

Lab 10

The screenshot shows the pgAdmin 4 interface with the Object Explorer on the left and a query editor on the right. The query editor contains the following PL/pgSQL code:

```
CREATE OR REPLACE PROCEDURE insert_flight(
    p_flight_no VARCHAR,
    p_scheduled_departure DATE,
    p_scheduled_arrival DATE,
    p_departure_airport_id INT,
    p_arrival_airport_id INT,
    p_departing_gate VARCHAR,
    p_arriving_gate VARCHAR,
    p_airline_id INT,
    p_status VARCHAR,
    p_actual_departure DATE,
    p_actual_arrival DATE,
    p_created_at DATE,
    p_update_at DATE
)
LANGUAGE plpgsql
AS $$
BEGIN
    INSERT INTO flights(
        flight_no, scheduled_departure, scheduled_arrival,
        departure_airport_id, arrival_airport_id,
        departing_gate, arriving_gate, airline_id,
        status, actual_departure, actual_arrival,
        created_at, update_at
    )
    VALUES(
        p_flight_no, p_scheduled_departure, p_scheduled_arrival,
        p_departure_airport_id, p_arrival_airport_id,
        p_departing_gate, p_arriving_gate, p_airline_id,
        p_status, p_actual_departure, p_actual_arrival,
        p_created_at, p_update_at
    );
END;
$$;
```

The status bar at the bottom indicates "Query returned successfully in 64 msec." and "CRLF Ln 4, Col 1".

The screenshot shows the pgAdmin 4 interface with the Object Explorer on the left and a query editor on the right. The query editor contains the following PL/pgSQL code:

```
$$;
SELECT * FROM flights;

CREATE OR REPLACE PROCEDURE task2(
    p_flight_id INT, p_status VARCHAR
)
LANGUAGE plpgsql
AS $$
BEGIN
    UPDATE flights SET status = p_status WHERE flight_id = p_flight_id;
END;
$$;

SELECT * FROM flights;
```

The status bar at the bottom indicates "Query returned successfully in 65 msec." and "CRLF Ln 43, Col 1".

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

Processes x suppliers/postgres@PostgreSQL 17* x public.booking/su... x public.booking_fli... x public.booking/su... x suppliers/postgres...

suppliers/postgres@PostgreSQL 17

Databases (2)

- postgres
- suppliers

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
- baggage_check
- boarding_pass
- booking
- booking_flight

Total rows: Query complete 00:00:00.034

Scratch Pad x

```

END;
$$;

CREATE OR REPLACE PROCEDURE task3(
    p_departure_airport_id INT
)
LANGUAGE plpgsql
AS $$
BEGIN
    SELECT
        flight_id,
        flight_no,
        scheduled_departure,
        scheduled_arrival,
        arrival_airport_id,
        status
    FROM flights
    WHERE departure_airport_id = p_departure_airport_id;
END;
$$;

CREATE OR REPLACE FUNCTION task4(
    p_arrival_airport_id INT
)
RETURNS INTERVAL
LANGUAGE plpgsql
AS $$
```

Data Output Messages Notifications

CREATE PROCEDURE

Query returned successfully in 34 msec.

✓ Query returned successfully in 34 msec. CRLF Ln 54, Col 1

10:47 02.12.2025

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

Processes x suppliers/postgres@PostgreSQL 17* x public.booking/su... x public.booking_fli... x public.booking/su... x suppliers/postgres...

suppliers/postgres@PostgreSQL 17

Databases (2)

- postgres
- suppliers

Catalogs

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Extensions

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Schemas (1)

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Foreign Tables

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Materialized Views

Operators

Procedures

Sequences

Tables (10)

- airline
- airport
- baggage
- baggage_check
- boarding_pass
- booking
- booking_flight
- flights
- passengers

Columns

Constraints (4)

age

Total rows: Query complete 00:00:00.067

Scratch Pad x

```

status VARCHAR
FROM flights WHERE departure_airport_id = p_departure_airport_id;
END;
$$;

CREATE OR REPLACE FUNCTION task4(
    p_arrival_airport_id INT
)
RETURNS INTERVAL
LANGUAGE plpgsql
AS $$
DECLARE
    avg_time INTERVAL;
BEGIN
    SELECT AVG(actual_arrival - scheduled_arrival)
    INTO avg_time
    FROM flights
    WHERE arrival_airport_id = p_arrival_airport_id;
    RETURN avg_time;
END;
$$;

SELECT * FROM flights;
```

Data Output Messages Notifications

CREATE FUNCTION

Query returned successfully in 67 msec.

