

# /sql/create\_tables.sql

A screenshot of the pgAdmin 4 web interface. The top navigation bar includes 'File', 'Object', 'Tools', 'Edit', 'View', 'Window', and 'Help'. The main window has a tab titled 'postgres/postgres@PostgreSQL 17\*'. Below the tab, there's a toolbar with icons for various actions. The 'Query' tab is active, showing a SQL query: `create database Proyecto_Final`. The 'Data Output' tab is also visible, showing the result: `CREATE DATABASE` and `Query returned successfully in 611 msec.`. The bottom status bar indicates 'Total rows: Query complete 00:00:00.611' and 'CRLF Ln 2, Col 1'.

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History

```
1 create database Proyecto_Final
2
```

Scratch Pad X

Data Output Messages Notifications

CREATE DATABASE

Query returned successfully in 611 msec.

Total rows: Query complete 00:00:00.611 CRLF Ln 2, Col 1

12°C Parc nublado 8:37 p.m. 11/12/2025

A screenshot of the pgAdmin 4 web interface. The top navigation bar includes 'File', 'Object', 'Tools', 'Edit', 'View', 'Window', and 'Help'. The main window has a tab titled 'postgres/postgres@PostgreSQL 17\*'. Below the tab, there's a toolbar with icons for various actions. The 'Query' tab is active, showing a SQL query: `CREATE TABLE "user" ( user_id SERIAL PRIMARY KEY, name VARCHAR(150) NOT NULL, email VARCHAR(255) UNIQUE NOT NULL, created_at TIMESTAMP DEFAULT now() );`. The 'Data Output' tab is also visible, showing the result: `CREATE TABLE` and `Query returned successfully in 119 msec.`. The bottom status bar indicates 'Total rows: Query complete 00:00:00.119' and 'CRLF Ln 7, Col 1'.

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History

```
1 CREATE TABLE "user" (
2   user_id SERIAL PRIMARY KEY,
3   name VARCHAR(150) NOT NULL,
4   email VARCHAR(255) UNIQUE NOT NULL,
5   created_at TIMESTAMP DEFAULT now()
6 );
7
```

Scratch Pad X

Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 119 msec.

Total rows: Query complete 00:00:00.119 CRLF Ln 7, Col 1

12°C Parc nublado 8:39 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 CREATE TABLE booking (
2   booking_id SERIAL PRIMARY KEY,
3   customer_id INT NOT NULL REFERENCES customer(customer_id) ON DELETE CASCADE,
4   branch_id INT NOT NULL REFERENCES branch(branch_id),
5   scheduled_at TIMESTAMP NOT NULL,
6   status VARCHAR(30) NOT NULL DEFAULT 'scheduled',
7   created_at TIMESTAMP DEFAULT now()
8 );
```

Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 62 msec.

Total rows: Query complete 00:00:00.062

✓ Query returned successfully in 62 msec. X

CRLF Ln 8, Col 3

12°C Parc nublado

Buscar

ESP LAA

8:46 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 CREATE TABLE booking_service (
2   booking_id INT NOT NULL REFERENCES booking(booking_id) ON DELETE CASCADE,
3   service_id INT NOT NULL REFERENCES service(service_id) ON DELETE CASCADE,
4   PRIMARY KEY (booking_id, service_id)
5 );
6
```

Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 63 msec.

Total rows: Query complete 00:00:00.063

✓ Query returned successfully in 63 msec. X

CRLF Ln 6, Col 1

12°C Parc nublado

Buscar

ESP LAA

8:46 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History

```
1 CREATE TABLE payment (  
2   payment_id SERIAL PRIMARY KEY,  
3   booking_id INT NOT NULL REFERENCES booking(booking_id) ON DELETE CASCADE,  
4   amount NUMERIC(10,2) NOT NULL,  
5   method VARCHAR(50),  
6   paid_at TIMESTAMP  
7 );  
8
```

Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 59 msec.

Total rows: Query complete 00:00:00.059

✓ Query returned successfully in 59 msec. X

CRLF Ln 8, Col 1

12°C Parc nublado

Buscar

8:46 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History

```
1 CREATE TABLE customer (  
2   customer_id SERIAL PRIMARY KEY,  
3   user_id INT NOT NULL REFERENCES "user"(user_id) ON DELETE CASCADE,  
4   document_id VARCHAR(50),  
5   phone VARCHAR(30)  
6 );
```

Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 66 msec.

Total rows: Query complete 00:00:00.066

CRLF Ln 6, Col 3

12°C Parc nublado

Buscar

8:42 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History

```
1 CREATE VIEW vw_booking_details AS
2 SELECT b.booking_id, u.name as customer_name, br.name as branch_name, b.scheduled_at, b.status
3 FROM booking b
4 JOIN customer c ON c.customer_id = b.customer_id
5 JOIN "user" u ON u.user_id = c.user_id
6 JOIN branch br ON br.branch_id = b.branch_id;
```

Execute script F5

Scratch Pad X

Data Output Messages Notifications

CREATE VIEW

Query returned successfully in 70 msec.

