

MINISTRY OF EDUCATION AND TRAINING  
EASTERN INTERNATIONAL UNIVERSITY



MIS 443  
BUSINESS DATA MANAGEMENT

# Final Exam

Lecturers: *Mr. Dang Thai Doan*  
*Ms. Huynh Tuyen Ngan*

Name	IRN
Lê Nguyễn Tâm Như	2132300065

Quarter 4/2024-2025

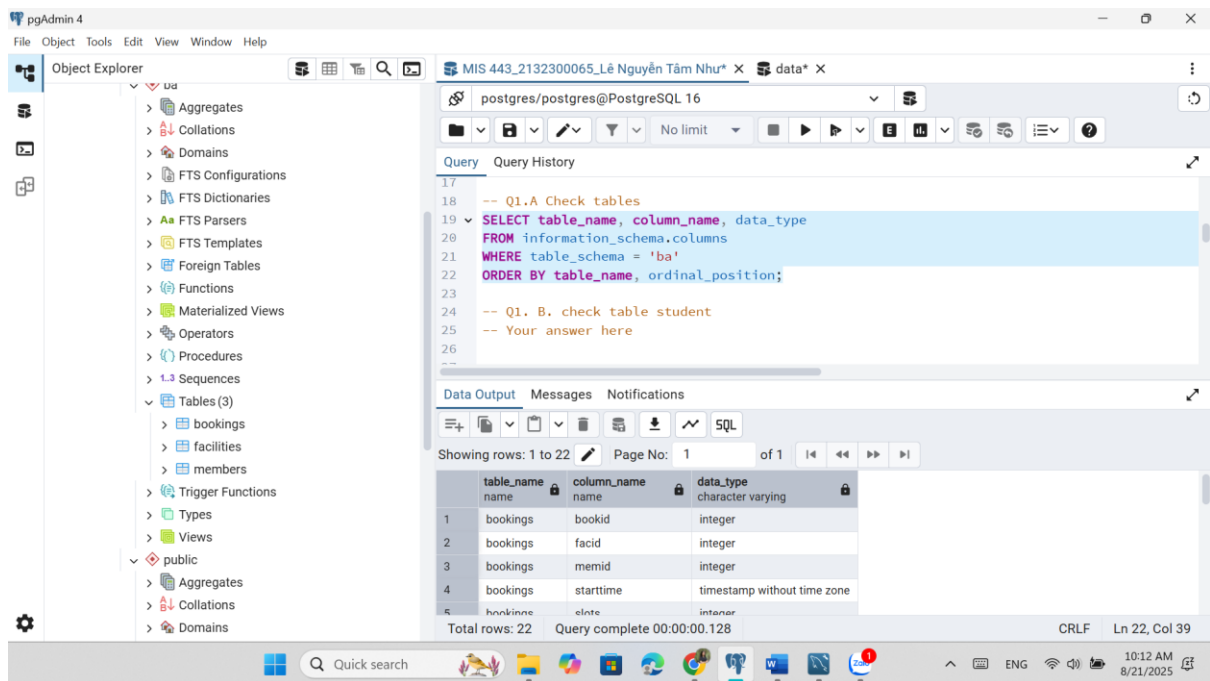
Date Submission: 21/8/2025

Github Link:

**Question 1: Create a database named “yourfullname” (e.g: dangthaidoan”) use PGAdmin, then create a schema name “ba” that has three tables: members, bookings and facilities using SQL statements. Ensure each table includes appropriate primary and foreign keys, and data types.**

### A. Check tables

SQL Query:



The screenshot shows the pgAdmin 4 interface. On the left, the Object Explorer displays the database structure, including a schema named 'public' with tables 'bookings', 'facilities', and 'members'. The main query editor shows the following SQL query:

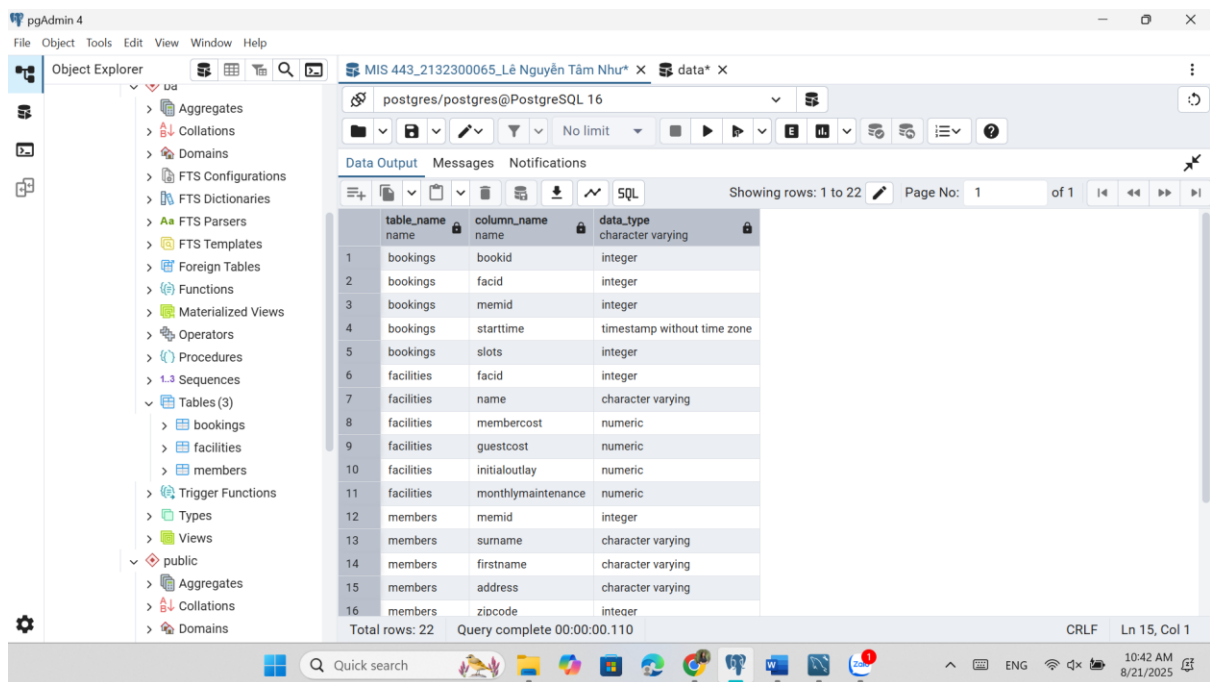
```
-- Q1.A Check tables
SELECT table_name, column_name, data_type
FROM information_schema.columns
WHERE table_schema = 'ba'
ORDER BY table_name, ordinal_position;
```

The query results are displayed in a table with the following columns: table\_name, column\_name, and data\_type. The results show the columns for the 'bookings' table.

	table_name	column_name	data_type
1	bookings	bookid	integer
2	bookings	facid	integer
3	bookings	memid	integer
4	bookings	starttime	timestamp without time zone
5	bookings	elate	integer

The status bar at the bottom indicates 'Total rows: 22' and 'Query complete 00:00:00.128'.

## SQL output:



pgAdmin 4

MIS 443\_2132300065\_Lê Nguyễn Tâm Như\* x data\* x

postgres/postgres@PostgreSQL 16

No limit

Data Output Messages Notifications

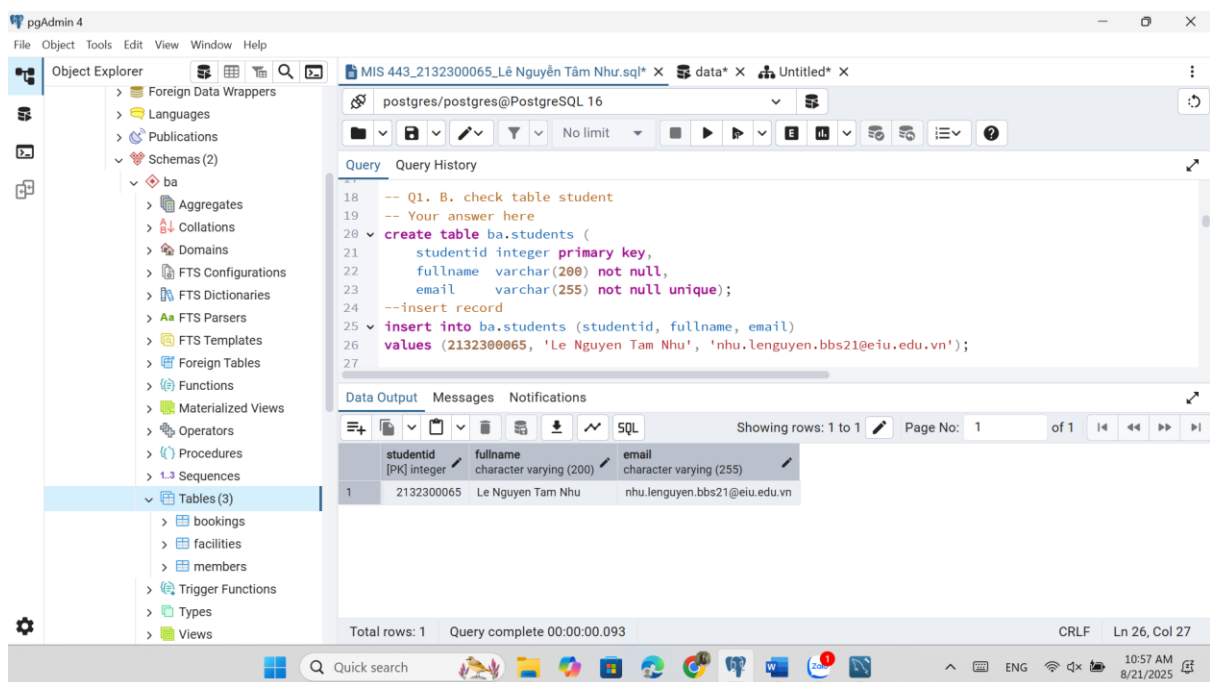
Showing rows: 1 to 22 Page No: 1 of 1

	table_name	column_name	data_type
1	bookings	bookid	integer
2	bookings	facid	integer
3	bookings	memid	integer
4	bookings	starttime	timestamp without time zone
5	bookings	slots	integer
6	facilities	facid	integer
7	facilities	name	character varying
8	facilities	membercost	numeric
9	facilities	guestcost	numeric
10	facilities	initialoutlay	numeric
11	facilities	monthlymaintenance	numeric
12	members	memid	integer
13	members	surname	character varying
14	members	firstname	character varying
15	members	address	character varying
16	members	zipcode	integer