✓ Query returned successfully in 67 msec. CRLF Ln 80, Col 1

08:50 02.12.2025

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

- Catalogs
- Event Triggers
- Foreign Data Wrappers
- Languages
- Publications
- Schemas (1)
 - public

Processes suppliers/postgres@PostgreSQL 17*

```

94     RETURN avg_time;
95   END;
96 $$;

98 CREATE OR REPLACE FUNCTION task5(
99   p_flight_id INT
100 )
101 RETURNS TABLE (
102   passenger_id INT,
103   first_name VARCHAR,
104   last_name VARCHAR,
105   country_of_citizenship VARCHAR
106 )
107 )
108 LANGUAGE plpgsql
109 AS $$
110 BEGIN
111   RETURN QUERY
112   SELECT p.passenger_id,
113         p.first_name,
114         p.last_name,
115         p.country_of_citizenship FROM booking_flight bf
116   JOIN booking b ON bf.booking_id = b.booking_id
117   JOIN passengers p ON p.passenger_id = b.passenger_id
118   WHERE bf.flight_id = p_flight_id;
119
120 END;
121 $$;

122
123 SELECT * FROM booking_flight
124

```

Data Output Messages Notifications

CREATE FUNCTION

Total rows: Query complete 00:00:00.055

Query returned successfully in 55 msec. CRLF Ln 99, Col 1

08:59 PYC 02.12.2025

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

- Servers
- PostgreSQL 17
 - Databases (2)
 - postgres
 - suppliers
- suppliers
 - Casts
 - Catalogs
 - Event Triggers
 - Extensions
 - Foreign Data Wrappers
 - Languages
 - Publications
 - Schemas (1)
 - public

Processes suppliers/postgres@PostgreSQL 17*

```

123
124
125
126 CREATE OR REPLACE FUNCTION task6()
127 RETURNS TABLE(
128   passenger_id INT,
129   first_name VARCHAR,
130   last_name VARCHAR,
131   country_of_citizenship VARCHAR,
132   flights_taken INT
133 )
134 LANGUAGE plpgsql
135 AS $$
136 BEGIN
137   RETURN QUERY
138   SELECT
139     p.passenger_id,
140     p.first_name,
141     p.last_name,
142     p.country_of_citizenship,
143     COUNT(b.booking_id) AS flights_taken
144   FROM passengers p JOIN booking b ON b.passenger_id = p.passenger_id
145   GROUP BY p.passenger_id
146   ORDER BY flights_taken DESC
147   LIMIT 1;
148 END;
149 $$;

150
151
152 SELECT * FROM booking_flight

```

Data Output Messages Notifications

CREATE FUNCTION

Query returned successfully in 55 msec.

Total rows: Query complete 00:00:00.055

Query returned successfully in 55 msec. CRLF Ln 126, Col 1

09:31 ENG 02.12.2025

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

Processes x suppliers/postgres@PostgreSQL 17* public.booking/su... x public.booking_flig... x public.booking/su... x suppliers/postgres...

Query History

```

144 CREATE OR REPLACE PROCEDURE task77()
145   LANGUAGE plpgsql
146   AS $$
147   BEGIN
148     SELECT
149       flight_id,
150       flight_no,
151       actual_departure,
152       actual_arrival
153     FROM flights
154     WHERE (actual_arrival - actual_departure) > INTERVAL '1 day'
155       AND status = 'Delayed';
156   END;
157 $$;
158
159
160
161
162 CREATE OR REPLACE FUNCTION task8()
163   RETURNS TABLE(
164   airline_name VARCHAR,
165   airline_id INT,
166   cnt INT
167 )
168   LANGUAGE plpgsql
169   AS $$
170   BEGIN

```

Data Output Messages Notifications

CREATE PROCEDURE

Query returned successfully in 24 msec.

Total rows: Query complete 00:00:00.024

✓ Query returned successfully in 24 msec. CRLF Ln 145, Col 1

10:47 02.12.2025

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

Processes x suppliers/postgres@PostgreSQL 17* public.booking/su... x public.booking_flig... x public.booking/su... x suppliers/postgres...

