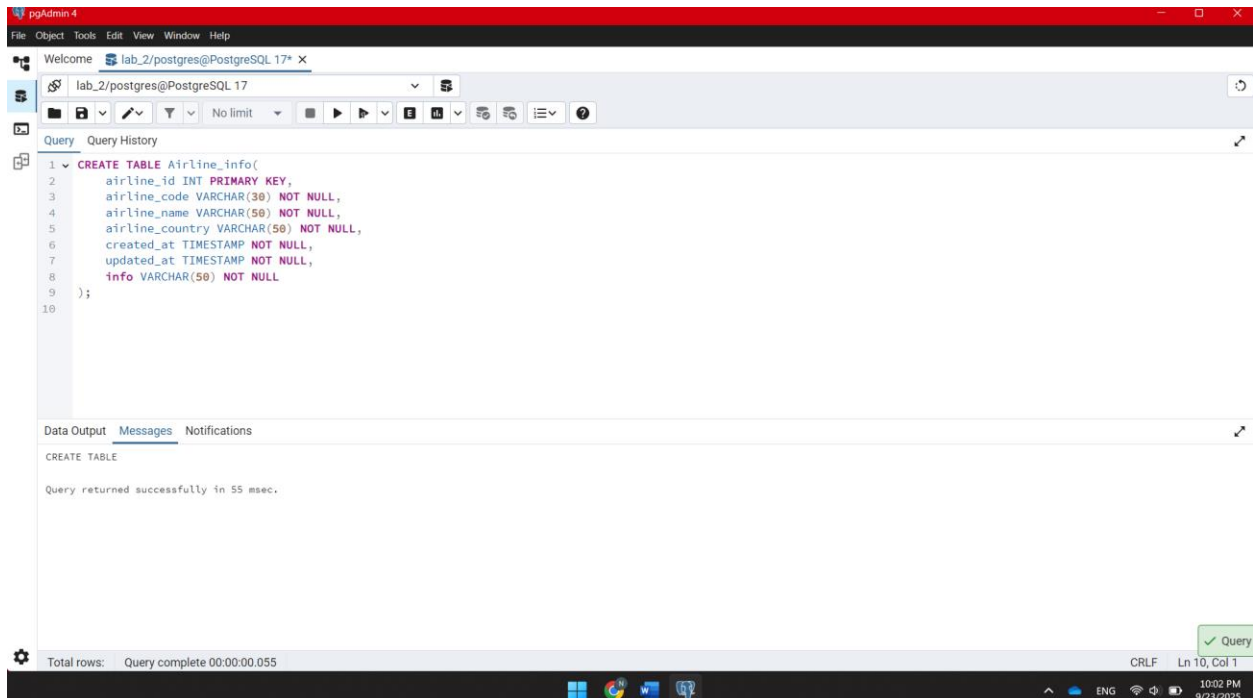
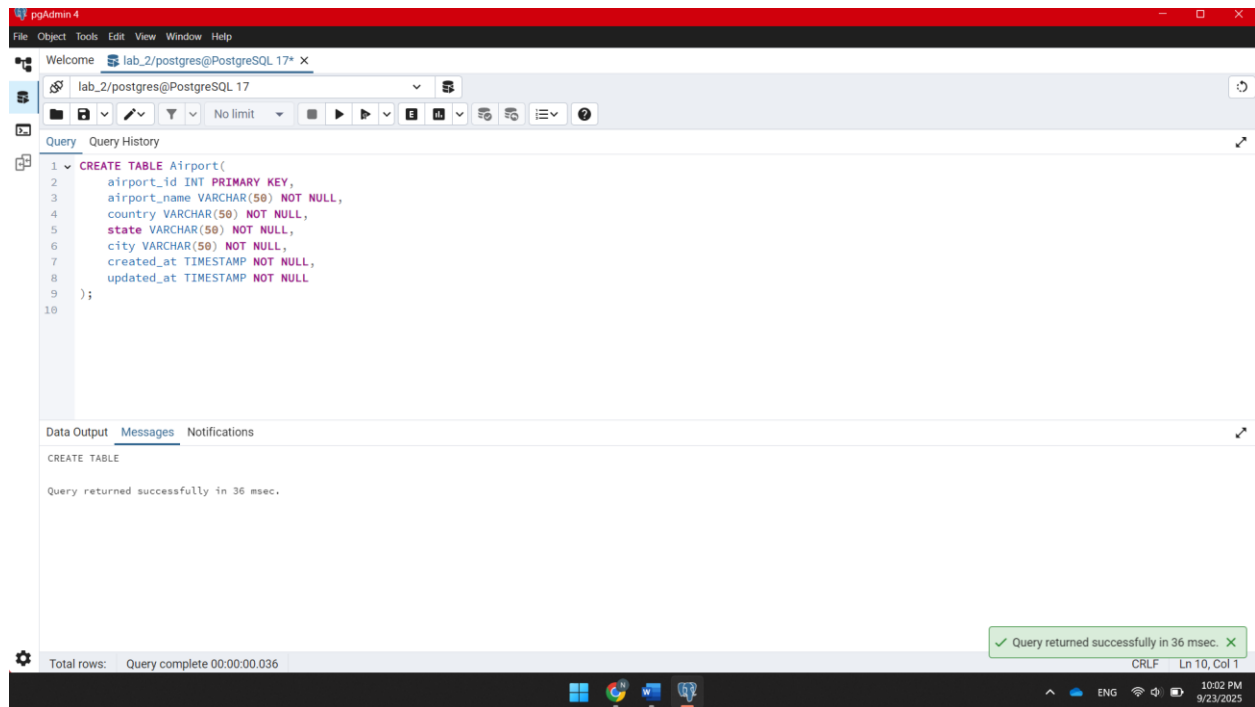


