

Laboratory work #2

1. Created database tables & 'flights' schema

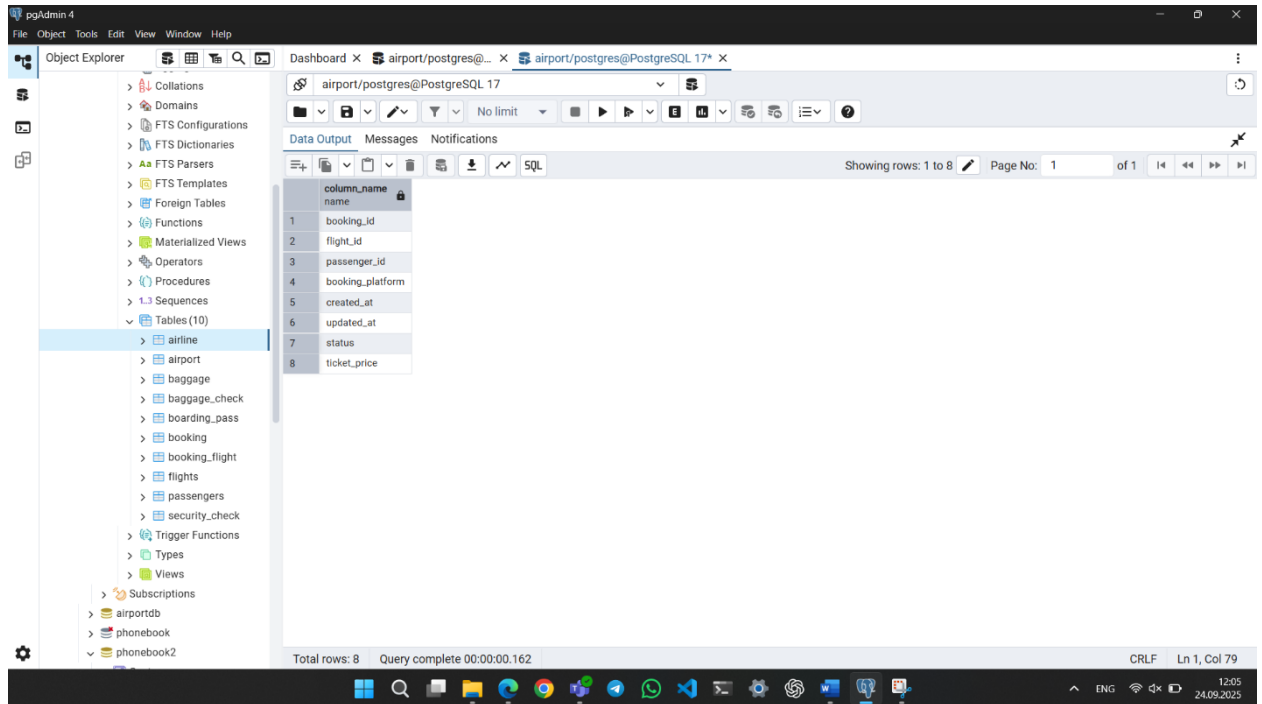
The screenshot shows the pgAdmin 4 interface. On the left, the 'Object Explorer' pane displays a tree of database objects. The 'airline' table is selected under the 'airline' schema. The main pane shows the table's structure with 12 columns. The columns are: flight_id (integer), sch_departure_time (timestamp without time zone), sch_arrival_time (timestamp without time zone), departing_airport_id (integer), arriving_airport_id (integer), departing_gate (character varying), arriving_gate (character varying), airline_id (integer), act_departure_time (timestamp without time zone), act_arrival_time (timestamp without time zone), created_at (timestamp without time zone), and updated_at (timestamp without time zone). All columns are nullable.

| column_name | data_type | is_nullable |
|----------------------|-----------------------------|-------------|
| flight_id | integer | NO |
| sch_departure_time | timestamp without time zone | NO |
| sch_arrival_time | timestamp without time zone | NO |
| departing_airport_id | integer | NO |
| arriving_airport_id | integer | NO |
| departing_gate | character varying | NO |
| arriving_gate | character varying | NO |
| airline_id | integer | NO |
| act_departure_time | timestamp without time zone | NO |
| act_arrival_time | timestamp without time zone | NO |
| created_at | timestamp without time zone | NO |
| updated_at | timestamp without time zone | NO |

