Airport Database

ENTITY – RELATIONSHIP
MODEL

SQL - RDWH Project

By: Group 1

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- Key Entities
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Business Scope

Designing a Database for an Airport represents a complex undertaking, covering different entities interacting with each other under the Airport umbrella

E-R model designed represents capturing and storing data for the entities in a non redundant manner, encapsulating different relationships of entities with each other

Steps Followed -

- Creating the E-R Diagram
- Normalizing the E-R Diagram
- Designing the Database

Achieving Normalization

In RDBMS, nothing is considered as fully normalized. To create a normalized database, followed the below sequence

For First Normal Form – Divided the multi value attributes into atomic values

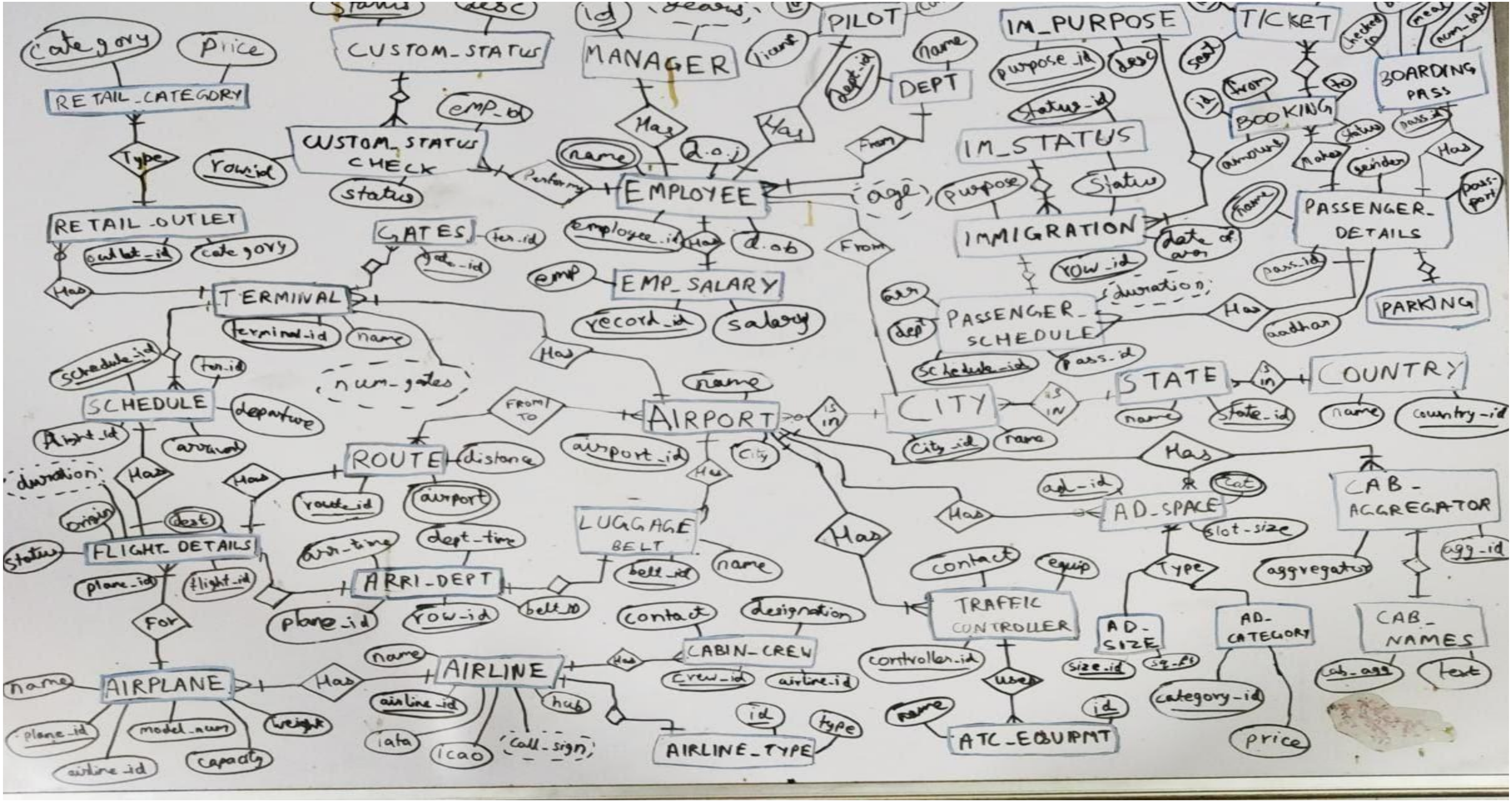
Second Normal Form – Worked on removing partial dependency on any key which is part of a composite primary key.

Third Normal Form - Worked on removing Transitive Dependencies on the primary key attribute in the tables

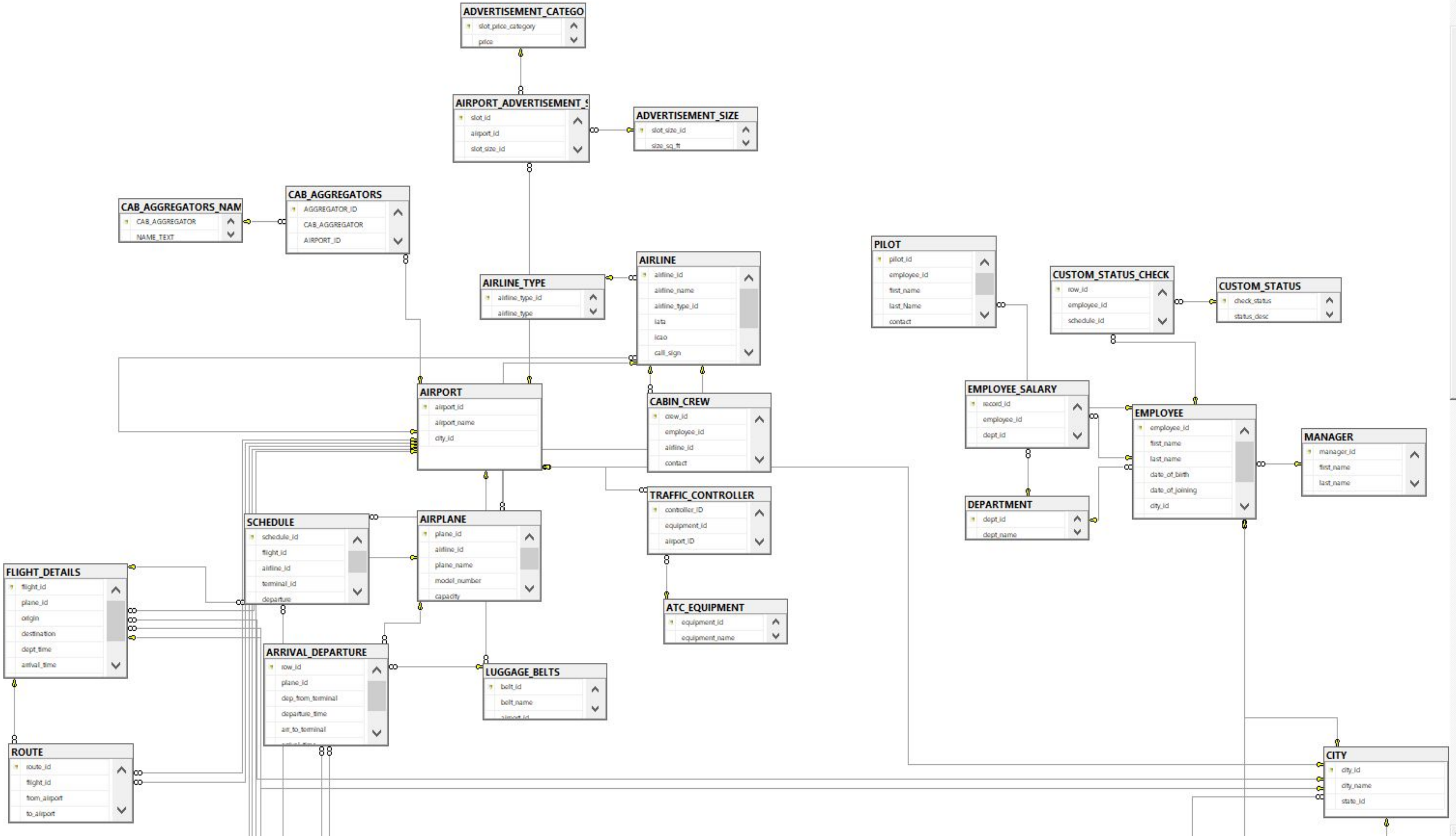
Key Entities Identified in an Airport database