# Lab work 2

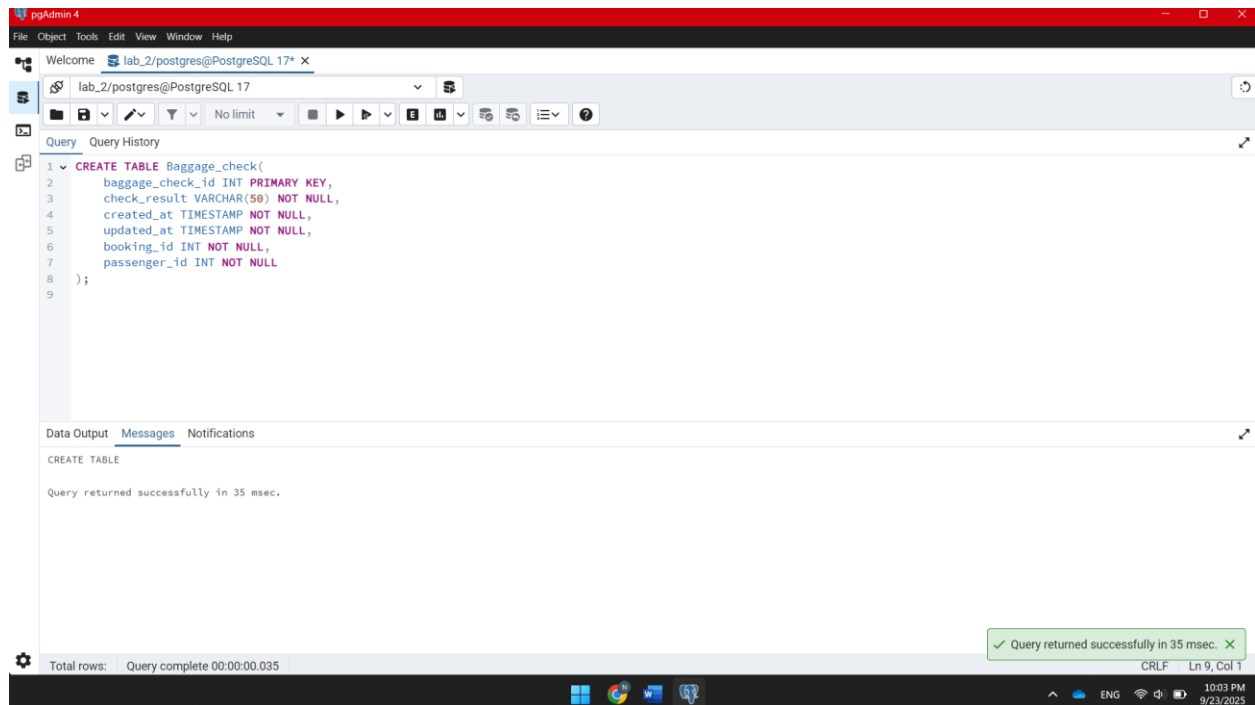
## DDL



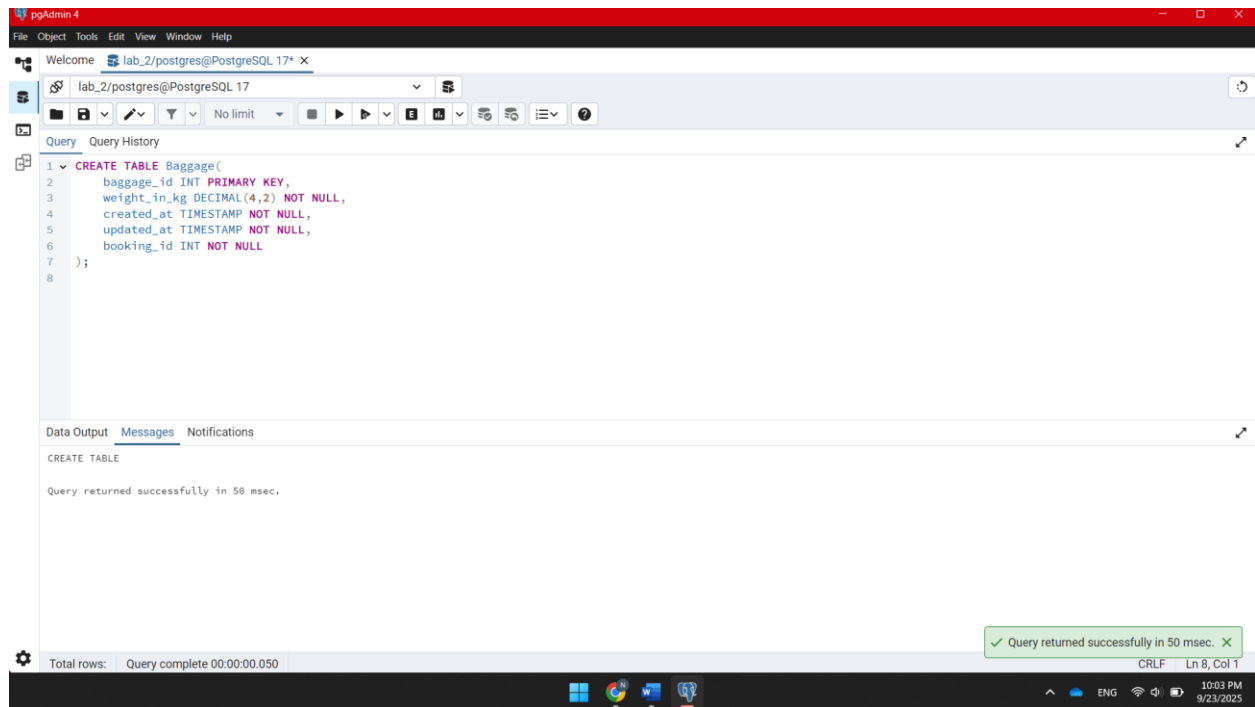
```
CREATE TABLE Airline_info(  
    airline_id INT PRIMARY KEY,  
    airline_code VARCHAR(30) NOT NULL,  
    airline_name VARCHAR(50) NOT NULL,  
    airline_country VARCHAR(50) NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL,  
    info VARCHAR(50) NOT NULL  
);
```



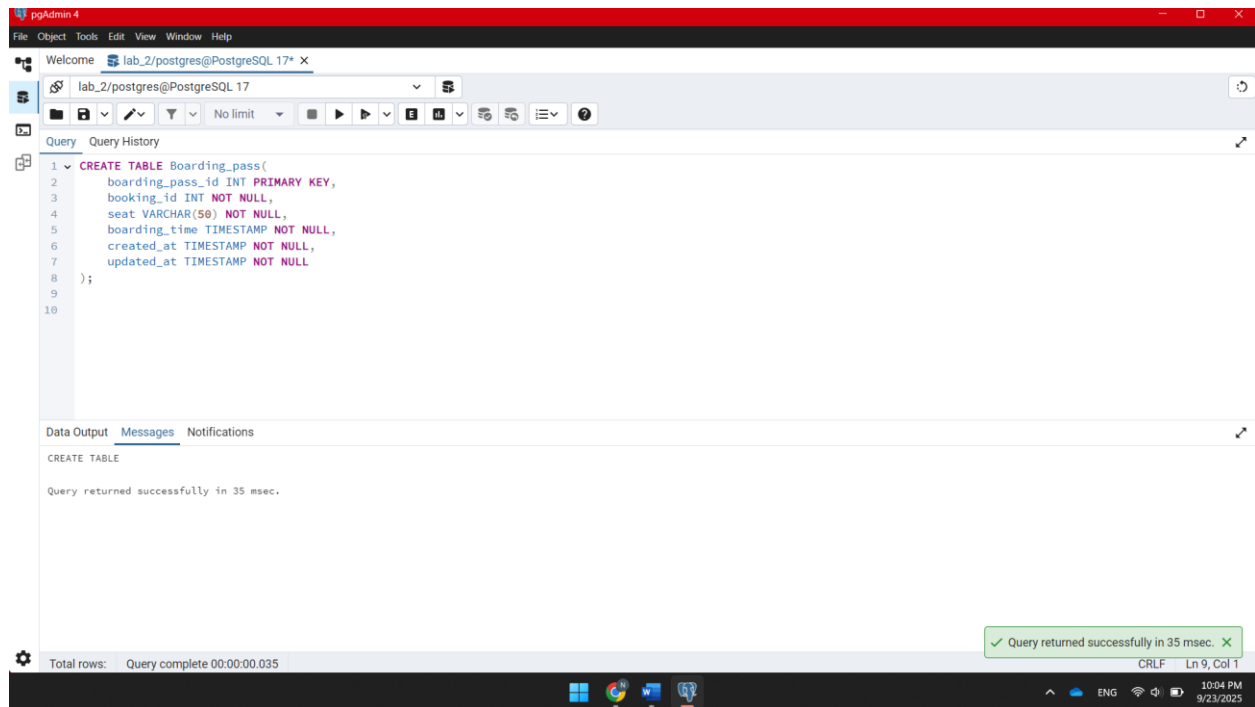
```
CREATE TABLE Airport(  
    airport_id INT PRIMARY KEY,  
    airport_name VARCHAR(50) NOT NULL,  
    country VARCHAR(50) NOT NULL,  
    state VARCHAR(50) NOT NULL,  
    city VARCHAR(50) NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL  
);
```



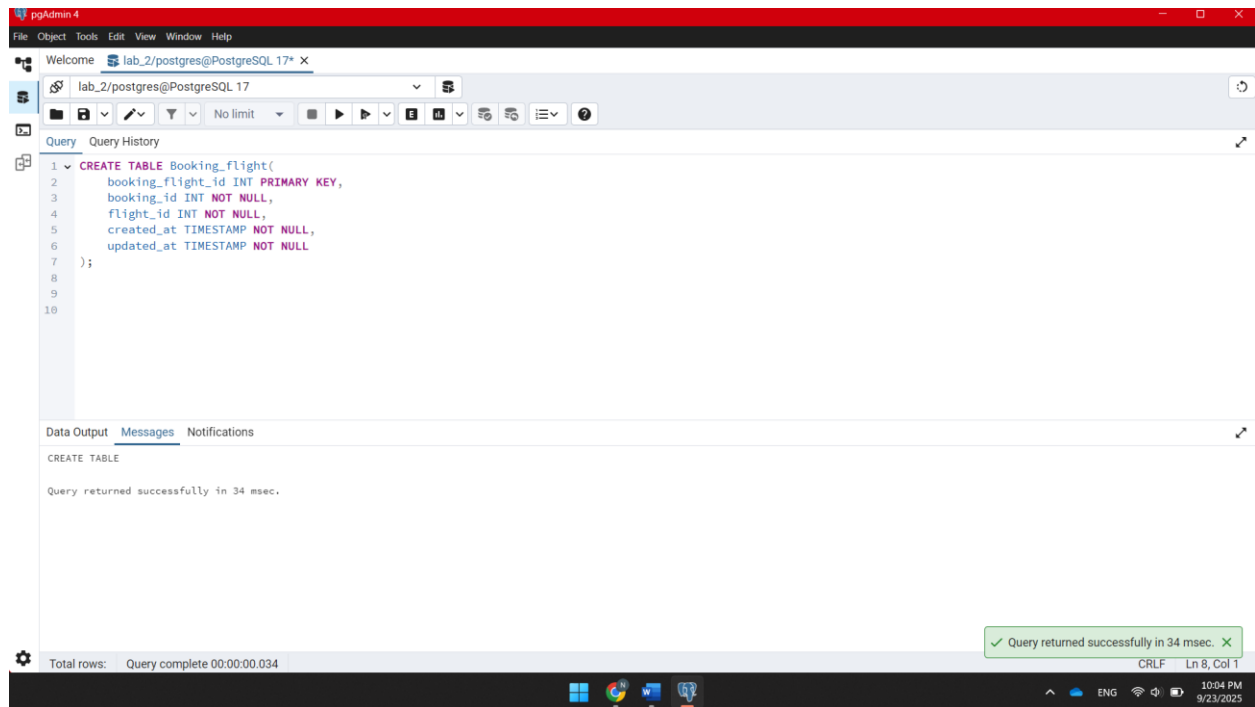
```
CREATE TABLE Baggage_check(  
    baggage_check_id INT PRIMARY KEY,  
    check_result VARCHAR(50) NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL,  
    booking_id INT NOT NULL,  
    passenger_id INT NOT NULL  
);
```