Total rows: Query complete 00:00:00.070

12°C Parc nublado

8:47 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History

```
1 CREATE TABLE employee (
2 employee_id SERIAL PRIMARY KEY,
3 user_id INT NOT NULL REFERENCES "user"(user_id) ON DELETE CASCADE,
4 role VARCHAR(50)
5 );
```

Scratch Pad X

Data Output Messages Notifications

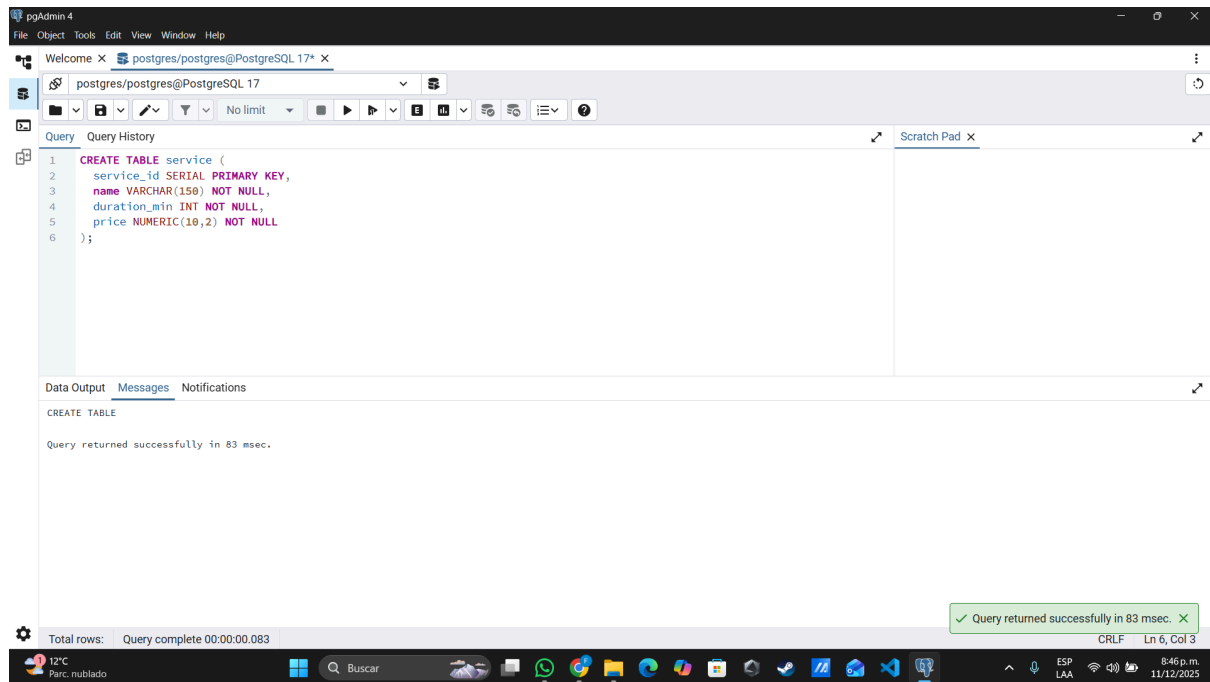
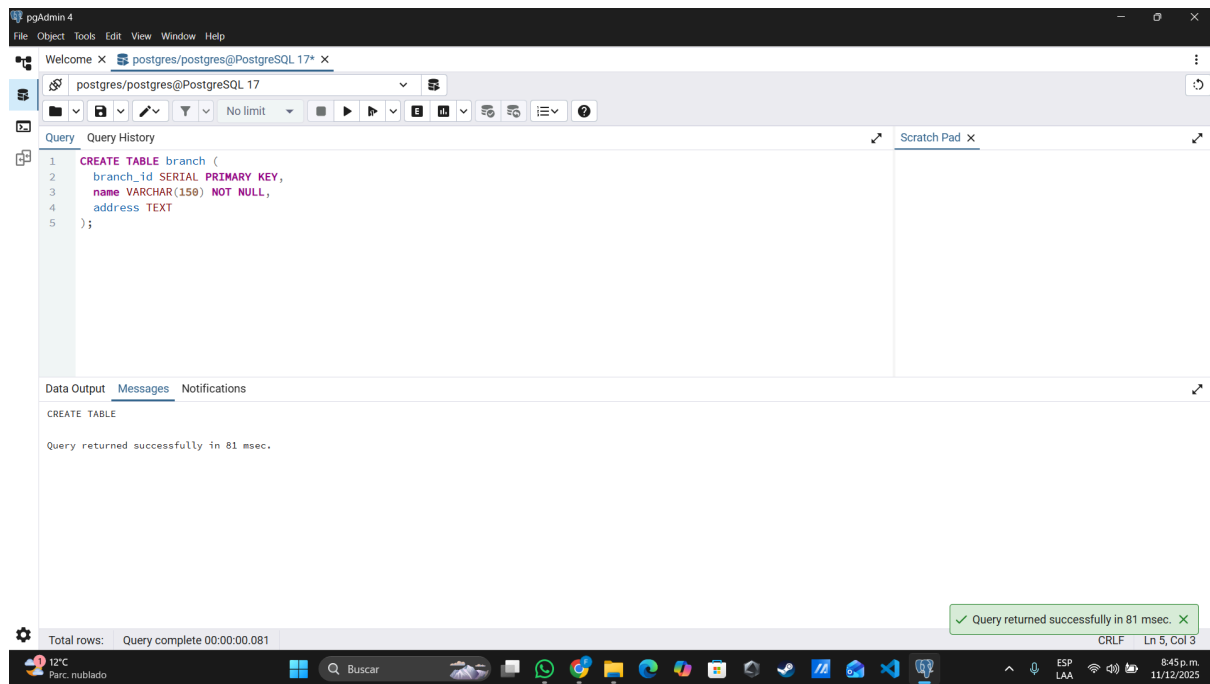
CREATE TABLE