- Airport
- Passengers
- Flights
- Schedule
- Employees
- Booking

E-R Diagram


category
price
RETAIL_CATEGORY
Type
RETAIL_OUTLET
outlet_id
category
Has
status
desc
CUSTOM_STATUS
CUSTOM_STATUS CHECK
emp_id
row_id
status
Perform
id
years
MANAGER
Has
name
d.o.j
EMPLOYEE
employee_id
Has
d.o.b
EMP_SALARY
emp
record_id
salary
PILOT
licence
Has
DEPT
dept_id
name
From
age
From
IM_PURPOSE
purpose_id
desc
IM_STATUS
status_id
purpose
status
IMMIGRATION
row_id
date of arr
TICKET
seat
BOOKING
id
from
to
amount
makes
status
BOARDING PASS
checked in
meal
num_bags
pass_id
Has
sender
passport
PASSENGER_DETAILS
name
pass_id
aadhar
PARKING
PASSENGER_SCHEDULE
arr
dept
duration
schedule_id
pass_id
Has
GATES
ter_id
gate_id
TERMINAL
terminal_id
name
num_gates
Has
schedule_id
ter_id
SCHEDULE
departure
flight_id
arrival
duration
Has
origin
dest
status
FLIGHT_DETAILS
plane_id
flight_id
For
FROM/TO
AIRPORT
name
airport_id
City
Has
ROUTE
distance
Has
route_id
airport
dept_time
arr_time
ARRI_DEPT
plane_id
row_id
belt_ID
LUGGAGE BELT
belt_id
name
is in
CITY
city_id
name
is in
STATE
name
state_id
is in
COUNTRY
name
country_id
Has
CAB_AGGREGATOR
aggregator
agg_id
CAB_NAMES
cab_agg
text
Has
ad_id
cat
AD_SPACE
slot-size
Type
AD_SIZE
size_id
sq_ft
AD_CATEGORY
category_id
price
Has
contact
equip
TRAFFIC CONTROLLER
controller_id
uses
ATC_EQUIPMT
name
id
contact
designation
CABIN_CREW
crew_id
airline_id
Has
AIRLINE
name
airline_id
hub
iata
icao
call_sign
id
type
AIRLINE_TYPE
Has
AIRPLANE
name
plane_id
model_num
weight
airline_id
capacity

Database Diagram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AIRPORT_ADVERTISEMENT_S
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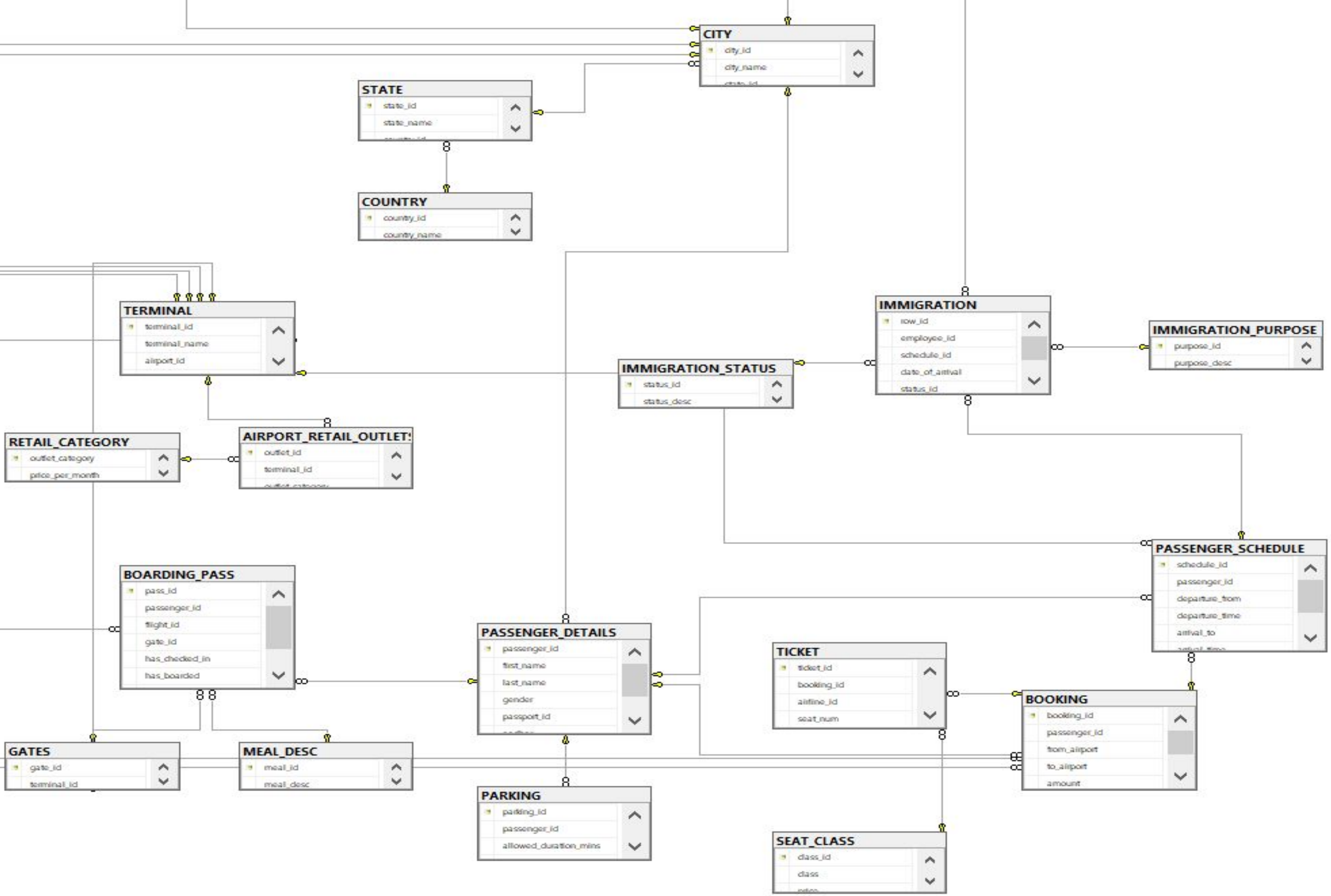
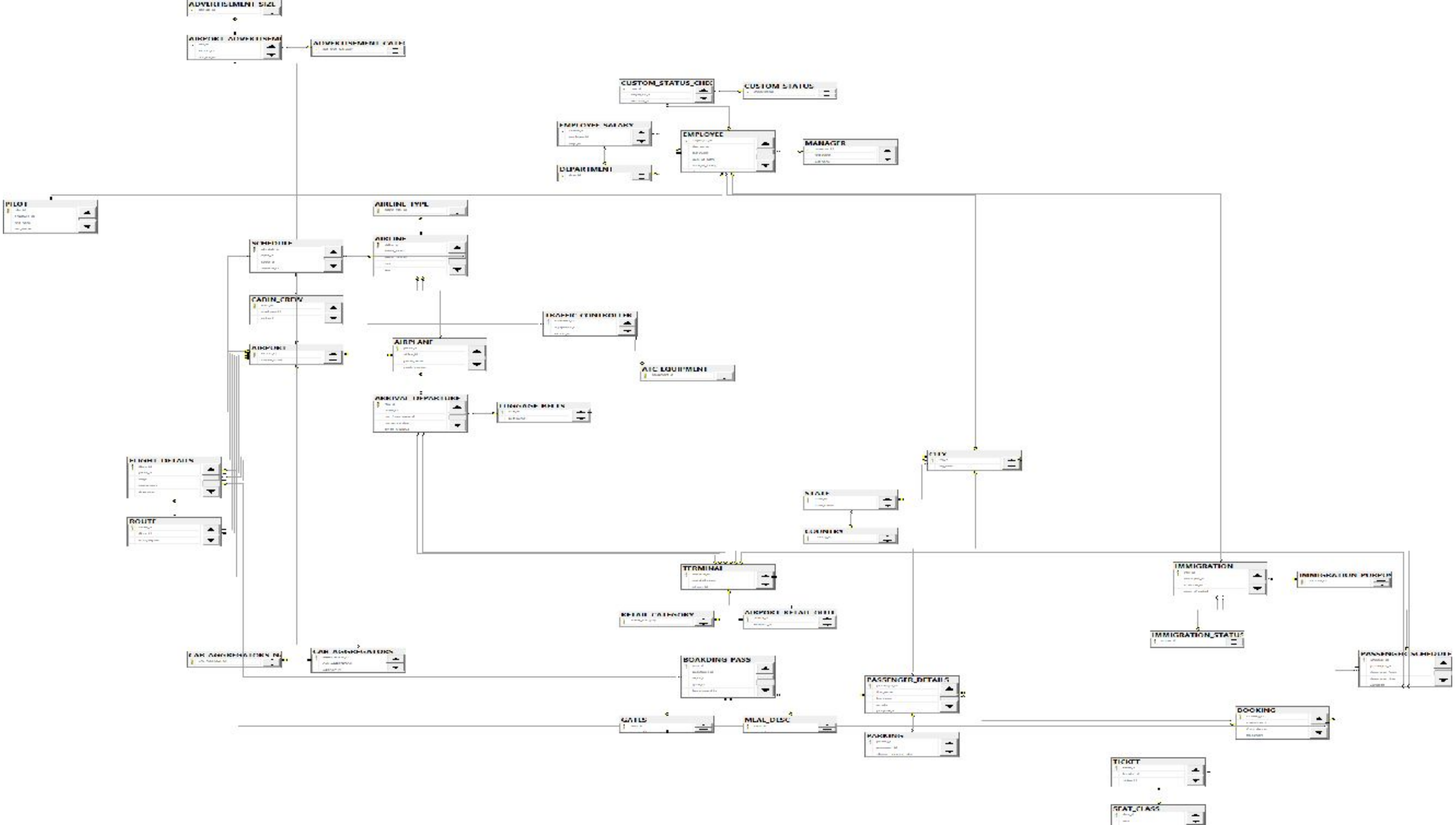
airport_id
slot_size_id
ADVERTISEMENT_SIZE
slot_size_id
size_sq_ft
CAB_AGGREGATORS_NAM
CAB_AGGREGATOR
NAME_TEXT
CAB_AGGREGATORS
AGGREGATOR_ID
CAB_AGGREGATOR
AIRPORT_ID
AIRLINE_TYPE
airline_type_id
airline_type
AIRLINE
airline_id
airline_name
airline_type_id
iata
icao
call_sign
PILOT
pilot_id
employee_id
first_name
last_Name
contact
CUSTOM_STATUS_CHECK
row_id
employee_id
schedule_id
CUSTOM_STATUS
check_status
status_desc
AIRPORT
airport_id
airport_name
city_id
CABIN_CREW
crew_id
employee_id
airline_id
contact
EMPLOYEE_SALARY
record_id
employee_id
dept_id
EMPLOYEE
employee_id
first_name
last_name
date_of_birth
date_of_joining
city_id
MANAGER
manager_id
first_name
last_name
DEPARTMENT
dept_id
dept_name
TRAFFIC_CONTROLLER
controller_ID
equipment_id
airport_ID
SCHEDULE
schedule_id
flight_id
airline_id
terminal_id
departure
AIRPLANE
plane_id
airline_id
plane_name
model_number
capacity
FLIGHT_DETAILS
flight_id
plane_id
origin
destination
dept_time
arrival_time
ATC_EQUIPMENT
equipment_id
equipment_name
ARRIVAL_DEPARTURE
row_id
plane_id
dep_from_terminal
departure_time
arr_to_terminal
LUGGAGE_BELTS
belt_id
belt_name
ROUTE
route_id
flight_id
from_airport
to_airport
CITY
city_id
city_name
state_id