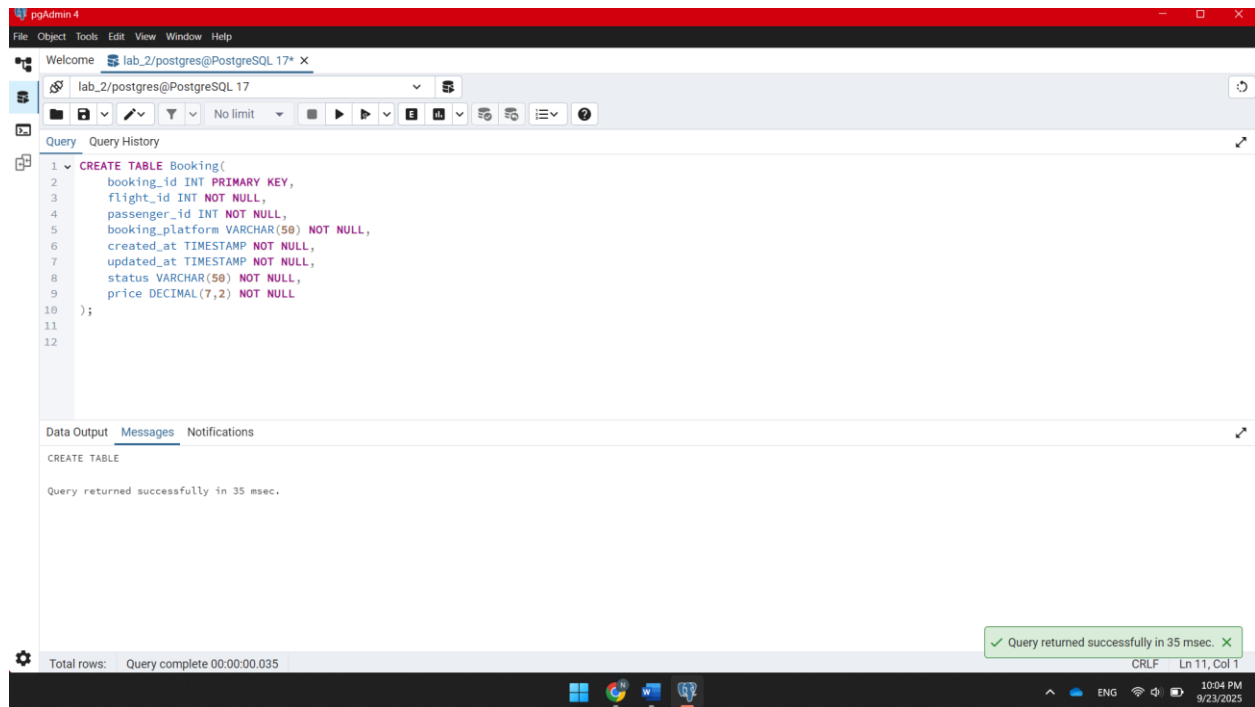
```
CREATE TABLE Baggage(  
    baggage_id INT PRIMARY KEY,  
    weight_in_kg DECIMAL(4,2) NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL,  
    booking_id INT NOT NULL  
);
```



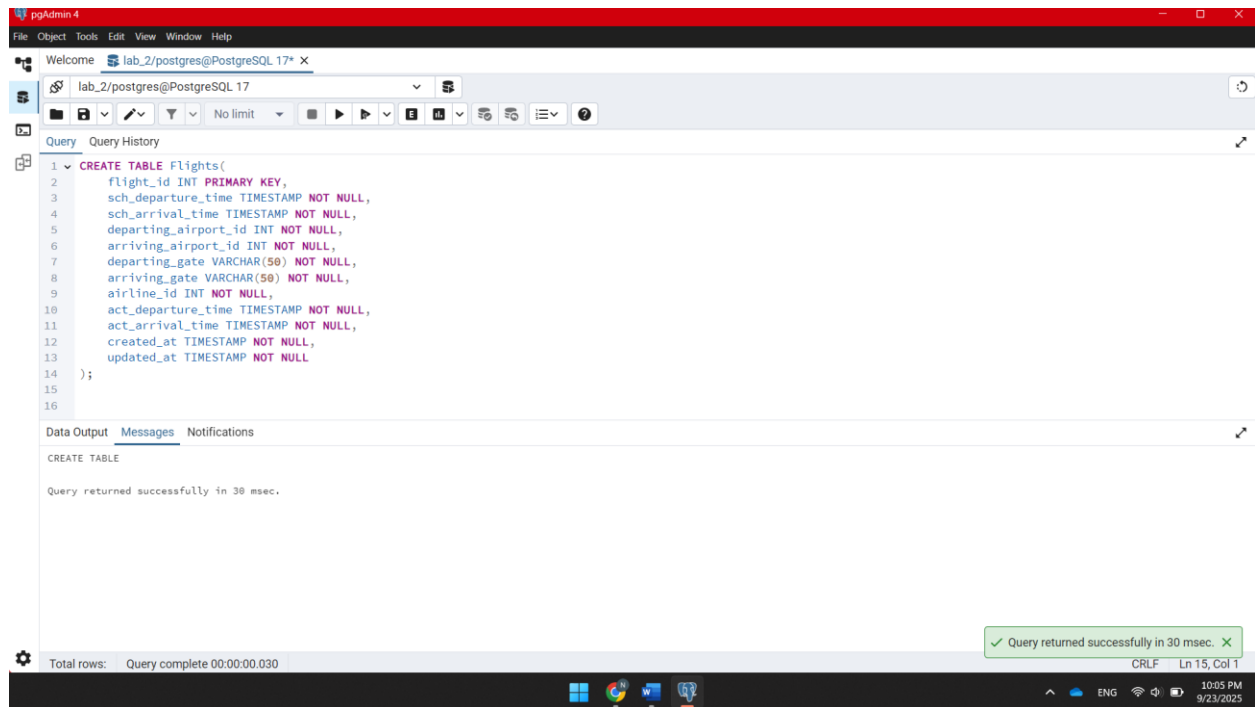
```
CREATE TABLE Boarding_pass(  
    boarding_pass_id INT PRIMARY KEY,  
    booking_id INT NOT NULL,  
    seat VARCHAR(50) NOT NULL,  
    boarding_time TIMESTAMP NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL  
);
```



```
CREATE TABLE Booking_flight(  
    booking_flight_id INT PRIMARY KEY,  
    booking_id INT NOT NULL,  
    flight_id INT NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL  
);
```

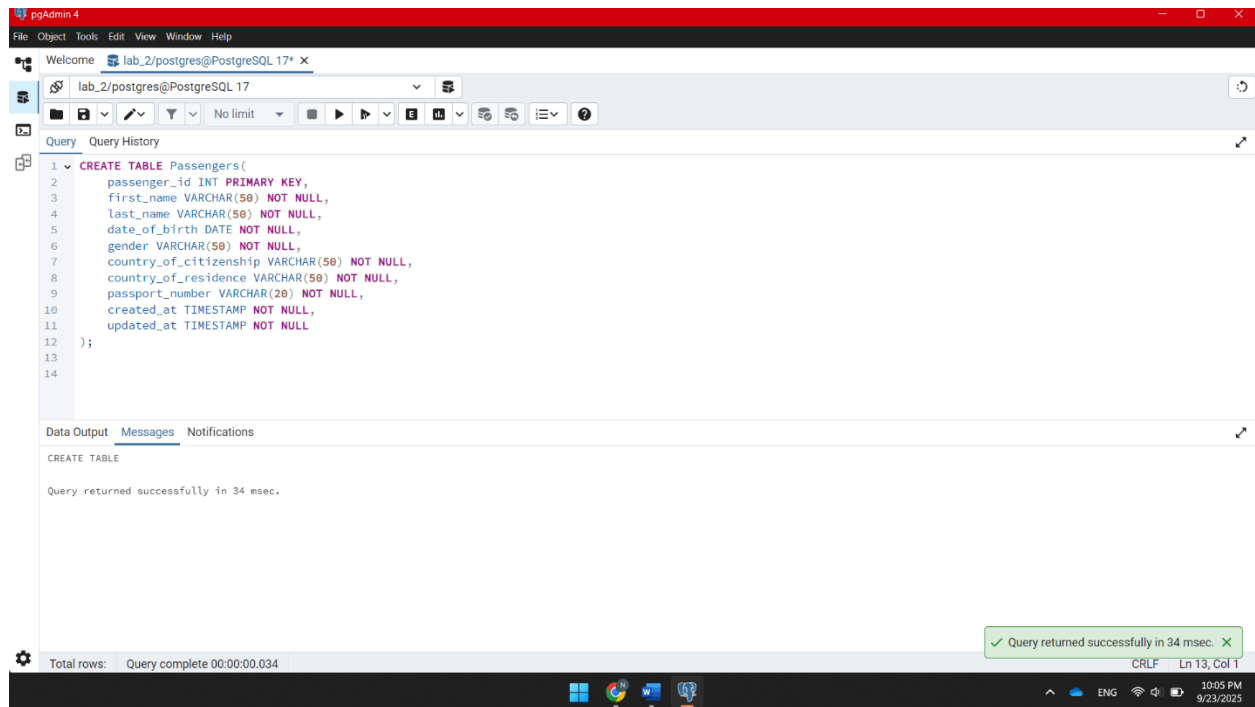


```
CREATE TABLE Booking(  
    booking_id INT PRIMARY KEY,  
    flight_id INT NOT NULL,  
    passenger_id INT NOT NULL,  
    booking_platform VARCHAR(50) NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL,  
    status VARCHAR(50) NOT NULL,  
    price DECIMAL(7,2) NOT NULL  
);
```