Total rows: 22 Query complete 00:00:00.110 CRLF Ln 15, Col 1

## B. Check table student

### SQL Query:



pgAdmin 4

MIS 443\_2132300065\_Lê Nguyễn Tâm Như.sql\* x data\* x Untitled\* x

postgres/postgres@PostgreSQL 16

No limit

Query Query History

```
-- Q1. B. check table student
-- Your answer here
create table ba.students (
  studentid integer primary key,
  fullname varchar(200) not null,
  email varchar(255) not null unique);
--insert record
insert into ba.students (studentid, fullname, email)
values (2132300065, 'Le Nguyen Tam Nhu', 'nhu.lenguyen.bbs21@eiu.edu.vn');
```

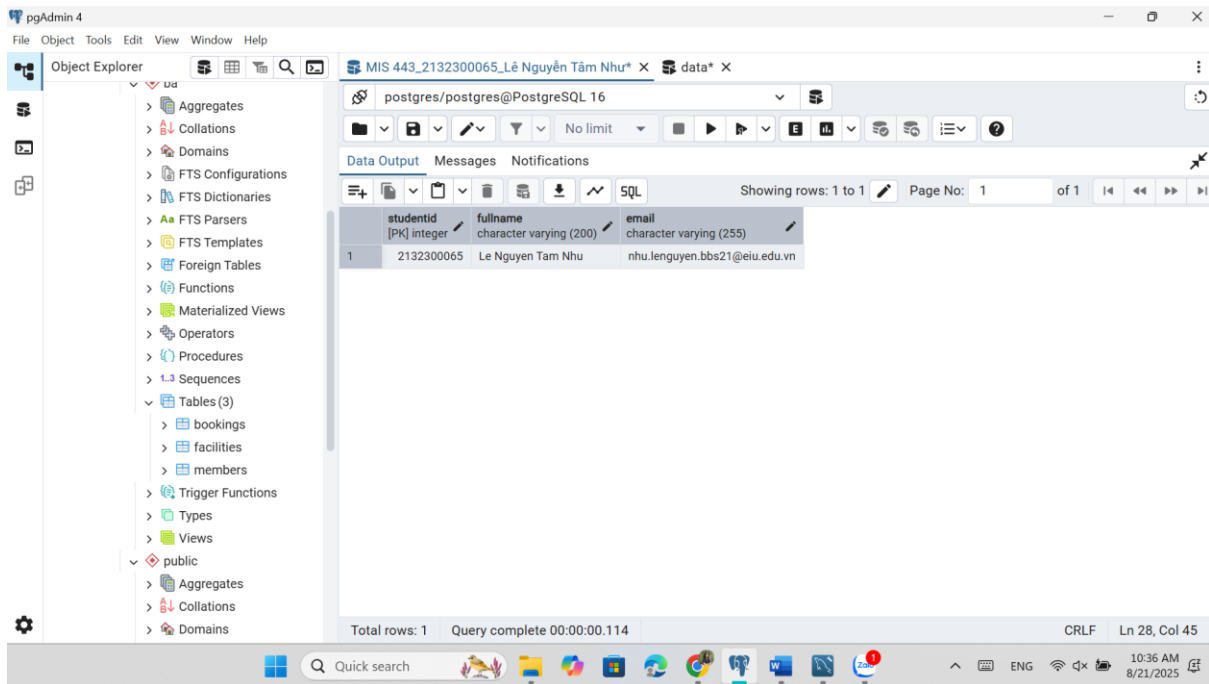
Data Output Messages Notifications

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

	studentid	fullname	email
1	2132300065	Le Nguyen Tam Nhu	nhu.lenguyen.bbs21@eiu.edu.vn

