

Universidad Nacional Autónoma de México

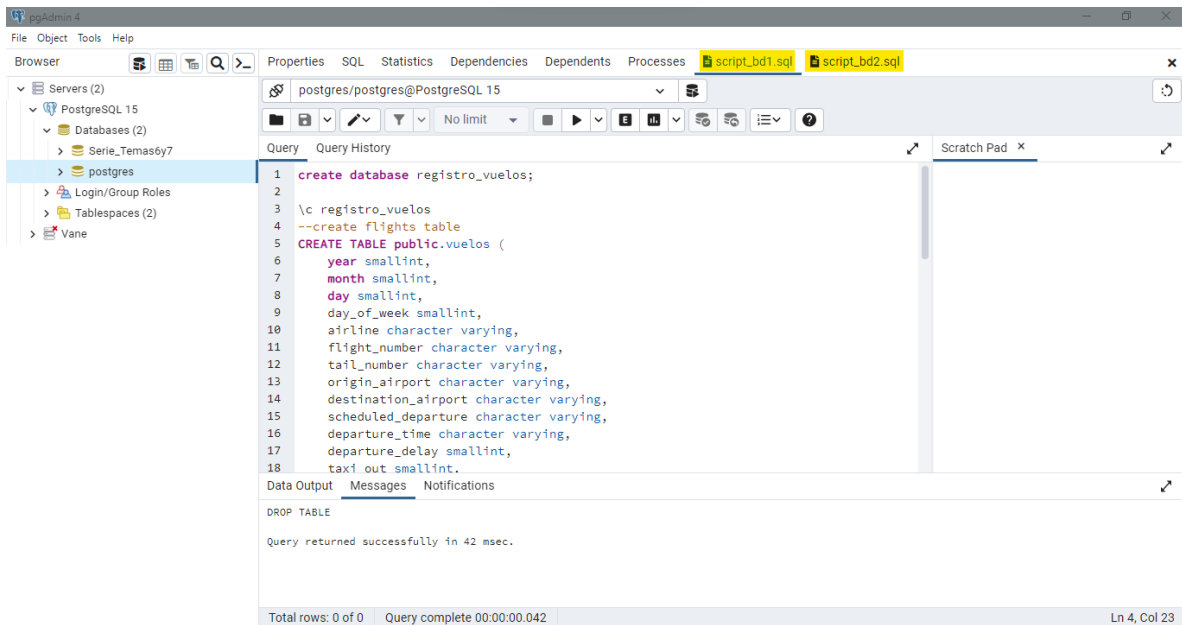
Facultad de Ingeniería

Nava Alberto Vanessa

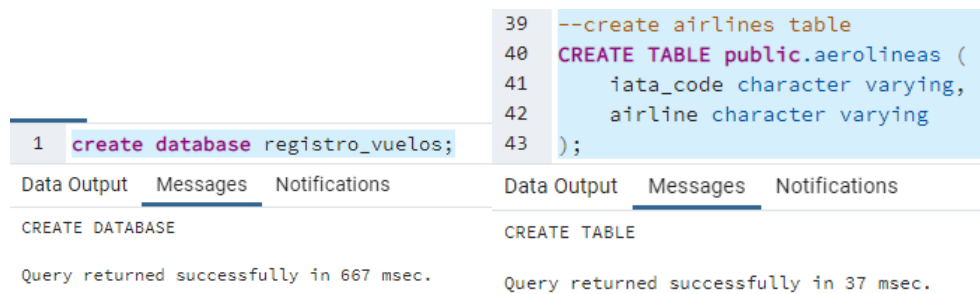
Base de Datos

Serie tema 6 y 7

Subiendo los scripts a pgAdmin:



Creando la database y las tablas de script1:



```

4  --create flights table
5  CREATE TABLE public.vuelos (
6      year smallint,
7      month smallint,
8      day smallint,
9      day_of_week smallint,
10     airline character varying,
11     flight_number character varying,
12     tail_number character varying,
13     origin_airport character varying,
14     destination_airport character varying,
15     scheduled_departure character varying,
16     departure_time character varying,
17     departure_delay smallint,
18     taxi_out smallint,
19     wheels_off character varying,
20     scheduled_time smallint,
21     elapsed_time smallint,
22     air_time smallint,
23     distance smallint,

```

Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 43 msec.

Total rows: 0 of 0    Query complete 00:00:00.043

```

45 --create airports table
46 CREATE TABLE public.aeropuertos (
47     iata_code character varying,
48     airport character varying,
49     city character varying,
50     state character varying,
51     country character varying,
52     latitude double precision,
53     longitude double precision
54 );

```

Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 39 msec.

Creando la database y las tablas de script2:

```

1  create database datos_clase;
2
3  --create datos_clase

```

Data Output Messages Notifications

CREATE DATABASE

Query returned successfully in 677 msec.

```

5  CREATE TABLE cliente (
6      id_Cliente varchar(13) not null primary key,
7      nombre char(50) not null,
8      ap_Pat char(50) not null,
9      ap_Mat char(50) null,
10     estado varchar(25) not null DEFAULT 'cdmx'
11 );
12

```

Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 56 msec.

```

13 --Tabla articulos
14 CREATE TABLE articulo (
15     num_Articulo int,
16     nombre_Articulo varchar(30) not null,
17     precio numeric not null,
18     categoria varchar(35) not null,
19     CONSTRAINT verifica_Precio CHECK (precio > 0),
20     CONSTRAINT articulo_PK PRIMARY KEY(num_articulo));
21

```

Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 49 msec.

```

22 --Tabla ordenes
23 CREATE TABLE orden (
24     id_Orden int not null,
25     fecha date not null DEFAULT now(),
26     id_Cliente varchar(13),
27     CONSTRAINT orden_PK PRIMARY KEY(id_orden),
28     CONSTRAINT orden_cliente_FK FOREIGN KEY (id_Cliente) REFERENCES cliente(id_Cliente) ON
29

```











Data Output Messages Notifications

CREATE TABLE

Query returned successfully in 42 msec.