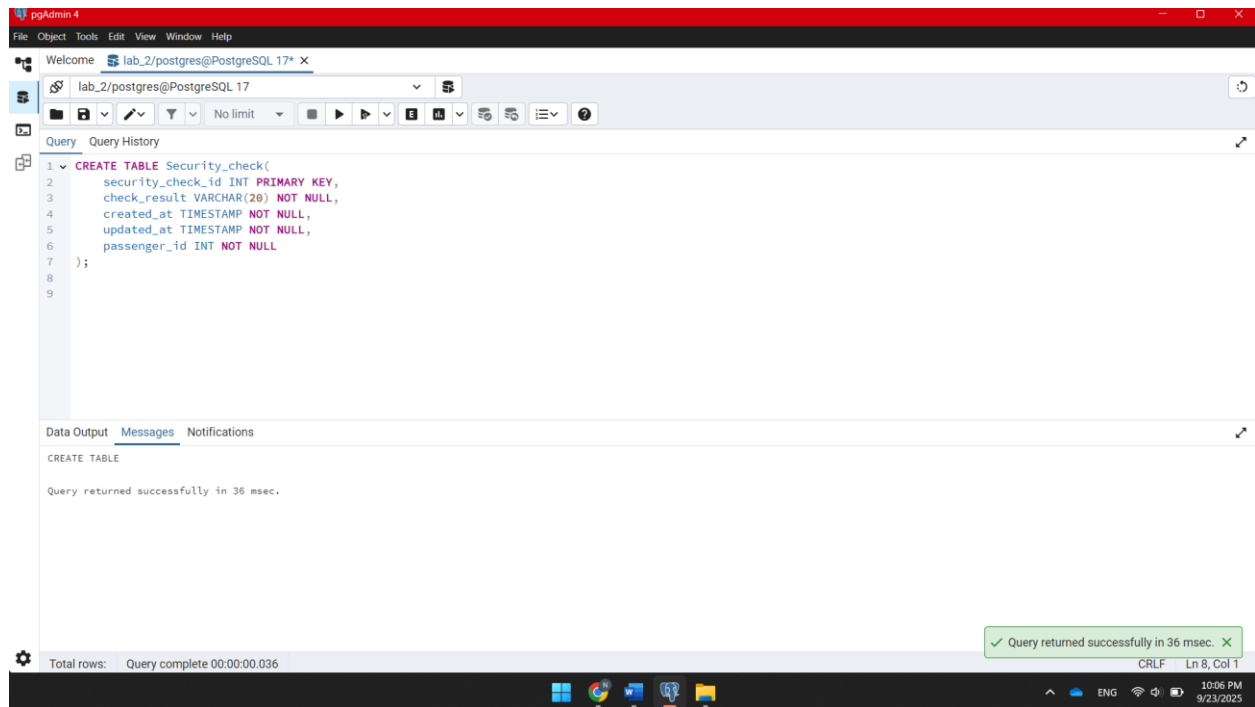


```
CREATE TABLE Flights(  
    flight_id INT PRIMARY KEY,  
    sch_departure_time TIMESTAMP NOT NULL,  
    sch_arrival_time TIMESTAMP NOT NULL,  
    departing_airport_id INT NOT NULL,  
    arriving_airport_id INT NOT NULL,  
    departing_gate VARCHAR(50) NOT NULL,  
    arriving_gate VARCHAR(50) NOT NULL,  
    airline_id INT NOT NULL,  
    act_departure_time TIMESTAMP NOT NULL,  
    act_arrival_time TIMESTAMP NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL  
);
```

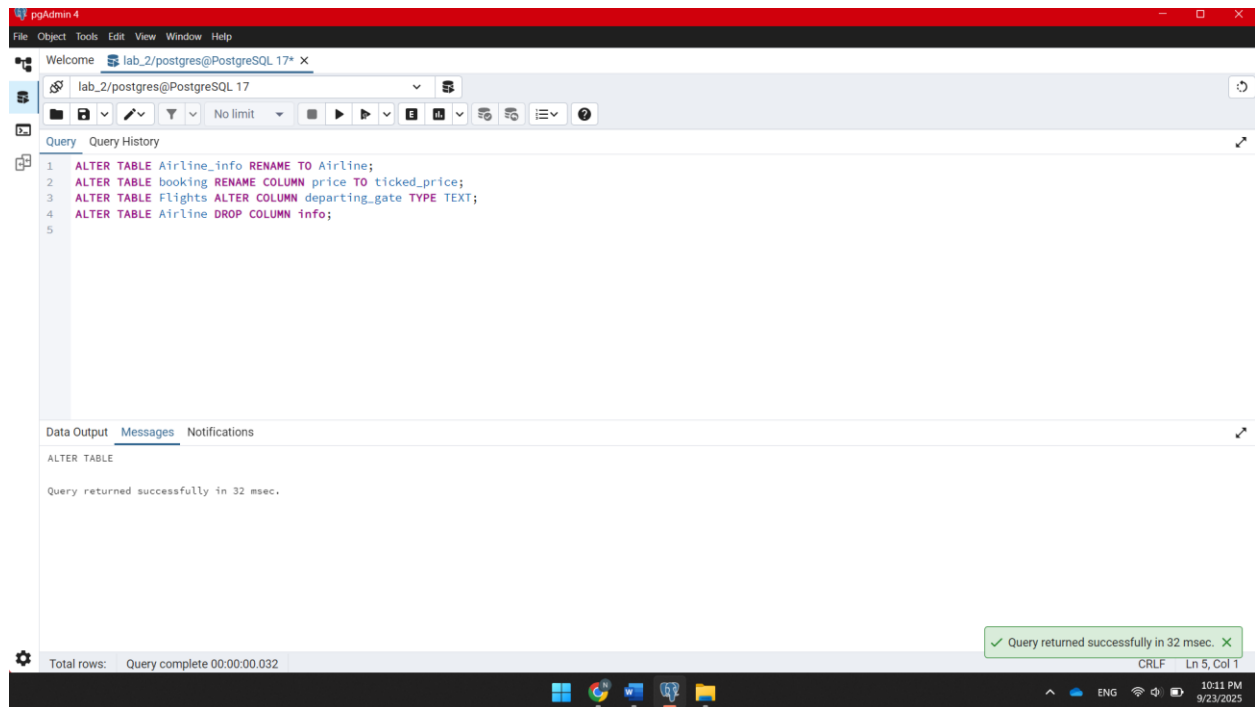




```
CREATE TABLE Passengers(  
    passenger_id INT PRIMARY KEY,  
    first_name VARCHAR(50) NOT NULL,  
    last_name VARCHAR(50) NOT NULL,  
    date_of_birth DATE NOT NULL,  
    gender VARCHAR(50) NOT NULL,  
    country_of_citizenship VARCHAR(50) NOT NULL,  
    country_of_residence VARCHAR(50) NOT NULL,  
    passport_number VARCHAR(20) NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL  
);
```



```
CREATE TABLE Security_check(  
    security_check_id INT PRIMARY KEY,  
    check_result VARCHAR(20) NOT NULL,  
    created_at TIMESTAMP NOT NULL,  
    updated_at TIMESTAMP NOT NULL,  
    passenger_id INT NOT NULL  
);
```