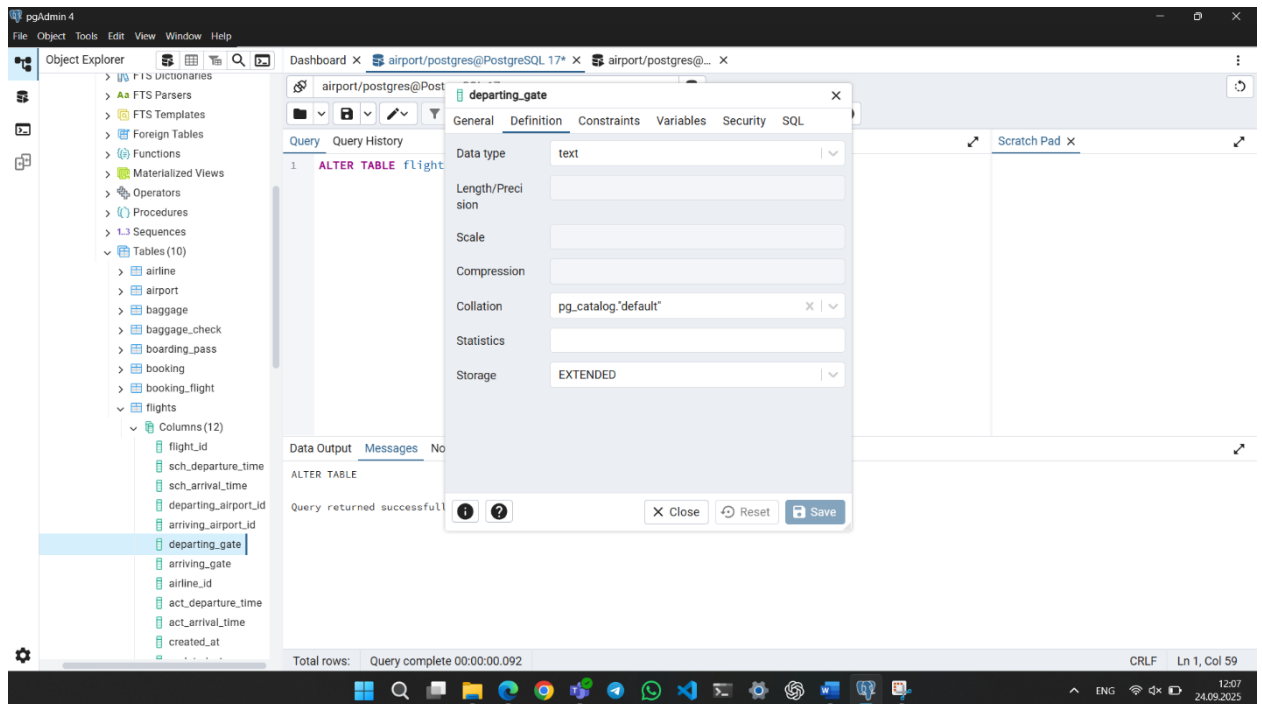
2. Renamed airline_info to airline

The screenshot shows the pgAdmin 4 interface. In the 'Object Explorer' pane, the 'airline' table is highlighted with a red circle. The main pane shows a SQL query in the 'Query' tab: `ALTER TABLE airline_info RENAME TO airline;`. The 'Messages' pane at the bottom displays an error message: `ERROR: отношение "airline_info" не существует` (relation "airline_info" does not exist). The status bar at the bottom indicates 'Query complete 00:00:00.105'.

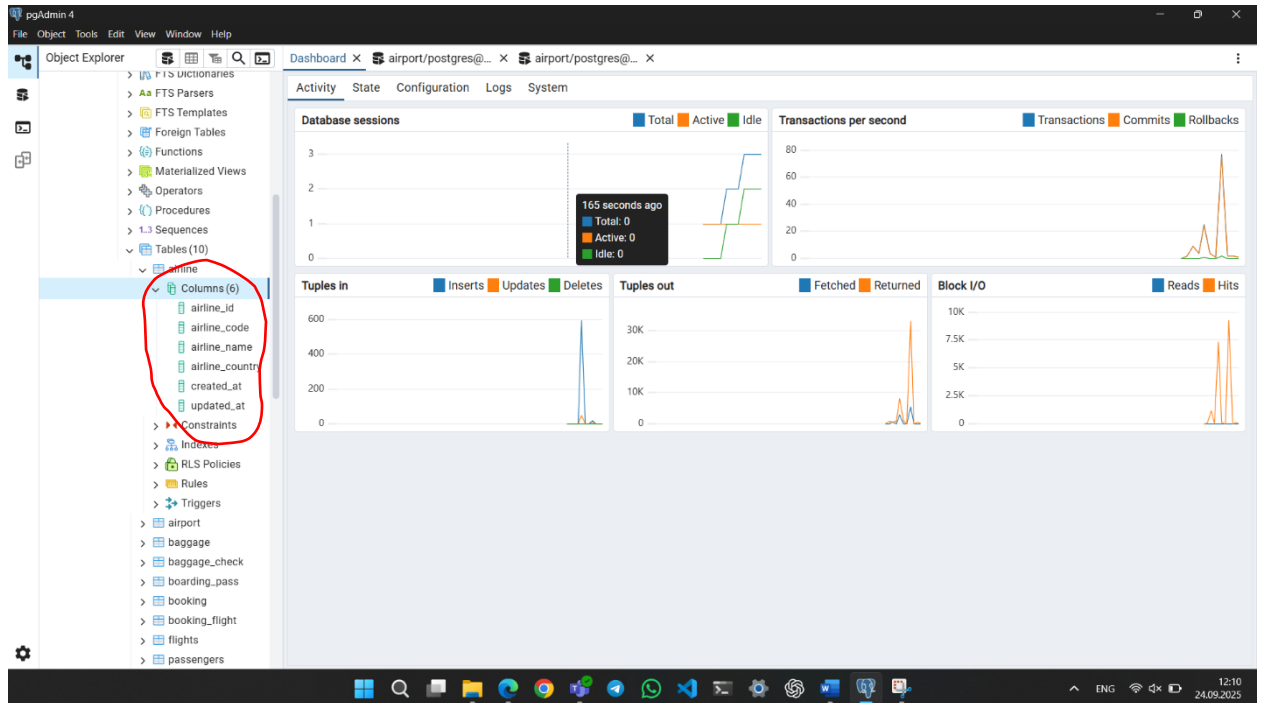
3. Renamed price to ticket_price in booking



