Object Explorer

> Operators
> Procedures
> 1..3 Sequences
> Tables (10)
  > airline
  > airport
  > baggage
  > baggage_check
  > boarding_pass
  > booking
  > booking_flight
  > flights
    > Columns (12)
      flight_id
      sch_departure_ti
      sch_arrival_time
      departing_airpor
      arriving_airport_
      departing_gate
      arriving_gate
      airline_id
      act_departure_ti
      act_arrival_time
      created_at
      updated_at
    > Constraints
    > Indexes
    > RLS Policies
    > Rules
    > Triggers

airport_db/postgres@PostgreSQL 17

Query   Query History

```
1   -- task 1
2   CREATE INDEX idx_act_departure_time ON flights(act_departure_time);
3
```

Scratch Pad

Data Output   Messages   Notifications

```
CREATE INDEX

Query returned successfully in 1 secs 225 msec.
```

Total rows: Query complete 00:00:01.225   CRLF   Ln 2, Col 36

File   Object   Tools   Edit   View   Window   Help

Object Explorer

t_db/postgre... ×   airport_db/postgre... ×   public.passengers... ×   airport_db/postgre... ×   airport_db/postgre... ×   airport_db/postgres@PostgreSQL 17* ×

> Operators
> Procedures
> 1..3 Sequences
> Tables (10)
  > airline
  > airport
  > baggage
  > baggage_check
  > boarding_pass
  > booking
  > booking_flight
  > flights
    > Columns (12)
      flight_id
      sch_departure_time
      sch_arrival_time
      departing_airport_id
      arriving_airport_id
      departing_gate
      arriving_gate
      airline_id
      act_departure_time
      act_arrival_time
      created_at
      updated_at
  > Constraints
  > Indexes
  > RLS Policies
  > Rules
  > Triggers

airport_db/postgres@PostgreSQL 17

No limit

Query   Query History   Scratch Pad ×

```
1   -- task 1
2   CREATE INDEX idx_act_departure_time ON flights(act_departure_time);
3
4   -- task 2
5   CREATE UNIQUE INDEX idx_unique_flight_no_sched
6   ON flights(flight_number, sch_departure_time);
7
8
9
```

Data Output   Messages   Notifications

CREATE INDEX

Query returned successfully in 153 msec.

Total rows: Query complete 00:00:00.164   CRLF   Ln 6, Col 45

Object Explorer

> Operators
> {} Procedures
> 1..3 Sequences
> Tables (10)
  > airline
  > airport
  > baggage
  > baggage_check
  > boarding_pass
  > booking
  > booking_flight
  > flights
    > Columns (12)
      > flight_id
      > sch_departure_time
      > sch_arrival_time
      > departing_airport_id
      > arriving_airport_id
      > departing_gate
      > arriving_gate
      > airline_id
      > act_departure_time
      > act_arrival_time
      > created_at
      > updated_at
    > Constraints
    > Indexes
    > RLS Policies
    > Rules
    > Triggers

airport_db/postgres@PostgreSQL 17

Query   Query History

```sql
1   -- task 1
2   CREATE INDEX idx_act_departure_time ON flights(act_departure_time);
3
4   -- task 2
5   CREATE UNIQUE INDEX idx_unique_flight_no_sched
6   ON flights(flight_number, sch_departure_time);
7
8   -- task 3
9   CREATE INDEX idx_airports_combo
10  ON flights(departing_airport_id, arriving_airport_id);
11
12
13
14
```

Scratch Pad

Data Output   Messages   Notifications

```
CREATE INDEX

Query returned successfully in 243 msec.
```

✓ Query returned successfully in 243 msec. ✕

Total rows: Query complete 00:00:00.247   CRLF   Ln 10, Col 42

Object Explorer

Servers (2)
- PostgreSQL 16
- PostgreSQL 17
  - Databases (2)
    - airport_db
      - Casts
      - Catalogs
      - Event Triggers
      - Extensions
      - Foreign Data Wrappers
      - Languages
      - Publications
      - Schemas (1)
        - public
          - Aggregates
          - Collations
          - Domains
          - FTS Configurations
          - FTS Dictionaries
          - FTS Parsers
          - FTS Templates
          - Foreign Tables
          - Functions
          - Materialized Views
          - Operators
          - Procedures
          - Sequences
          - Tables (10)
            - airline
            - airport
            - baggage