Query returned successfully in 70 msec.

Total rows: Query complete 00:00:00.070

12°C Parc nublado

8:45 p.m. 11/12/2025



/sql/insert\_data.sql

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History

```
1 INSERT INTO branch (name, address) VALUES
2 ('Sucursal Centro','Calle 1 #10-20'),
3 ('Sucursal Norte','Av 5 #30-40');
```

Scratch Pad X

Data Output Messages Notifications

INSERT 0 2

Query returned successfully in 80 msec.

Total rows: Query complete 00:00:00.080

✓ Query returned successfully in 80 msec. X

12°C Parc nublado

Buscar

ESP LAA

8:49 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History

```
1 INSERT INTO service (name, duration_min, price) VALUES
2 ('Cambio de aceite', 30, 45.00),
3 ('Alineación', 60, 80.00),
4 ('Revisión general', 45, 60.00);
```

Scratch Pad X

Data Output Messages Notifications

INSERT 0 3

Query returned successfully in 63 msec.

Total rows: Query complete 00:00:00.063

✓ Query returned successfully in 63 msec. X

12°C Parc nublado

Buscar

ESP LAA

8:49 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 INSERT INTO booking (customer_id, branch_id, scheduled_at, status) VALUES
2 (1, 1, now() + interval '2 day', 'scheduled'),
3 (1, 2, now() + interval '7 day', 'scheduled'),
4 (2, 1, now() + interval '1 day', 'cancelled');
```

Data Output Messages Notifications

INSERT 0 3

Query returned successfully in 73 msec.

Total rows: Query complete 00:00:00.073

12°C Parc nublado

8:51 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 INSERT INTO booking_service (booking_id, service_id) VALUES
2 (1,1),(1,3),(2,2);
```

Data Output Messages Notifications

INSERT 0 3

Query returned successfully in 65 msec.

Total rows: Query complete 00:00:00.065

12°C Parc nublado

8:51 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 INSERT INTO payment (booking_id, amount, method, paid_at) VALUES
2 (1, 105.00, 'card', now()),
3 (2, 80.00, 'cash', null);
```

Data Output Messages Notifications

INSERT 0 2

Query returned successfully in 66 msec.

Total rows: Query complete 00:00:00.066 CRLF Ln 3, Col 26

12°C Parc nublado Buscar ESP LAA 8:52 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 INSERT INTO "user" (name, email) VALUES
2 ('Ana Perez', 'ana.perez@example.com'),
3 ('Carlos Lopez', 'carlos.lopez@example.com'),
4 ('Sofia Martinez', 'sofia.m@example.com'),
5 ('Diego Ruiz', 'diego.ruiz@example.com');
```

