Lambton College

Project Report

On

Airline Ticket Reservation System

(CSD 2206-5 DATABASE DESIGN AND SQL)

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INTRODUCTION

Airline Ticket Reservation System is a database project that facilitate the reservation of the online air tickets through an effective and yet simple GUI for a normal passenger intending to travel in airways. The project is basically targeted all those people who would like to travel through air. Apart from reserving tickets, through this system a passenger can compare fares 'from' various cities 'to' various cities.

SQL Queries

1. Data entry into tables that you have created.

```sql
USE AIRWAY_BOOKING;

SELECT * FROM AIRCRAFT;
SELECT * FROM AIRLINE;
SELECT * FROM BOOKING;
SELECT * FROM FLIGHT;
SELECT * FROM GATE;
SELECT * FROM PASSENGER;
SELECT * FROM PASSENGER_INFO;
SELECT * FROM PAYMENT_ACCOUNT;
SELECT * FROM ROUTE;
SELECT * FROM ROUTE_GROUP;
SELECT * FROM ROUTE_GROUP_DETAIL;
SELECT * FROM TERMINAL;
SELECT * FROM TICKET;
```

Queries.sql - DESK...GU5GQSH\Acer (52))* ✕

```
USE AIRWAY_BOOKING;

SELECT * FROM AIRCRAFT;
SELECT * FROM AIRLINE;
SELECT * FROM BOOKING;
SELECT * FROM FLIGHT;
SELECT * FROM GATE;
SELECT * FROM PASSENGER;
SELECT * FROM PASSENGER_INFO;
SELECT * FROM PAYMENT_ACCOUNT;
SELECT * FROM ROUTE;
SELECT * FROM ROUTE_GROUP;
SELECT * FROM ROUTE_GROUP_DETAIL;
SELECT * FROM TERMINAL;
SELECT * FROM TICKET;
```

100 %

▦ Results   🔲 Messages

	aircraft_id	airline_id	aircraft_name	number_eco_seat	number_bus_seat	description
1	2P001	2P	AIRBUS 380	50	300	NULL
2	2P002	2P	AIRBUS 999	100	450	NULL
3	AA001	AA	BOEING 747	70	400	NULL
4	AA002	AA	BOEING 303	30	200	NULL
5	AC001	AC	BOEING 747	70	400	NULL
6	AC002	AC	BOEING 300	70	350	NULL
7	BR001	BR	BOEING 777	70	450	NULL
8	BR002	BR	BOEING 350	70	450	NULL

	airline_id	airline_name	description
1	2P	AIR PHILIPPINES	NULL
2	AA	AMERICAN AIRLINES	NULL

✔ Query... | DESKTOP-GU5GQSH\SQLEXPRESS ... | DESKTOP-GU5GQSH\Acer (52) | AIRWAY_BOOKING | 00:00:02 | 216 rows

Queries.sql - DESK...GU5GQSH\Acer (52))* ✕

100 %

Results | Messages

	airline_id	airline_name	description
1	2P	AIR PHILIPPINES	NULL
2	AA	AMERICAN AIRLINES	NULL
3	AC	AIR CANADA	NULL
4	BR	EVA AIR	NULL
5	CX	CATHAY PACIFIC	NULL
6	NQ	AIR JAPAN	NULL
7	RV	AIR CANADA ROUGE	NULL
8	S2	AIR SAHARA	NULL

	booking_id	card_id	status	discount	issued_date
1	BOOKING00001	3333333333	SUCCEEDED	0	2019-11-01 08:34:15.000
2	BOOKING00002	1111111111	SUCCEEDED	0	2019-11-11 08:34:15.000
3	BOOKING00003	2222222222	SUCCEEDED	0	2019-11-01 08:34:15.000
4	BOOKING00004	4444444444	SUCCEEDED	0	2019-11-15 08:34:15.000
5	BOOKING00005	5555555555	SUCCEEDED	0	2019-11-05 08:34:15.000
6	BOOKING00006	6666666666	SUCCEEDED	0	2019-11-01 08:34:15.000
7	BOOKING00007	7777777777	SUCCEEDED	0	2019-11-20 08:34:15.000
8	BOOKING00008	8888888888	SUCCEEDED	0	2019-11-01 08:34:15.000