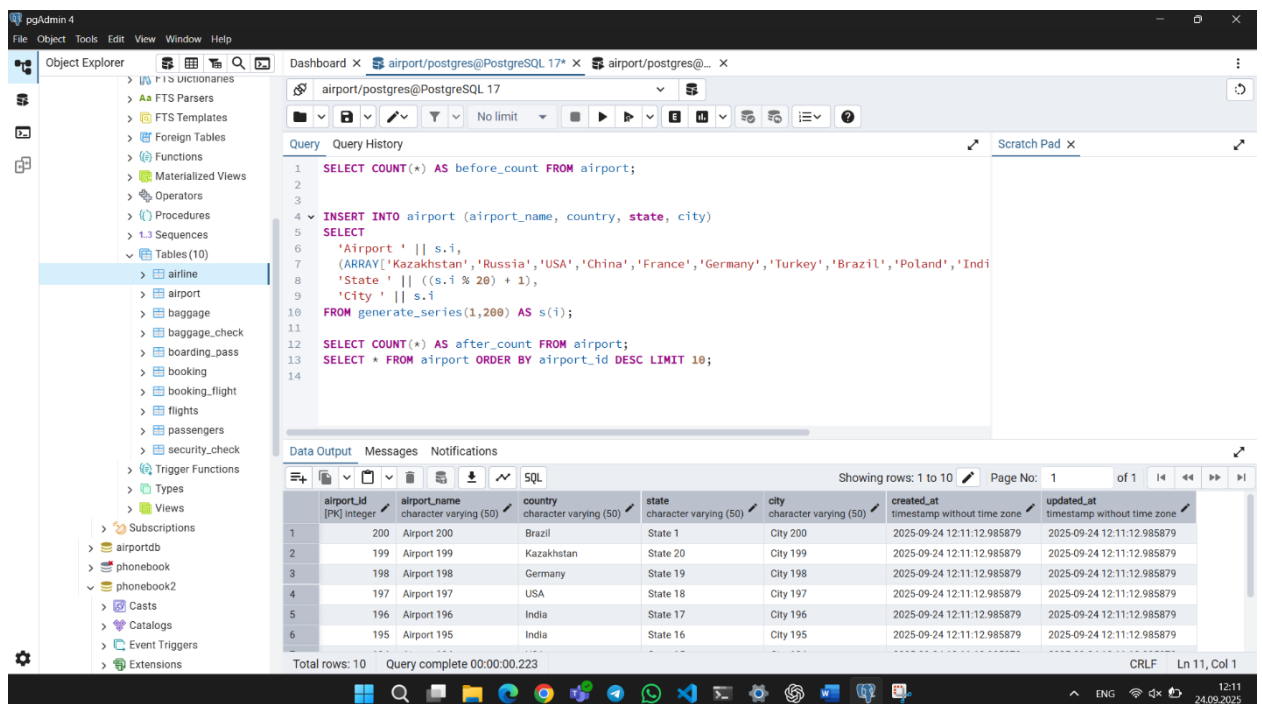
4. Changed departing_gate type to TEXT in flights