Data Output Messages Notifications

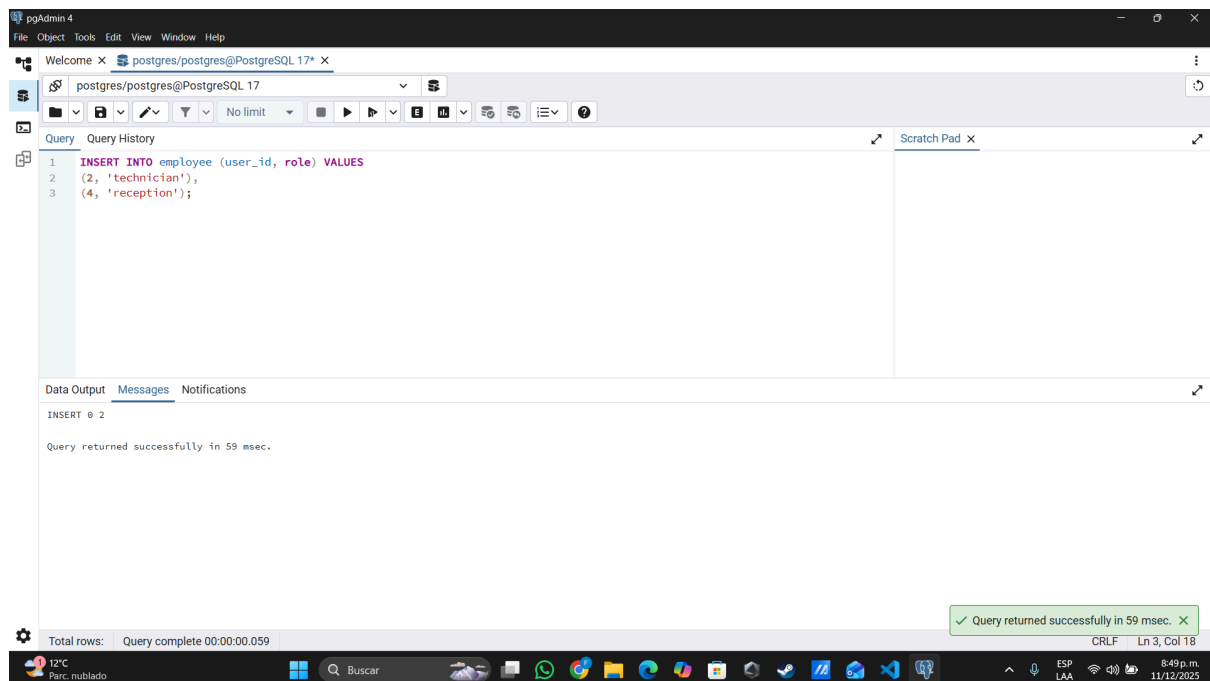
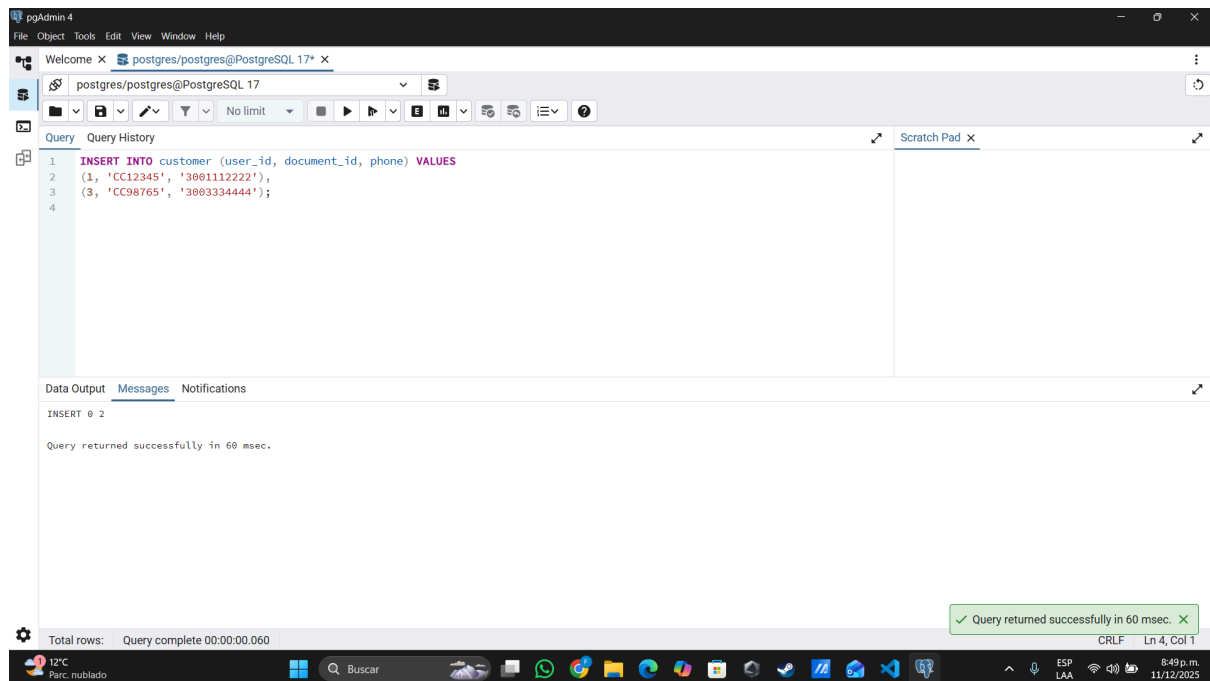
INSERT 0 4

Query returned successfully in 90 msec.