Total rows: 1 Query complete 00:00:00.093 CRLF Ln 26, Col 27

## SQL output:



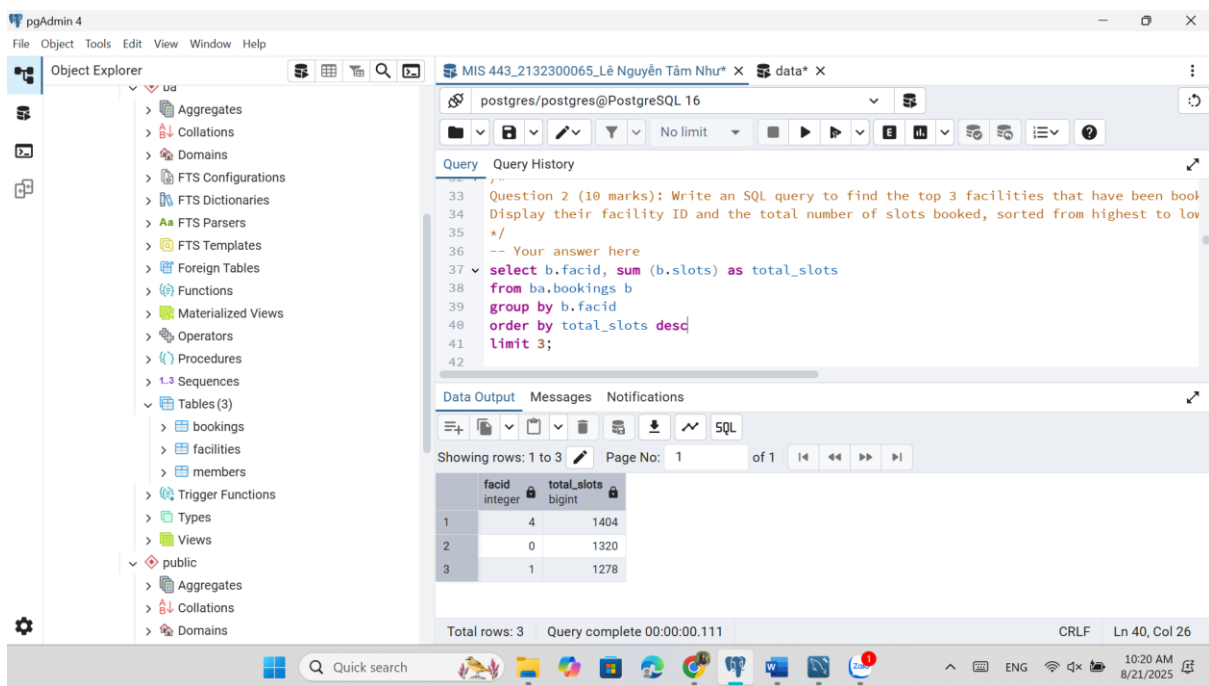
The screenshot shows the pgAdmin 4 interface. On the left, the Object Explorer shows a database named 'MIS 443\_2132300065\_Lê Nguyễn Tâm Như\*' with a table 'data'. The main pane displays the query result for the 'data' table. The table has three columns: 'studentid' (integer), 'fullname' (character varying (200)), and 'email' (character varying (255)). The result shows one row with the following data:

studentid	fullname	email
2132300065	Le Nguyen Tam Nhu	nhu.lenguyen.bbs21@eiu.edu.vn

Total rows: 1 Query complete 00:00:00.114

**Question 2: Write an SQL query to find the top 3 facilities that have been booked the most number of total slots (not just number of bookings). Display their facility ID and the total number of slots booked, sorted from highest to lowest.**

## SQL Query:



The screenshot shows the pgAdmin 4 interface. The main pane displays the SQL query:

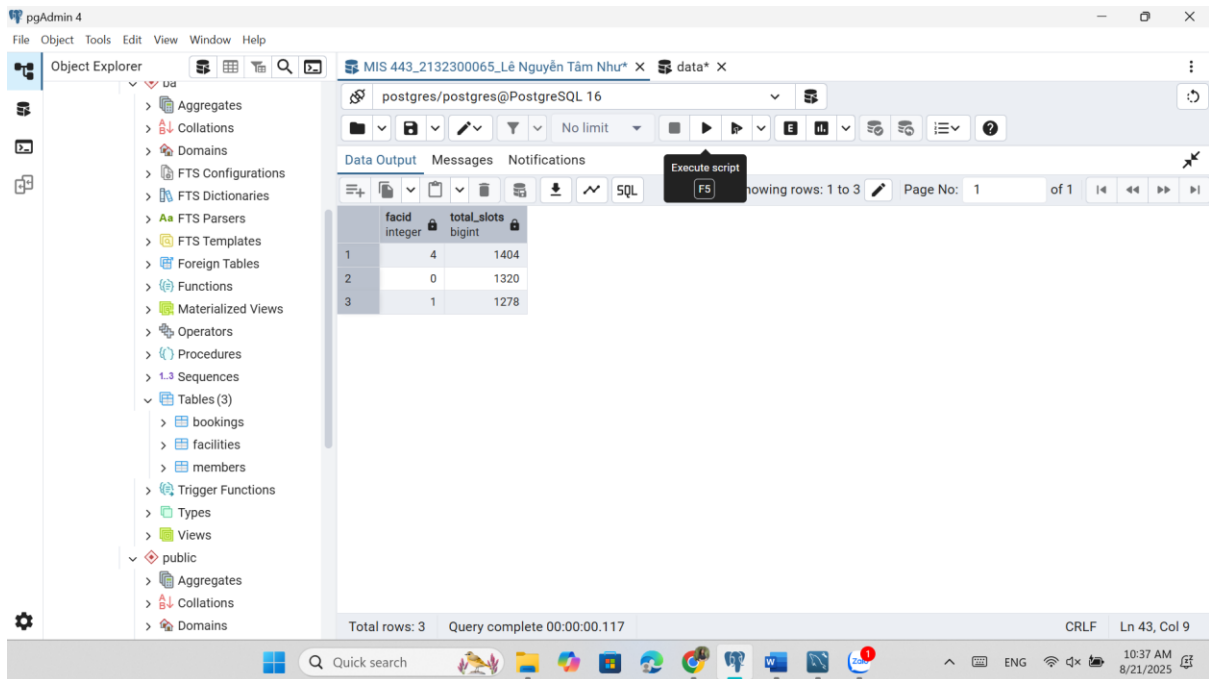
```
select b.facid, sum(b.slots) as total_slots
from ba.bookings b
group by b.facid
order by total_slots desc
limit 3;
```

