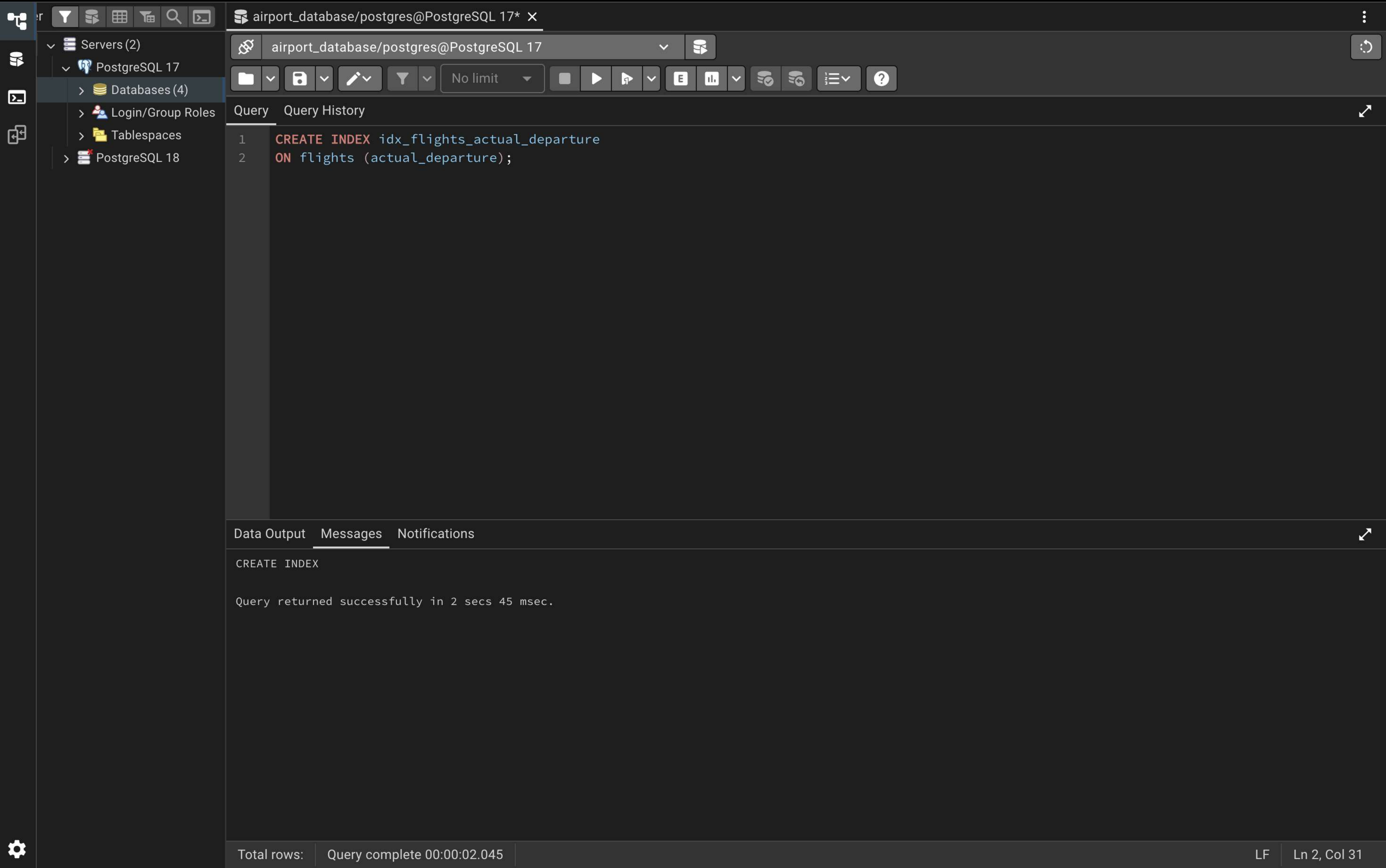
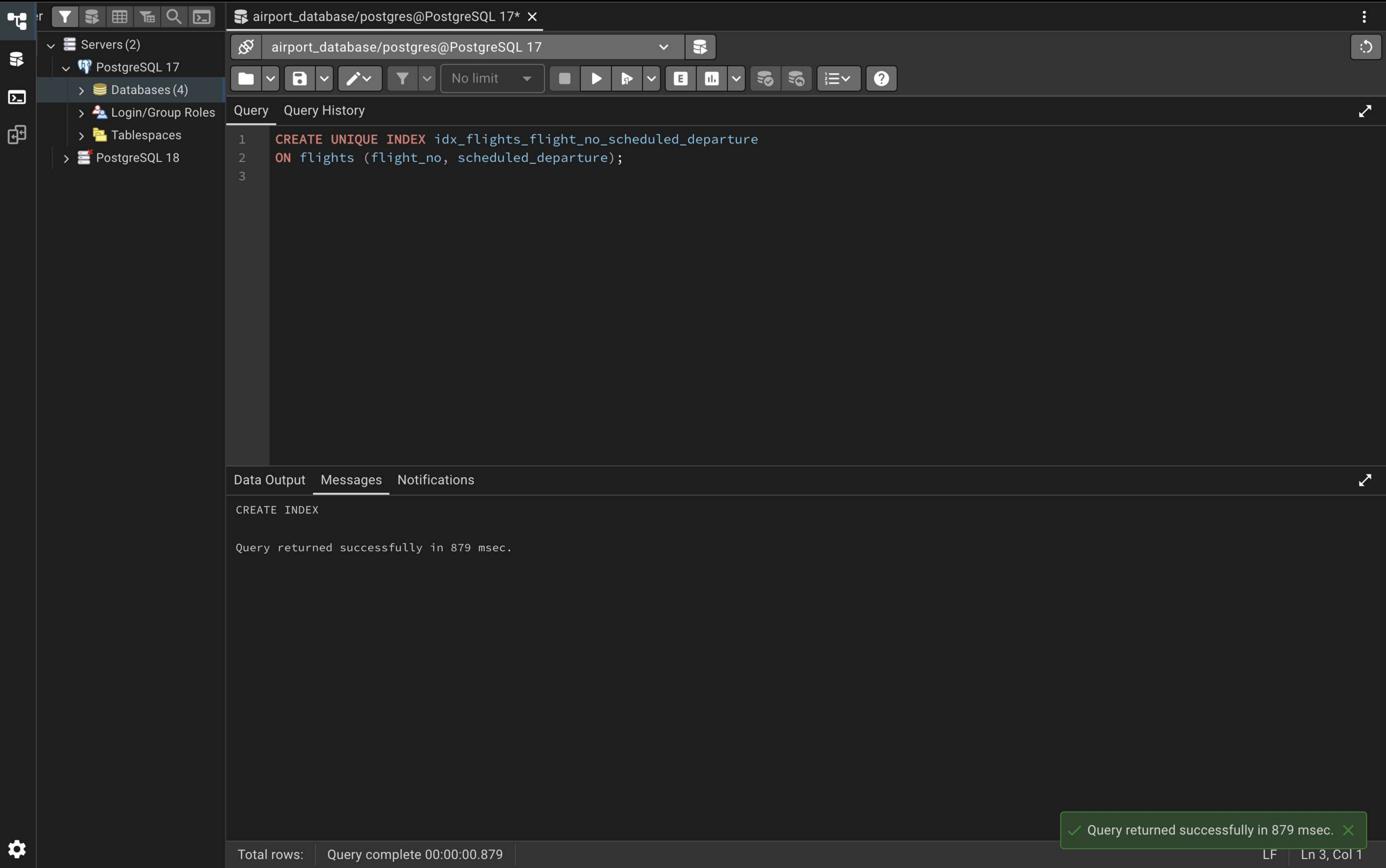


```sql
CREATE INDEX idx_flights_actual_departure
ON flights (actual_departure);
```

```
CREATE INDEX

Query returned successfully in 2 secs 45 msec.
```