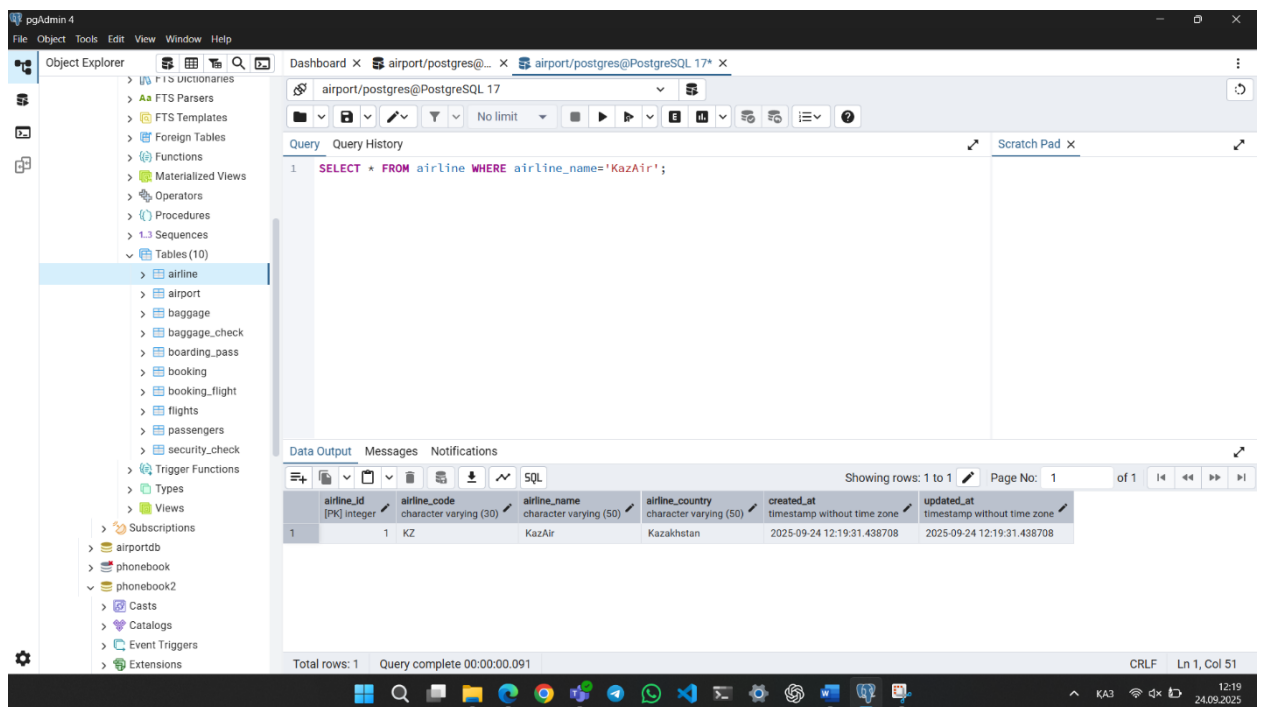
5. Dropped info column from airline



6. Inserted 200 random rows into airport



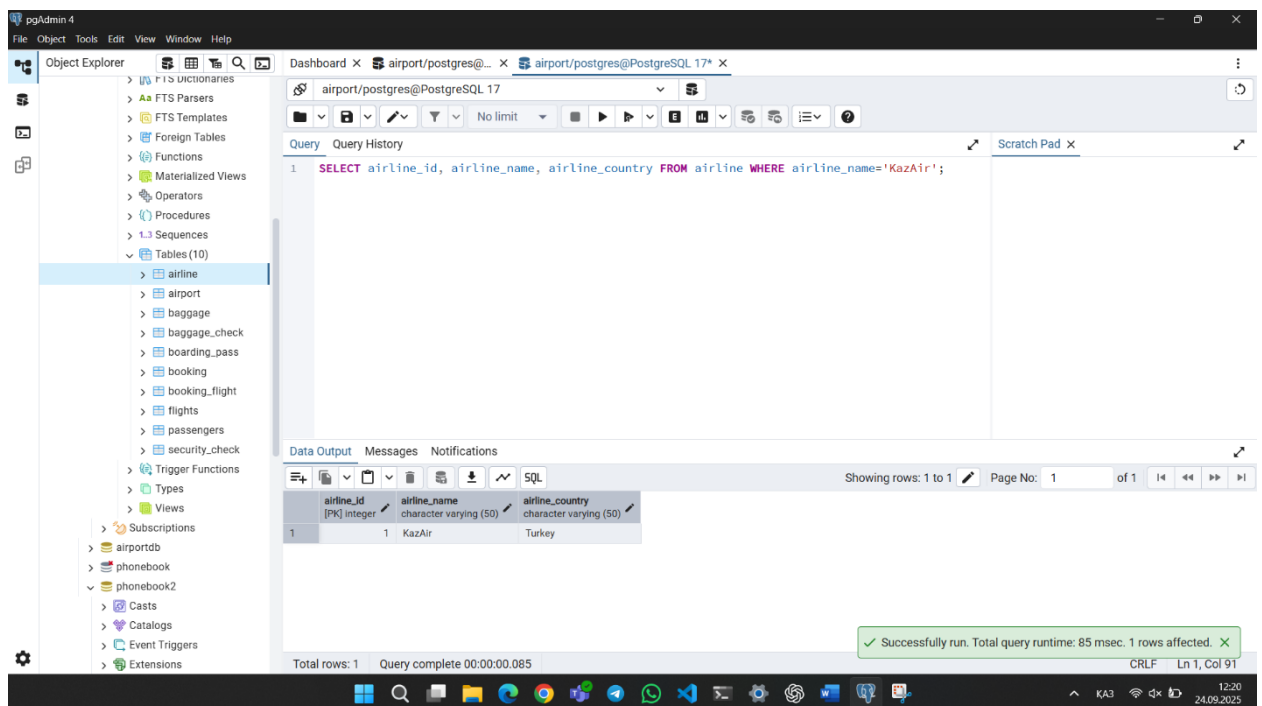
7.Added KazAir to airline (insert) and updated