Query History

```

151 CREATE OR REPLACE FUNCTION task7()
152   RETURNS TABLE(
153   flight_id INT,
154   flight_no VARCHAR,
155   actual_departure DATE,
156   actual_arrival DATE
157 )
158 LANGUAGE plpgsql
159 AS $$
160 BEGIN
161   RETURN QUERY
162   SELECT flight_id,
163   flight_no,
164   actual_departure,
165   actual_arrival
166   FROM
167   flights WHERE (actual_arrival - actual_departure) > 1 and status = 'Delayed';
168 END;
169 $$;
170

```

Data Output Messages Notifications

CREATE FUNCTION

Query returned successfully in 51 msec.

Total rows: Query complete 00:00:00.051

✓ Query returned successfully in 51 msec. CRLF Ln 152, Col 1

09:43 02.12.2025

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer Processes suppliers/postgres@PostgreSQL 17* public.booking/su... public.booking_flig... public.booking/su... suppliers/postgres@...

Suppliers/Postgres@PostgreSQL 17

Databases (2)

- postgres
- suppliers

Casts

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Event Triggers

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Publications

Schemas (1)

- public

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Collations

Domains

FTS Configurations

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Foreign Tables

Functions

Materialized Views

Operators

Procedures

Sequences

Tables (10)

- airline
- airport
- baggage
- baggage_check
- boarding_pass
- booking
- booking_flight

Processes

suppliers/postgres@PostgreSQL 17*

No limit

Scratch Pad

Query History

```
172
173
174 CREATE OR REPLACE FUNCTION task8()
175   RETURNS TABLE(
176     airline_name VARCHAR,
177     airline_id INT,
178     cnt INT
179   )
180 LANGUAGE plpgsql
181 AS $$
182 BEGIN
183   RETURN QUERY
184   SELECT a.airline_name, a.airline_id, COUNT(f.airline_id) AS cnt
185   FROM airline a JOIN flights f ON a.airline_id = f.airline_id;
186   GROUP BY a.airline_name, a.airline_id;
187 END;
188 $$;
189
190 SELECT * FROM airline;
191
```

Data Output Messages Notifications

CREATE FUNCTION

Query returned successfully in 56 msec.

Total rows: Query complete 00:00:00.056

✓ Query returned successfully in 56 msec. ✘

CRLF Ln 174, Col 1

09:54 ENG 02.12.2025

A screenshot of the pgAdmin 4 interface. The left sidebar shows a tree view of database objects under 'Suppliers/Postgres@PostgreSQL 17'. The 'Tables' node is expanded, showing ten tables: airline, airport, baggage, baggage_check, boarding_pass, booking, and booking_flight. The 'public' schema is also expanded, showing various object types like functions and operators. The main pane displays a SQL query in the 'Query' tab. The query creates a function named 'task8' that returns a table of airline names and their counts. It uses a JOIN between 'airline' and 'flights' tables. The query executes successfully, returning 56 msec. The status bar at the bottom right shows the time as 09:54 and the date as 02.12.2025.

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

Processes x suppliers/postgres@PostgreSQL 17* public.booking/su... x public.booking_fli... x public.booking/su... x suppliers/postgres...

Databases (2)

- postgres
- suppliers
 - Casts
 - Catalogs
 - Event Triggers
 - Extensions
 - Foreign Data Wrappers
 - Languages
 - Publications
 - Schemas (1)
 - public

Tables (10)

- airline
- airport
- baggage
- baggage_check
- boarding_pass
- booking
- booking_flight

Query History

```

179
180
181 CREATE OR REPLACE PROCEDURE task9(
182     p_flight_id INT
183 )
184 LANGUAGE plpgsql
185 AS $$*
186 BEGIN
187
188     SELECT
189         f.flight_id,
190         AVG(b.price) AS avg_price
191     FROM booking_flight bf
192     JOIN booking b ON b.booking_id = bf.booking_id
193     JOIN flights f ON f.flight_id = bf.flight_id
194     WHERE bf.flight_id = p_flight_id
195     GROUP BY f.flight_id;
196
197
198
199
200 CREATE OR REPLACE FUNCTION task10()
201 RETURNS TABLE(
202     flight_id INT,
203     departure_airport_id INT,
204     arrival_airport_id INT
205 )
206 LANGUAGE plpgsql

```

Data Output Messages Notifications

CREATE PROCEDURE

Query returned successfully in 28 msec.