Cargando los archivos csv:

Orden:

Data Output		Messages		Notifications	
<div><div></div></div>					
	<b>id_orden</b> [PK] integer		<b>fecha</b> date		<b>id_cliente</b> character varying (13)
1	1		2001-12-24		abcd
2	2		2020-04-16		ejemplo
3	4		2020-04-21		aksmvieoci125
Total rows: 3 of 3			Query complete 00:00:00.134		

Cliente:

Data Output Messages Notifications					
	id_cliente [PK] character varying (13)	nombre character (50)	ap_pat character (50)	ap_mat character (50)	estado character varying (25)
1	abcd	mario	martinez	\N	cdmx
2	aksmvieoci125	Luisa	Balderas	\N	cdmx
3	aksmvieoci126	Luis	Lopez	\N	cdmx
4	aksmvieoci127	Luis	Valderrama	\N	cdmx
5	aksmvieoci137	Luis	Valderrama	\N	cdmx
6	aksmvieoci144	Angela	Perez		nayarit
7	ejemplo	Jaime	Cruz	flores	nayarit
Total rows: 7 of 7 Query complete 00:00:00.175					

Artículo:

Data Output Messages Notifications				
	num_articulo [PK] integer	nombre_articulo character varying (30)	precio numeric	categoria character varying (35)
1	1	Reloj	600	accesorios
2	2	gorra	120	accesorios
3	3	tenis	700	calzado
4	4	lentes	400	accesorios
5	5	zapatos	550	calzado
6	6	bermuda	500	ropa
7	7	jeans	650	ropa
8	8	bolsa	300	accesorios
9	9	mochila	570	accesorios
10	10	falda	450	ropa
Total rows: 10 of 10 Query complete 00:00:00.174				

## Aerolíneas:

Data Output			Messages	Notifications
	<b>iata_code</b> character varying	<b>airline</b> character varying		
1	UA	United Air Lines Inc.		
2	AA	American Airlines Inc.		
3	US	US Airways Inc.		
4	F9	Frontier Airlines Inc.		
5	B6	JetBlue Airways		
6	OO	Skywest Airlines Inc.		
7	AS	Alaska Airlines Inc.		
8	NK	Spirit Air Lines		
9	WN	Southwest Airlines Co.		
10	DL	Delta Air Lines Inc.		
11	EV	Atlantic Southeast Airlines		
12	HA	Hawaiian Airlines Inc.		
13	MQ	American Eagle Airlines Inc.		
14	VX	Virgin America		
Total rows: 14 of 14			Query complete 00:00:00.154	

## Aeropuertos:

Data Output						Messages	Notifications
	<b>iata_code</b> character varying	<b>airport</b> character varying	<b>city</b> character varying	<b>state</b> character varying	<b>country</b> character varying		
1	ABE	Lehigh Valley International Airport	Allentown	PA	USA		
2	ABI	Abilene Regional Airport	Abilene	TX	USA		
3	ABQ	Albuquerque International Sunport	Albuquerque	NM	USA		
4	ABR	Aberdeen Regional Airport	Aberdeen	SD	USA		
5	ABY	Southwest Georgia Regional Airport	Albany	GA	USA		
6	ACK	Nantucket Memorial Airport	Nantucket	MA	USA		
7	ACT	Waco Regional Airport	Waco	TX	USA		
8	ACV	Arcata Airport	Arcata/Eureka	CA	USA		
9	ACY	Atlantic City International Airport	Atlantic City	NJ	USA		
10	ADK	Adak Airport	Adak	AK	USA		
11	ADQ	Kodiak Airport	Kodiak	AK	USA		
12	AEX	Alexandria International Airport	Alexandria	LA	USA		
13	AGS	Augusta Regional Airport (Bush Field)	Augusta	GA	USA		
14	AKN	King Salmon Airport	King Salmon	AK	USA		
Total rows: 322 of 322						Query complete 00:00:00.267	

## Vuelos:

	year smallint	month smallint	day smallint	day_of_week smallint	airline character varying	flight_number character varying	tail_number character varying	origin_airport character varying
1	2015	1	1	4	AS	98	N407AS	ANC
2	2015	1	1	4	AA	2336	N3KUAA	LAX
3	2015	1	1	4	US	840	N171US	SFO
4	2015	1	1	4	AA	258	N3HYAA	LAX
5	2015	1	1	4	AS	135	N527AS	SEA
6	2015	1	1	4	DL	806	N3730B	SFO
7	2015	1	1	4	NK	612	N635NK	LAS
8	2015	1	1	4	US	2013	N584UW	LAX
9	2015	1	1	4	AA	1112	N3LAAA	SFO
10	2015	1	1	4	DL	1173	N826DN	LAS
11	2015	1	1	4	DL	2336	N958DN	DEN
12	2015	1	1	4	AA	1674	N853AA	LAS
13	2015	1	1	4	DL	1434	N547US	LAX
14	2015	1	1	4	DL	2324	N3751B	SLC

Total rows: 1000 of 5819079    Query complete 00:00:29.563

Procediendo a la resolución de los ejercicios planteados, teniendo en cuenta:

- Tiempo que tomó en ejecutarse la consulta.
- Agregar columna que incluya fecha y hora del sistema. `SELECT NOW()`
- Agregar columna que incluya el usuario que ejecutó la consulta. `SELECT CURRENT_USER`

1. Indicar las ciudades que tienen más de un aeropuerto.

The screenshot shows the pgAdmin 4 interface. The left pane displays the database structure for 'Serie\_Temas6y7' in the 'public' schema. The main pane shows a SQL query and its results.