	flight_id	aircraft_id	route_id	gate_id	depart_date	arrive_date	eco_class_price
1	2019110001	S2001	0001	1	2019-11-25 08:40:00.000	2019-11-25 12:30:00.000	500.5
2	2019110002	BR002	0002	1	2019-11-26 08:40:00.000	2019-11-26 12:40:00.000	500.5
3	2019110003	CX001	0003	1	2019-11-27 08:40:00.000	2019-11-27 11:30:00.000	500.5
4	2019110004	VN001	0004	1	2019-11-28 08:40:00.000	2019-11-28 12:30:00.000	500.5
5	2019110005	S2002	0005	1	2019-11-29 08:40:00.000	2019-11-29 12:30:00.000	500.5
6	2019110006	BR001	0006	1	2019-11-30 08:40:00.000	2019-11-30 12:30:00.000	500.5

Queries.sql - DESK...GU5GQSH\Acer (52))* ✕

100 %

Results | Messages

6	2019110006	BR001	0006	1	2019-11-30 08:40:00.000	2019-11-30 12:30:00.000	500.5
7	2019110007	CX002	0007	1	2019-12-01 08:40:00.000	2019-12-01 12:30:00.000	500.5
8	2019110008	VN002	0008	1	2019-12-02 08:40:00.000	2019-12-02 12:30:00.000	500.5

	gate_id	terminal_id	gate_name
1	1	1	1
2	2	2	5
3	3	3	1
4	4	4	5
5	5	5	1
6	6	6	5
7	7	7	1
8	8	8	5

	passenger_id	passport_number
1	000001	CSD220601
2	000002	CSD230601
3	000003	CSD320602
4	000004	CSD320891
5	000005	CSD550601
6	000006	CSD320601
7	000007	CSD260601
8	000008	CSD560601

	passport_number	name	phone	date_of_birth	address	email
1	CSD220601	THOMAS DANIEL	4335337777	1990-05-20	US	THOMAS@GMAIL.COM
2	CSD228601	THOMSON RAIN	1335337777	1990-05-20	CANADA	THOMSON@GMAIL.COM

100 % ▾

Results | Messages

2	CSD228601	THOMSON RAIN	1335337777	1990-05-20	CANADA	THOMSON@GMAIL.COM
3	CSD230601	JOHN DANIEL	5235337777	1990-05-20	CANADA	JOHN@GMAIL.COM
4	CSD260601	SANSAN KAUR	7335337777	1990-05-20	INDIA	SANSAN@GMAIL.COM
5	CSD320601	MOHAMED ABI	5335337777	1990-05-20	ARAB	ABI@GMAIL.COM
6	CSD320602	THORN BROWN	2235337777	1990-05-20	US	THORN@GMAIL.COM
7	CSD320891	THUY LINH NG...	4335338777	1990-05-20	VIETN...	THUYLINH@GMAIL.COM
8	CSD323331	THUNDER RAIN	1335338887	1990-05-20	CANADA	THUNDER@GMAIL.COM

	card_id	name	password	expire_date
1	1111111111	JOHN DANIEL	308	2025-03-01
2	1111122222	THUNDER RAIN	580	2025-03-01
3	2222222222	THORN BROWN	380	2025-03-01
4	3333333333	THOMAS DANI...	388	2025-03-01
5	4444444444	THUY LINH N...	378	2025-03-01
6	5555555555	SHAWN DANIEL	318	2025-03-01
7	6666666666	MOHAMED ABI	328	2025-03-01
8	7777777777	SANSAN KAUR	378	2025-03-01

	route_id	source_airport_id	destination_airport_id
1	0001	SGN	DEL
2	0002	SGN	TPE
3	0003	SGN	HKG
4	0004	SGN	HAN
5	0005	DEL	SGN
6	0006	TPE	SGN
7	0007	HKG	SGN
8	0008	HAN	SGN