The query result shows the top 3 facilities with the most total slots booked:

facid	total_slots
1	1404
2	1320
3	1278

Total rows: 3 Query complete 00:00:00.111

## SQL output:



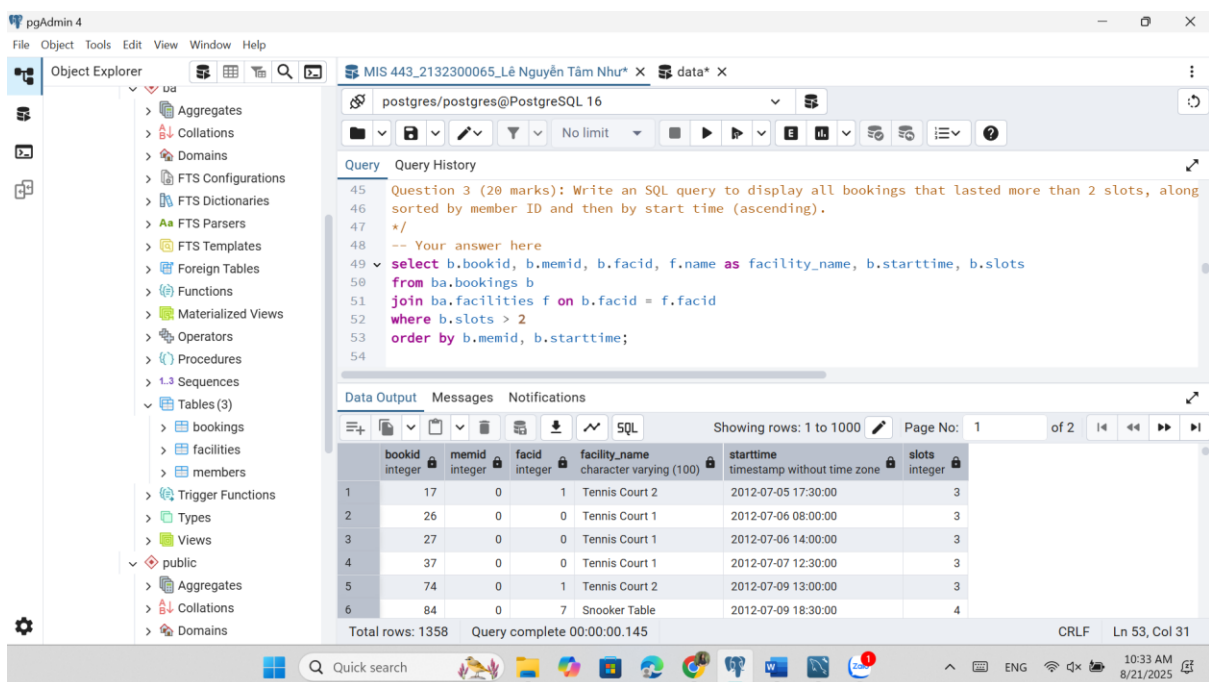
The screenshot shows the pgAdmin 4 interface. The Object Explorer on the left shows the database structure. The main window displays the results of a query. The query results are shown in a table with the following data:

	facid	total_slots
1	4	1404
2	0	1320
3	1	1278

Total rows: 3 Query complete 00:00:00.117

**Question 3: Write an SQL query to display all bookings that lasted more than 2 slots, along with the member ID, facility ID, and facility name, sorted by member ID and then by start time (ascending).**