**Query:**

```
--Ejercicio 1
SELECT city ciudad, COUNT(AIRPORT) aeropuerto, (SELECT CURRENT_USER usuario),
       (SELECT NOW() fecha_hora) FROM aeropuertos GROUP BY city HAVING COUNT (airport)>1;
```

**Data Output:**

	ciudad character varying	aeropuerto bigint	usuario name	fecha_hora timestamp with time zone
1	Jackson	2	postgres	2023-06-04 18:25:25.365065-06
2	Springfield	2	postgres	2023-06-04 18:25:25.365065-06
3	Albany	2	postgres	2023-06-04 18:25:25.365065-06
4	Columbia	2	postgres	2023-06-04 18:25:25.365065-06
5	New York	2	postgres	2023-06-04 18:25:25.365065-06
6	Jacksonville	2	postgres	2023-06-04 18:25:25.365065-06
7	Wilmington	2	postgres	2023-06-04 18:25:25.365065-06
8	San Diego	2	postgres	2023-06-04 18:25:25.365065-06
9	Chicago	2	postgres	2023-06-04 18:25:25.365065-06
10	Houston	2	postgres	2023-06-04 18:25:25.365065-06
11	Charleston	2	postgres	2023-06-04 18:25:25.365065-06
12	Portland	2	postgres	2023-06-04 18:25:25.365065-06
13	Columbus	2	postgres	2023-06-04 18:25:25.365065-06
14	Rochester	2	postgres	2023-06-04 18:25:25.365065-06

Total rows: 14 of 14    Query complete 00:00:00.070    Ln 5, Col 84

Consulta en texto:

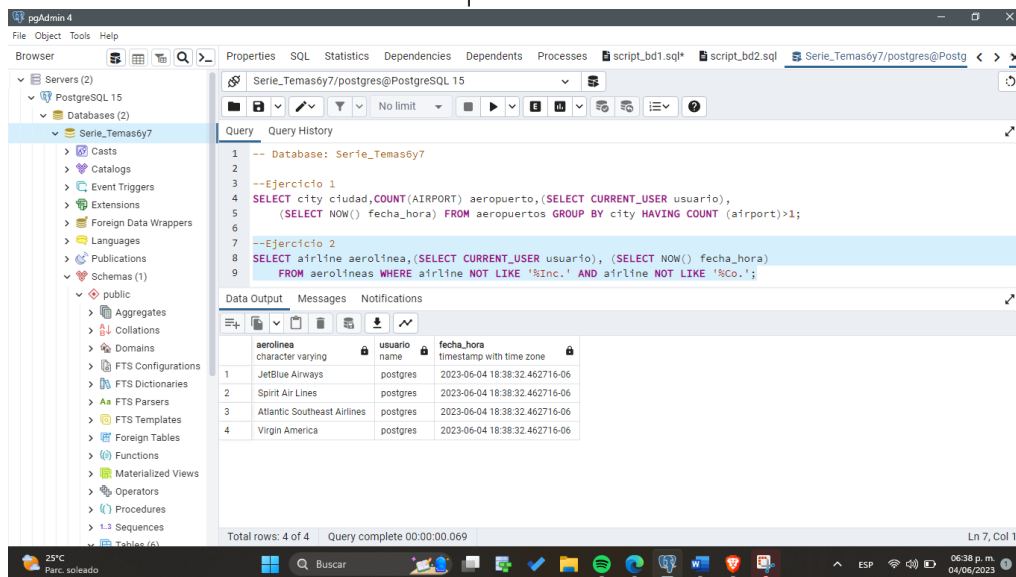
--Ejercicio 1

```
SELECT city ciudad,COUNT(AIRPORT) aeropuerto,(SELECT CURRENT_USER
usuario), (SELECT NOW()) fecha_hora) FROM aeropuertos GROUP BY city HAVING
COUNT (airport)>1;
```

Notación correspondiente en álgebra relacional:

$$R1 = \sigma_{COUNT(city)>1}(aeropuertos)$$
$$\Pi_{city, COUNT(city)}(R1)$$

2. Nombre de las aerolíneas que no terminan en "Inc" ni en "Co".



Consulta en texto:

