR	Myrtle Beach, SC	660	618	13712	G ZBJG	British Airways

Data Summary - airline_company

Our airline_company table consists of 2 columns, *airline* and *parent_airline*, and has 281 rows.

```
61  SELECT *
62  FROM airline_company;
63
```

Data Output | Messages | Notifications

	airline character varying (50)	parent_airline character varying (50)
1	Airline	Parent Airline
2	Aegean Airlines	Aegean Airlines
3	Olympic Air	Aegean Airlines
4	Aeroflot	Aeroflot
5	Rossiya Airlines	Aeroflot
6	Aurora Airlines	Aeroflot
7	Pobeda	Aeroflot
8	Aerolineas Argentinas	Aerolineas Argentinas
9	Austral Líneas Aéreas	Aerolineas Argentinas
10	Air Algerie	Air Algerie

Data Summary - passengers

Our airline_company table consists of 3 columns, *customer_id*, *customer_name* and *phone_number*, and has 300 rows.

```
61  SELECT *
62  FROM passengers;
63
```

Data Output | Messages | Notifications

	customer_id [PK] character varying (50)	customer_name character varying (50)	phone_number character varying (50)
1	FA024A	Dana Ratliff	268-772-9204
2	7B49CF	Santiago Gibson	776-722-8590
3	395297	Mary Walker	476-745-5447
4	DA7BF4	Alta Ritter	598-064-6863
5	AAEAE9	Tomasa Duff	956-562-2828
6	2401F9	Donald Dixon	275-024-7437
7	BA31C6	Marjorie Claycomb	464-297-3069
8	17CF63	Charlotte Brammer	711-037-1858
9	32EA8A	Janey Marion	716-400-2369
10	FDEE41	William Carrillo	108-722-8585

Data Summary - employees

Our airline_company table consists of 3 columns, *name*, *last_name* and *employee_id*, and has 295 rows.

```
61  SELECT *
62  FROM employees;
63
```

Data Output | Messages | Notifications

	name character varying (50)	last_name character varying (50)	employee_id [PK] character varying (50)
1	Judy	Cobb	7819
2	Lily	Duran	7691
3	Amalia	Hicks	3735
4	Alys	Gibbs	8316
5	Easter	Fletcher	7092
6	Elmina	Pearson	7297
7	Callie	Leung	2928
8	Paula	Kemp	6519
9	Theodora	Roy	3875
10	Huldah	Khoury	7131

Query #1 - Amisha Gupta

List all types of aircrafts that fly to Pittsburgh, PA. Return airline name, total number of flights , aircraft type, and origin city

```
SELECT flying_in.aircraft_type, flights.airline, COUNT(flights.flight_id),
flights.origin_city, flights.destination_city
FROM flights, flying_in
WHERE flying_in.flight_id= flights.flight_id
AND flights.destination_city LIKE 'Pittsburgh, PA'
GROUP BY  flights.airline, flying_in.aircraft_type, flights.origin_city,
flights.destination_city
```

Query #2 - Patrick Copeland

Find the airline name and number of flights that traveled through a city whose name contains the letter 'e'. Only return those airlines who flew at least ten flights and list them in descending order.

```
SELECT flights.airline, COUNT(flights.flight_id) AS counts
FROM flights
WHERE flights.destination_city LIKE '%e%' OR flights.origin_city LIKE '%e%'
GROUP BY flights.airline
HAVING COUNT(flights.flight_id) >= 10
ORDER BY counts DESC
```

Query #3 - Janis Grikstas

Find the cargo airlines that exist in the database, but have no flight records.

```
SELECT airline_company.airline
FROM airline_company
LEFT JOIN flights on flights.airline = airline_company.airline
WHERE flights.airline IS NULL
  AND airline_company.airline LIKE '%Cargo%' OR airline_company.airline
  LIKE '%Freight%'
```

Query #4 - Saahaj Mattey

List the number of flights flying to Detroit and their aircraft types, MI where the aircrafts are made by ‘Boeing’ and ‘Airbus’, that cost over $50 million.

```
SELECT airplane_model.aircraft_type, COUNT(flights.flight_id) as FlightCount
FROM flights, airplane_model, flying_in
WHERE flying_in.flight_id = flights.flight_id
   AND flying_in.aircraft_type = airplane_model.aircraft_type
   AND flights.destination_city LIKE 'Detroit, MI' and airplane_model.unit_cost > 50
   AND airplane_model.aircraft_type LIKE 'Boeing%'
      OR airplane_model.aircraft_type LIKE 'Airbus%'
GROUP BY airplane_model.aircraft_type
```

Query #5 - Brian Franklin

Find all flights that land in a destination city that starts with the letter 'P' and contain a passenger whose name contains a lowercase 'a'. Return the airplane models, as well as the flight IDs of these flights, the destination city, and customer names ordered in alphabetical order by first name.

```
SELECT passengers.customer_name, flying_in.aircraft_type, flights.flight_id,
  flights.destination_city
FROM flights, flying_in, flying_on, passengers
WHERE flights.destination_city LIKE 'P%'
  AND flights.flight_id = flying_in.flight_id
  AND flights.flight_id = flying_on.flight_id
  AND flying_on.customer_id = passengers.customer_id
  AND passengers.customer_name LIKE '%a%'
ORDER BY (customer_name) ASC;
```

Query #6 - Pranav Chandiramani

Print the arrival and departure city of flights where first number of customer phone no matches the last digit of the flight id and the airplane unit cost is over or equal to $30 million, ordered by origin airport in ascending order.

```
SELECT flights.destination_city, flights.origin_city
FROM flights, passengers, airplane_model, flying_on, flying_in
WHERE flights.flight_id = flying_on.flight_id
AND passengers.customer_id = flying_on.customer_id
AND LEFT(passengers.phone_number, 1) = RIGHT(flying_on.flight_id, 1)
AND flights.flight_id = flying_in.flight_id
AND airplane_model.aircraft_type = flying_in.aircraft_type
AND airplane_model.unit_cost >= 30
ORDER BY flights.origin_city
```

Query #7 - Sanghamitra Volam

Print the number of Flights with employee(s) who's name starts with 'A'.

```
SELECT count(flights.flight_id)
FROM flights,employees,working_on
WHERE flights.flight_id = working_on.flight_id
AND working_on.employee_id = employees.employee_id
AND left(employees.employee_id, 1) = 'A';
```

GitHub Repository

https://github.com/amishagupta18/Airline_Database_Management