CITY
city_id
city_name
STATE
state_id
state_name
COUNTRY
country_id
country_name
TERMINAL
terminal_id
terminal_name
airport_id
IMMIGRATION
row_id
employee_id
schedule_id
date_of_arrival
status_id
IMMIGRATION_PURPOSE
purpose_id
purpose_desc
IMMIGRATION_STATUS
status_id
status_desc
RETAIL_CATEGORY
outlet_category
price_per_month
AIRPORT_RETAIL_OUTLET!
outlet_id
terminal_id
PASSENGER_SCHEDULE
schedule_id
passenger_id
departure_from
departure_time
arrival_to
BOARDING_PASS
pass_id
passenger_id
flight_id
gate_id
has_checked_in
has_boarded
PASSENGER_DETAILS
passenger_id
first_name
last_name
gender
passport_id
TICKET
ticket_id
booking_id
airline_id
seat_num
BOOKING
booking_id
passenger_id
from_airport
to_airport
amount
GATES
gate_id
terminal_id
MEAL_DESC
meal_id
meal_desc
PARKING
parking_id
passenger_id
allowed_duration_mins
SEAT_CLASS
class_id
class


ADVERTISEMENT_SIZE
AIRPORT_ADVERTISEME
ADVERTISEMENT_CATE
CUSTOM_STATUS_CHEC
CUSTOM_STATUS
EMPLOYEE_SALARY
EMPLOYEE
MANAGER
DEPARTMENT
PILOT
AIRLINE_TYPE
SCHEDULE
AIRLINE
CABIN_CREW
TRAFFIC_CONTROLLER
AIRPORT
AIRPLANE
ATC_EQUIPMENT
ARRIVAL_DEPARTURE
LUGGAGE_RULES
CITY
FLIGHT_DETAILS
STATE
ROUTE
COUNTRY
TERMINAL
IMMIGRATION
IMMIGRATION_PURPOS
RETAIL_CATEGORY
AIRPORT_RETAIL_OUTL
IMMIGRATION_STATUS
CAR_AGGREGATORS_N
CAR_AGGREGATORS
BOARDING_PASS
PASSENGER_SCHEDULE
PASSENGER_DETAILS
GATES
MEAL_DESC
BOOKING
PARKING
TICKET
SEAT_CLASS