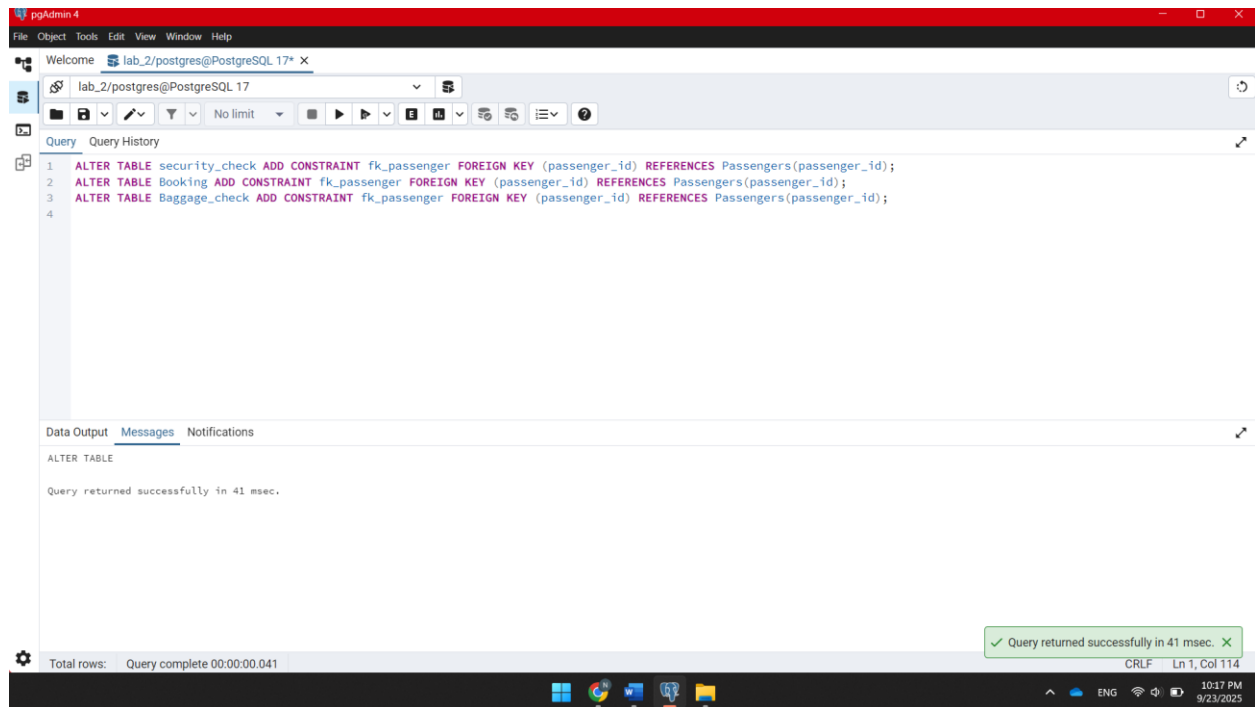


5 ALTER TABLE Airline\_info RENAME TO Airline;

6 ALTER TABLE Booking RENAME COLUMN price TO ticket\_price;

7 ALTER TABLE Flights ALTER COLUMN departing\_gate TYPE TEXT;

8 ALTER TABLE Airline DROP COLUMN info;

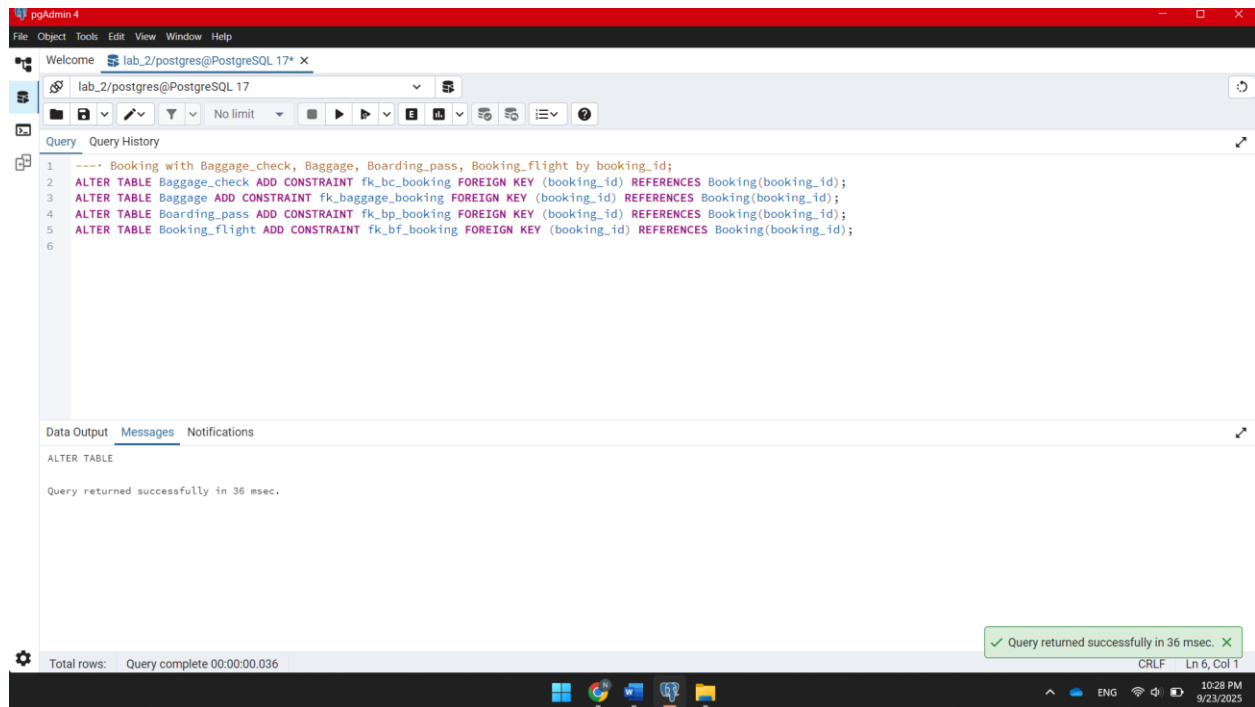


## 9.1

ALTER TABLE security\_check ADD CONSTRAINT fk\_passenger FOREIGN KEY (passenger\_id) REFERENCES Passengers(passenger\_id);

ALTER TABLE Booking ADD CONSTRAINT fk\_passenger FOREIGN KEY (passenger\_id) REFERENCES Passengers(passenger\_id);

ALTER TABLE Baggage\_check ADD CONSTRAINT fk\_passenger FOREIGN KEY (passenger\_id) REFERENCES Passengers(passenger\_id);



## 9.2

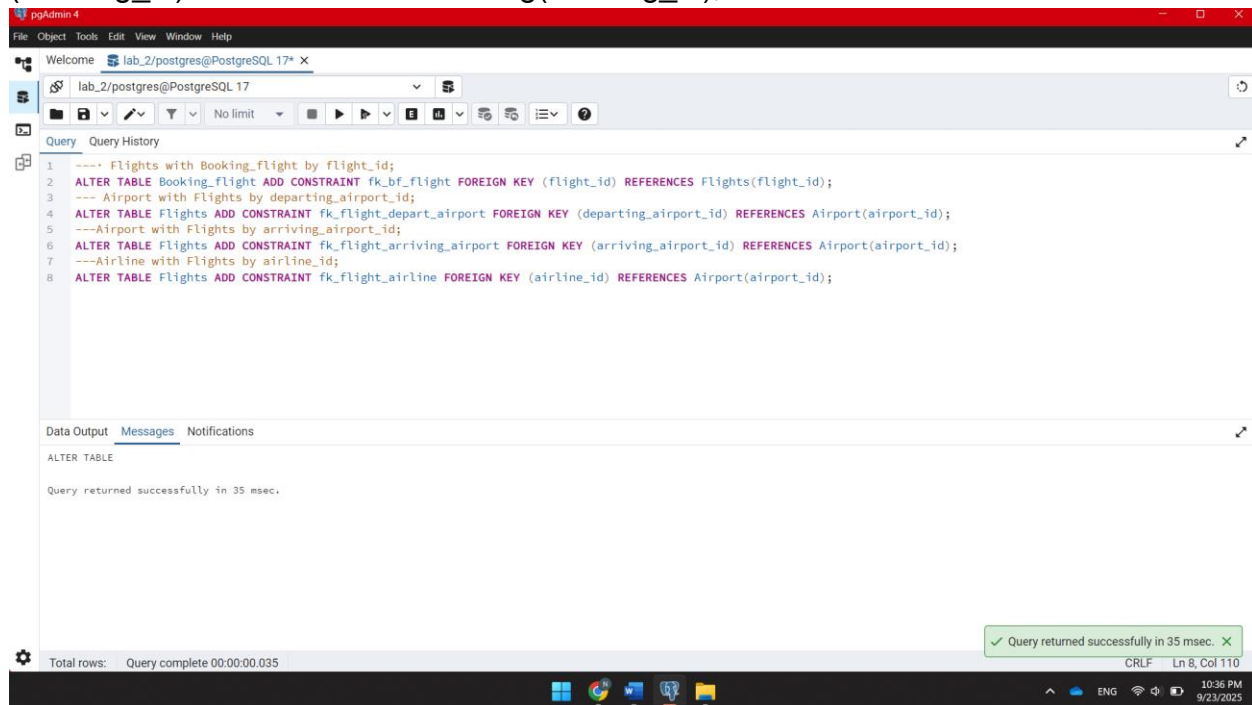
---- Booking with Baggage\_check, Baggage, Boarding\_pass, Booking\_flight by booking\_id;

```
ALTER TABLE Baggage_check ADD CONSTRAINT fk_bc_booking FOREIGN KEY (booking_id) REFERENCES Booking(booking_id);
```

```
ALTER TABLE Baggage ADD CONSTRAINT fk_baggage_booking FOREIGN KEY (booking_id) REFERENCES Booking(booking_id);
```

```
ALTER TABLE Boarding_pass ADD CONSTRAINT fk_bp_booking FOREIGN KEY (booking_id) REFERENCES Booking(booking_id);
```

