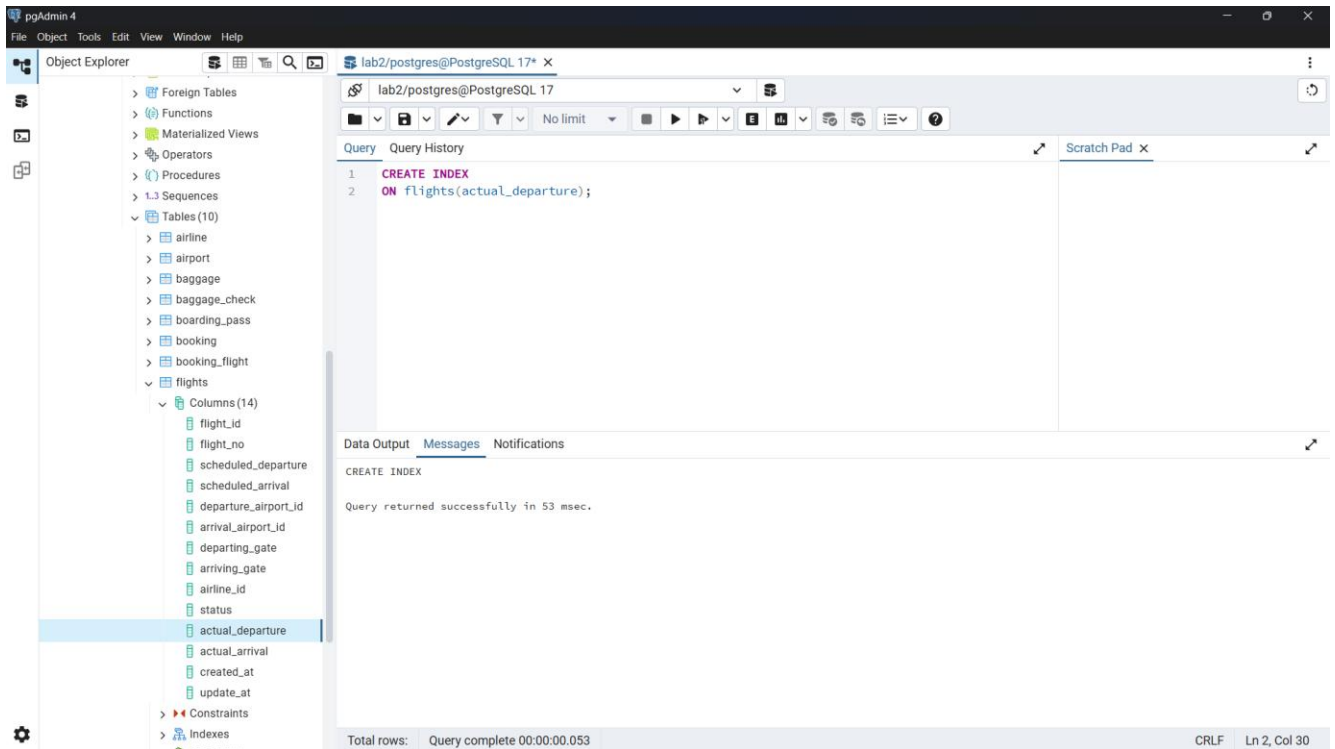
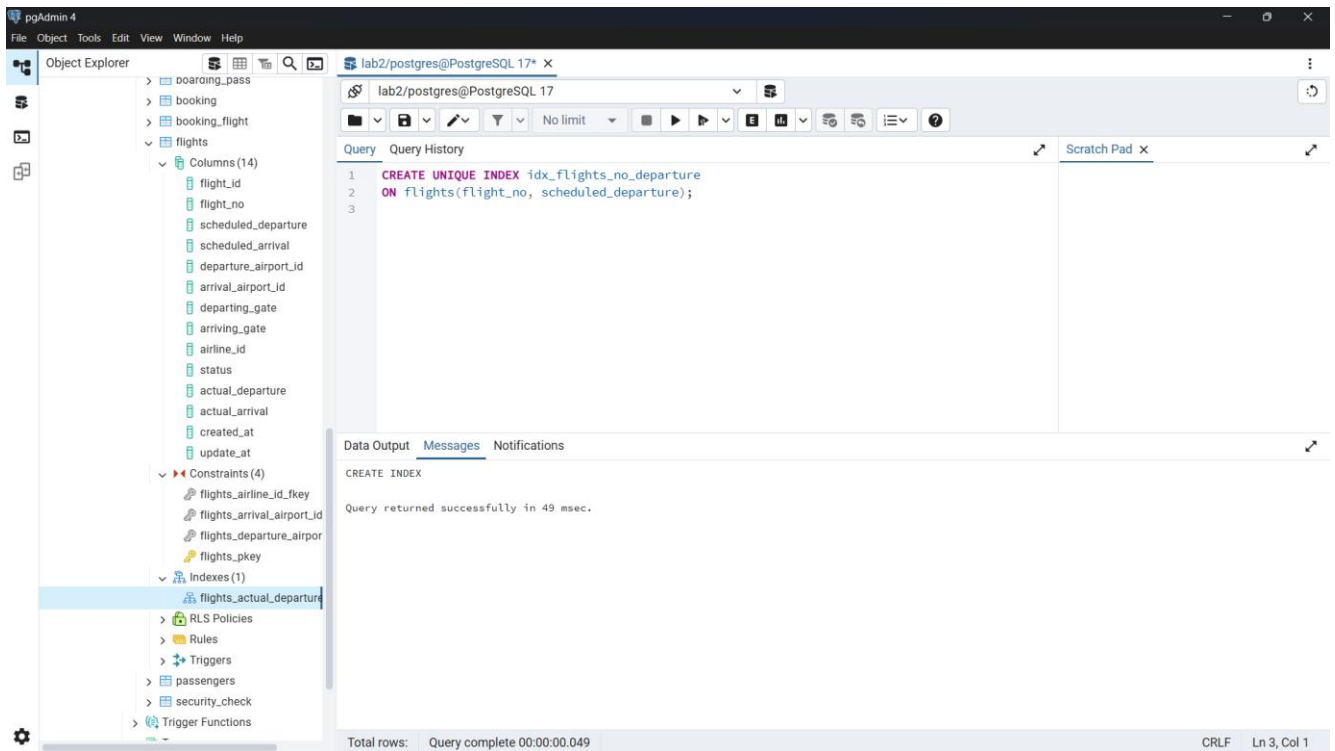