## SQL Query:

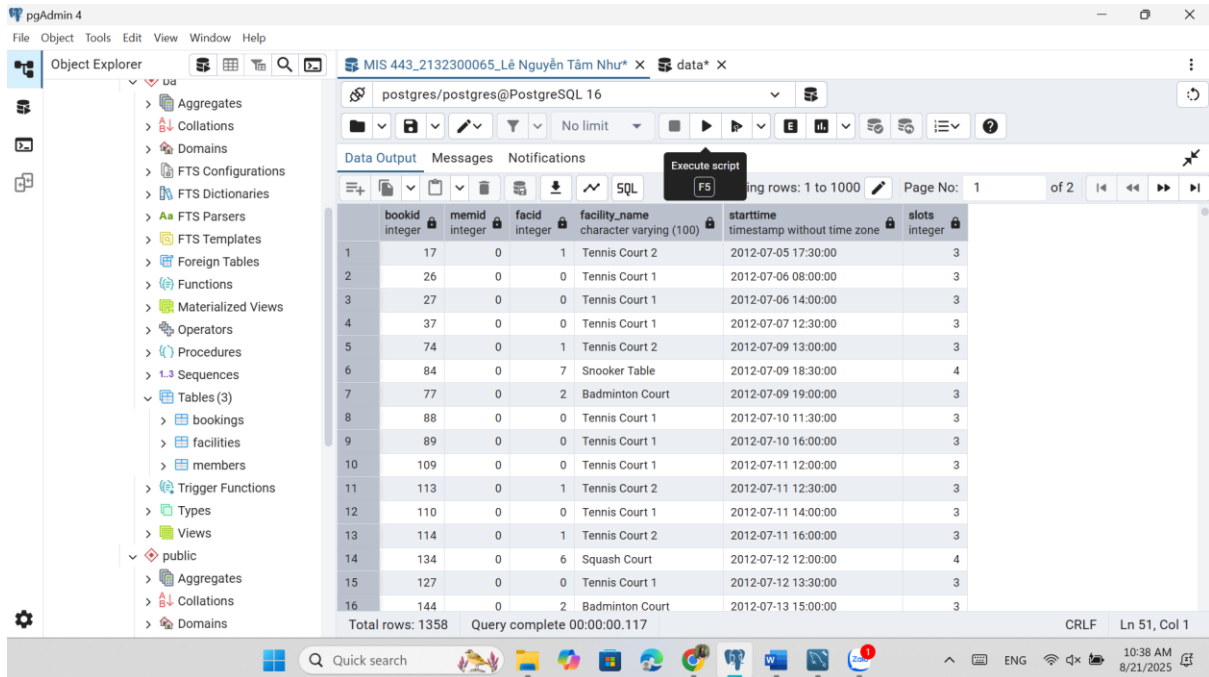


The screenshot shows the pgAdmin 4 interface. The Object Explorer on the left shows the database structure. The main window displays the results of a query. The query results are shown in a table with the following data:

	bookid	memid	facid	facility_name	starttime	slots
1	17	0	1	Tennis Court 2	2012-07-05 17:30:00	3
2	26	0	0	Tennis Court 1	2012-07-06 08:00:00	3
3	27	0	0	Tennis Court 1	2012-07-06 14:00:00	3
4	37	0	0	Tennis Court 1	2012-07-07 12:30:00	3
5	74	0	1	Tennis Court 2	2012-07-09 13:00:00	3
6	84	0	7	Snooker Table	2012-07-09 18:30:00	4

Total rows: 1358 Query complete 00:00:00.145

## SQL output:



pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

- Aggregates
- Collations
- Domains
- FTS Configurations
- FTS Dictionaries
- FTS Parsers
- FTS Templates
- Foreign Tables
- Functions
- Materialized Views
- Operators
- Procedures
- Sequences
- Tables (3)
  - bookings
  - facilities
  - members
- Trigger Functions
- Types
- Views
- public
  - Aggregates
  - Collations
  - Domains

postgres/postgres@PostgreSQL 16

Data Output Messages Notifications

Execute script

Showing rows: 1 to 1000 Page No: 1 of 2

	bookid integer	memid integer	facid integer	facility_name character varying (100)	starttime timestamp without time zone	slots integer
1	17	0	1	Tennis Court 2	2012-07-05 17:30:00	3
2	26	0	0	Tennis Court 1	2012-07-06 08:00:00	3
3	27	0	0	Tennis Court 1	2012-07-06 14:00:00	3
4	37	0	0	Tennis Court 1	2012-07-07 12:30:00	3
5	74	0	1	Tennis Court 2	2012-07-09 13:00:00	3
6	84	0	7	Snooker Table	2012-07-09 18:30:00	4
7	77	0	2	Badminton Court	2012-07-09 19:00:00	3
8	88	0	0	Tennis Court 1	2012-07-10 11:30:00	3
9	89	0	0	Tennis Court 1	2012-07-10 16:00:00	3
10	109	0	0	Tennis Court 1	2012-07-11 12:00:00	3
11	113	0	1	Tennis Court 2	2012-07-11 12:30:00	3
12	110	0	0	Tennis Court 1	2012-07-11 14:00:00	3
13	114	0	1	Tennis Court 2	2012-07-11 16:00:00	3
14	134	0	6	Squash Court	2012-07-12 12:00:00	4
15	127	0	0	Tennis Court 1	2012-07-12 13:30:00	3
16	144	0	2	Badminton Court	2012-07-13 15:00:00	3