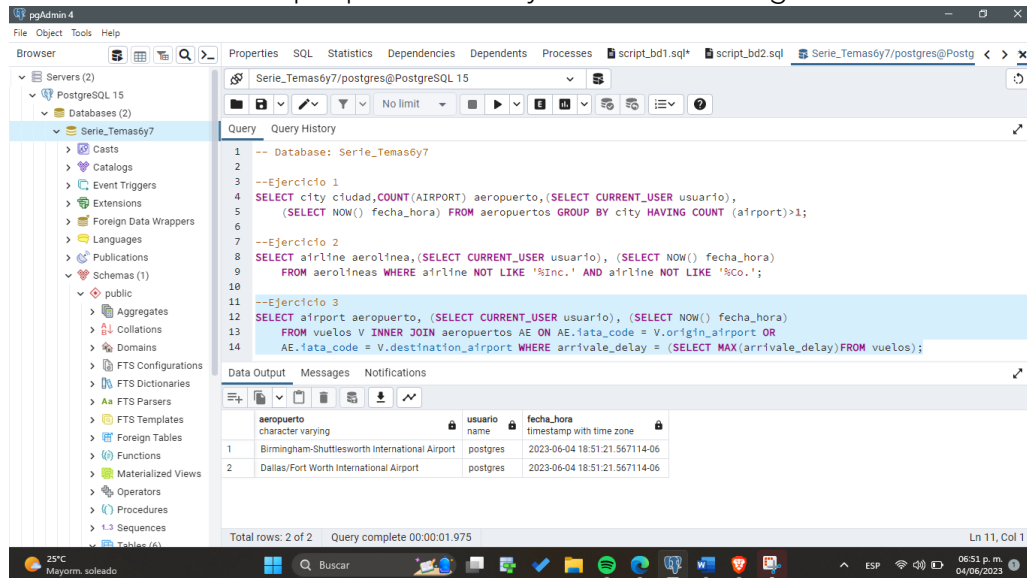
--Ejercicio 2

```
SELECT airline aerolinea,(SELECT CURRENT_USER usuario), (SELECT NOW())
fecha_hora) FROM aerolineas WHERE airline NOT LIKE '%Inc.' AND airline NOT
LIKE '%Co.';
```

Notación correspondiente en álgebra relacional:

$$R1 = \sigma_{NOT(airline \text{ like } \%Inc') \text{ AND } NOT(airline \text{ like } \%Co.)}(aerolineas)$$

3. Indicar los nombres de los aeropuertos que estuvieron implicados en el vuelo que presentó mayor retraso de llegada.

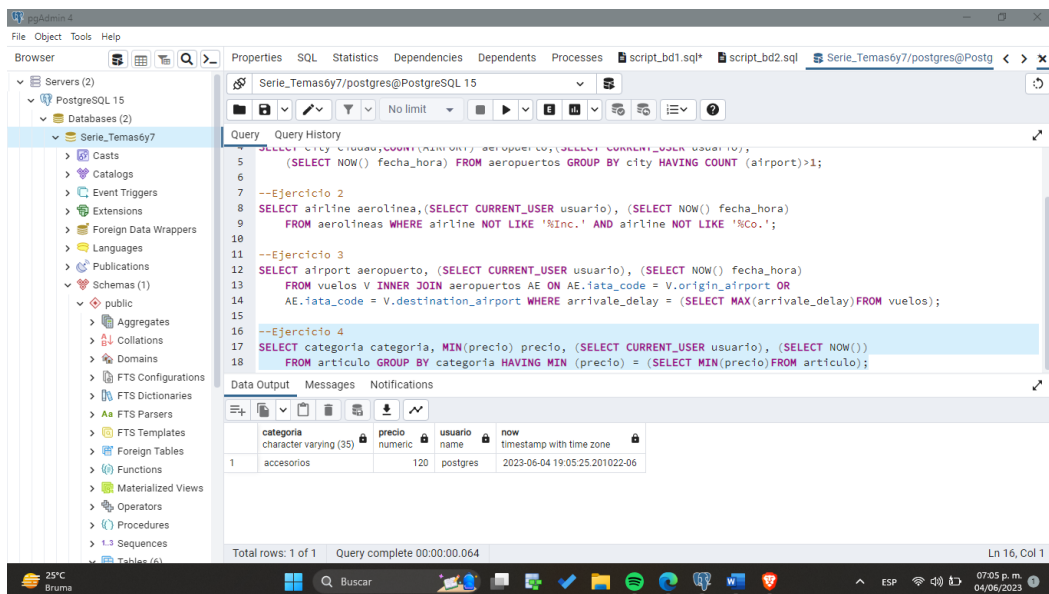


Consulta en texto:

--Ejercicio 3

```
SELECT airport aeropuerto, (SELECT CURRENT_USER usuario), (SELECT NOW() fecha_hora) FROM vuelos V INNER JOIN aeropuertos AE ON AE.iata_code = V.origin_airport OR AE.iata_code = V.destination_airport WHERE arrivale_delay = (SELECT MAX(arrivale_delay)FROM vuelos);
```