Laboratory work 7

1.



2.



3.

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lab2/postgres@PostgreSQL 17*

CREATE INDEX idx_depAirId_arrAirId
ON flights(departure_airport_id, arrival_airport_id);

Query returned successfully in 48 msec.

Total rows: Query complete 00:00:00.048 CRLF Ln 2, Col 41

4.

With indexes:

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SELECT *
FROM flights
WHERE flight_id = 23;

flight_id	flight_no	scheduled_departure	scheduled_arrival	departure_airport_id	arrival_airport_id	departing_gate	arriving_gate
23	CN-65	2023-03-21	2024-01-08	2	3	934	3006

Total rows: 1 Query complete 00:00:00.060 CRLF Ln 3, Col 22

Without indexes:

pgAdmin 4

lab2/postgres@PostgreSQL 17*

lab2/postgres@PostgreSQL 17

```
1 SELECT *
2 FROM flights
3 WHERE flight_id = 23;
```

Data Output Messages Notifications

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

	flight_id [PK] integer	flight_no character varying (50)	scheduled_departure date	scheduled_arrival date	departure_airport_id integer	arrival_airport_id integer	departing_gate character varying (50)	arriving_gate character varying (50)	airline_id integer
1	23	CN-65	2023-03-21	2024-01-08	2	3	934	3006	

Successfully run. Total query runtime: 73 msec. 1 rows affected.