Deployment Files

- DB and Table Creation File

airport_db_v1.2.sql

- SQL Queries File

queries_for_project.sql

SQL Queries Screenshots

Query 1

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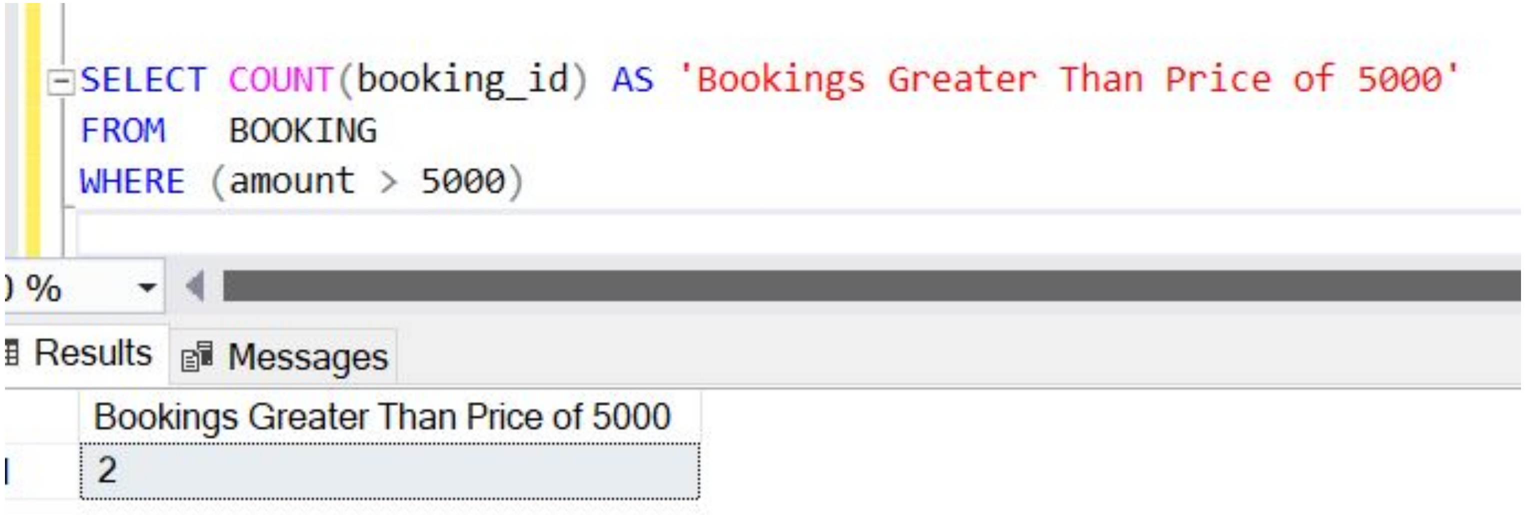
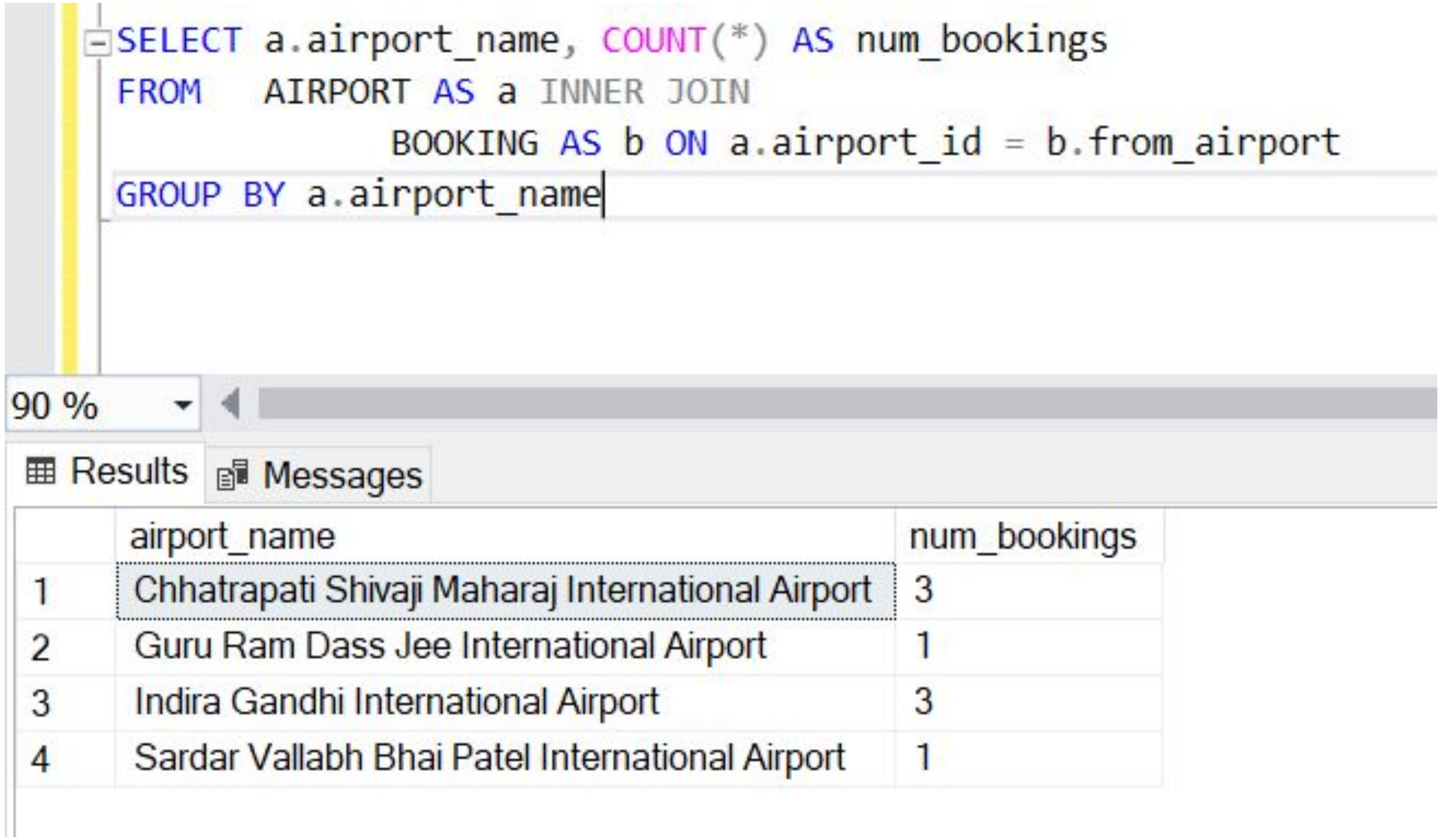


```sql
SELECT COUNT(booking_id) AS 'Bookings Greater Than Price of 5000'
FROM   BOOKING
WHERE (amount > 5000)
```

```
    Bookings Greater Than Price of 5000
1   2
```

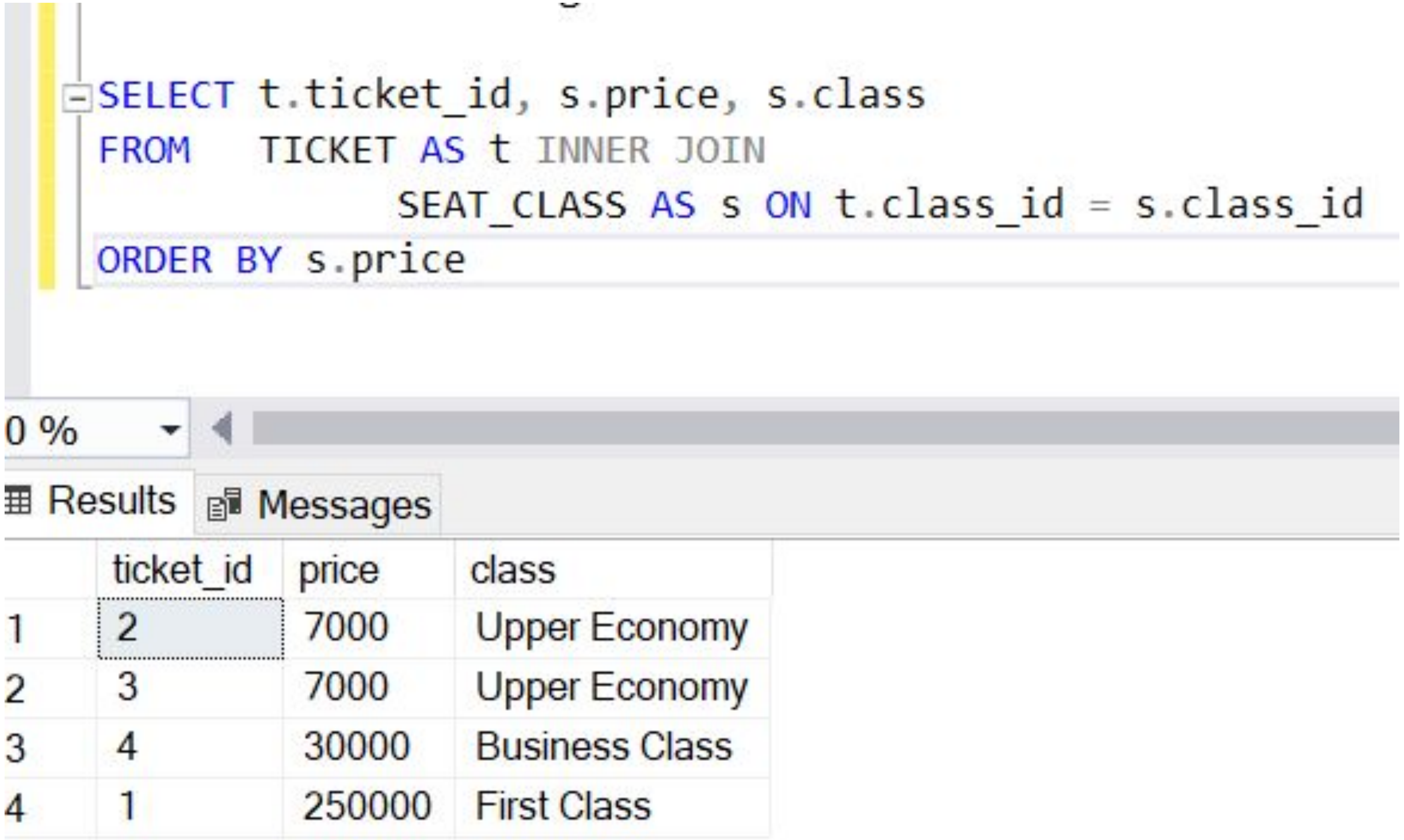
Query 2



```
SELECT a.airport_name, COUNT(*) AS num_bookings
FROM   AIRPORT AS a INNER JOIN
                BOOKING AS b ON a.airport_id = b.from_airport
GROUP BY a.airport_name
```

	airport_name	num_bookings
1	Chhatrapati Shivaji Maharaj International Airport	3
2	Guru Ram Dass Jee International Airport	1
3	Indira Gandhi International Airport	3
4	Sardar Vallabh Bhai Patel International Airport	1