ALTER TABLE Booking\_flight ADD CONSTRAINT fk\_bf\_booking FOREIGN KEY (booking\_id) REFERENCES Booking(booking\_id);



9.3 --- Flights with Booking\_flight by flight\_id;

ALTER TABLE Booking\_flight ADD CONSTRAINT fk\_bf\_flight FOREIGN KEY (flight\_id) REFERENCES Flights(flight\_id);

--- Airport with Flights by departing\_airport\_id;

ALTER TABLE Flights ADD CONSTRAINT fk\_flight\_depart\_airport FOREIGN KEY (departing\_airport\_id) REFERENCES Airport(airport\_id);

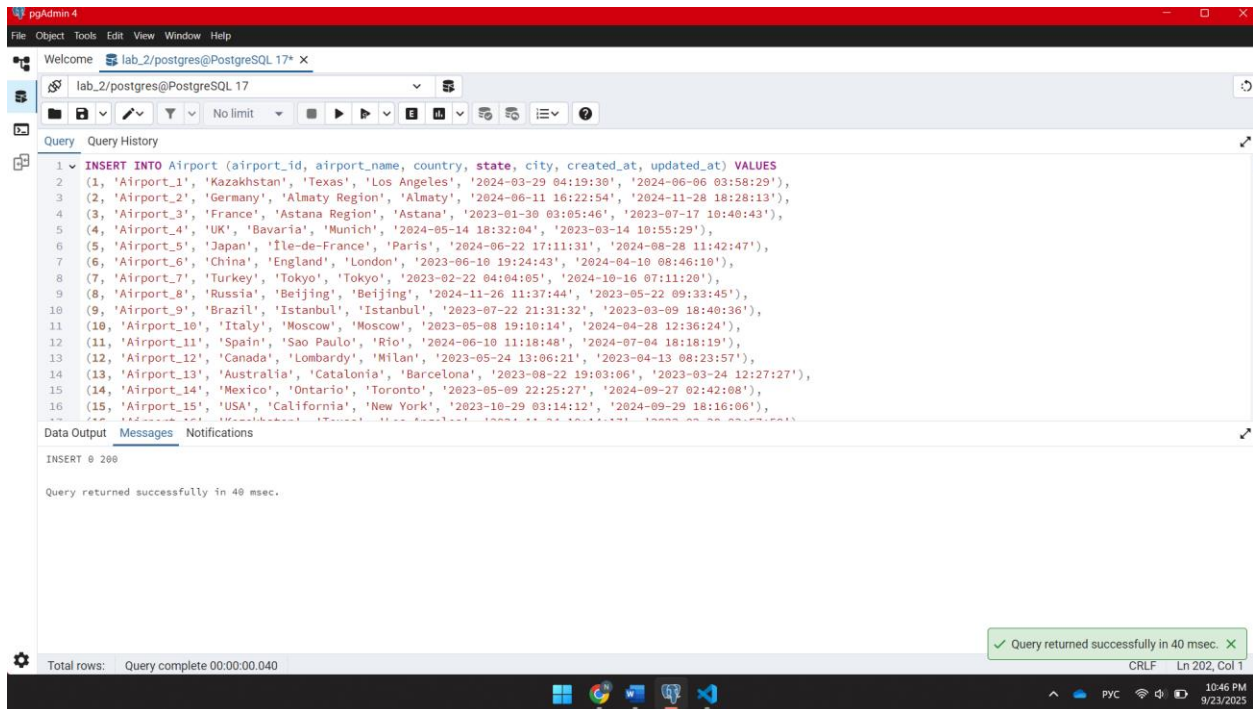
---Airport with Flights by arriving\_airport\_id;

ALTER TABLE Flights ADD CONSTRAINT fk\_flight\_arriving\_airport FOREIGN KEY (arriving\_airport\_id) REFERENCES Airport(airport\_id);

---Airline with Flights by airline\_id;

ALTER TABLE Flights ADD CONSTRAINT fk\_flight\_airline FOREIGN KEY (airline\_id) REFERENCES Airport(airport\_id);

# DML



The screenshot shows the pgAdmin 4 web interface. The top bar indicates the user is logged in as 'lab\_2/postgres@PostgreSQL 17'. The main query editor displays an SQL INSERT statement into the 'Airport' table. The statement includes 15 rows of data, each with columns for airport\_id, airport\_name, country, state, city, created\_at, and updated\_at. The 'Data Output' pane at the bottom shows the message 'INSERT 0 15' and 'Query returned successfully in 40 msec.' A green status bar at the bottom right confirms the successful execution.

```
1 INSERT INTO Airport (airport_id, airport_name, country, state, city, created_at, updated_at) VALUES
2 (1, 'Airport_1', 'Kazakhstan', 'Texas', 'Los Angeles', '2024-03-29 04:19:30', '2024-06-06 03:58:29'),
3 (2, 'Airport_2', 'Germany', 'Almaty Region', 'Almaty', '2024-06-11 16:22:54', '2024-11-28 18:28:13'),
4 (3, 'Airport_3', 'France', 'Astana Region', 'Astana', '2023-01-30 03:05:46', '2023-07-17 10:40:43'),
5 (4, 'Airport_4', 'UK', 'Bavaria', 'Munich', '2024-05-14 18:32:04', '2023-03-14 10:55:29'),
6 (5, 'Airport_5', 'Japan', 'Île-de-France', 'Paris', '2024-06-22 17:11:31', '2024-08-28 11:42:47'),
7 (6, 'Airport_6', 'China', 'England', 'London', '2023-06-10 19:24:43', '2024-04-10 08:46:10'),
8 (7, 'Airport_7', 'Turkey', 'Tokyo', 'Tokyo', '2023-02-22 04:04:05', '2024-10-16 07:11:20'),
9 (8, 'Airport_8', 'Russia', 'Beijing', 'Beijing', '2024-11-26 11:37:44', '2023-05-22 09:33:45'),
10 (9, 'Airport_9', 'Brazil', 'Istanbul', 'Istanbul', '2023-07-22 21:31:32', '2023-03-09 18:40:36'),
11 (10, 'Airport_10', 'Italy', 'Moscow', 'Moscow', '2023-05-08 19:10:14', '2024-04-28 12:36:24'),
12 (11, 'Airport_11', 'Spain', 'Sao Paulo', 'Rio', '2024-06-10 11:18:48', '2024-07-04 18:18:19'),
13 (12, 'Airport_12', 'Canada', 'Lombardy', 'Milan', '2023-05-24 13:06:21', '2023-04-13 08:23:57'),
14 (13, 'Airport_13', 'Australia', 'Catalonia', 'Barcelona', '2023-08-22 19:03:06', '2023-03-24 12:27:27'),
15 (14, 'Airport_14', 'Mexico', 'Ontario', 'Toronto', '2023-05-09 22:25:27', '2024-09-27 02:42:08'),
16 (15, 'Airport_15', 'USA', 'California', 'New York', '2023-10-29 03:14:12', '2024-09-29 18:16:06'),
```

INSERT 0 15

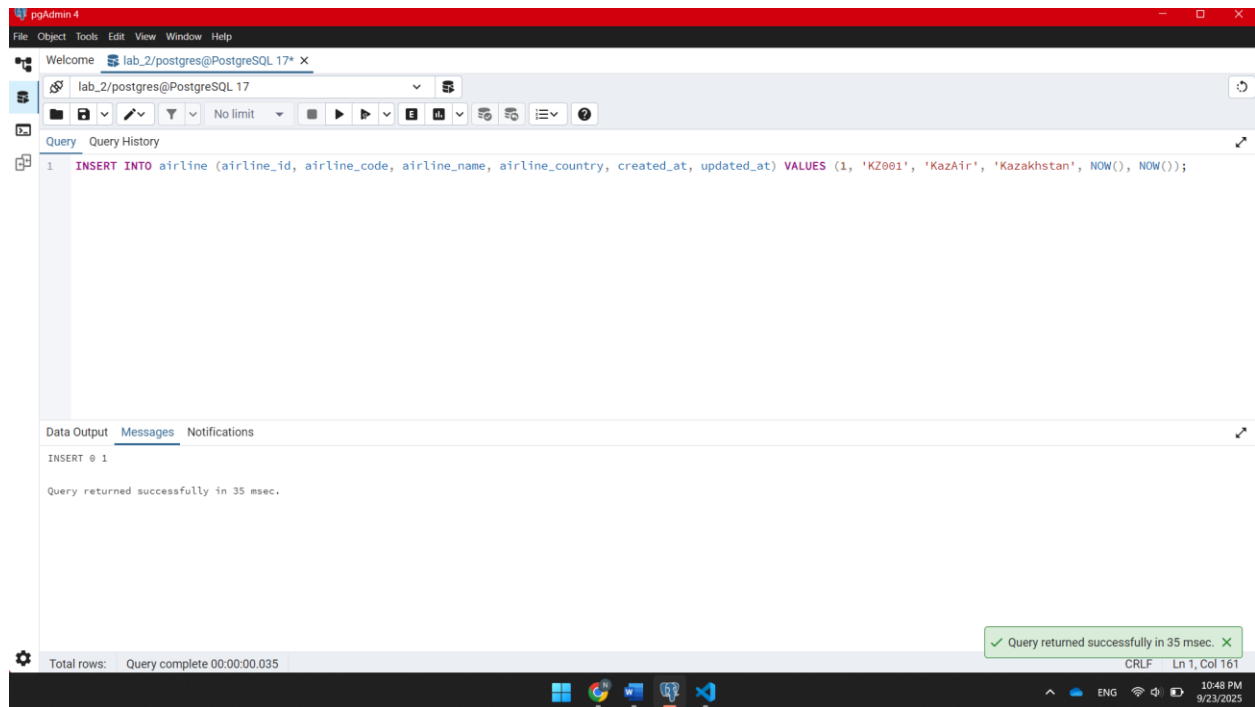
Query returned successfully in 40 msec.