100 % ▾

Results | Messages

	route_group_id	source_airport_id	destination_airport_id
1	0001	SGN	YYZ
2	0002	SGN	JFK
3	0003	SGN	YVR
4	0004	DEL	YYZ
5	0005	DEL	JFK
6	0006	YYZ	SGN
7	0007	JFK	SGN
8	0008	YVR	SGN

	route_id	route_group_id
1	0002	0001
2	0020	0001
3	0002	0002
4	0023	0002
5	0002	0003
6	0022	0003
7	0010	0004
8	0021	0004

	terminal_id	airport_id	terminal_name	description
1	1	SGN	A	NULL
2	2	SGN	B	NULL
3	3	YYZ	1	NULL
4	4	YYZ	2	NULL
5	5	DEL	A	NULL
6	6	DEL	B	NULL

2. Travel history of a specific passenger.

```sql
USE AIRWAY_BOOKING;

/*Q2 Travel history of a specific passenger*/
/*Performing: All flights that passenger_id 000002 has flied*/
SELECT p.passenger_id, T.flight_id
FROM PASSENGER AS P INNER JOIN TICKET AS T ON P.passenger_id = T.passenger_id
        INNER JOIN FLIGHT AS F ON T.flight_id = F.flight_id
WHERE p.passenger_id = '000002';
```

3. Total hours that a specific aircraft has served during a specific time interval.

```
USE AIRWAY_BOOKING;

/*Q3 total hours that a specific aircarft has served during a specific time interval*/
/*Performing: Total hours aircraft_if BR002 has served from Nov 26th 2019 to Dec 11th
2019*/
SELECT SUM(DATEDIFF(HH,depart_date,arrive_date)) AS 'Total Hours'
FROM FLIGHT
WHERE flight_id IN
        (SELECT F.flight_id
        FROM AIRCRAFT AS AC INNER JOIN FLIGHT AS F ON AC.aircraft_id = F.aircraft_id
        WHERE (F.aircraft_id = 'BR002' AND F.depart_date BETWEEN '2019-11-26 00:00:00'
AND '2019-12-11 00:00:00'));
```


4. Total number of aircrafts belonging to a specific airline.

```
USE AIRWAY_BOOKING;

/*Q4 number of aircarfts belong to a specific airline*/
/*Performing: Total aircraft that Philipines Airline(2P) possessing*/
SELECT COUNT(aircraft_name) AS 'Total aircarfts'
FROM AIRCRAFT WHERE airline_id = '2P';
```

5. Total number of hours that a specific passenger has travelled during a specific time interval.

```sql
USE AIRWAY_BOOKING;

/*Q5 total hours that a specific passenger has travel during a specific time
interval*/
/*Performing: Total hours passesger_if 000007 has traveled during the period of Nov
26th 219 - Dec 11th 2019*/
SELECT SUM(DATEDIFF(HH,depart_date,arrive_date)) AS 'Total Hours'
FROM FLIGHT
WHERE flight_id IN
        (SELECT f.flight_id
        FROM PASSENGER AS P INNER JOIN TICKET AS T ON P.passenger_id = T.passenger_id
        INNER JOIN FLIGHT AS F ON T.flight_id = F.flight_id
        WHERE (P.passenger_id = '000007' AND F.depart_date BETWEEN '2019-11-26 00:00:00'
AND '2019-12-11 00:00:00'));
```


6. Total number of hours that a specific airline has been running during a specific time interval.

```sql
USE AIRWAY_BOOKING;

/*Q6 Total number of hours that a specific airline has been running during a specific
time interval*/
/*Performing: Total number of hours that Eva Airline has been running between Nov 26
2019 and Dec 11 2019*/
SELECT SUM(DATEDIFF(HH,depart_date,arrive_date)) AS 'Total Hours'
    FROM FLIGHT
    WHERE flight_id IN (SELECT F.flight_id
        FROM AIRCRAFT AS AC INNER JOIN AIRLINE AS AL
        ON AC.airline_id = AL.airline_id
        INNER JOIN FLIGHT AS F ON AC.aircraft_id = F.aircraft_id
        WHERE AL.airline_id = 'BR' AND F.depart_date BETWEEN '2019-11-26 00:00:00'AND
        '2019-12-11 00:00:00');
```