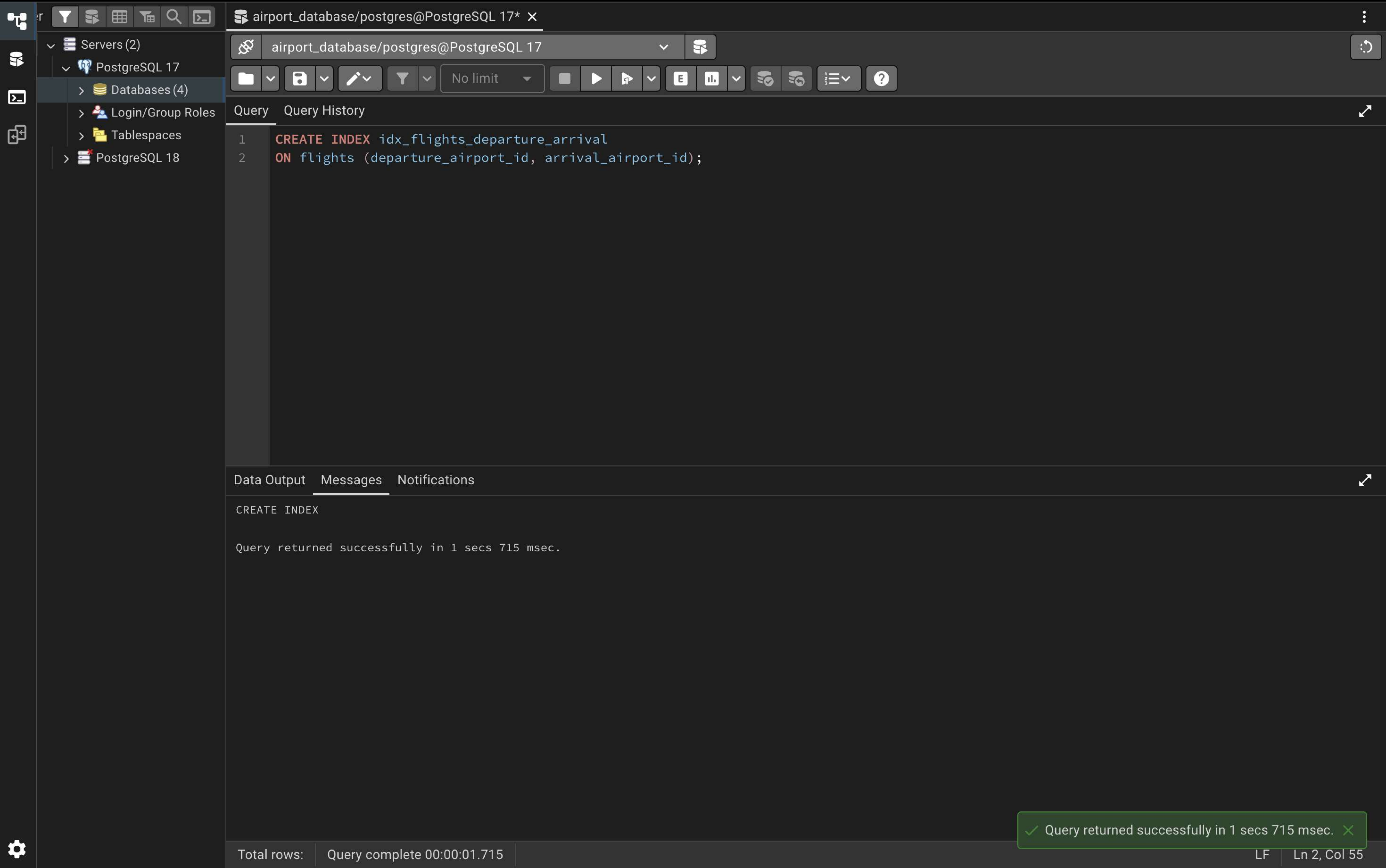
```
CREATE UNIQUE INDEX idx_flights_flight_no_scheduled_departure
ON flights (flight_no, scheduled_departure);
```

```
CREATE INDEX

Query returned successfully in 879 msec.
```