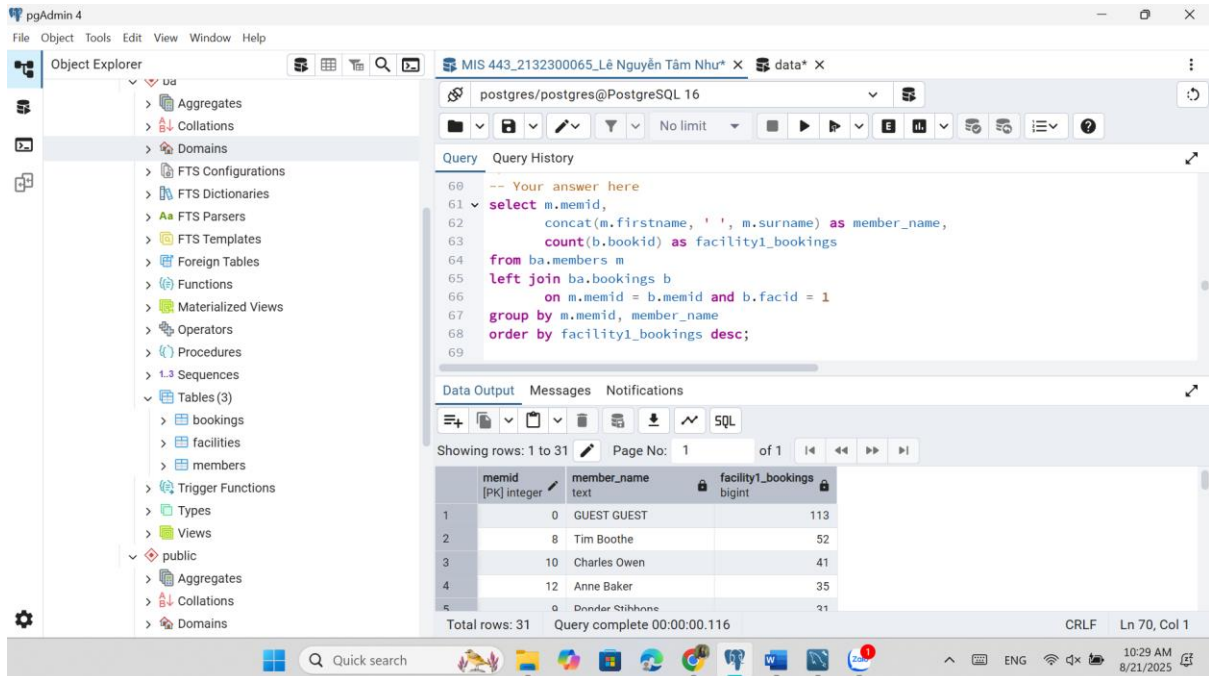
Total rows: 1358 Query complete 00:00:00.117 CRLF Ln 51, Col 1

Quick search

10:38 AM 8/21/2025

**Question 4: Write an SQL query to display each member and the number of bookings they made for facility ID = 1. Include all members, even those who have never booked that facility.**

SQL Query:



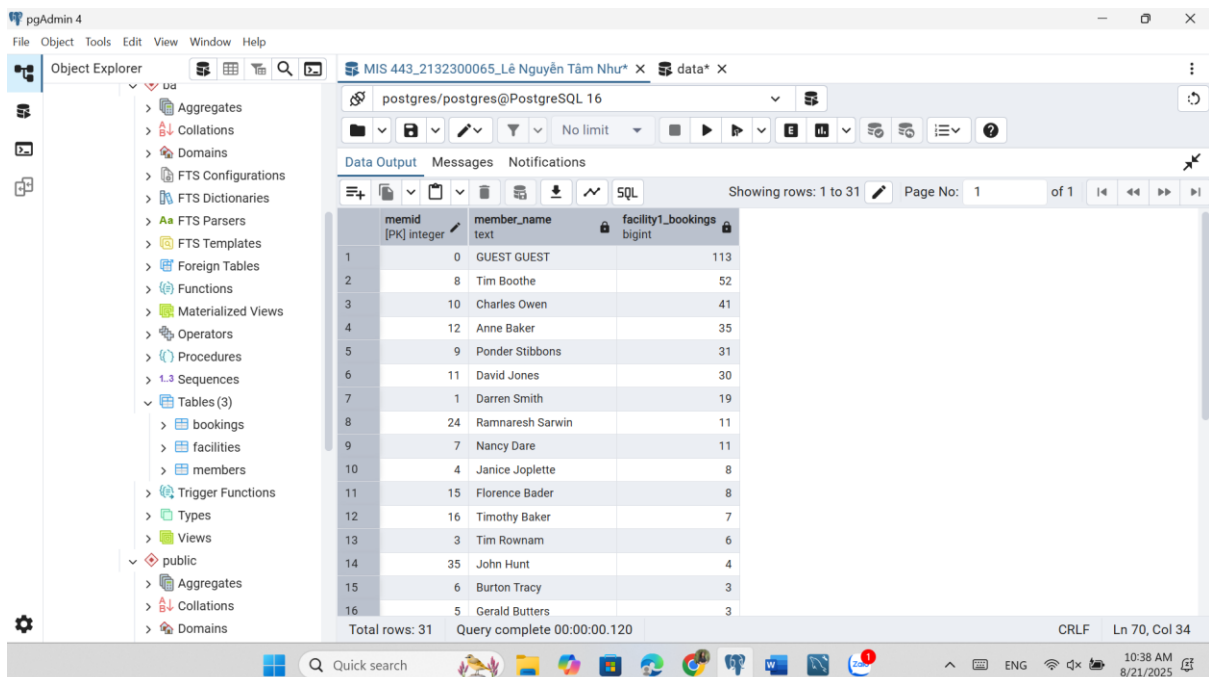
The screenshot shows the pgAdmin 4 interface. The SQL query is as follows:

```
-- Your answer here
select m.memid,
       concat(m.firstname, ' ', m.surname) as member_name,
       count(b.bookid) as facility1_bookings
from ba.members m
left join ba.bookings b
on m.memid = b.memid and b.facid = 1
group by m.memid, member_name
order by facility1_bookings desc;
```