4. Mostrar aquella categoría (tabla artículo) que tiene el precio mínimo. La información debe estar agrupada.

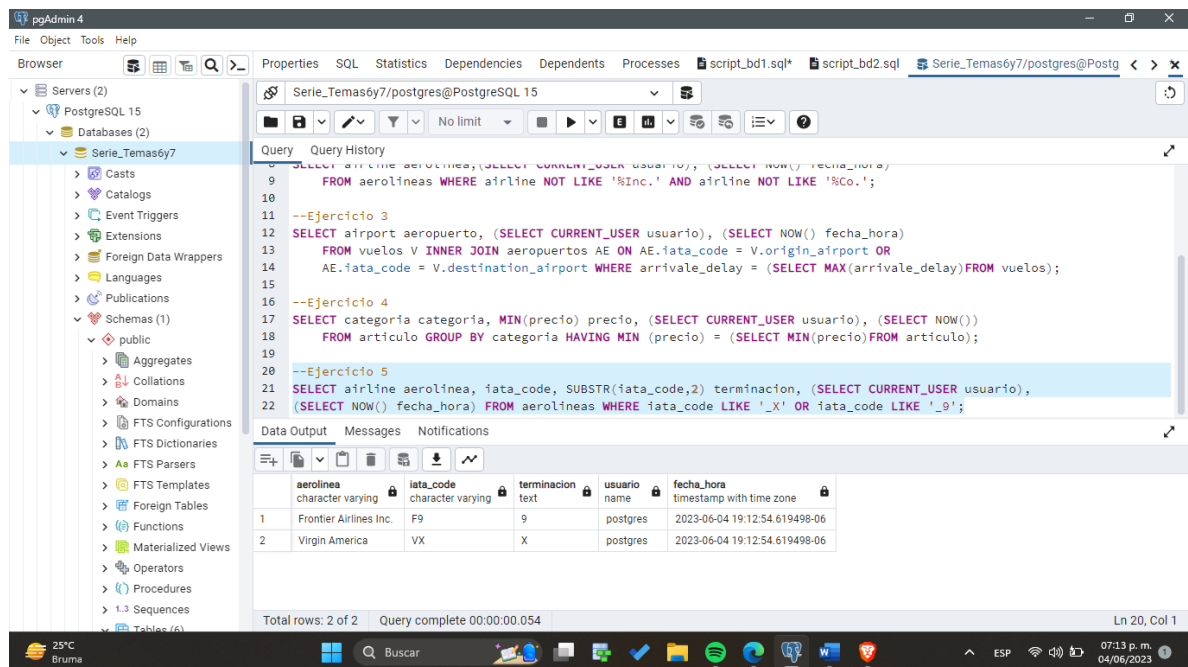


Consulta en texto:

--Ejercicio 4

```
SELECT categoria categoria, MIN(precio) precio, (SELECT CURRENT_USER
usuario), (SELECT NOW()) FROM articulo GROUP BY categoria HAVING MIN
(precio) = (SELECT MIN(precio)FROM articulo);
```

5. Se desea conocer el nombre de aquellas aerolíneas cuyo segundo carácter del iata\_code termina en X ó 9. Debe incluirse una columna que muestre dicha terminación.



The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, including the 'public' schema. The main window shows a SQL query editor with the following code:

```
--Ejercicio 3
SELECT airline aerolinea, (SELECT CURRENT_USER usuario), (SELECT NOW() fecha_hora)
FROM aerolineas WHERE airline NOT LIKE '%Inc.' AND airline NOT LIKE '%Co.';

--Ejercicio 4
SELECT categoria categoria, MIN(precio) precio, (SELECT CURRENT_USER usuario), (SELECT NOW())
FROM articulo GROUP BY categoria HAVING MIN (precio) = (SELECT MIN(precio)FROM articulo);

--Ejercicio 5
SELECT airline aerolinea, iata_code, SUBSTR(iata_code,2) terminacion, (SELECT CURRENT_USER usuario),
(SELECT NOW() fecha_hora) FROM aerolineas WHERE iata_code LIKE '_X' OR iata_code LIKE '_9';
```

The 'Data Output' tab shows the results of the query:

	aerolinea	iata_code	terminacion	usuario	fecha_hora
1	Frontier Airlines Inc.	F9	9	postgres	2023-06-04 19:12:54.619498-06
2	Virgin America	VX	X	postgres	2023-06-04 19:12:54.619498-06

Total rows: 2 of 2. Query complete 00:00:00.054. Ln 20, Col 1

Consulta en texto:

--Ejercicio 5

```
SELECT airline aerolinea, iata_code, SUBSTR(iata_code,2) terminacion, (SELECT
CURRENT_USER usuario), (SELECT NOW() fecha_hora) FROM aerolineas
WHERE iata_code LIKE '_X' OR iata_code LIKE '_9';
```

6. Proporcionar el nombre de los aeropuertos cuya latitud se encuentre entre 40 y 41, además que su longitud sea menor que el promedio.

Nota: el promedio se toma de aquellas observaciones cuya latitud se encuentre entre 40 y 41.



pgAdmin 4

File Object Tools Help

Browser

- Servers (2)
  - PostgreSQL 15
    - Databases (2)
      - Serie\_Temas6y7
        - Castes
        - 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 (6)

Properties SQL Statistics Dependencies Dependents Processes script\_bd1.sql\* script\_bd2.sql Serie\_Temas6y7/postgres@Postg

Query

```

18 FROM articulo GROUP BY categoria HAVING MIN (precio) = (SELECT MIN(precio) FROM articulo);
19
20 --Ejercicio 5
21 SELECT airline aerolinea, iata_code, SUBSTR(iata_code,2) terminacion, (SELECT CURRENT_USER usuario),
22 (SELECT NOW() fecha_hora) FROM aerolineas WHERE iata_code LIKE '_X' OR iata_code LIKE '_9';
23
24 --Ejercicio 6
25 SELECT airport aeropuerto, (SELECT CURRENT_USER usuario), (SELECT NOW() fecha_hora)
26 FROM aeropuertos WHERE (latitude BETWEEN 40 AND 41) AND longitude < (SELECT AVG(longitude)
27 FROM aeropuertos WHERE latitude BETWEEN 40 AND 41);

```

Query History

Data Output

aeropuerto	usuario	fecha_hora
1 Arcata Airport	postgres	2023-06-04 19:35:24.759472-06
2 Elko Regional Airport	postgres	2023-06-04 19:35:24.759472-06
3 Central Nebraska Regional Airport	postgres	2023-06-04 19:35:24.759472-06
4 Yampa Valley Airport (Yampa Valley Regional)	postgres	2023-06-04 19:35:24.759472-06
5 Lincoln Airport (Lincoln Municipal)	postgres	2023-06-04 19:35:24.759472-06
6 Redding Municipal Airport	postgres	2023-06-04 19:35:24.759472-06
7 Salt Lake City International Airport	postgres	2023-06-04 19:35:24.759472-06
8 Valdez Airport	postgres	2023-06-04 19:35:24.759472-06

Total rows: 8 of 8 Query complete 00:00:00.083

Successfully run. Total query runtime: 83 msec. 8 rows affected.