airport_db/postgres@PostgreSQL 17

Query   Query History

```
       CREATE INDEX idx_act_departure_time ON flights(act_departure_time);

 4
 5     -- task 2
 6     CREATE UNIQUE INDEX idx_unique_flight_no_sched
 7     ON flights(flight_number, sch_departure_time);
 8
 9     -- task 3
10     CREATE INDEX idx_airports_combo
11     ON flights(departing_airport_id, arriving_airport_id);
12
13     -- task 4
14     SET enable_seqscan = OFF;
15     EXPLAIN ANALYZE
16     SELECT * FROM flights
17     WHERE act_departure_time BETWEEN '2023-01-01' AND '2023-01-15';
```

Scratch Pad

Data Output   Messages   Notifications

Showing rows: 1 to 7   Page No: 1   of 1

	QUERY PLAN text
1	Bitmap Heap Scan on flights (cost=4.17..7.95 rows=2 width=71) (actual time=0.132..0.133 rows=1 loops=1)
2	Recheck Cond: ((act_departure_time >= '2023-01-01 00:00:00'::timestamp without time zone) AND (act_departure_time <= '2023-01-15 00:00:00'::timestamp without time ...
3	Heap Blocks: exact=1
4	-> Bitmap Index Scan on idx_act_departure_time (cost=0.00..4.16 rows=2 width=0) (actual time=0.102..0.103 rows=1 loops=1)
5	Index Cond: ((act_departure_time >= '2023-01-01 00:00:00'::timestamp without time zone) AND (act_departure_time <= '2023-01-15 00:00:00'::timestamp without time ...
6	Planning Time: 0.167 ms
7	Execution Time: 0.158 ms

Total rows: 7   Query complete 00:00:00.107   CRLF   Ln 1, Col 1

File Object Tools Edit View Window Help

Object Explorer   t_db/postgre... × public.passengers... × airport_db/postgre... × airport_db/postgre... × airport_db/postgres@PostgreSQL 17* × public.flights/airp... ×

Servers (2)
  PostgreSQL 16
  PostgreSQL 17
    Databases (2)
      airport_db
        Casts
        Catalogs
        Event Triggers
        Extensions
        Foreign Data Wrappers
        Languages
        Publications
        Schemas (1)
          public
            Aggregates
            Collations
            Domains
            FTS Configurations
            FTS Dictionaries
            FTS Parsers
            FTS Templates
            Foreign Tables
            Functions
            Materialized Views
            Operators
            Procedures
            Sequences
            Tables (10)
              airline
              airport

airport_db/postgres@PostgreSQL 17

Query   Query History   Scratch Pad ×

```
 8   -- task 3
 9   CREATE INDEX idx_airports_combo
10   ON flights(departing_airport_id, arriving_airport_id);
11
12   -- task 4
13   SET enable_seqscan = OFF;
14   EXPLAIN ANALYZE
15   SELECT * FROM flights
16   WHERE act_departure_time BETWEEN '2023-01-01' AND '2023-01-15';
17
18   -- task 5
19   SET enable_seqscan = OFF;
20   EXPLAIN ANALYZE
21   SELECT * FROM flights
22   WHERE departing_airport_id = 400 AND arriving_airport_id = 323;
```

Data Output   Messages   Notifications

	QUERY PLAN text
1	Index Scan using idx_airports_combo on flights (cost=0.14..8.16 rows=1 width=71) (actual time=0.067..0.068 rows=1 loops=...
2	Index Cond: ((departing_airport_id = 400) AND (arriving_airport_id = 323))
3	Planning Time: 0.167 ms
4	Execution Time: 0.085 ms

Showing rows: 1 to 4   Page No: 1   of 1

Total rows: 4   Query complete 00:00:00.102   CRLF   Ln 1, Col 1

Object Explorer

airport_db/postgres@PostgreSQL 17

> FTS Dictionaries
> FTS Parsers
> FTS Templates
> Foreign Tables
> Functions
> Materialized Views
> Operators
> Procedures
> Sequences
> Tables (10)
  > airline
  > airport
  > baggage
  > baggage_check
  > boarding_pass
  > booking
  > booking_flight
  > flights
  > passengers
    > Columns (10)
        passenger_id
        first_name
        last_name
        date_of_birth
        gender
        country_of_citize
        country_of_resid
        passport_numbe
        created_at
        updated_at
    > Constraints