Total rows: Query complete 00:00:00.090 CRLF Ln 5, Col 41

12°C Parc nublado Buscar ESP LAA 8:48 p.m. 11/12/2025





/sql/queries\_avanzadas.sql

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 SELECT s.service_id, s.name, p.payment_id
2 FROM service s
3 FULL OUTER JOIN booking_service bs ON bs.service_id = s.service_id
4 FULL OUTER JOIN booking b ON b.booking_id = bs.booking_id
5 FULL OUTER JOIN payment p ON p.booking_id = b.booking_id;
```

Data Output Messages Notifications

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

service_id	name	payment_id
3	Revisión general	1
1	Cambio de aceite	1
2	Alineación	2
[null]	[null]	[null]

Total rows: 4 Query complete 00:00:00.094

Successfully run. Total query runtime: 94 msec. 4 rows affected. X

12°C Parc nublado

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 SELECT br.branch_id, br.name, SUM(p.amount) AS total
2 FROM payment p
3 JOIN booking b ON b.booking_id = p.booking_id
4 JOIN branch br ON br.branch_id = b.branch_id
5 GROUP BY br.branch_id, br.name
6 HAVING SUM(p.amount) > 100;
```

Data Output Messages Notifications

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

branch_id	name	total
1	Sucursal Centro	105.00

Total rows: 1 Query complete 00:00:00.410

Successfully run. Total query runtime: 410 msec. 1 rows affected. X

12°C Parc nublado

pgAdmin 4

File Object Tools Edit View Window Help

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 SELECT c.customer_id, u.name
2 FROM customer c
3 JOIN "user" u ON u.user_id = c.user_id
4 WHERE (SELECT SUM(amount) FROM payment p JOIN booking b ON b.booking_id = p.booking_id WHERE b.customer_id = c.customer_id)
5 (SELECT AVG(total) FROM (SELECT SUM(amount) as total FROM payment GROUP BY booking_id) t);
```

Data Output Messages Notifications

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

customer_id	name
integer	character varying (150)
1	Ana Perez

Total rows: 1 Query complete 00:00:00.101

Successfully run. Total query runtime: 101 msec. 1 rows affected.

CRLF Ln 5, Col 97

12°C Parc nublado

Buscar

8:53 p.m. 11/12/2025

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 SELECT b.booking_id, u.name AS customer_name, br.name AS branch_name
2 FROM booking b
3 JOIN customer c ON c.customer_id = b.customer_id
4 JOIN "user" u ON u.user_id = c.user_id
5 JOIN branch br ON br.branch_id = b.branch_id
6 WHERE b.status = 'scheduled';
```

Data Output Messages Notifications

Showing rows: 1 to 2 Page No: 1 of 1

booking_id	customer_name	branch_name
1	Ana Perez	Sucursal Norte
2	Ana Perez	Sucursal Centro

Total rows: 2 Query complete 00:00:00.102

12°C Parc nublado

8:52 p.m. 11/12/2025

Successfully run

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```
1 SELECT u.name, b.booking_id, b.scheduled_at
2 FROM "user" u
3 LEFT JOIN customer c ON c.user_id = u.user_id
4 LEFT JOIN booking b ON b.customer_id = c.customer_id
5 ORDER BY u.user_id;
6
```

Data Output Messages Notifications

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

name	booking_id	scheduled_at
Ana Perez	1	2025-12-13 20:51:32.196644
Ana Perez	2	2025-12-18 20:51:32.196644
Carlos Lopez	[null]	[null]
Sofia Martinez	3	2025-12-12 20:51:32.196644
Diego Ruiz	[null]	[null]

Total rows: 5 Query complete 00:00:00.090

12°C Parc nublado

8:52 p.m. 11/12/2025

Successfully run. Total query runtime: 90 msec. 5 rows affected.

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```

1 WITH bookings_in_range AS (
2   SELECT branch_id, scheduled_at FROM booking
3   WHERE scheduled_at BETWEEN now() AND now() + interval '10 day'
4 )
5 SELECT br.branch_id, br.name, COUNT(bir.scheduled_at) AS reserved_in_next_10_days
6 FROM branch br
7 LEFT JOIN bookings_in_range bir ON bir.branch_id = br.branch_id
8 GROUP BY br.branch_id, br.name;
9

```

Data Output Messages Notifications

Showing rows: 1 to 2 Page No: 1 of 1

branch_id [PK] integer	name character varying (150)	reserved_in_next_10_days bigint
2	Sucursal Norte	1
1	Sucursal Centro	2