Query returned successfully in 879 msec.

Total rows: Query complete 00:00:00.879

LF Ln 3, Col 1

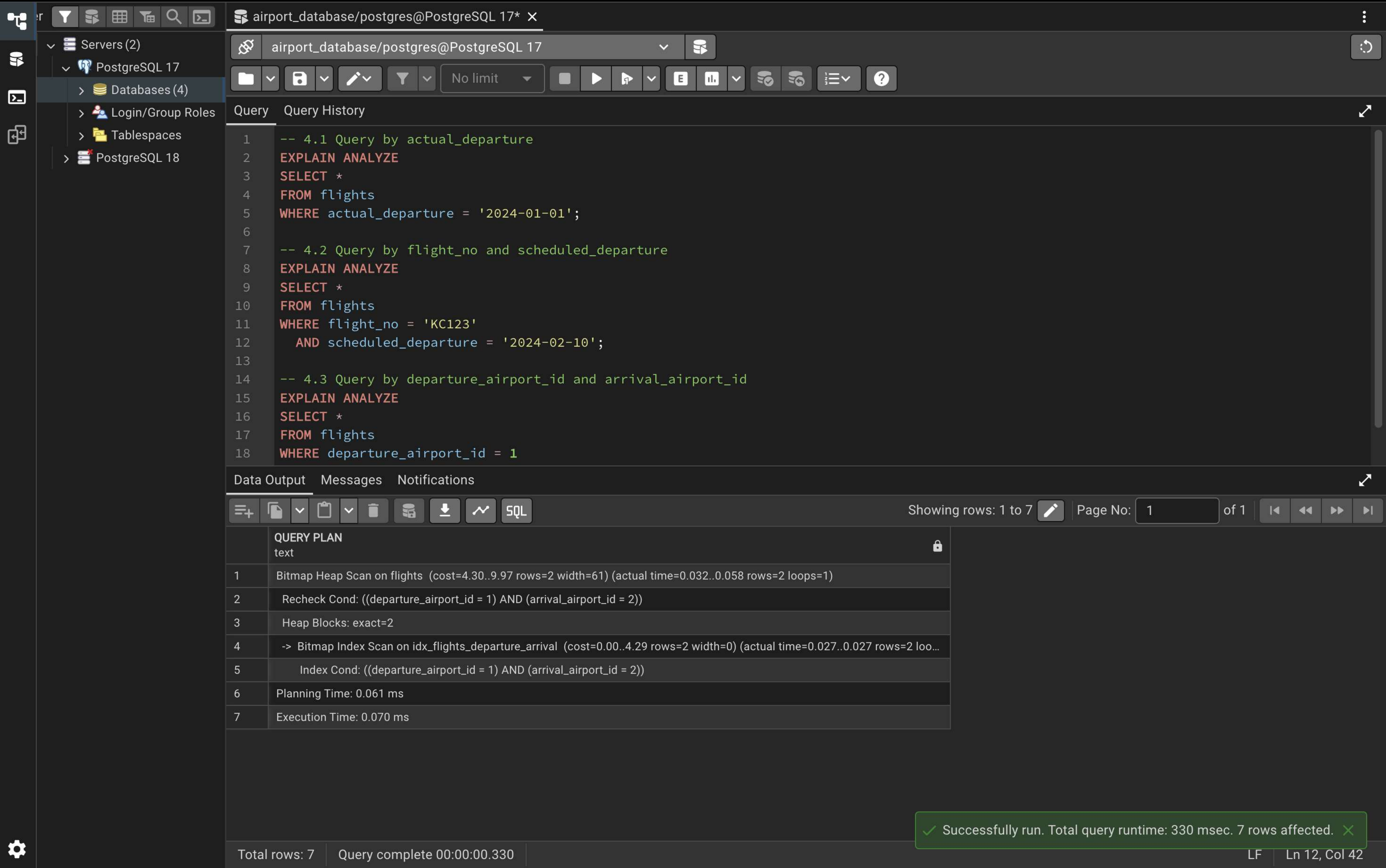


```
CREATE INDEX idx_flights_departure_arrival
ON flights (departure_airport_id, arrival_airport_id);
```

```
CREATE INDEX

Query returned successfully in 1 secs 715 msec.
```

Query complete 00:00:01.715

Query returned successfully in 1 secs 715 msec.