Query   Query History

```
14    EXPLAIN ANALYZE
15    SELECT * FROM flights
16    WHERE act_departure_time BETWEEN '2023-01-01' AND '2023-01-15';
17
18    -- task 5
19    SET enable_seqscan = OFF;
20    EXPLAIN ANALYZE
21    SELECT * FROM flights
22    WHERE departing_airport_id = 400 AND arriving_airport_id = 323;
23
24    -- task 6
25    CREATE UNIQUE INDEX idx_unique_passport
26    ON passengers(passport_number);
27
28
```

Scratch Pad ×

Data Output   Messages   Notifications

```
CREATE INDEX

Query returned successfully in 1 secs 729 msec.
```

✓ Query returned successfully in 1 secs 729 msec. ×

Total rows: Query complete 00:00:01.729   CRLF   Ln 26, Col 30

pgAdmin 4

File   Object   Tools   Edit   View   Window   Help

Object Explorer

t_db/postgre... ×   ⊞ public.passengers... ×   🖳 airport_db/postgre... ×   🖳 airport_db/postgre... ×   🖳 airport_db/postgres@PostgreSQL 17* ×   ⊞ public.flights/airp... ×

airport_db/postgres@PostgreSQL 17

Query   Query History   Scratch Pad ×

```
18   -- task 5
19   SET enable_seqscan = OFF;
20   EXPLAIN ANALYZE
21   SELECT * FROM flights
22   WHERE departing_airport_id = 400 AND arriving_airport_id = 323;
23
24   -- task 6
25   CREATE UNIQUE INDEX idx_unique_passport
26   ON passengers(passport_number);
27
28   insert into passengers (first_name, last_name, date_of_birth, gender, country_of_citizenship, c
29   values ('Orlando', 'Thompson', '1982-07-29', 'Male', 'Peru', 'Ukraine', 'B4079068', '2021-12-16
30           ('Christyna', 'Coupar', '1972-02-02', 'Female', 'France', 'Ukraine', 'B4079068', '2024-1
31
```

Data Output   Messages   Notifications

ERROR: повторяющееся значение ключа нарушает ограничение уникальности "idx_unique_passport"
Ключ "(passport_number)=(B4079068)" уже существует.

ОШИБКА: повторяющееся значение ключа нарушает ограничение уникальности "idx_unique_passport"
SQL state: 23505
Detail: Ключ "(passport_number)=(B4079068)" уже существует.

FTS Parsers
FTS Templates
Foreign Tables
Functions
Materialized Views
Operators
Procedures
1..3 Sequences
Tables (10)
   airline
   airport
   baggage
   baggage_check
   boarding_pass
   booking
   booking_flight
   flights
   passengers
      Columns (10)
         passenger_id
         first_name
         last_name
         date_of_birth
         gender
         country_of_citize
         country_of_resid
         passport_numbe
         created_at
         updated_at
      Constraints

Total rows: Query complete 00:00:01.037   CRLF   Ln 29, Col 32

File Object Tools Edit View Window Help

Object Explorer   t_db/postgre... ×   public.passengers... ×   airport_db/postgre... ×   airport_db/postgre... ×   airport_db/postgres@PostgreSQL 17* ×   public.flights/airp... ×

airport_db/postgres@PostgreSQL 17

Query Query History   Scratch Pad ×

```
27
28  insert into passengers (first_name, last_name, date_of_birth, gender, country_of_citizenship, c
29  values ('Orlando', 'Thompson', '1982-07-29', 'Male', 'Peru', 'Ukraine', 'B4079068', '2021-12-16
30         ('Christyna', 'Coupar', '1972-02-02', 'Female', 'France', 'Ukraine', 'B4079068', '2024-1
31
32  -- task 7
33  CREATE INDEX idx_passenger_details
34  ON passengers(first_name, last_name, date_of_birth, country_of_citizenship);
35
36  EXPLAIN ANALYZE
37  SELECT * FROM passengers
38  WHERE country_of_citizenship = 'Philippines'
39    AND date_of_birth BETWEEN '1984-01-01' AND '1984-12-31';
40
```