Total rows: 1 Query complete 00:00:00.073 CRLF Ln 3, Col 22

5.

pgAdmin 4

lab2/postgres@PostgreSQL 17*

lab2/postgres@PostgreSQL 17

```
1 EXPLAIN ANALYZE
2 SELECT *
3 FROM flights
4 WHERE flight_id = 23;
```

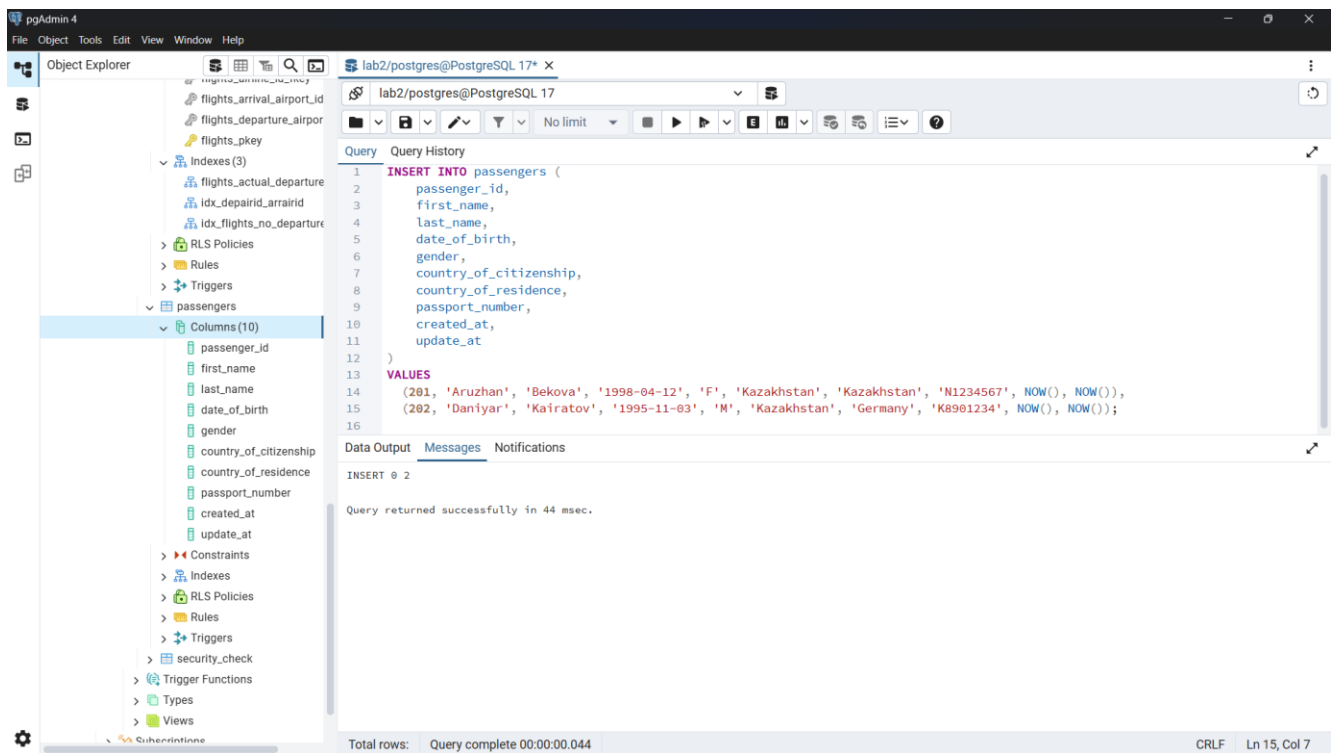
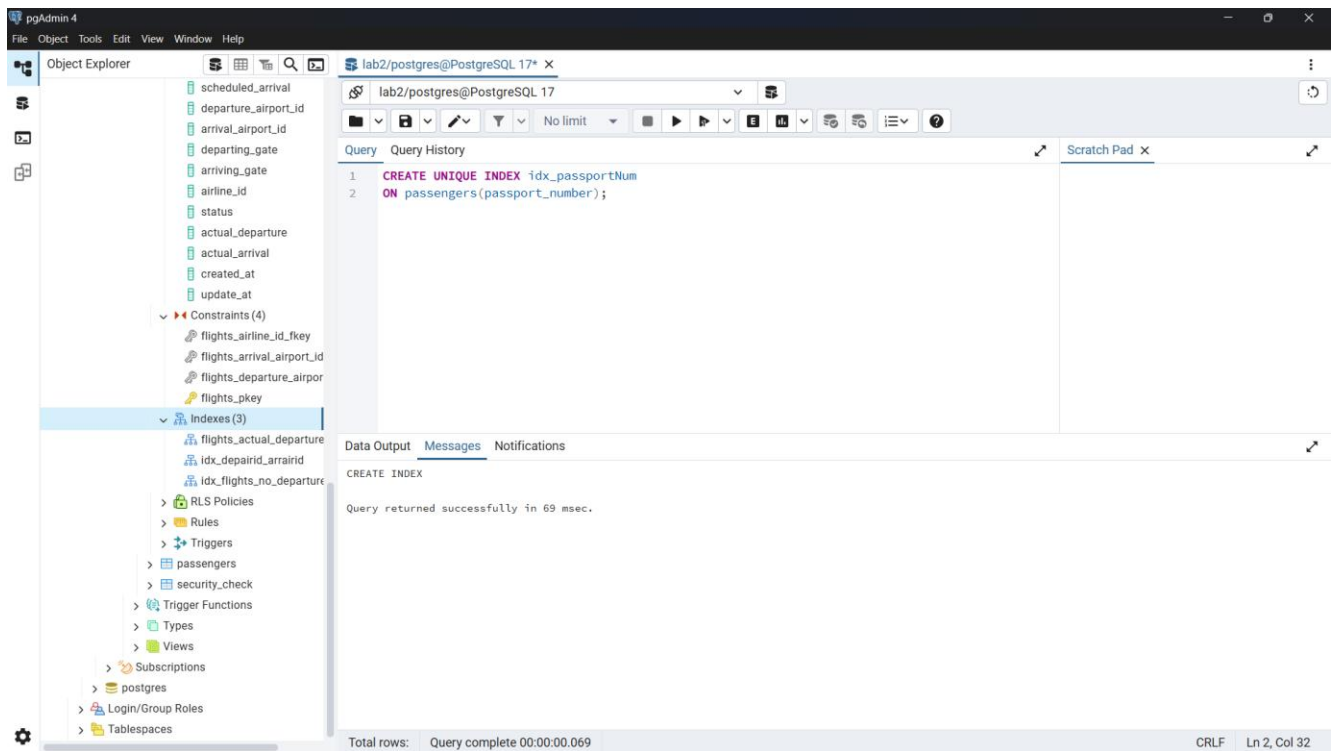
Data Output Messages Notifications