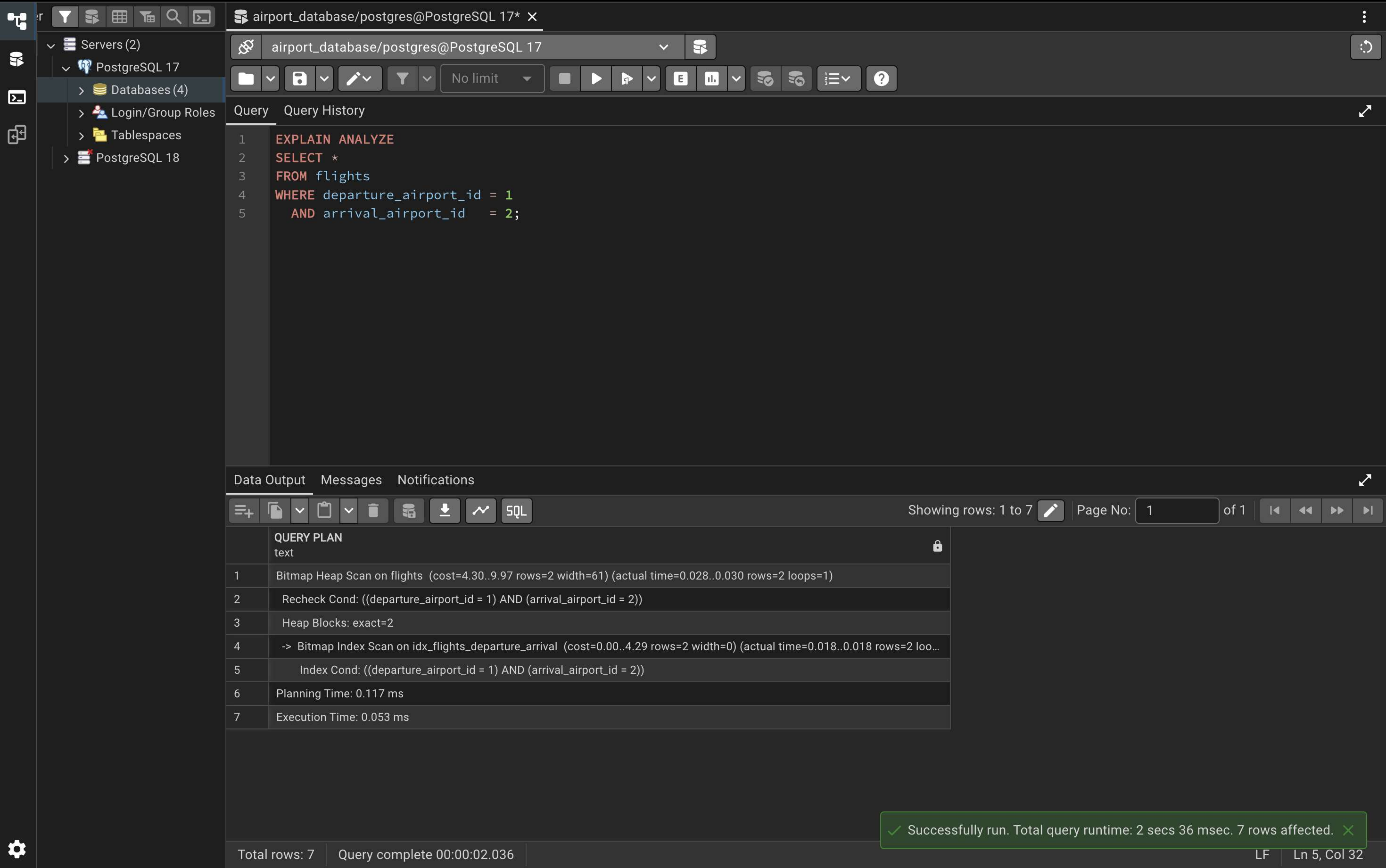


```sql
-- 4.1 Query by actual_departure
EXPLAIN ANALYZE
SELECT *
FROM flights
WHERE actual_departure = '2024-01-01';

-- 4.2 Query by flight_no and scheduled_departure
EXPLAIN ANALYZE
SELECT *
FROM flights
WHERE flight_no = 'KC123'
  AND scheduled_departure = '2024-02-10';

-- 4.3 Query by departure_airport_id and arrival_airport_id
EXPLAIN ANALYZE
SELECT *
FROM flights
WHERE departure_airport_id = 1
```

	QUERY PLAN text
1	Bitmap Heap Scan on flights (cost=4.30..9.97 rows=2 width=61) (actual time=0.032..0.058 rows=2 loops=1)
2	Recheck Cond: ((departure_airport_id = 1) AND (arrival_airport_id = 2))
3	Heap Blocks: exact=2
4	-> Bitmap Index Scan on idx_flights_departure_arrival (cost=0.00..4.29 rows=2 width=0) (actual time=0.027..0.027 rows=2 loo…
5	Index Cond: ((departure_airport_id = 1) AND (arrival_airport_id = 2))
6	Planning Time: 0.061 ms
7	Execution Time: 0.070 ms

✓ Successfully run. Total query runtime: 330 msec. 7 rows affected.