The screenshot shows the pgAdmin 4 interface. The Object Explorer on the left lists the database structure, with the 'airline' table selected. The Query Editor in the center contains the SQL query: `SELECT * FROM airline WHERE airline_name='KazAir';`. The Data Output pane at the bottom displays the results of the query in a table format.

| airline_id [PK] integer | airline_code character varying (30) | airline_name character varying (50) | airline_country character varying (50) | created_at timestamp without time zone | updated_at timestamp without time zone |
|-------------------------|-------------------------------------|-------------------------------------|--|--|--|
| 1 | KZ | KazAir | Kazakhstan | 2025-09-24 12:19:31.438708 | 2025-09-24 12:19:31.438708 |

Total rows: 1 Query complete 00:00:00.091 CRLF Ln 1, Col 51



The screenshot shows the pgAdmin 4 interface. The Object Explorer on the left lists the database structure, with the 'airline' table selected. The Query Editor in the center contains the SQL query: `SELECT airline_id, airline_name, airline_country FROM airline WHERE airline_name='KazAir';`. The Data Output pane at the bottom displays the results of the query in a table format.

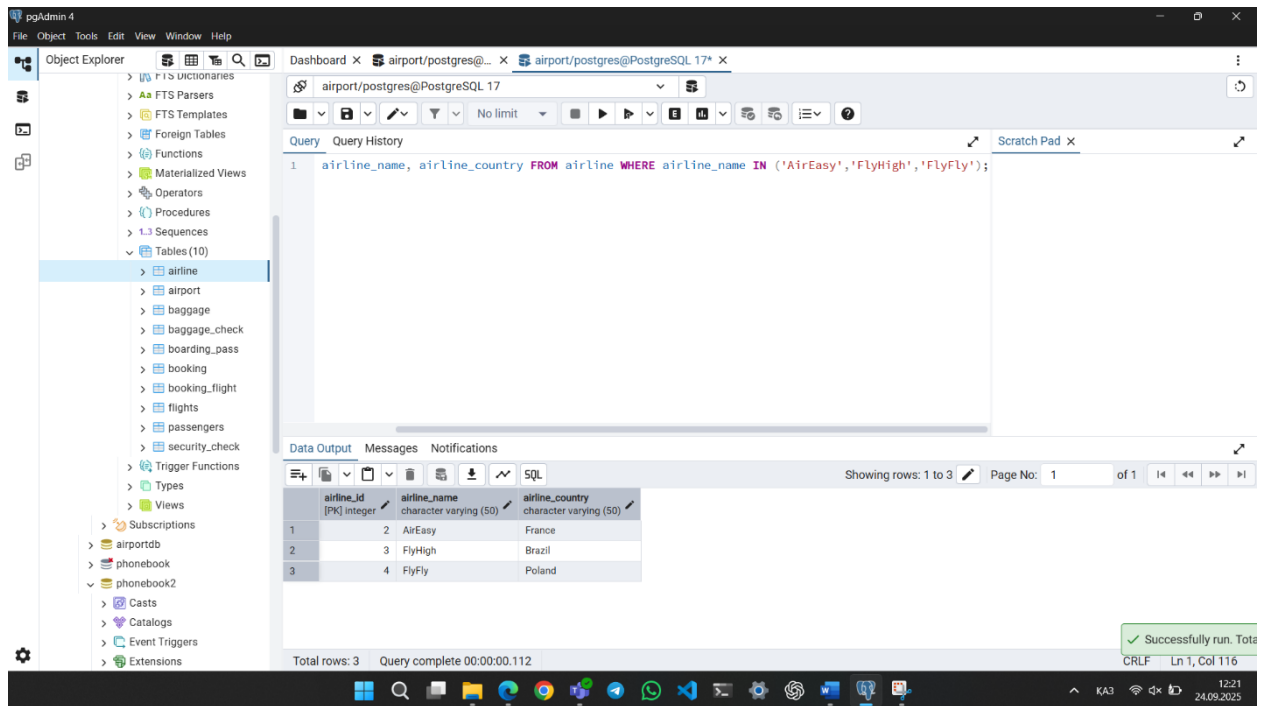
| airline_id [PK] integer | airline_name character varying (50) | airline_country character varying (50) |
|-------------------------|-------------------------------------|--|
| 1 | KazAir | Turkey |

Total rows: 1 Query complete 00:00:00.085

Successfully run. Total query runtime: 85 msec. 1 rows affected.