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

	QUERY PLAN
1	Index Scan using flights_pkey on flights (cost=0.28..8.29 rows=1 width=61) (actual time=0.033..0.034 rows=1 loops=1)
2	Index Cond: (flight_id = 23)
3	Planning Time: 0.159 ms
4	Execution Time: 0.068 ms

Total rows: 4 Query complete 00:00:00.059 CRLF Ln 4, Col 22

6.



2 Unique passengers were added to the db

7.

pgAdmin 4

lab2/postgres@PostgreSQL 17*

lab2/postgres@PostgreSQL 17

```
1 CREATE INDEX idx_passengers_info
2 ON passengers (first_name, last_name, date_of_birth, country_of_citizenship);
3
```

Query returned successfully in 58 msec.

Total rows: Query complete 00:00:00.050 CRLF Ln 3, Col 1

pgAdmin 4

lab2/postgres@PostgreSQL 17*

lab2/postgres@PostgreSQL 17

```
1 SELECT *
2 FROM passengers
3 WHERE country_of_citizenship = 'Philippines'
4 AND date_of_birth BETWEEN '1984-01-01' AND '1984-12-31';
5
```

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

	passenger_id	first_name	last_name	date_of_birth	gender	country_of_citizenship	country_of_residence	passport_number
1	8	Howard	Igo	1984-03-29	Male	Philippines	China	408429911-1

Total rows: 1 Query complete 00:00:00.062 CRLF Ln 5, Col 1

pgAdmin 4

lab2/postgres@PostgreSQL 17*

lab2/postgres@PostgreSQL 17

```

1 EXPLAIN ANALYZE
2 SELECT *
3 FROM passengers
4 WHERE country_of_citizenship = 'Philippines'
5 AND date_of_birth BETWEEN '1984-01-01' AND '1984-12-31';
6

```

Query History

Data Output Messages Notifications

Showing rows: 1 to 5 Page No: 1 of 1

QUERY PLAN

Seq Scan on passengers (cost=0.00..6.54 rows=1 width=64) (actual time=0.027..0.057 rows=1 loops=1)

Filter: ((date_of_birth >= '1984-01-01'::date) AND (date_of_birth <= '1984-12-31'::date) AND ((country_of_citizenship)::text = 'Philippines')::te...

Rows Removed by Filter: 201

Planning Time: 0.185 ms

Execution Time: 0.074 ms

Total rows: 5 Query complete 00:00:00.061 CRLF Ln 6, Col 1

Seq scan means that the index is not used

8.

pgAdmin 4

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lab2/postgres@PostgreSQL 17

```

1 SELECT *
2 FROM pg_indexes
3 WHERE tablename = 'flights' OR tablename = 'passengers';

```

Query History

Data Output Messages Notifications

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

id	schemaname	tablename	indexname	tablespace	indexdef
1	public	passengers	passengers_pkey	[null]	CREATE UNIQUE INDEX passengers_pkey ON public.passengers USING btree (passenger_id)
2	public	flights	flights_pkey	[null]	CREATE UNIQUE INDEX flights_pkey ON public.flights USING btree (flight_id)
3	public	flights	flights_actual_departure_idx	[null]	CREATE INDEX flights_actual_departure_idx ON public.flights USING btree (actual_departure)
4	public	flights	idx_flights_no_departure	[null]	CREATE UNIQUE INDEX idx_flights_no_departure ON public.flights USING btree (flight_no, scheduled_departure)
5	public	flights	idx_depairid_arrairid	[null]	CREATE INDEX idx_depairid_arrairid ON public.flights USING btree (departure_airport_id, arrival_airport_id)
6	public	passengers	idx_passportnum	[null]	CREATE UNIQUE INDEX idx_passportnum ON public.passengers USING btree (passport_number)
7	public	passengers	idx_passengers_info	[null]	CREATE INDEX idx_passengers_info ON public.passengers USING btree (first_name, last_name, date_of_birth, country_of_citizenship)

Total rows: 7 Query complete 00:00:00.096 CRLF Ln 3, Col 57

pgAdmin 4

File Object Tools Edit View Window Help

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lab2/postgres@PostgreSQL 17

Query Query History

```
1 DROP INDEX flights_actual_departure_idx;  
2 DROP INDEX idx_depAirId_arrAirId;  
3 DROP INDEX idx_flights_no_departure;  
4 DROP INDEX idx_passengers_info;  
5 DROP INDEX idx_passportnum;
```

Data Output Messages Notifications

DROP INDEX

Query returned successfully in 67 msec.

Total rows: Query complete 00:00:00.067 CRLF Ln 3, Col 22

Object Explorer

- Columns
- Constraints (4)
 - flights_airline_id_fkey
 - flights_arrival_airport_id_fkey
 - flights_departure_airport_id_fkey
 - flights_pkey
- Indexes (3)
 - flights_actual_departure_idx
 - idx_depairid_arrairid
 - idx_flights_no_departure
- RLS Policies
- Rules
- Triggers
- passengers (10)
 - Columns (10)
 - passenger_id
 - first_name
 - last_name
 - date_of_birth
 - gender
 - country_of_citizenship
 - country_of_residence
 - passport_number
 - created_at
 - update_at
 - Constraints
 - Indexes (2)
 - idx_passengers_info
 - idx_passportnum
 - RLS Policies
 - Rules
 - Triggers

S