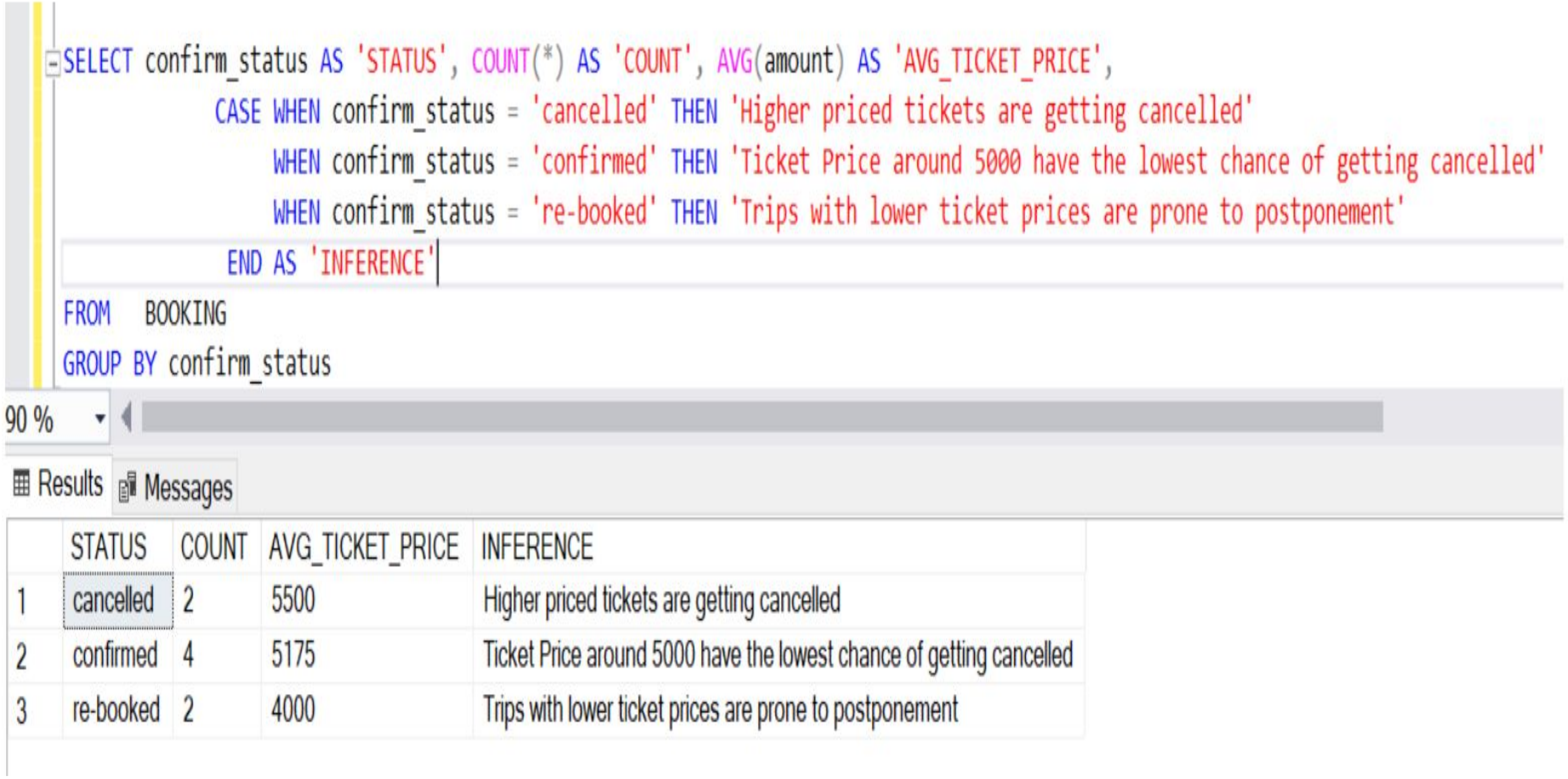
Query 3



```
SELECT t.ticket_id, s.price, s.class
FROM   TICKET AS t INNER JOIN
             SEAT_CLASS AS s ON t.class_id = s.class_id
ORDER BY s.price
```

	ticket_id	price	class
1	2	7000	Upper Economy
2	3	7000	Upper Economy
3	4	30000	Business Class
4	1	250000	First Class

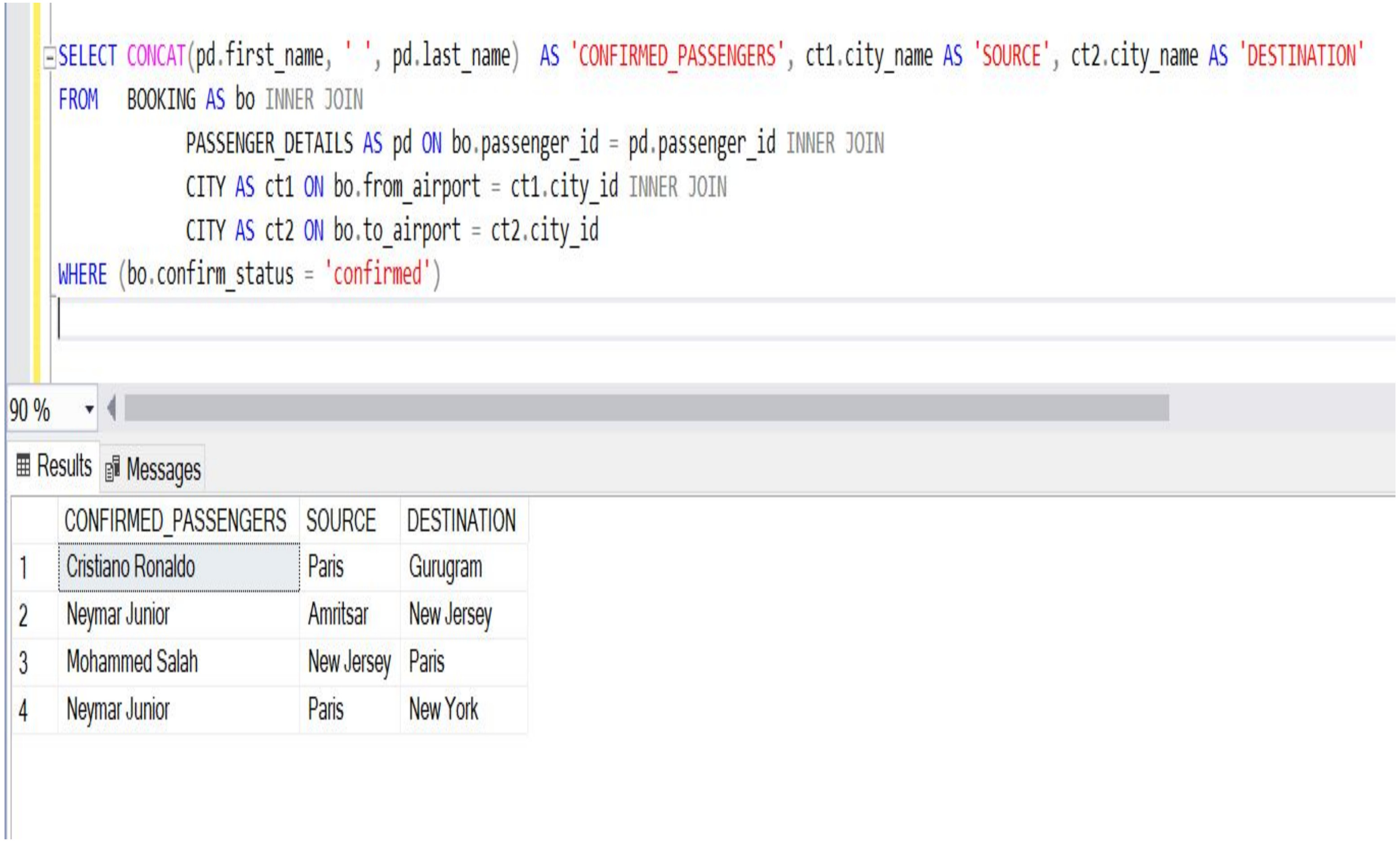
Query 4



```sql
SELECT confirm_status AS 'STATUS', COUNT(*) AS 'COUNT', AVG(amount) AS 'AVG_TICKET_PRICE',
            CASE WHEN confirm_status = 'cancelled' THEN 'Higher priced tickets are getting cancelled'
                 WHEN confirm_status = 'confirmed' THEN 'Ticket Price around 5000 have the lowest chance of getting cancelled'
                 WHEN confirm_status = 're-booked' THEN 'Trips with lower ticket prices are prone to postponement'
             END AS 'INFERENCE'
FROM   BOOKING
GROUP BY confirm_status
```