Total rows: 2 Query complete 00:00:00.144

Successfully run. Total query runtime: 141 msec. 2 rows affected. X

CRLF Ln 9, Col 1

12°C Parc nublado

pgAdmin 4

Welcome X postgres/postgres@PostgreSQL 17\* X

postgres/postgres@PostgreSQL 17

Query Query History Scratch Pad X

```

1 WITH payments_per_booking AS (
2   SELECT booking_id, SUM(amount) AS paid_total FROM payment GROUP BY booking_id
3 )
4 SELECT b.booking_id, u.name, COALESCE(ppb.paid_total,0) as paid_total
5 FROM booking b
6 JOIN customer c ON c.customer_id = b.customer_id
7 JOIN "user" u ON u.user_id = c.user_id
8 LEFT JOIN payments_per_booking ppb ON ppb.booking_id = b.booking_id
9 WHERE COALESCE(ppb.paid_total,0) < (
10   SELECT AVG(amount) FROM payment
11 );

```

Data Output Messages Notifications

Showing rows: 1 to 2 Page No: 1 of 1

booking_id integer	name character varying (150)	paid_total numeric
2	Ana Perez	80.00
3	Sofia Martinez	0

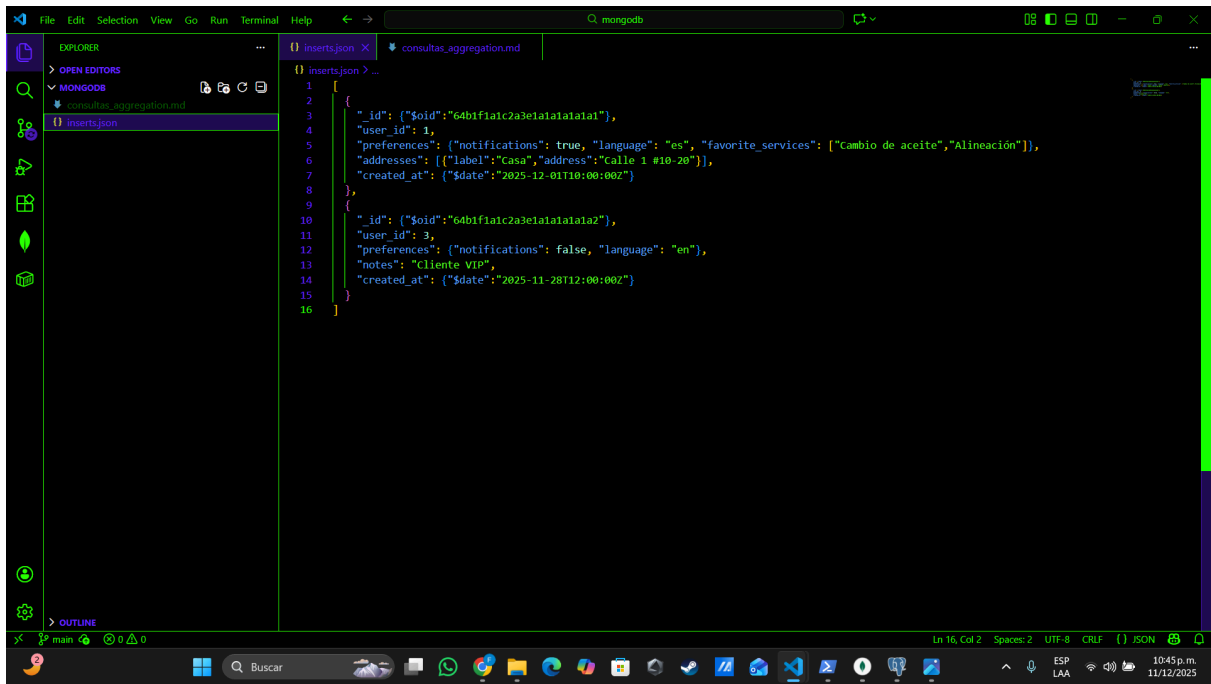
Total rows: 2 Query complete 00:00:00.091

Successfully run. Total query runtime: 91 msec. 2 rows affected. X

CRLF Ln 11, Col 3

Noticias para ust... Nuevo temblor e...