CRLF Ln 1, Col 91

8. Inserted three airlines at once



The screenshot shows the pgAdmin 4 interface with a query executed successfully. The query is:

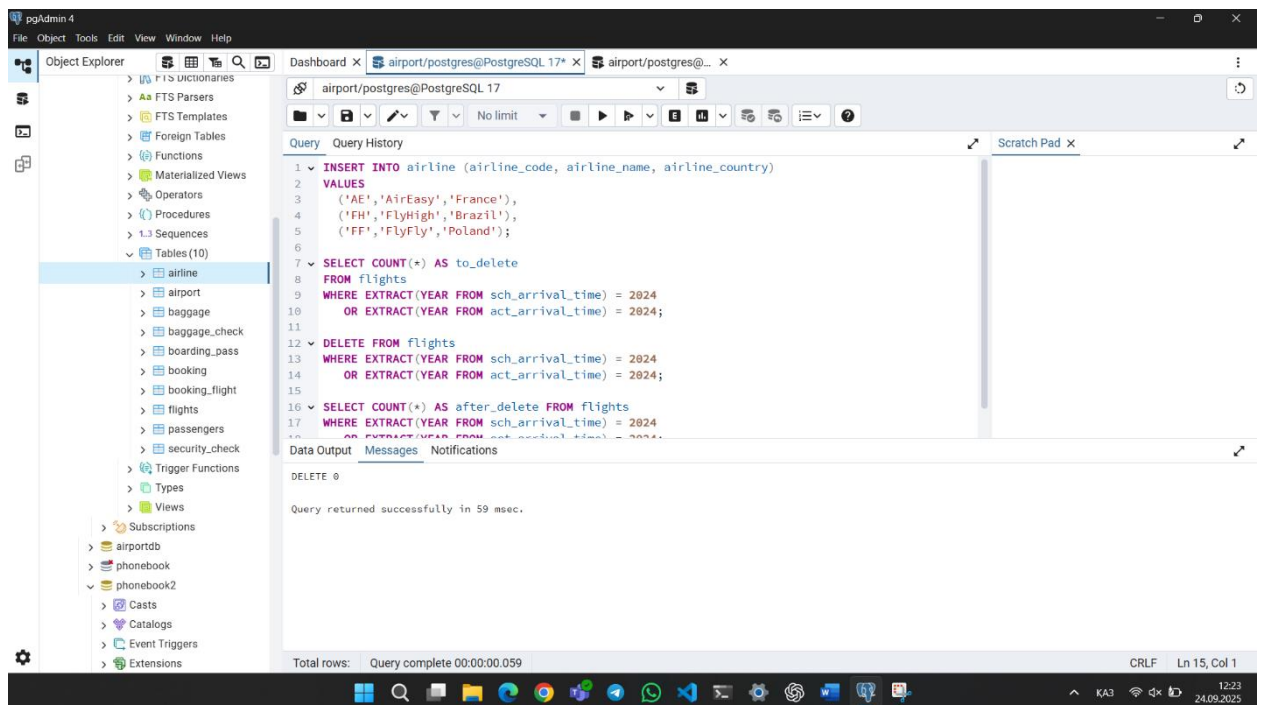
```
1 airline_name, airline_country FROM airline WHERE airline_name IN ('AirEasy','FlyHigh','FlyFly');
```

The Data Output tab displays the following table:

| airline_id [PK] integer | airline_name character varying (50) | airline_country character varying (50) |
|-------------------------|-------------------------------------|--|
| 1 | 2 AirEasy | France |
| 2 | 3 FlyHigh | Brazil |
| 3 | 4 FlyFly | Poland |

Summary: Total rows: 3, Query complete 00:00:00.112. A green notification box at the bottom right states: "Successfully run. Total rows: 3, Query complete 00:00:00.112. CRLF Ln 1, Col 116".