Consulta en texto:

--Ejercicio 6

SELECT airport aeropuerto, (SELECT CURRENT\_USER usuario), (SELECT NOW() fecha\_hora) FROM aeropuertos WHERE (latitude BETWEEN 40 AND 41) AND longitude < (SELECT AVG(longitude) FROM aeropuertos WHERE latitude BETWEEN 40 AND 41);

7. ¿Cuántos aviones por aerolínea y día fueron cancelados saliendo del aeropuerto de Honolulu?

pgAdmin 4

File Object Tools Help

Browser

- Servers (2)
  - PostgreSQL 15
    - Databases (2)
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            - Procedures
            - Sequences
            - Tables (6)

Properties SQL Statistics Dependencies Dependents Processes script\_bd1.sql\* script\_bd2.sql Serie\_Temas6y7/postgres@Postg

Query

```

29 --Ejercicio 7
30 SELECT V.airline aerolinea, V.day dia, COUNT (flight_number), (SELECT CURRENT_USER usuario), (SELECT NOW() fecha_hora)
31 FROM vuelos V JOIN aeropuertos ae ON V.origin_airport = ae.iata_code WHERE ae.city = 'Honolulu' AND V.cancelled IS NOT
32 NULL GROUP BY airline, day;

```

Query History

Data Output

aerolinea	dia	count	usuario	fecha_hora
1 AA	1	80	postgres	2023-06-04 20:28:13.858595-06
2 AA	2	78	postgres	2023-06-04 20:28:13.858595-06
3 AA	3	78	postgres	2023-06-04 20:28:13.858595-06
4 AA	4	81	postgres	2023-06-04 20:28:13.858595-06
5 AA	5	79	postgres	2023-06-04 20:28:13.858595-06
6 AA	6	77	postgres	2023-06-04 20:28:13.858595-06
7 AA	7	78	postgres	2023-06-04 20:28:13.858595-06
8 AA	8	78	postgres	2023-06-04 20:28:13.858595-06
9 AA	9	75	postgres	2023-06-04 20:28:13.858595-06
10 AA	10	76	postgres	2023-06-04 20:28:13.858595-06
11 AA	11	78	postgres	2023-06-04 20:28:13.858595-06
12 AA	12	77	postgres	2023-06-04 20:28:13.858595-06
13 AA	13	79	postgres	2023-06-04 20:28:13.858595-06

Total rows: 217 of 217 Query complete 00:00:01.702

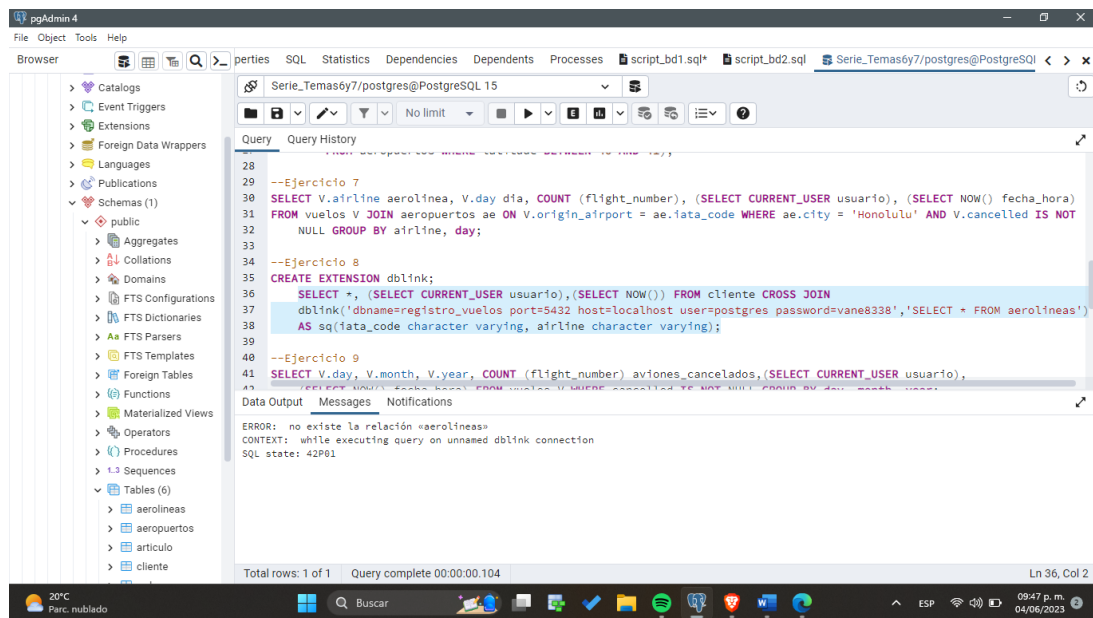
Consulta en texto:

--Ejercicio 7

```
SELECT V.airline aerolinea, V.day dia, COUNT (flight_number), (SELECT  
CURRENT_USER usuario), (SELECT NOW() fecha_hora) FROM vuelos V JOIN  
aeropuertos ae ON V.origin_airport = ae.iata_code WHERE ae.city = 'Honolulu'  
AND V.cancelled IS NOT
```

```
NULL GROUP BY airline, day;
```

8. Hacer un cross join entre la tabla cliente y la tabla aerolíneas.



Se tenía la idea de realizar el cruce entre tablas con dblink, pero por alguna extraña razón no se me permitía ver la consulta pues decía que no existía ninguna relación, no encontré el fallo de la lógica de la consulta por lo que no se logró visualizar el resultado.