Total rows: 7   Query complete 00:00:00.330

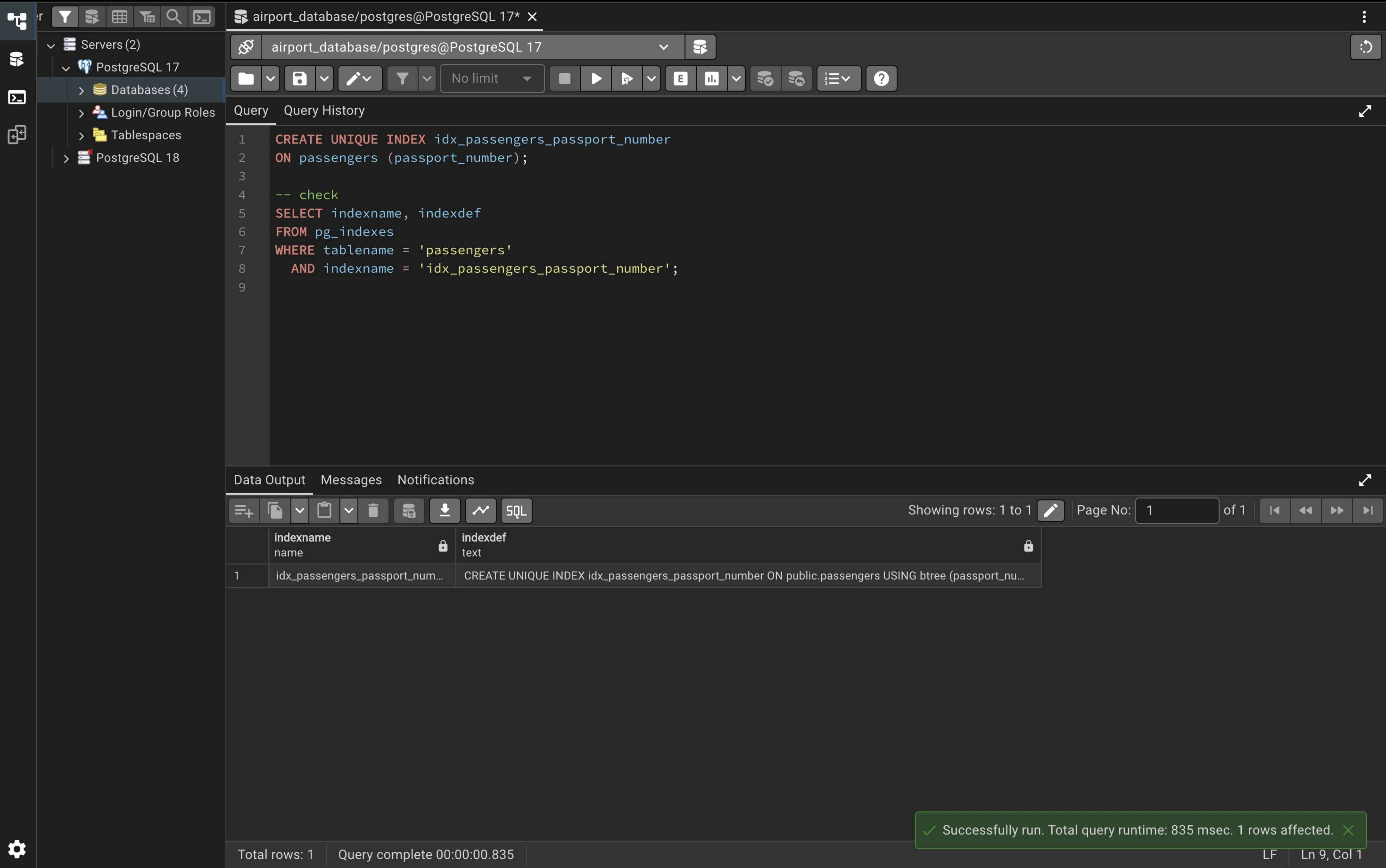


```sql
EXPLAIN ANALYZE
SELECT *
FROM flights
WHERE departure_airport_id = 1
  AND arrival_airport_id   = 2;
```

```
QUERY PLAN
text
1  Bitmap Heap Scan on flights  (cost=4.30..9.97 rows=2 width=61) (actual time=0.028..0.030 rows=2 loops=1)
2    Recheck Cond: ((departure_airport_id = 1) AND (arrival_airport_id = 2))
3    Heap Blocks: exact=2
4    ->  Bitmap Index Scan on idx_flights_departure_arrival  (cost=0.00..4.29 rows=2 width=0) (actual time=0.018..0.018 rows=2 loo…
5          Index Cond: ((departure_airport_id = 1) AND (arrival_airport_id = 2))
6  Planning Time: 0.117 ms
7  Execution Time: 0.053 ms
```

✓ Successfully run. Total query runtime: 2 secs 36 msec. 7 rows affected.