7. List of all passengers who flew to a specific city during a specific time interval.

```
USE AIRWAY_BOOKING;

/*Q7 List of all passengers who flew to a specific city during a specific time
interval*/
/*Performing: List all passgener who flew to Hong Kong between Nov 26 2019 and Dec 11
2019*/
SELECT P.passenger_id, P_I.passport_number, P_I.name, P_I.phone, P_I.email,
P_I.date_of_birth
FROM PASSENGER_INFO AS P_I INNER JOIN PASSENGER AS P ON P_I.passport_number =
P.passport_number
WHERE P.passenger_id IN
    (SELECT T.passenger_id FROM TICKET AS T INNER JOIN FLIGHT AS F ON T.flight_id =
F.flight_id INNER JOIN ROUTE AS R ON F.route_id = R.route_id
        INNER JOIN AIRPORT AS APD ON R.destination_airport_id = APD.airport_id
        WHERE (APD.city = 'HONG KONG' AND F.arrive_date BETWEEN '2019-11-26 00:00:00' AND
'2019-12-11 00:00:00'));
```

8. Most visited city during the last month.

```sql
USE AIRWAY_ BOOKING;


/*Q8 Most visited city during the last month.*/
/*Performing: Show the city was visited the most in the period from Nov 26 2019 to
Dec 11 2019*/
SELECT TOP(1) *
FROM
        (SELECT AP.city, COUNT(AP.city) AS 'Visited times'
        FROM FLIGHT AS F INNER JOIN ROUTE AS R ON F.route_id = R.route_id
        INNER JOIN AIRPORT AS AP ON R.destination_airport_id = AP.airport_id
        WHERE F.arrive_date BETWEEN '2019-11-26 00:00:00' AND '2019-12-11 00:00:00'
        GROUP BY AP.city) AS C
ORDER BY C.[Visited times] DESC;
```

```
Queries.sql - DESK...GU5GQSH\Acer (52))*  ×

  ⊟USE AIRWAY_BOOKING;

  ⊟SELECT TOP(1) *
   FROM
        (SELECT AP.city, COUNT(AP.city) AS 'Visited times'
        FROM FLIGHT AS F INNER JOIN ROUTE AS R ON F.route_id = R.route_id
        INNER JOIN AIRPORT AS AP ON R.destination_airport_id = AP.airport_id
        WHERE F.arrive_date BETWEEN '2019-11-26 00:00:00' AND '2019-12-11 00:00:00'
        GROUP BY AP.city) AS C
   ORDER BY C.[Visited times] DESC;

100 %    ▼ <

  ▦ Results  🖹 Messages
```

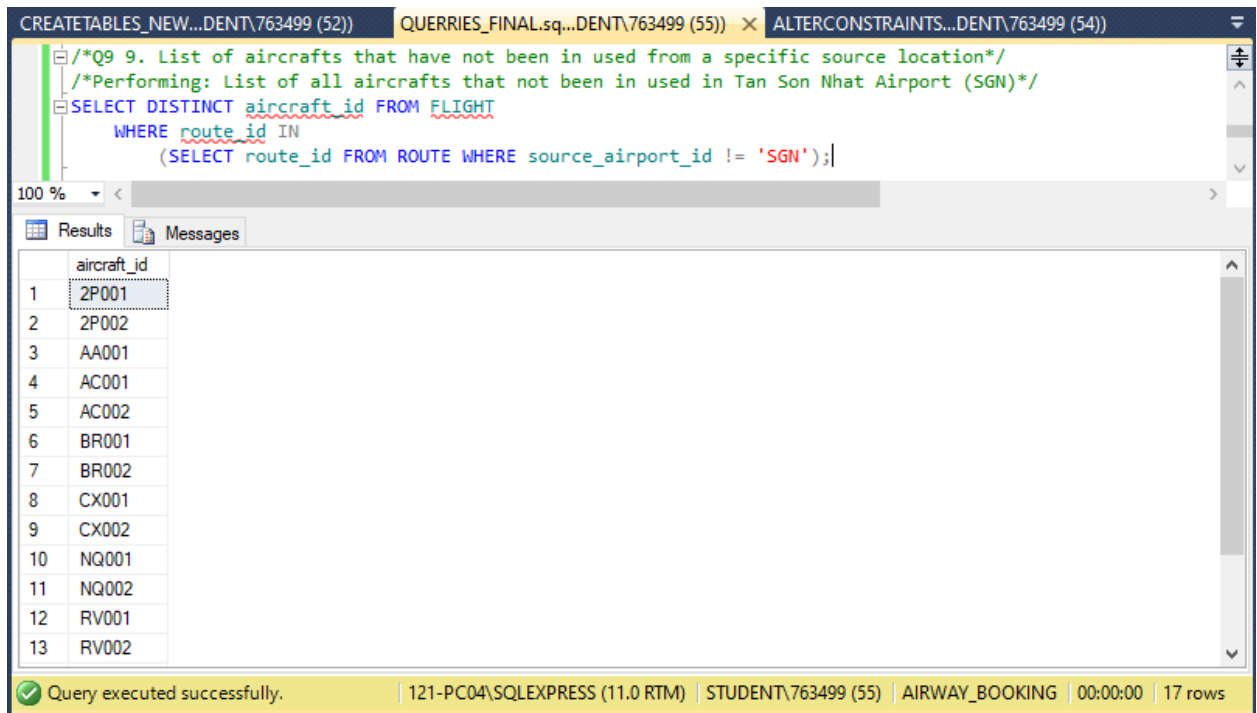|	city	Visited times
1	HO CHI MINH CITY	4