9. Deleted flights with arrivals



The screenshot shows the pgAdmin 4 interface with a query executed successfully. The query is:

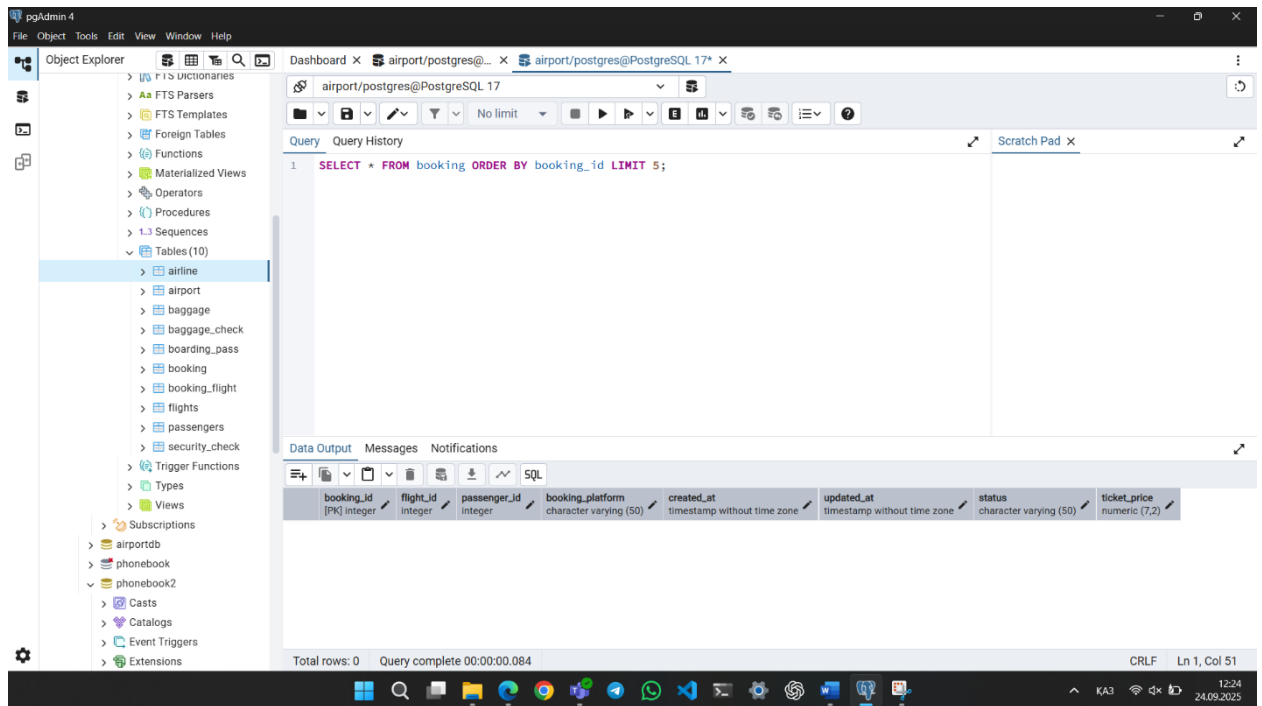
```
1 INSERT INTO airline (airline_code, airline_name, airline_country)
2 VALUES
3 ('AE','AirEasy','France'),
4 ('FH','FlyHigh','Brazil'),
5 ('FF','FlyFly','Poland');
6
7 SELECT COUNT(*) AS to_delete
8 FROM flights
9 WHERE EXTRACT(YEAR FROM sch_arrival_time) = 2024
10 OR EXTRACT(YEAR FROM act_arrival_time) = 2024;
11
12 DELETE FROM flights
13 WHERE EXTRACT(YEAR FROM sch_arrival_time) = 2024
14 OR EXTRACT(YEAR FROM act_arrival_time) = 2024;
15
16 SELECT COUNT(*) AS after_delete FROM flights
17 WHERE EXTRACT(YEAR FROM sch_arrival_time) = 2024
18 OR EXTRACT(YEAR FROM act_arrival_time) = 2024;
```

The Data Output tab shows the result of the DELETE statement:

```
DELETE 0
```

Summary: Query returned successfully in 59 msec. CRLF Ln 15, Col 1

10. Increased all ticket prices by 15%



The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, including the 'airline' database and its tables. The main pane shows a query editor with the following SQL query:

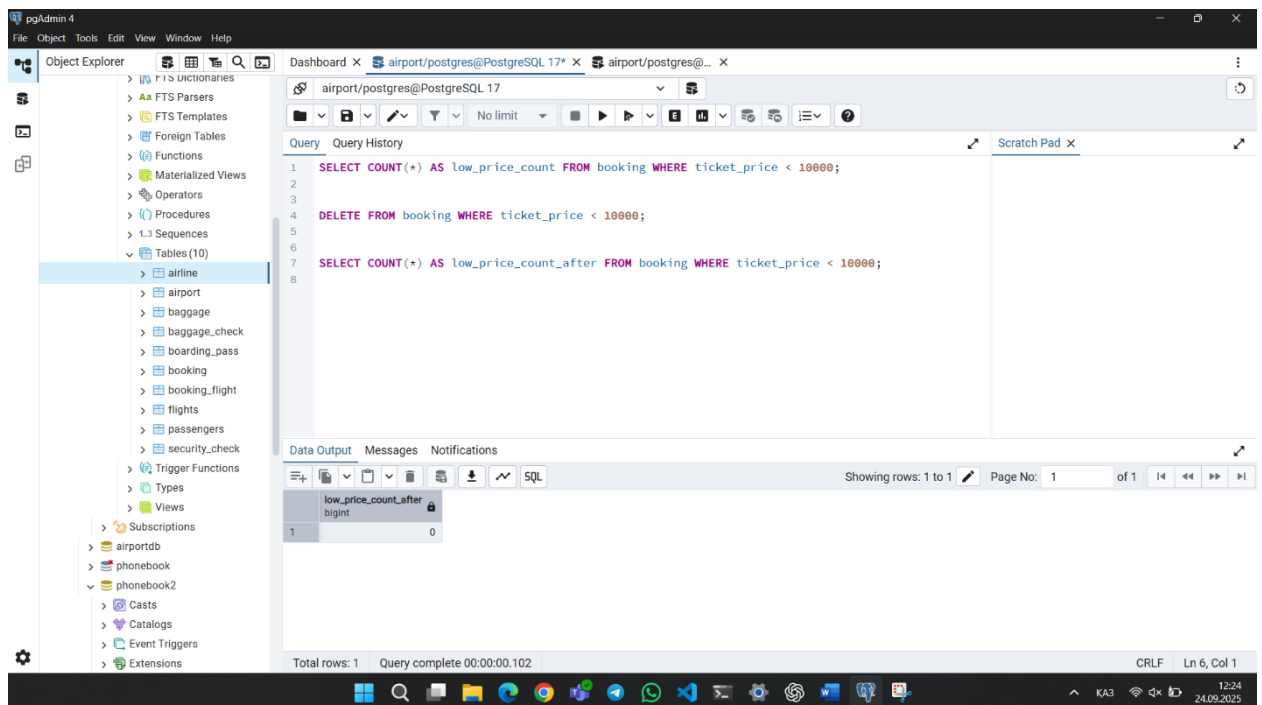
```
1 SELECT * FROM booking ORDER BY booking_id LIMIT 5;
```

The 'Data Output' tab is active, showing the results of the query. The table has the following columns:

| booking_id | flight_id | passenger_id | booking_platform | created_at | updated_at | status | ticket_price |
|--------------|-----------|--------------|------------------------|-----------------------------|-----------------------------|------------------------|---------------|
| [PK] integer | integer | integer | character varying (50) | timestamp without time zone | timestamp without time zone | character varying (50) | numeric (7,2) |

The status bar at the bottom indicates 'Total rows: 0' and 'Query complete 00:00:00.084'.

11. Deleted all bookings where ticket_price < 10000



The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure. The main pane shows a query editor with the following SQL query:

```
1 SELECT COUNT(*) AS low_price_count FROM booking WHERE ticket_price < 10000;  
2  
3  
4 DELETE FROM booking WHERE ticket_price < 10000;  
5  
6  
7 SELECT COUNT(*) AS low_price_count_after FROM booking WHERE ticket_price < 10000;  
8
```

The 'Data Output' tab is active, showing the results of the query. The table has the following columns:

| low_price_count_after |
|-----------------------|
| bigint |

The status bar at the bottom indicates 'Total rows: 1' and 'Query complete 00:00:00.102'.

12. Final verification: table schemas and key constraints

The screenshot displays the pgAdmin 4 interface. On the left, the Object Explorer shows the database structure, with the 'flights' table selected under the 'airline' schema. The main query editor shows two SQL queries. The first query lists columns for the 'flights' table. The second query lists constraints for the 'flights' table. The Data Output pane at the bottom shows the results of the second query, listing four constraints: 'flights_pkey' (PRIMARY KEY), 'flights_departing_airport_id_fkey' (FOREIGN KEY), 'flights_arriving_airport_id_fkey' (FOREIGN KEY), and 'flights_airline_id_fkey' (FOREIGN KEY).

```
1 SELECT column_name, data_type, is_nullable
2 FROM information_schema.columns
3 WHERE table_name = 'flights';
4
5 SELECT conname, pg_get_constraintdef(c.oid) AS definition
6 FROM pg_constraint c
7 JOIN pg_class t ON c.conrelid = t.oid
8 WHERE t.relname = 'flights';
9
```

| conname | definition |
|-----------------------------------|---|
| flights_pkey | PRIMARY KEY (flight_id) |
| flights_departing_airport_id_fkey | FOREIGN KEY (departing_airport_id) REFERENCES airport(airport_id) |
| flights_arriving_airport_id_fkey | FOREIGN KEY (arriving_airport_id) REFERENCES airport(airport_id) |
| flights_airline_id_fkey | FOREIGN KEY (airline_id) REFERENCES airline(airline_id) |

Total rows: 4 Query complete 00:00:00.154 CRLF Ln 4, Col 1