Consulta en texto:

--Ejercicio 8

```
CREATE EXTENSION dblink;
```

```
SELECT *, (SELECT CURRENT_USER usuario),(SELECT NOW()) FROM
cliente CROSS JOIN dblink('dbname=registro_vuelos port=5432
host=localhost user=postgres password=vane8338','SELECT * FROM
aerolineas') AS sq(iata_code character varying, airline character varying);
```

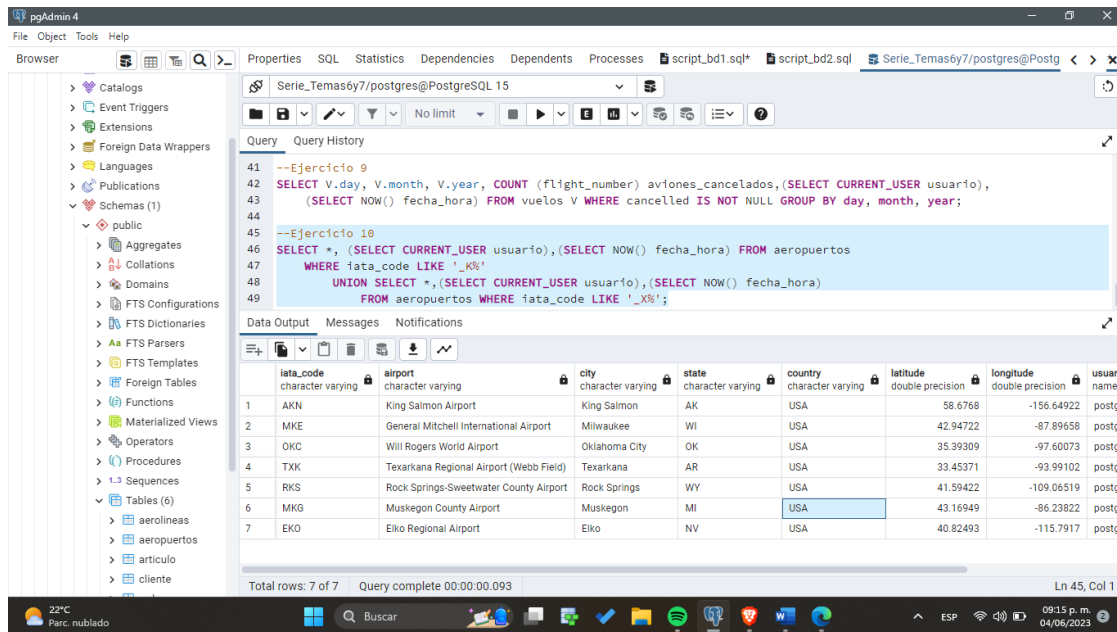
## 9. Cantidad de vuelos cancelados por día.

The screenshot displays the pgAdmin 4 web interface. On the left, the 'Servers' tree is expanded to show the 'public' schema under the 'Serie\_Temas6y7' database. The main window is divided into three panes: 'Query' (containing a SQL query), 'Data Output' (showing the query results), and 'Messages' (empty). The SQL query is a SELECT statement with a GROUP BY clause. The 'Data Output' pane shows a table with 6 columns: day, month, year, aviones\_cancelados, usuario, and fecha\_hora. The table contains 13 rows of data. The status bar at the bottom indicates 'Total rows: 365 of 365' and 'Query complete 00:00:01.664'. The system clock in the bottom right corner shows '08:35 p. m. 04/06/2023'.

Consulta en texto: --Ejercicio 9

```
SELECT      V.day,      V.month,      V.year,      COUNT      (flight_number)
aviones_cancelados,(SELECT  CURRENT_USER  usuario), (SELECT  NOW()
fecha_hora) FROM vuelos V WHERE cancelled IS NOT NULL GROUP BY day, month,
year;
```

10. Seleccionar el nombre de los aeropuertos cuya segunda letra del iata\_code sea 'K' o 'X', sin usar operadores AND, NOT u OR.



Consulta en texto:

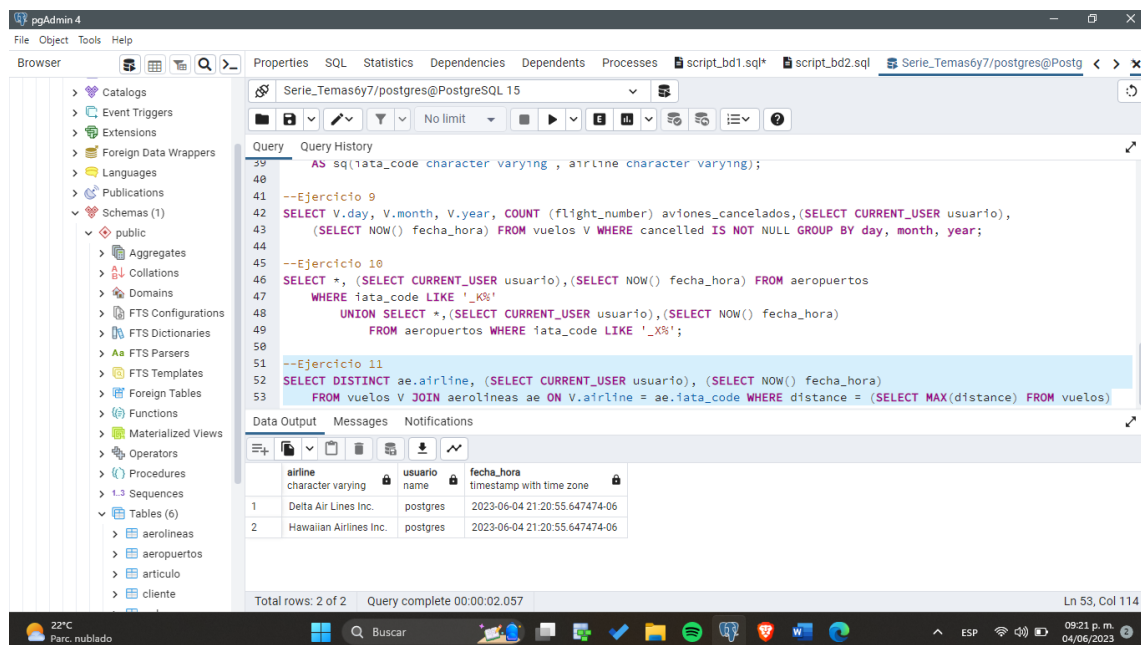
--Ejercicio 10

```

SELECT *, (SELECT CURRENT_USER usuario), (SELECT NOW() fecha_hora)
FROM aeropuertos WHERE iata_code LIKE '_K%' UNION SELECT *, (SELECT
CURRENT_USER usuario), (SELECT NOW() fecha_hora) FROM aeropuertos
WHERE iata_code LIKE '_X%';

```

11. Indicar el nombre(S) de la aerolínea cuya distancia del vuelo es la mayor.

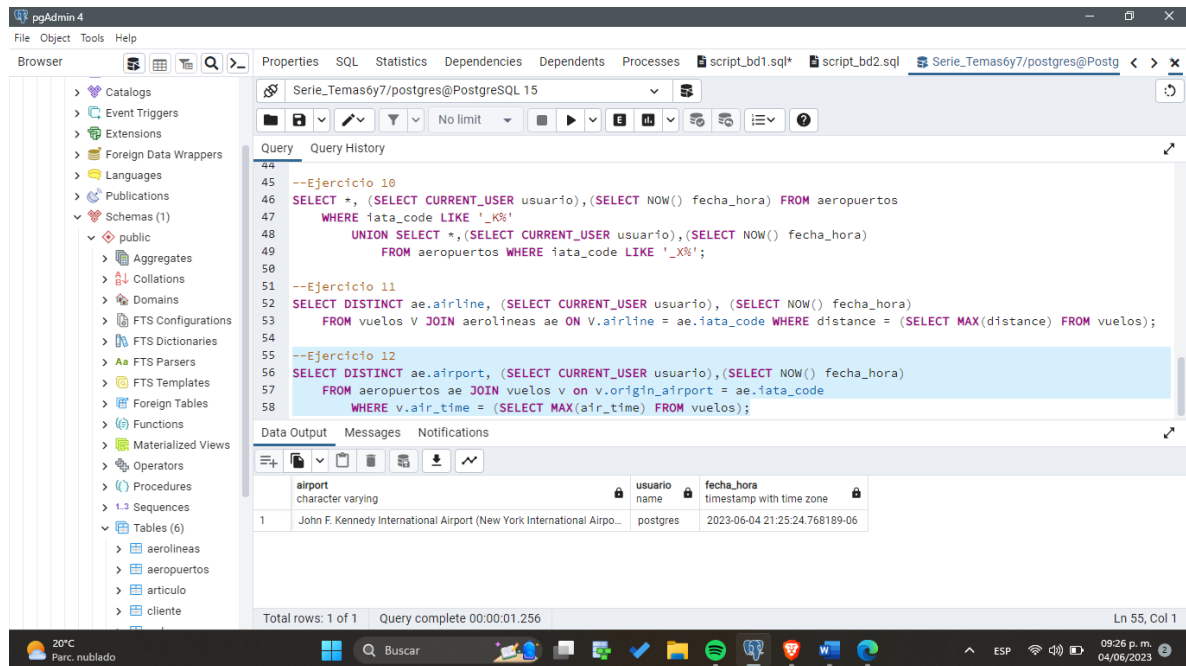


Consulta en texto:

--Ejercicio 11

```
SELECT DISTINCT ae.airline, (SELECT CURRENT_USER usuario), (SELECT NOW() fecha_hora) FROM vuelos V JOIN aerolineas ae ON V.airline = ae.iata_code WHERE distance = (SELECT MAX(distance) FROM vuelos);
```

12. Indicar el nombre del aeropuerto de origen donde se presentó el mayor tiempo de vuelo.



The screenshot shows the pgAdmin 4 interface. The left sidebar displays the database structure, including the 'public' schema and tables 'aerolineas', 'aeropuertos', 'articulo', and 'cliente'. The main pane shows a SQL query for 'Ejercicio 12' which selects the airport name, current user, and current time for the flight with the maximum air time. The 'Data Output' pane shows the results of the query.

airport	usuario	fecha_hora
character varying	name	timestamp with time zone
1 John F. Kennedy International Airport (New York International Airpo...	postgres	2023-06-04 21:25:24.768189-06

Total rows: 1 of 1 Query complete 00:00:01.256 Ln 55, Col 1

Consulta en texto:

--Ejercicio 12

```
SELECT DISTINCT ae.airport, (SELECT CURRENT_USER usuario),(SELECT NOW() fecha_hora) FROM aeropuertos ae JOIN vuelos v on v.origin_airport = ae.iata_code WHERE v.air_time = (SELECT MAX(air_time) FROM vuelos);
```