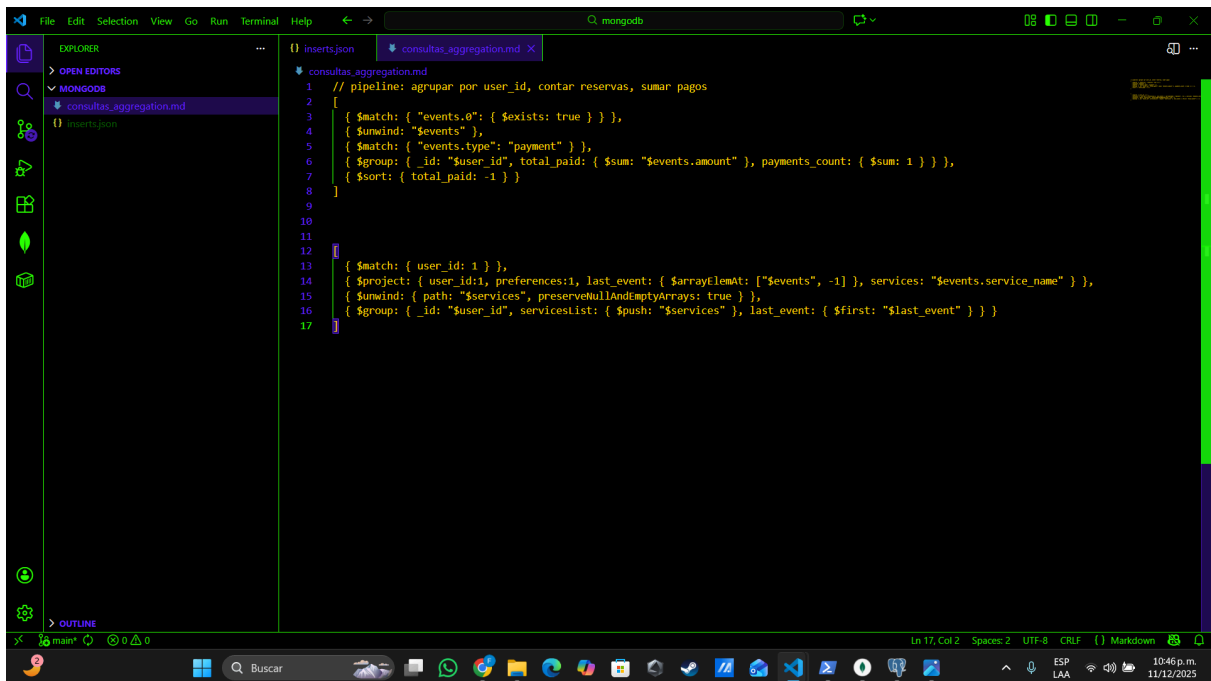
/mongodb/inserts.json



The screenshot shows the VS Code editor with a file named `insert.json` open. The file contains two JSON documents. The first document has fields: `_id` (a long hexadecimal string), `user_id` (1), `preferences` (an object with `notifications` true, `language` "es", and `favorite_services` ["Cambio de aceite", "Alineación"]), `addresses` (an array with one object containing `label` "Casa" and `address` "Calle 1 #10-20"), and `created_at` (a date string). The second document has fields: `_id` (another hexadecimal string), `user_id` (3), `preferences` (an object with `notifications` false and `language` "en"), `notes` ("Cliente VIP"), and `created_at` (another date string). The status bar at the bottom indicates the file is in UTF-8 encoding with CRLF line endings.

```
1 {
2   "_id": "64b1f1a1c2a3e1a1a1a1a1",
3   "user_id": 1,
4   "preferences": {"notifications": true, "language": "es", "favorite_services": ["Cambio de aceite", "Alineación"]},
5   "addresses": [{"label": "Casa", "address": "Calle 1 #10-20"}],
6   "created_at": {"$date": "2025-12-01T10:00:00Z"}
7 },
8 {
9   "_id": "64b1f1a1c2a3e1a1a1a1a2",
10  "user_id": 3,
11  "preferences": {"notifications": false, "language": "en"},
12  "notes": "Cliente VIP",
13  "created_at": {"$date": "2025-11-28T12:00:00Z"}
14 }
15 ]
16 ]
```

/mongodb/consultas\_aggregation.md



The screenshot shows the VS Code editor with a file named `consultas_aggregation.md` open. The file contains a MongoDB aggregation pipeline. The first stage is a `$pipeline` stage with two sub-pipelines. The first sub-pipeline groups by `user_id`, counts the number of reservations (`$sum: "$events.amount"`), and sorts by `total_paid` in descending order. The second sub-pipeline projects the `user_id`, preferences, and the last event (`$events`), and then groups by `user_id` to create a `servicesList` array from the `$events.service_name` field. The status bar at the bottom indicates the file is in UTF-8 encoding with CRLF line endings.

```
1 // pipeline: agrupar por user_id, contar reservas, sumar pagos
2 [
3   {
4     $match: { "events.0": { $exists: true } } },
5     $unwind: "$events",
6     $match: { "events.type": "payment" } },
7     $group: { _id: "$user_id", total_paid: { $sum: "$events.amount" }, payments_count: { $sum: 1 } } },
8     $sort: { total_paid: -1 } }
9 ],
10 [
11   {
12     $match: { user_id: 1 } },
13     $project: { user_id: 1, preferences: 1, last_event: { $arrayElemAt: ["$events", -1] }, services: "$events.service_name" } },
14     $unwind: { path: "$services", preserveNullAndEmptyArrays: true } },
15     $group: { _id: "$user_id", servicesList: { $push: "$services" }, last_event: { $first: "$last_event" } } }
16 ],
17 ]
```