## 9.1

**INSERT INTO Airport (airport\_id, airport\_name, country, state, city, created\_at, updated\_at) VALUES**

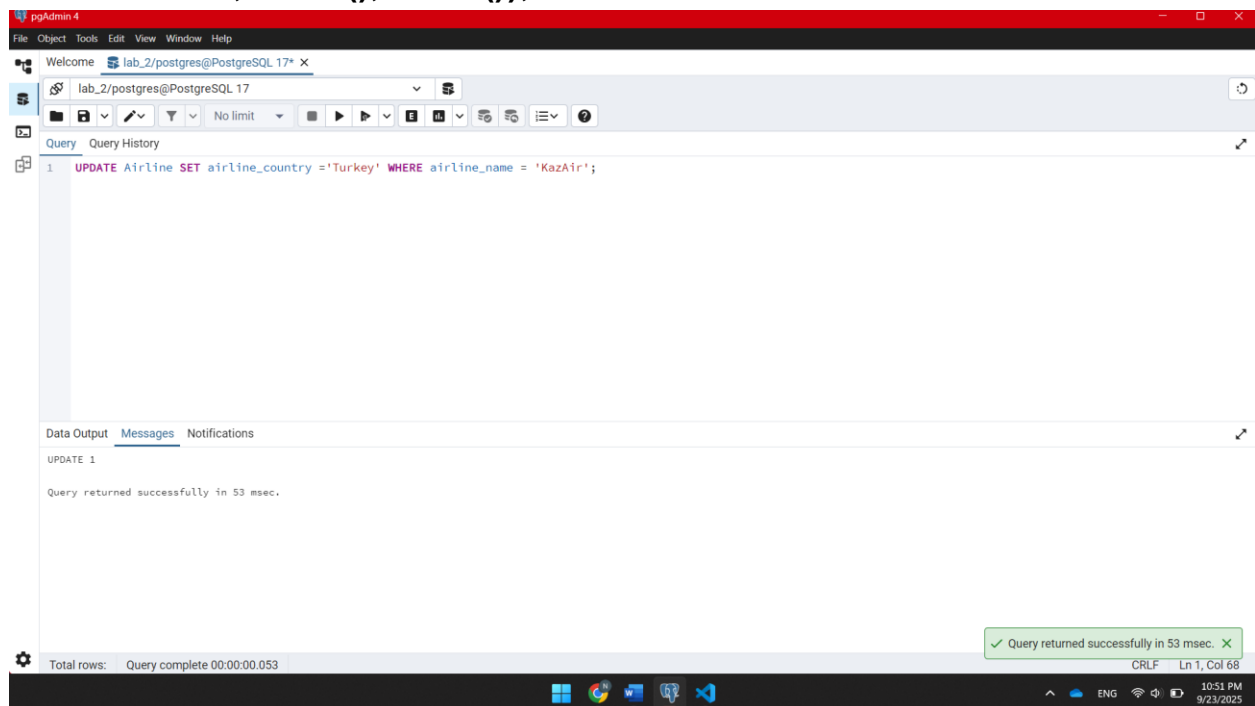
**(1, 'Airport\_1', 'Kazakhstan', 'Texas', 'Los Angeles', '2024-03-29 04:19:30', '2024-06-06 03:58:29'),**

**(2, 'Airport\_2', 'Germany', 'Almaty Region', 'Almaty', '2024-06-11 16:22:54', '2024-11-28 18:28:13');**



9.2

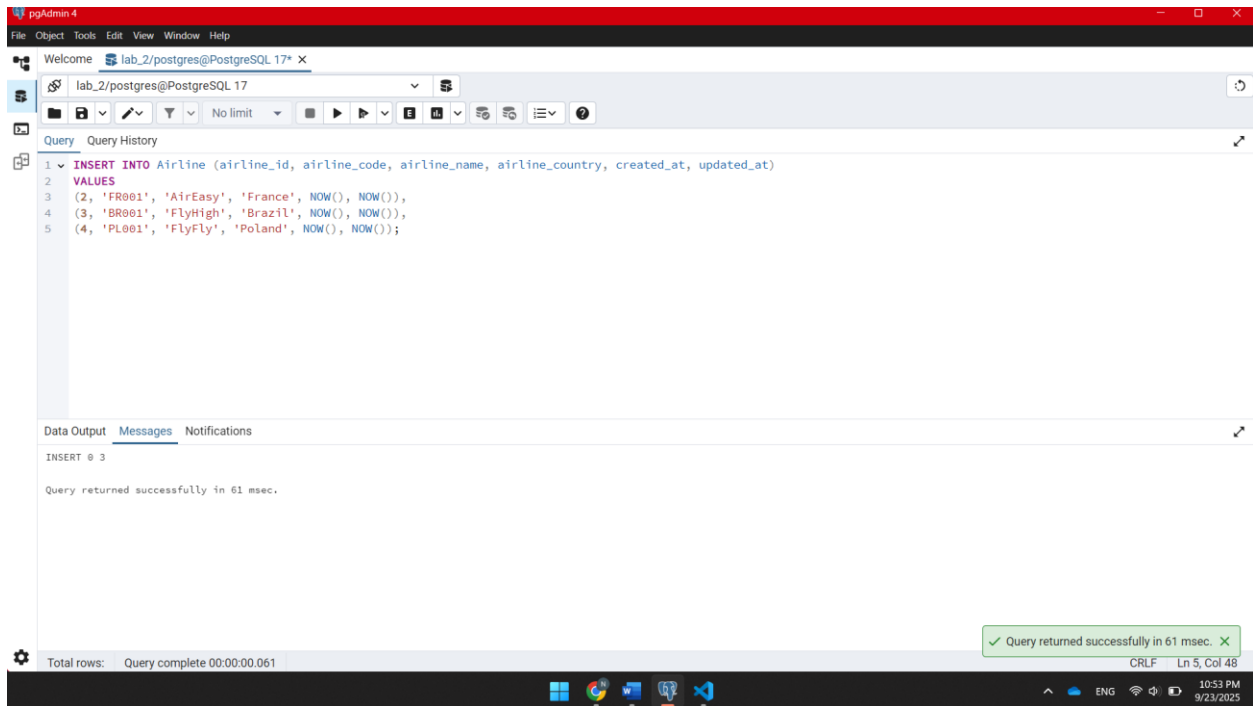
**INSERT INTO airline (airline\_id, airline\_code, airline\_name, airline\_country, created\_at, updated\_at) VALUES (1, 'KZ001', 'KazAir', 'Kazakhstan', NOW(), NOW());**