9. List of aircrafts that have **not** been in used from a specific source location.

```sql
USE AIRWAY_BOOKING;

SELECT DISTINCT aircraft_id FROM FLIGHT
        WHERE route_id IN
                (SELECT route_id FROM ROUTE WHERE source_airport_id != 'SGN');
```

```
CREATETABLES_NEW...DENT\763499 (52))    QUERRIES_FINAL.sq...DENT\763499 (55))  ×  ALTERCONSTRAINTS...DENT\763499 (54))

  /*Q9 9. List of aircrafts that have not been in used from a specific source location*/
  /*Performing: List of all aircrafts that not been in used in Tan Son Nhat Airport (SGN)*/
  SELECT DISTINCT aircraft_id FROM FLIGHT
      WHERE route_id IN
          (SELECT route_id FROM ROUTE WHERE source_airport_id != 'SGN');

100 %

  Results    Messages

      aircraft_id
  1   2P001
  2   2P002
  3   AA001
  4   AC001
  5   AC002
  6   BR001
  7   BR002
  8   CX001
  9   CX002
  10  NQ001
  11  NQ002
  12  RV001
  13  RV002

  Query executed successfully.        121-PC04\SQLEXPRESS (11.0 RTM)  STUDENT\763499 (55)  AIRWAY_BOOKING  00:00:00  17 rows
```

10. List of airlines that run flight from a specific source to a destination.

```
USE AIRWAY_BOOKING;


/*Q10 List of airlines that run flight from a specific source to a destination.*/
/*Performing: List of all airlines have the flight from DEL (Delhi City) to TPE
(TAIWAN)*/
SELECT AL.airline_name
FROM AIRLINE AS AL INNER JOIN AIRCRAFT AS AC ON AL.airline_id = AC.airline_id
       INNER JOIN FLIGHT AS F ON AC.aircraft_id = F.aircraft_id
WHERE F.flight_id IN
       (SELECT flight_id
         FROM FLIGHT
         WHERE route_id =
       (SELECT route_id FROM ROUTE
               WHERE source_airport_id = 'DEL' AND destination_airport_id =
'TPE'));
```

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```
Queries.sql - DESK...GU5GQSH\Acer (52))*  ×

USE AIRWAY_BOOKING;

SELECT AL.airline_name
  FROM AIRLINE AS AL INNER JOIN AIRCRAFT AS AC ON AL.airline_id = AC.airline_id
       INNER JOIN FLIGHT AS F ON AC.aircraft_id = F.aircraft_id
  WHERE F.flight_id IN
        (SELECT flight_id
         FROM FLIGHT
         WHERE route_id =
             (SELECT route_id
              FROM ROUTE
              WHERE source_airport_id = 'DEL' AND destination_airport_id = 'TPE'));

100 %    ▼  <

  Results   Messages

    airline_name
1   EVA AIR
2   AIR PHILIPPINES
```

11. The list of all options that a passenger can have when travelling from a source to a destination. This includes a connecting flight, for instance, a passenger is travelling from Toronto to Dehli and there is no direct flight, therefore, you have to find the options for this passenger.