Total rows: Query complete 00:00:00.028

✓ Query returned successfully in 28 msec. CRLF Ln 180, Col 1

10:48 02.12.2025

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

Processes x suppliers/postgres@PostgreSQL 17* public.booking/su... x public.booking_fli... x public.booking/su... x suppliers/postgres...

Databases (2)

- postgres
- suppliers
 - Casts
 - Catalogs
 - Event Triggers
 - Extensions
 - Foreign Data Wrappers
 - Languages
 - Publications
 - Schemas (1)
 - public

Tables (10)

- airline
- airport
- baggage
- baggage_check
- boarding_pass
- booking
- booking_flight

Query History

```

191
192
193 CREATE OR REPLACE FUNCTION task9(
194     p_flight_id INT
195 )
196 RETURNS TABLE(
197     flight_id INT,
198     med INT
199 )
200 LANGUAGE plpgsql
201 AS $$*
202 BEGIN
203
204     RETURN QUERY
205     SELECT f.flight_id, AVG(b.price) AS med FROM booking_flight bf
206     JOIN booking b ON b.booking_id = bf.booking_id
207     JOIN flights f ON f.flight_id = bf.flight_id
208     WHERE bf.flight_id = p_flight_id
209     GROUP BY f.flight_id;
210
211 $$;

```

Data Output Messages Notifications

CREATE FUNCTION

Query returned successfully in 53 msec.

Total rows: Query complete 00:00:00.053

✓ Query returned successfully in 53 msec. CRLF Ln 193, Col 1

10:04 02.12.2025

The screenshot shows the pgAdmin 4 interface with the following details:

- File Object Tools Edit View Window Help**
- Object Explorer** sidebar:
 - Servers
 - PostgreSQL 17
 - Databases (2)
 - postgres
 - suppliers
 - 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
 - baggage_check
 - boarding_pass
 - booking
- Processes** tab: suppliers/postgres@PostgreSQL 17*
- Query History** tab:

```
191   JOIN booking b ON b.booking_id = bf.booking_id
192   JOIN flights f ON f.flight_id = bf.flight_id
193   WHERE bf.flight_id = p.flight_id
194   GROUP BY f.flight_id;
195 END;
196 $$;
```

```
CREATE OR REPLACE PROCEDURE task101()
LANGUAGE plpgsql
AS $$
BEGIN
    SELECT
        f.flight_id,
        f.departure_airport_id,
        f.arrival_airport_id,
        b.price AS ticket_price
    FROM booking_flight bf
    JOIN booking b ON bf.booking_id = b.booking_id
    JOIN flights f ON f.flight_id = bf.flight_id
    ORDER BY b.price DESC
    LIMIT 1;
END;
$$;
```
- Data Output** tab: CREATE PROCEDURE
- Messages** tab: Query returned successfully in 27 msec.
- Total rows: 0** / **Query complete 00:00:00.027**
- Scratch Pad** tab
- Status Bar**: ✓ Query returned successfully in 27 msec. × CRLF Ln 200, Col 1

The screenshot shows the pgAdmin 4 interface with the following details:

- File**, **Object**, **Tools**, **Edit**, **View**, **Window**, **Help** menu.
- Object Explorer** sidebar:
 - Servers
 - PostgreSQL 17
 - Databases (2)
 - postgres
 - suppliers
 - 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
 - baggage_check
 - boarding_pass
 - booking
 - booking_flight
- Processes** tab: suppliers/postgres@PostgreSQL 17*
- Query History** tab (selected):

```
211
212
213 CREATE OR REPLACE FUNCTION task10()
214 RETURNS TABLE(
215   flight_id INT,
216   departure_airport_id INT,
217   arrival_airport_id INT
218 )
219 LANGUAGE plpgsql
220 AS $$
221 BEGIN
222   RETURN QUERY
223   SELECT f.flight_id, f.departure_airport_id, f.arrival_airport_id FROM booking_flight bf
224   JOIN booking b ON bf.booking_id = b.booking_id
225   JOIN flights f ON f.flight_id = bf.flight_id
226   ORDER BY b.price DESC
227   LIMIT 1;
228 END;
229 $$;
```
- Data Output** tab: CREATE FUNCTION
- Messages** tab: Query returned successfully in 30 msec.
- Notifications** tab: (empty)
- Total rows:** 1 (Query complete 00:00:00.030)
- Status Bar:** ✓ Query returned successfully in 30 msec. 10:41 02.12.2025