	STATUS	COUNT	AVG_TICKET_PRICE	INFERENCE
1	cancelled	2	5500	Higher priced tickets are getting cancelled
2	confirmed	4	5175	Ticket Price around 5000 have the lowest chance of getting cancelled
3	re-booked	2	4000	Trips with lower ticket prices are prone to postponement

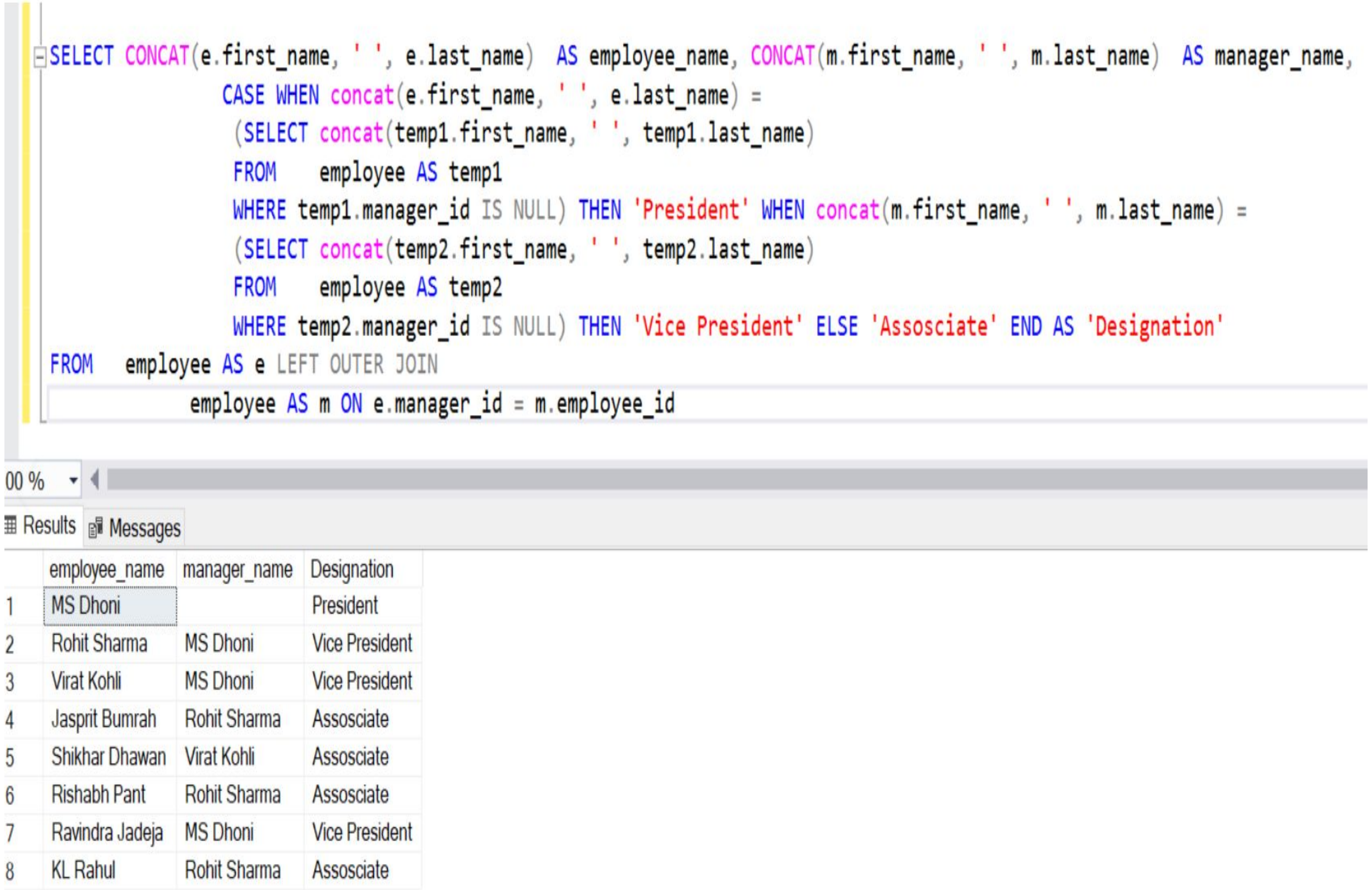
Query 5



```
SELECT CONCAT(pd.first_name, ' ', pd.last_name)  AS 'CONFIRMED_PASSENGERS', ct1.city_name AS 'SOURCE', ct2.city_name AS 'DESTINATION'
FROM   BOOKING AS bo INNER JOIN
          PASSENGER_DETAILS AS pd ON bo.passenger_id = pd.passenger_id INNER JOIN
          CITY AS ct1 ON bo.from_airport = ct1.city_id INNER JOIN
          CITY AS ct2 ON bo.to_airport = ct2.city_id
WHERE (bo.confirm_status = 'confirmed')
```

	CONFIRMED_PASSENGERS	SOURCE	DESTINATION
1	Cristiano Ronaldo	Paris	Gurugram
2	Neymar Junior	Amritsar	New Jersey
3	Mohammed Salah	New Jersey	Paris
4	Neymar Junior	Paris	New York

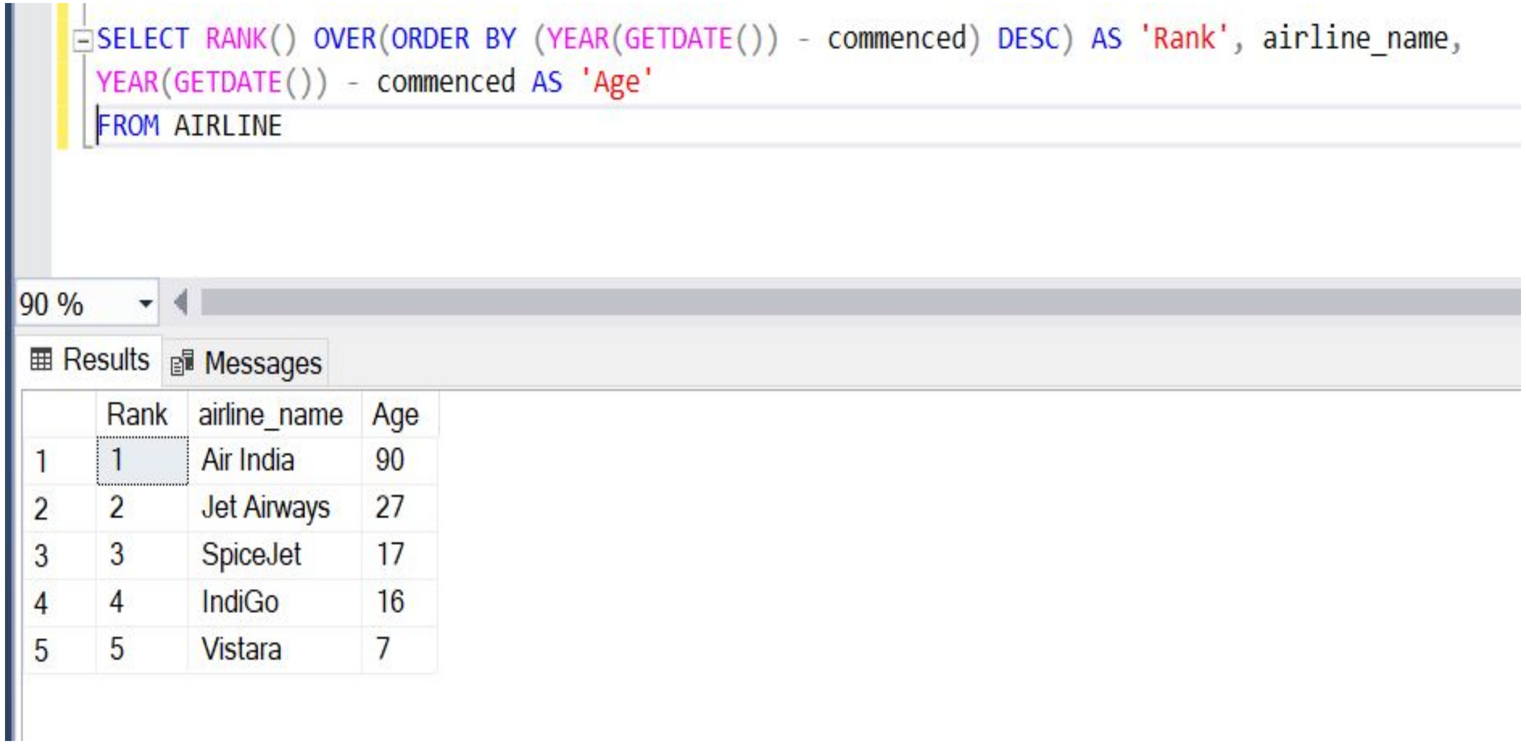
Query 6



```
SELECT CONCAT(e.first_name, ' ', e.last_name)  AS employee_name, CONCAT(m.first_name, ' ', m.last_name)  AS manager_name,
                CASE WHEN concat(e.first_name, ' ', e.last_name) =
                 (SELECT concat(temp1.first_name, ' ', temp1.last_name)
                 FROM    employee AS temp1
                 WHERE temp1.manager_id IS NULL) THEN 'President' WHEN concat(m.first_name, ' ', m.last_name) =
                 (SELECT concat(temp2.first_name, ' ', temp2.last_name)
                 FROM    employee AS temp2
                 WHERE temp2.manager_id IS NULL) THEN 'Vice President' ELSE 'Assosciate' END AS 'Designation'
FROM   employee AS e LEFT OUTER JOIN
             employee AS m ON e.manager_id = m.employee_id
```