/integracion/docker-compose.yml

```
1 version: '3.8'
2 services:
3   postgres:
4     image: postgres:15
5     environment:
6       POSTGRES_DB: appdb
7       POSTGRES_USER: appuser
8       POSTGRES_PASSWORD: apppass
9     ports:
10      - "5432:5432"
11     volumes:
12      - pgdata:/var/lib/postgresql/data
13
14   mongodb:
15     image: mongo:6
16     ports:
17      - "27017:27017"
18     volumes:
19      - mongodata:/data/db
20
21   redis:
22     image: redis:7
23     ports:
24      - "6379:6379"
25     command: redis-server --save 60 1
26
27 volumes:
28   pgdata:
29   mongodata:
```

/integracion/demo\_integration.js

```
1 // Demo Node.js que muestra la integración conceptual entre PostgreSQL, MongoDB y Redis
2 // Ejecutar: node demo_integration.js (asegurar npm i pg mongodb ioredis)
3
4 const { Client } = require('pg');
5 const { MongoClient } = require('mongodb');
6 const Redis = require('ioredis');
7
8 async function main() {
9   // Conexiones
10   const pg = new Client({ host: 'localhost', port: 5432, user: 'usuario', password: '1234', database: 'postgres' });
11   const mongo = new MongoClient('mongodb://localhost:27017');
12   const redis = new Redis();
13
14   await pg.connect();
15   await mongo.connect();
16
17   const db = mongo.db('appdb');
18
19   // 1) Leer usuario y perfil extendido
20   const res = await pg.query('SELECT u.user_id, u.name FROM public."user" u LIMIT 1');
21   console.log('User from PG:', res.rows[0]);
22
23   const profile = await db.collection('profiles').findOne({ user_id: res.rows[0].user_id });
24   console.log('Profile from MongoDB:', profile);
25
26   // 2) Incrementar contador global en Redis
27   const bookingsCount = await redis.incr('counter:bookings_total');
28   console.log('Bookings counter (Redis):', bookingsCount);
29
30   // 3) Push a queue para procesar notificación
31   await redis.lpush('queue:notifications', `notify:user:${res.rows[0].user_id}`);
32   console.log('Pushed notification job to Redis list');
33
34   // Cleanup
35   await pg.end();
36   await mongo.close();
37   redis.disconnect();
38 }
39
40 main().catch(err => { console.error(err); process.exit(1) });
```

CAPTURA FINAL FUNCIONAMIENTO AL 100%

```
File Edit Selection View Go Run Terminal Help
integracion

EXPLORER
  demo_integration.js
  docker-compose.yml
  package-lock.json
  package.json

demo_integration.js
  6 const Redis = require('ioredis');
  7
  8 async function main() {
  9   // Conexiones
 10   const pg = new Client({ host: 'localhost', port: 5432, user: 'usuario', password: '1234', database: 'postgres' });
 11   const mongo = new MongoClient('mongodb://localhost:27017');
 12   const redis = new Redis();
 13
 14   await pg.connect();
 15   await mongo.connect();
 16
 17   const db = mongo.db('appdb');
 18
 19   // 1) Leer usuario y perfil extendido
 20   const res = await pg.query('SELECT u.user_id, u.name FROM public."user" u LIMIT 1');
 21
 22   console.log('User from PG:', res.rows[0]);
 23
 24   const profile = await db.collection('profiles').findOne({ user_id: res.rows[0].user_id });
 25   console.log('Profile from MongoDB:', profile);
 26
 27   // 2) Incrementar contador global en Redis
 28
 29   PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
 30
 31 PS C:\Users\villa\OneDrive\Desktop\integracion> node demo_integration.js
 32 column: undefined,
 33 datatype: undefined,
 34 constraint: undefined,
 35 file: 'parse_relation.c',
 36 line: '1431',
 37 routine: 'parserOpenTable'
 38 }
 39 • PS C:\Users\villa\OneDrive\Desktop\integracion> node demo_integration.js
 40 User from PG: { user_id: 1, name: 'Ana Perez' }
 41 Profile from MongoDB: null
 42 Bookings counter (Redis): 1
 43 Pushed notification job to Redis list
 44 PS C:\Users\villa\OneDrive\Desktop\integracion>
```