Total rows: 7   Query complete 00:00:02.036

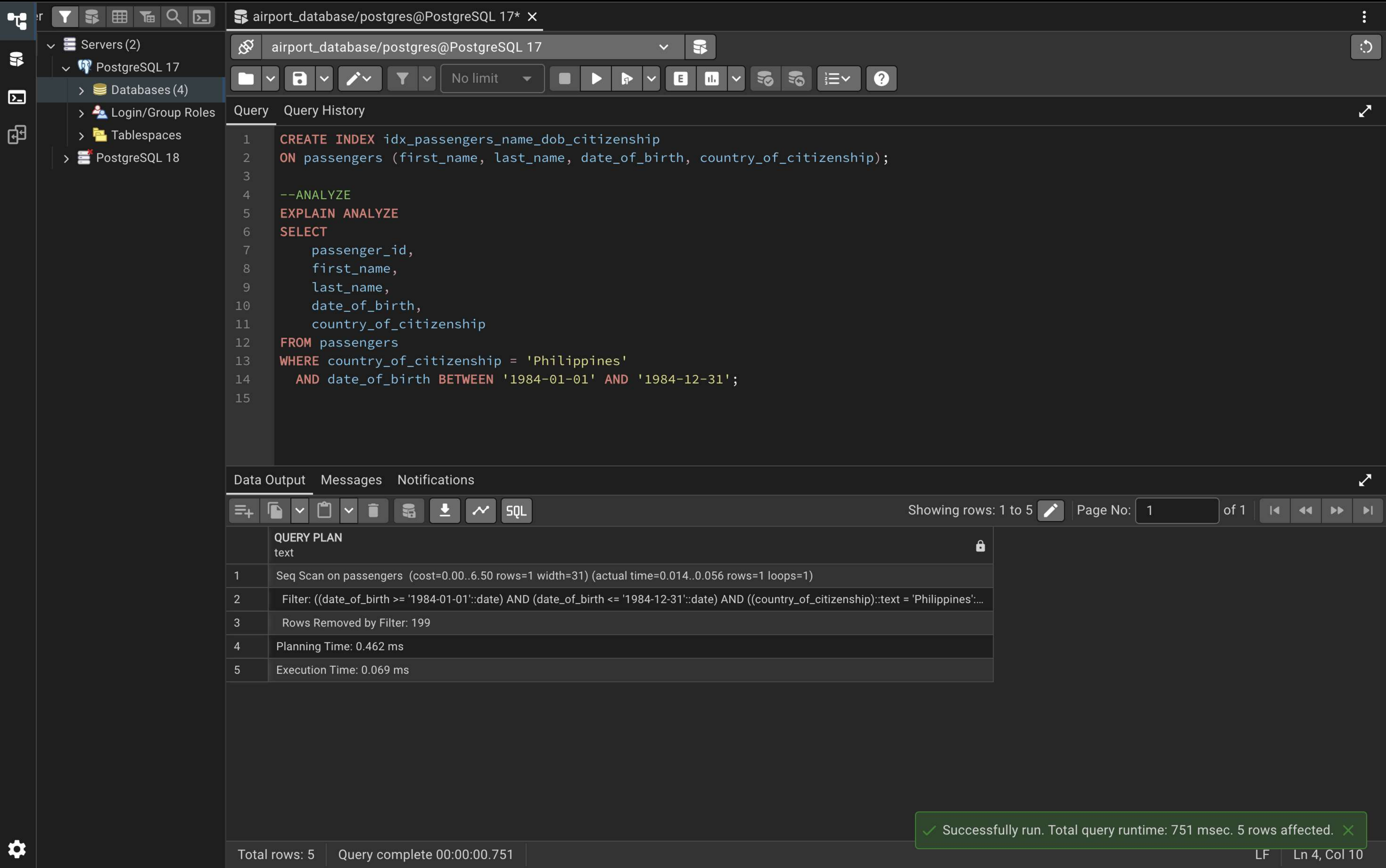


```sql
CREATE UNIQUE INDEX idx_passengers_passport_number
ON passengers (passport_number);

-- check
SELECT indexname, indexdef
FROM pg_indexes
WHERE tablename = 'passengers'
  AND indexname = 'idx_passengers_passport_number';

```

	indexname name	indexdef text
1	idx_passengers_passport_num...	CREATE UNIQUE INDEX idx_passengers_passport_number ON public.passengers USING btree (passport_nu...

✓ Successfully run. Total query runtime: 835 msec. 1 rows affected.