```
USE AIRWAY_BOOKING;

/*Q11 The list of all options that a passenger can have when travelling from a
source to a destination.
This includes a connecting flight, for instance, a passenger is travelling from
Toronto to Dehli and there is no
direct flight, therefore, you have to find the options for this passenger.*/
/*Performing: List all in-direct flights from SGN(Ho Chi Minh City) to
YYZ(Toronto)*/
SELECT RGD.route_group_id,F.flight_id, F.route_id, AP1.city AS 'Depart', AP2.city
AS 'Arrive', f.depart_date, f.arrive_date
FROM FLIGHT AS F INNER JOIN ROUTE AS R ON F.route_id = R.route_id
     INNER JOIN AIRPORT AS AP1 ON R.source_airport_id = AP1.airport_id
     INNER JOIN AIRPORT AS AP2 ON R.destination_airport_id = AP2.airport_id
     INNER JOIN ROUTE_GROUP_DETAIL AS RGD ON R.route_id = RGD.route_id
     WHERE RGD.route_group_id IN
             (SELECT route_group_id
              FROM ROUTE_GROUP
              WHERE source_airport_id = 'SGN' AND destination_airport_id = 'YYZ')
     ORDER BY RGD.route_group_id, F.depart_date;
```

12. What is the minimum number of hours that it will take for a passenger to travel from a source city to a destination city? Again, consider the connecting flights as mentioned in item number 9, e.g. travelling from Toronto to Dehli.

```sql
USE AIRWAY_BOOKING;

/*Q12 What is the minimum number of hours that it will take for a passenger to travel from a source city to a
destination city. Again, consider the connecting flights as mentioned in item number
9, e.g. travelling from Toronto to Dehli.*/
/*Performing: Amount of minimum hour it takes for flying from SGN to YYZ*/
SELECT MIN(B.Total_hours) AS 'Minimum number of hours' FROM
    (SELECT STR(CAST(SUM(DATEDIFF(MINUTE,C.depart_date,C.arrive_date)) AS
    DECIMAL(10,2))/60,10,2) AS 'Total_hours'
    FROM
      (SELECT RGD.route_group_id,F.flight_id, F.route_id, F.arrive_date, F.depart_date
      FROM FLIGHT AS F INNER JOIN ROUTE AS R ON F.route_id = R.route_id
      INNER JOIN AIRPORT AS AP1 ON R.source_airport_id = AP1.airport_id
      INNER JOIN AIRPORT AS AP2 ON R.destination_airport_id = AP2.airport_id
      INNER JOIN ROUTE_GROUP_DETAIL AS RGD ON R.route_id = RGD.route_id
      WHERE RGD.route_group_id IN
              (SELECT route_group_id
              FROM ROUTE_GROUP
              WHERE source_airport_id = 'SGN' AND destination_airport_id = 'YYZ')) AS C
    GROUP BY C.route_group_id) AS B;
```

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```
Queries.sql - DESK...GU5GQSH\Acer (52))*  ×

USE AIRWAY_BOOKING;

SELECT MIN(B.Total_hours) AS 'Minimum number of hours'
  FROM
      (SELECT STR(CAST(SUM(DATEDIFF(MINUTE,C.depart_date,C.arrive_date)) AS DECIMAL(10,2))/60,10,2) A
      FROM
          (SELECT RGD.route_group_id,F.flight_id, F.route_id, F.arrive_date, F.depart_date
          FROM FLIGHT AS F INNER JOIN ROUTE AS R ON F.route_id = R.route_id
          INNER JOIN AIRPORT AS AP1 ON R.source_airport_id = AP1.airport_id
          INNER JOIN AIRPORT AS AP2 ON R.destination_airport_id = AP2.airport_id
          INNER JOIN ROUTE_GROUP_DETAIL AS RGD ON R.route_id = RGD.route_id
          WHERE RGD.route_group_id IN
                  (SELECT route_group_id
                  FROM ROUTE_GROUP
                  WHERE source_airport_id = 'SGN' AND destination_airport_id = 'YYZ')
          ) AS C
      GROUP BY C.route_group_id) AS B;
```

100 %

Results | Messages

	Minimum number of hours
1	7.83