Data Output   Messages   Notifications

	QUERY PLAN text
1	Index Scan using idx_passenger_details on passengers (cost=0.27..22.78 rows=1 width=70) (actual time=0.117..0.118 rows=0 loops=1)
2	Index Cond: ((date_of_birth >= '1984-01-01'::date) AND (date_of_birth <= '1984-12-31'::date) AND ((country_of_citizenship)::text = 'Philippines'::te...
3	Planning Time: 0.804 ms
4	Execution Time: 0.143 ms

Showing rows: 1 to 4   Page No: 1   of 1

✓ Successfully run. Total query runtime: 476 msec. 4 rows affected. ✕

Total rows: 4   Query complete 00:00:00.476   CRLF   Ln 38, Col 26

```
32   -- task 7
33   CREATE INDEX idx_passenger_details
34   ON passengers(first_name, last_name, date_of_birth, country_of_citizenship);
35
36   EXPLAIN ANALYZE
37   SELECT * FROM passengers
38   WHERE country_of_citizenship = 'Philippines'
39     AND date_of_birth BETWEEN '1984-01-01' AND '1984-12-31';
40
41   -- task 8
42   SELECT indexname, indexdef
43   FROM pg_indexes
44   WHERE tablename = 'passengers';
45
```
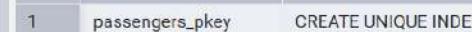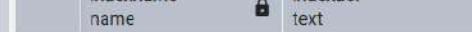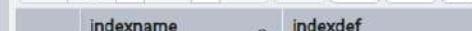
airport_db/postgres@PostgreSQL 17

Query   Query History   Scratch Pad ×

FTS Parsers
FTS Templates
Foreign Tables
Functions
Materialized Views
Operators
Procedures
Sequences
Tables (10)
  airline
  airport
  baggage
  baggage_check
  boarding_pass
  booking
  booking_flight
  flights
  passengers
    Columns (10)
      passenger_id
      first_name
      last_name
      date_of_birth
      gender
      country_of_citize
      country_of_resid
      passport_numbe
      created_at
      updated_at
    Constraints

Data Output   Messages   Notifications

Showing rows: 1 to 3   Page No: 1   of 1

	indexname name	indexdef text
1	passengers_pkey	CREATE UNIQUE INDEX passengers_pkey ON public.passengers USING btree (passenger_id)
2	idx_unique_passport	CREATE UNIQUE INDEX idx_unique_passport ON public.passengers USING btree (passport_number)
3	idx_passenger_details	CREATE INDEX idx_passenger_details ON public.passengers USING btree (first_name, last_name, date_of_birth, country_of_citizenship)

✓ Successfully run. Total query runtime: 872 msec. 3 rows affected. ×

Total rows: 3   Query complete 00:00:00.875   CRLF   Ln 43, Col 8

Object Explorer

t_db/postgre... ×   public.passengers... ×   airport_db/postgre... ×   airport_db/postgre... ×   airport_db/postgres@PostgreSQL 17* ×   public.flights/airp... ×

airport_db/postgres@PostgreSQL 17

Query   Query History

```sql
36   EXPLAIN ANALYZE
37   SELECT * FROM passengers
38   WHERE country_of_citizenship = 'Philippines'
39     AND date_of_birth BETWEEN '1984-01-01' AND '1984-12-31';
40
41   -- task 8
42   SELECT indexname, indexdef
43   FROM pg_indexes
44   WHERE tablename = 'passengers';
45
46   DROP INDEX IF EXISTS idx_unique_passport;
47   DROP INDEX IF EXISTS idx_passenger_details;
48
49
```

Scratch Pad ×

> FTS Dictionaries
> Aa FTS Parsers
> FTS Templates
> Foreign Tables
> Functions
> Materialized Views
> Operators
> Procedures
> 1.3 Sequences
> Tables (10)
  > airline
  > airport
  > baggage
  > baggage_check
  > boarding_pass
  > booking
  > booking_flight
  > flights
  > passengers
    > Columns (10)
      passenger_id
      first_name
      last_name
      date_of_birth
      gender
      country_of_citize
      country_of_resid
      passport_numbe
      created_at
      updated_at
    > Constraints

Data Output   Messages   Notifications

DROP INDEX

Query returned successfully in 120 msec.

Total rows: Query complete 00:00:00.120   CRLF   Ln 48, Col 1