Total rows: 1 Query complete 00:00:00.835

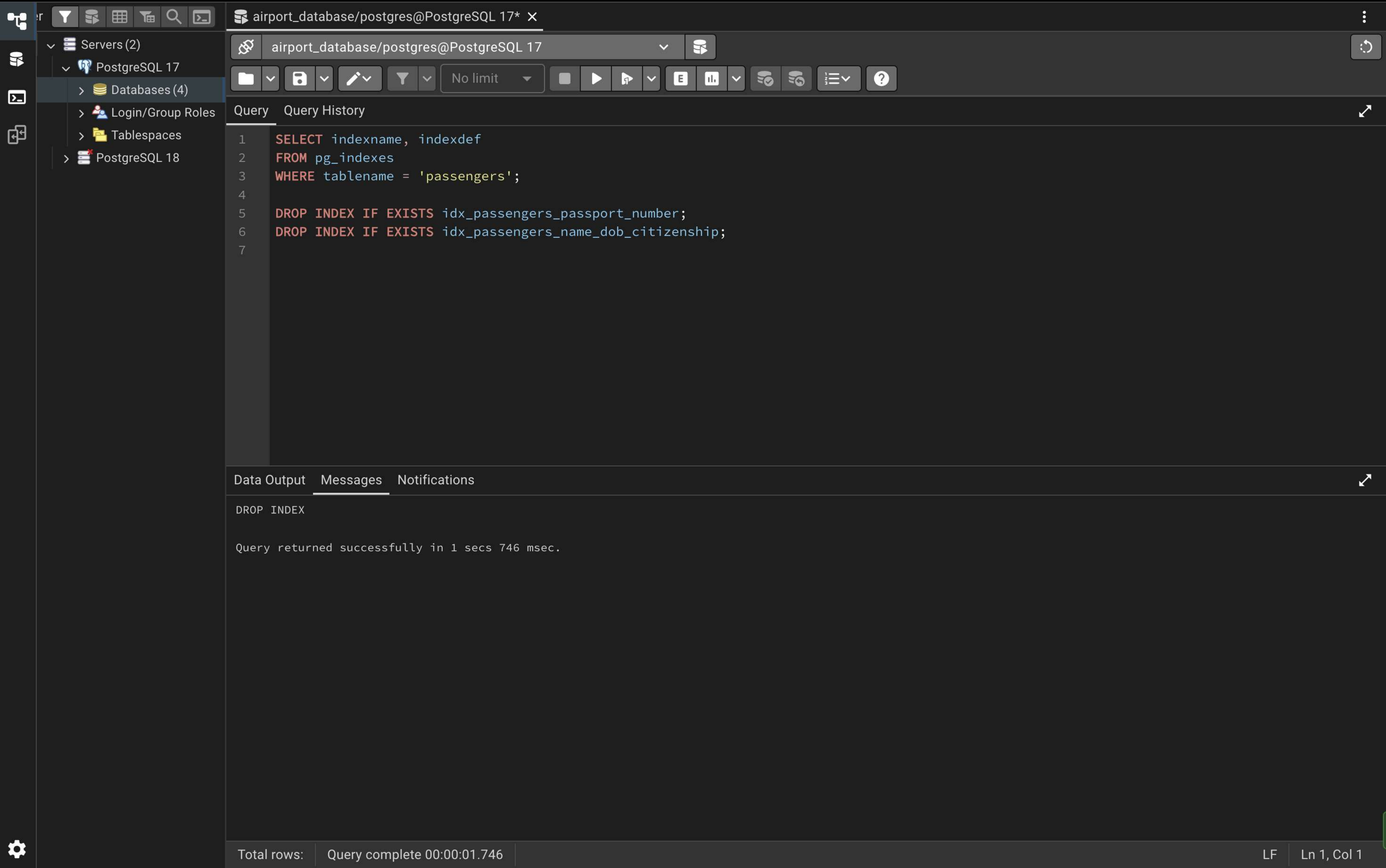


```sql
CREATE INDEX idx_passengers_name_dob_citizenship
ON passengers (first_name, last_name, date_of_birth, country_of_citizenship);

--ANALYZE
EXPLAIN ANALYZE
SELECT
    passenger_id,
    first_name,
    last_name,
    date_of_birth,
    country_of_citizenship
FROM passengers
WHERE country_of_citizenship = 'Philippines'
  AND date_of_birth BETWEEN '1984-01-01' AND '1984-12-31';
```

	QUERY PLAN text
1	Seq Scan on passengers (cost=0.00..6.50 rows=1 width=31) (actual time=0.014..0.056 rows=1 loops=1)
2	Filter: ((date_of_birth >= '1984-01-01'::date) AND (date_of_birth <= '1984-12-31'::date) AND ((country_of_citizenship)::text = 'Philippines':...
3	Rows Removed by Filter: 199
4	Planning Time: 0.462 ms
5	Execution Time: 0.069 ms

✓ Successfully run. Total query runtime: 751 msec. 5 rows affected.

Total rows: 5   Query complete 00:00:00.751



```sql
SELECT indexname, indexdef
FROM pg_indexes
WHERE tablename = 'passengers';

DROP INDEX IF EXISTS idx_passengers_passport_number;
DROP INDEX IF EXISTS idx_passengers_name_dob_citizenship;
```

```
DROP INDEX

Query returned successfully in 1 secs 746 msec.
```