9.3



**UPDATE Airline SET airline\_country ='Turkey' WHERE airline\_name = 'KazAir';**



9.4

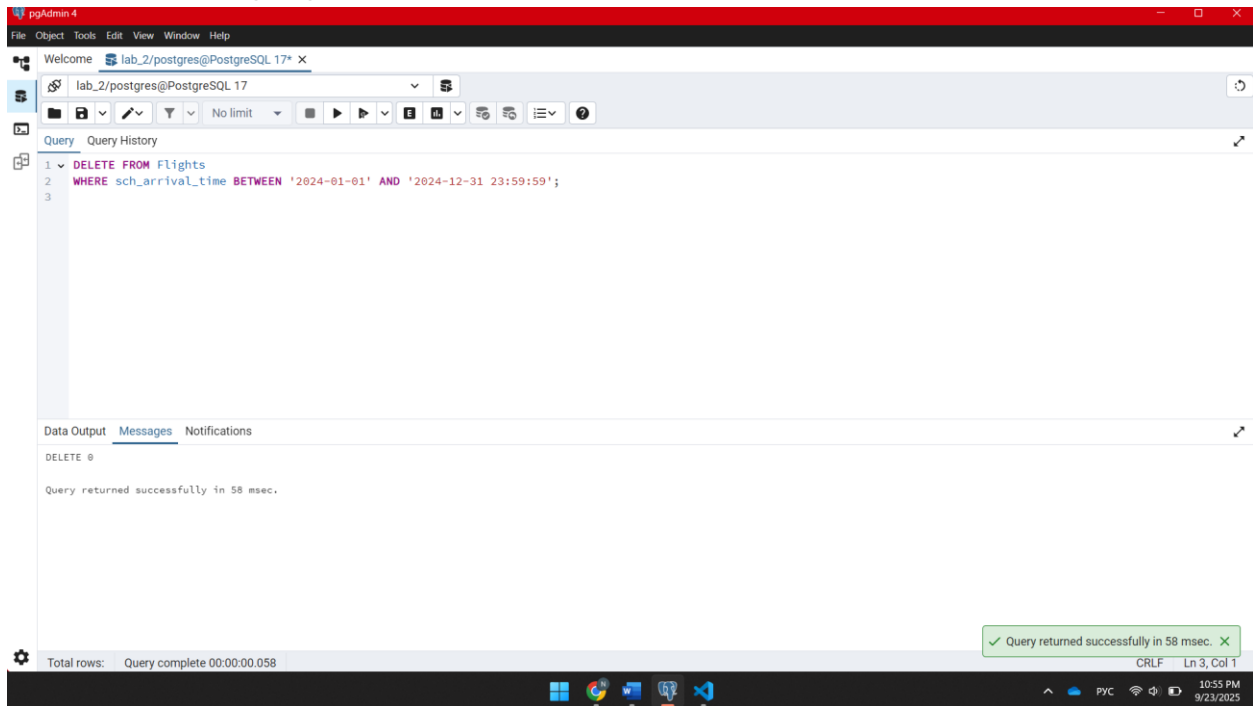
**INSERT INTO Airline (airline\_id, airline\_code, airline\_name,  
airline\_country, created\_at, updated\_at)**

**VALUES**

**(2, 'FR001', 'AirEasy', 'France', NOW(), NOW()),**

**(3, 'BR001', 'FlyHigh', 'Brazil', NOW(), NOW()),**

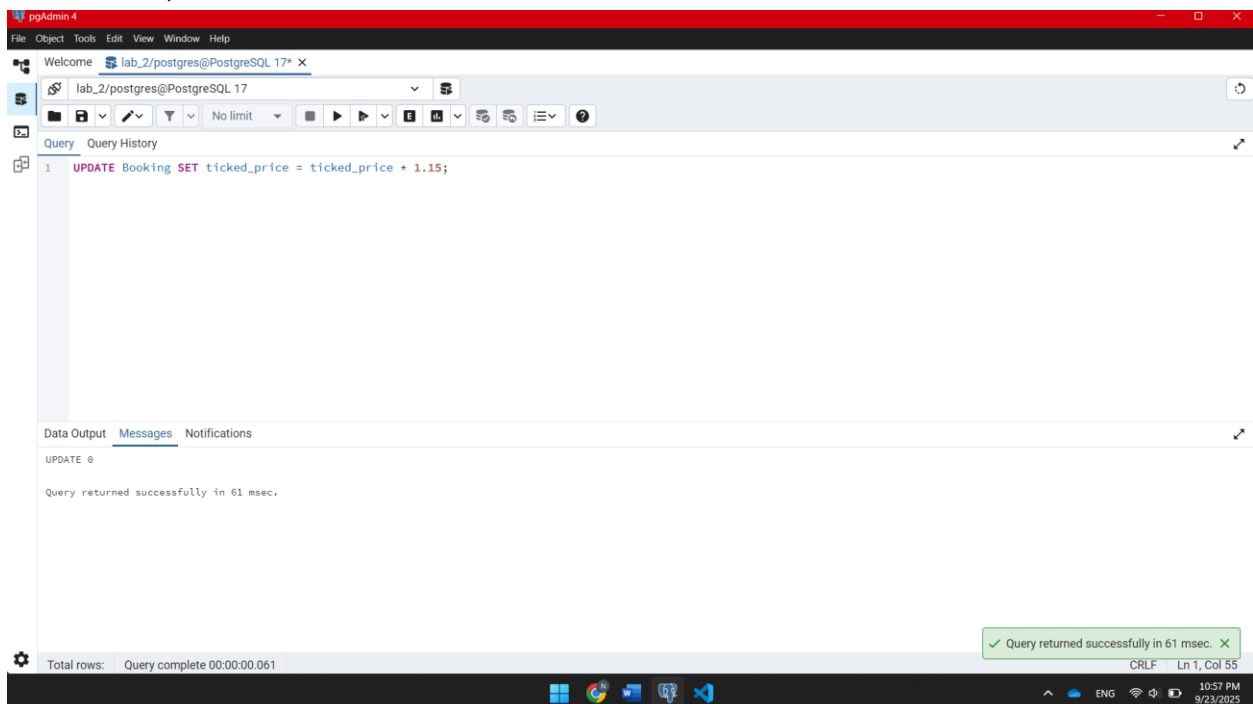
(4, 'PL001', 'FlyFly', 'Poland', NOW(), NOW());



9,5

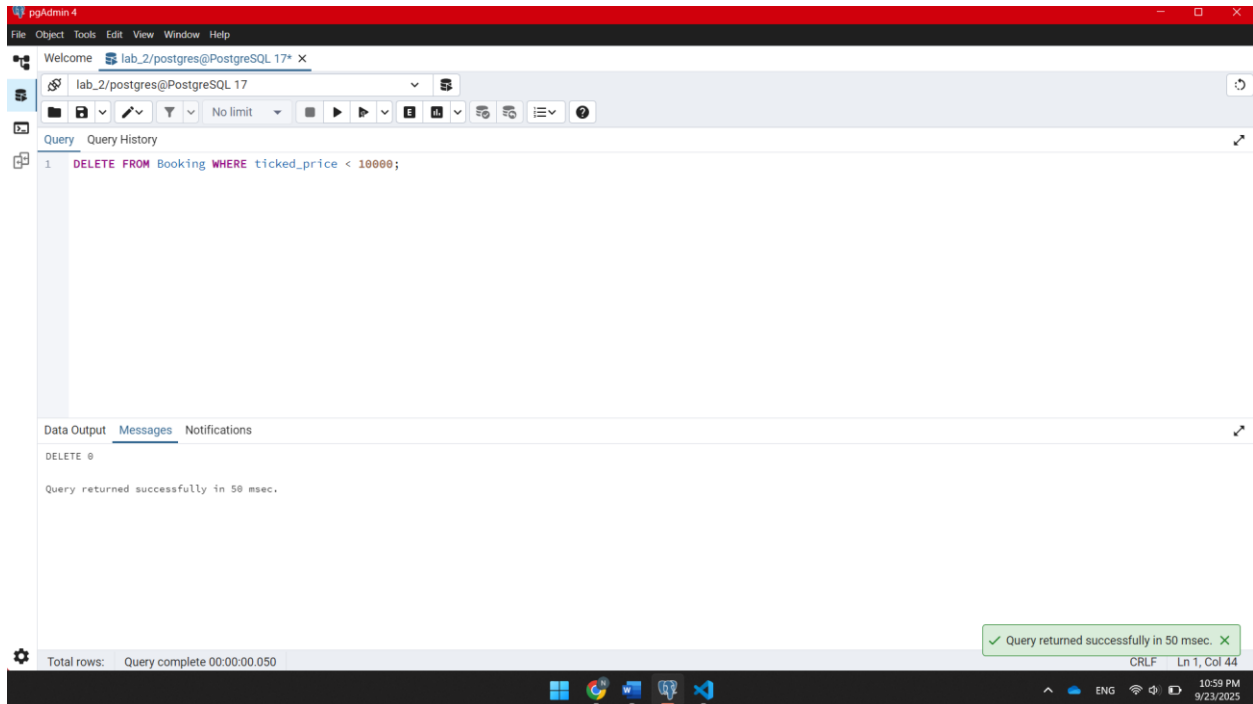
**DELETE FROM Flights**

**WHERE sch\_arrival\_time BETWEEN '2024-01-01' AND '2024-12-31 23:59:59';**



9.6

**UPDATE Booking SET ticked\_price = ticked\_price \* 1.15;**



9.7

**DELETE FROM Booking WHERE ticked\_price < 10000;**

## Constraints

- **PRIMARY KEY** — unique identifier
- **NOT NULL** — field cannot be empty
- **FOREIGN KEY** — relationship to another table

## ALTER TABLE

- **RENAME TO** — rename table
- **RENAME COLUMN** — rename column
- **ALTER COLUMN TYPE** — change data type
- **DROP COLUMN** — remove column

#### **DDL — Data Definition Language (*structure*)**

- **CREATE** — create objects
- **ALTER** — change objects
- **DROP** — delete objects
- **TRUNCATE** — clear table

#### **DML — Data Manipulation Language (*data*)**

- **INSERT** — add rows
- **UPDATE** — modify rows
- **DELETE** — remove rows