	employee_name	manager_name	Designation
1	MS Dhoni		President
2	Rohit Sharma	MS Dhoni	Vice President
3	Virat Kohli	MS Dhoni	Vice President
4	Jasprit Bumrah	Rohit Sharma	Assosciate
5	Shikhar Dhawan	Virat Kohli	Assosciate
6	Rishabh Pant	Rohit Sharma	Assosciate
7	Ravindra Jadeja	MS Dhoni	Vice President
8	KL Rahul	Rohit Sharma	Assosciate

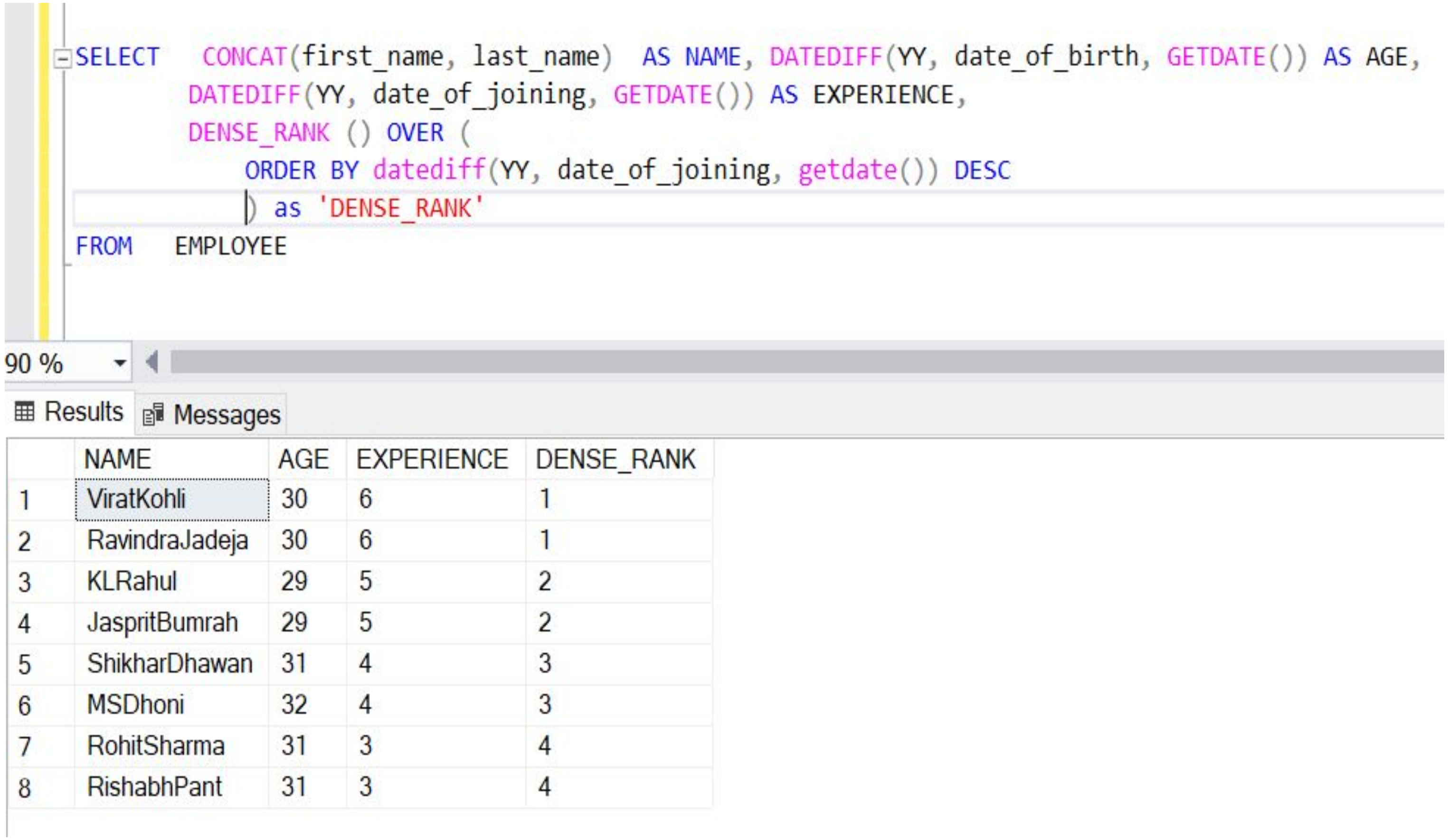
Query 7



```
SELECT RANK() OVER(ORDER BY (YEAR(GETDATE()) - commenced) DESC) AS 'Rank', airline_name,
YEAR(GETDATE()) - commenced AS 'Age'
FROM AIRLINE
```

	Rank	airline_name	Age
1	1	Air India	90
2	2	Jet Airways	27
3	3	SpiceJet	17
4	4	IndiGo	16
5	5	Vistara	7

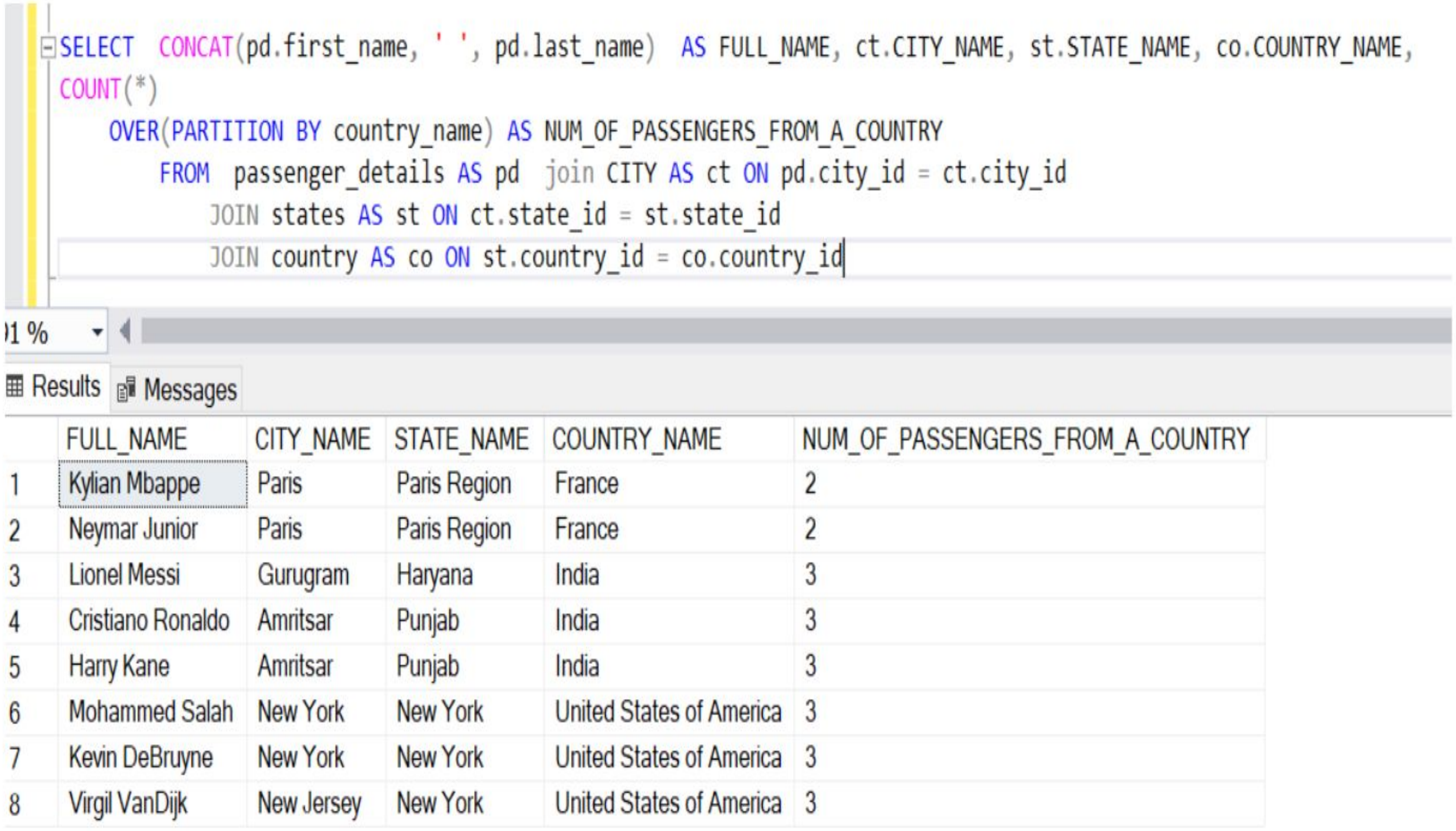
Query 8



```
SELECT   CONCAT(first_name, last_name)  AS NAME, DATEDIFF(YY, date_of_birth, GETDATE()) AS AGE,
        DATEDIFF(YY, date_of_joining, GETDATE()) AS EXPERIENCE,
        DENSE_RANK () OVER (
            ORDER BY datediff(YY, date_of_joining, getdate()) DESC
            ) as 'DENSE_RANK'
FROM    EMPLOYEE
```

	NAME	AGE	EXPERIENCE	DENSE_RANK
1	ViratKohli	30	6	1
2	RavindraJadeja	30	6	1
3	KLRahul	29	5	2
4	JaspritBumrah	29	5	2
5	ShikharDhawan	31	4	3
6	MSDhoni	32	4	3
7	RohitSharma	31	3	4
8	RishabhPant	31	3	4

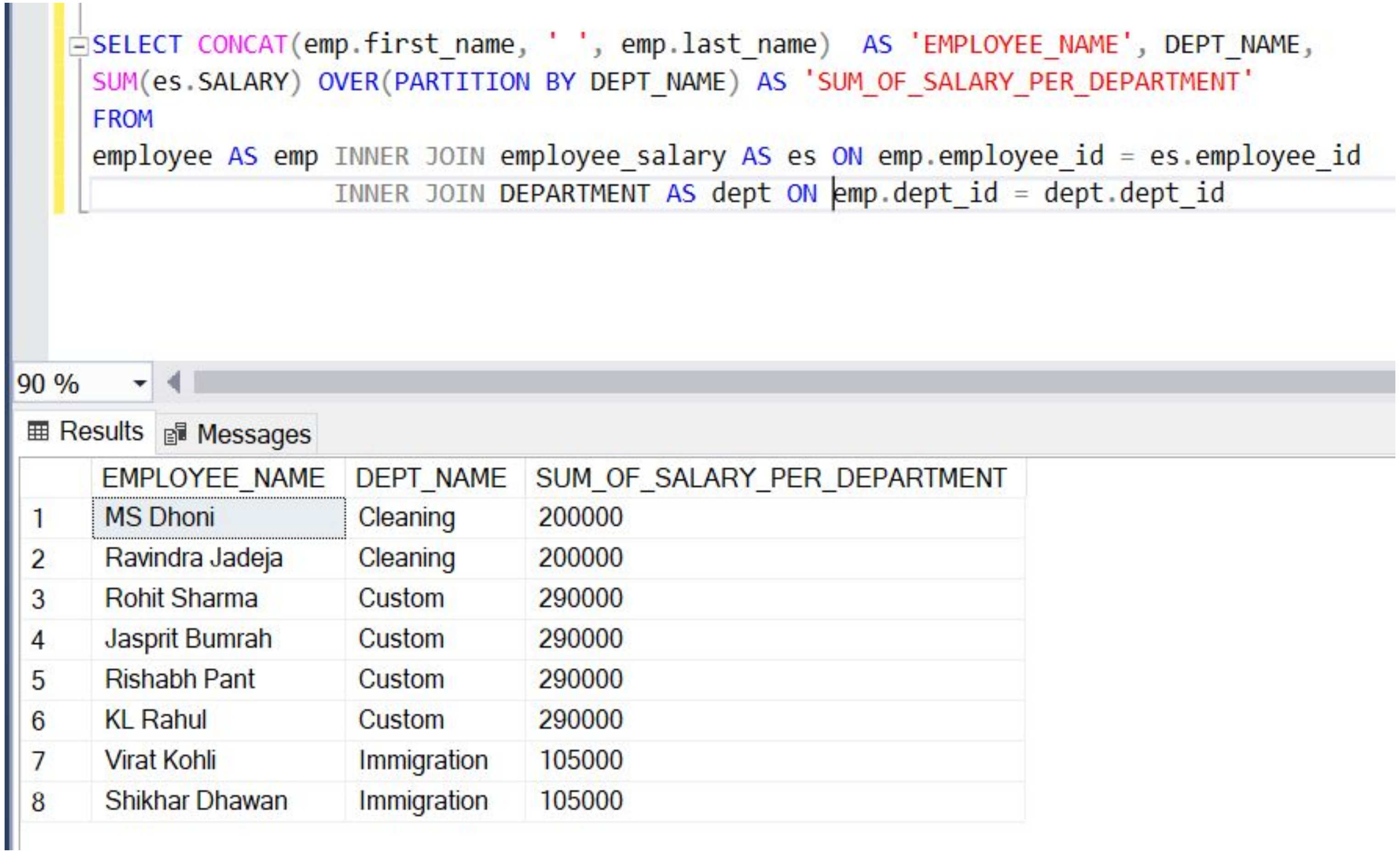
Query 9



```
SELECT  CONCAT(pd.first_name, ' ', pd.last_name)  AS FULL_NAME, ct.CITY_NAME, st.STATE_NAME, co.COUNTRY_NAME,
COUNT(*)
    OVER(PARTITION BY country_name) AS NUM_OF_PASSENGERS_FROM_A_COUNTRY
        FROM  passenger_details AS pd  join CITY AS ct ON pd.city_id = ct.city_id
            JOIN states AS st ON ct.state_id = st.state_id
            JOIN country AS co ON st.country_id = co.country_id
```

	FULL_NAME	CITY_NAME	STATE_NAME	COUNTRY_NAME	NUM_OF_PASSENGERS_FROM_A_COUNTRY
1	Kylian Mbappe	Paris	Paris Region	France	2
2	Neymar Junior	Paris	Paris Region	France	2
3	Lionel Messi	Gurugram	Haryana	India	3
4	Cristiano Ronaldo	Amritsar	Punjab	India	3
5	Harry Kane	Amritsar	Punjab	India	3
6	Mohammed Salah	New York	New York	United States of America	3
7	Kevin DeBruyne	New York	New York	United States of America	3
8	Virgil VanDijk	New Jersey	New York	United States of America	3

Query 10



```
SELECT CONCAT(emp.first_name, ' ', emp.last_name)  AS 'EMPLOYEE_NAME', DEPT_NAME,
SUM(es.SALARY) OVER(PARTITION BY DEPT_NAME) AS 'SUM_OF_SALARY_PER_DEPARTMENT'
FROM
employee AS emp INNER JOIN employee_salary AS es ON emp.employee_id = es.employee_id
                INNER JOIN DEPARTMENT AS dept ON emp.dept_id = dept.dept_id
```

	EMPLOYEE_NAME	DEPT_NAME	SUM_OF_SALARY_PER_DEPARTMENT
1	MS Dhoni	Cleaning	200000
2	Ravindra Jadeja	Cleaning	200000
3	Rohit Sharma	Custom	290000
4	Jasprit Bumrah	Custom	290000
5	Rishabh Pant	Custom	290000
6	KL Rahul	Custom	290000
7	Virat Kohli	Immigration	105000
8	Shikhar Dhawan	Immigration	105000

Thank You