The query output is displayed in a table with the following data:

memid	member_name	facility1_bookings
0	GUEST GUEST	113
8	Tim Boothe	52
10	Charles Owen	41
12	Anne Baker	35
9	Ponder Stibbons	31
11	David Jones	30
1	Darren Smith	19
24	Ramnaresh Sarwin	11
7	Nancy Dare	11
4	Janice Joplette	8
15	Florence Bader	8
16	Timothy Baker	7
3	Tim Rownam	6
35	John Hunt	4
6	Burton Tracy	3
5	Gerald Butters	3

SQL output:

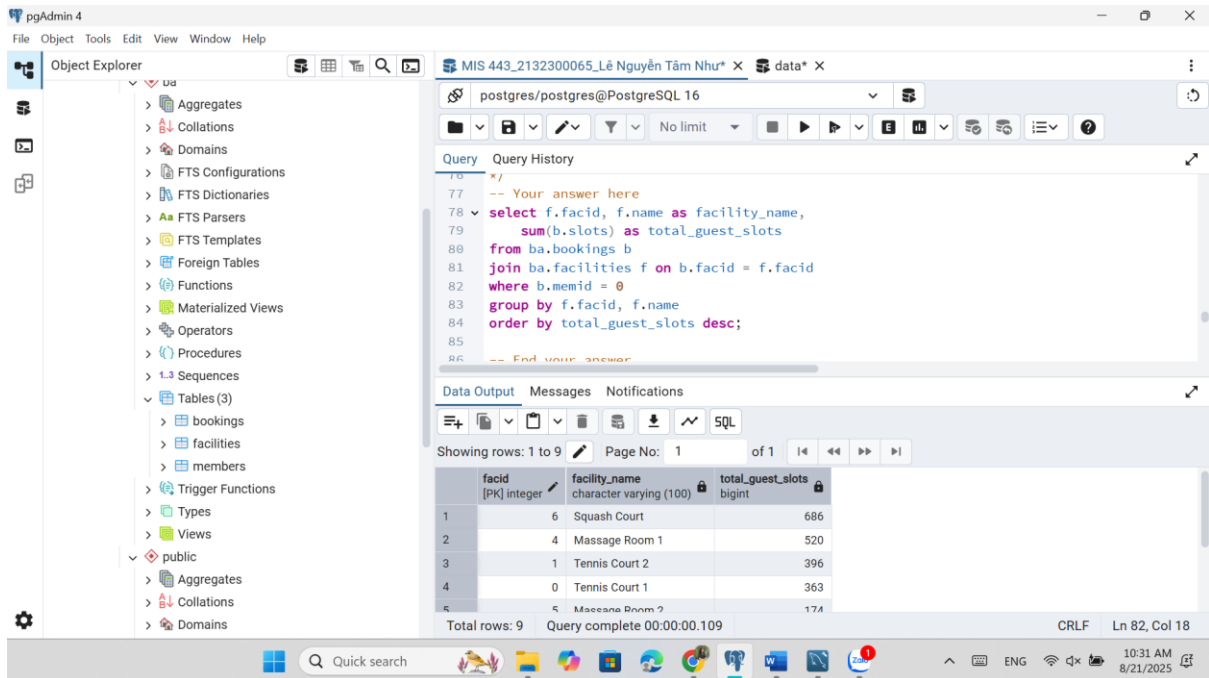


The screenshot shows the pgAdmin 4 interface with the SQL output table displayed. The table contains 31 rows of data, sorted by the number of bookings for facility 1 in descending order.

memid	member_name	facility1_bookings
0	GUEST GUEST	113
8	Tim Boothe	52
10	Charles Owen	41
12	Anne Baker	35
9	Ponder Stibbons	31
11	David Jones	30
1	Darren Smith	19
24	Ramnaresh Sarwin	11
7	Nancy Dare	11
4	Janice Joplette	8
15	Florence Bader	8
16	Timothy Baker	7
3	Tim Rownam	6
35	John Hunt	4
6	Burton Tracy	3
5	Gerald Butters	3

**Question 5: Write an SQL query to show the total number of slots booked by guests (memid = 0) for each facility. Include the facility name and display the result in descending order of total slots used.**

SQL Query:



The screenshot shows the pgAdmin 4 interface. The left pane displays the Object Explorer with the database structure. The right pane shows the SQL query editor with the following query:

```

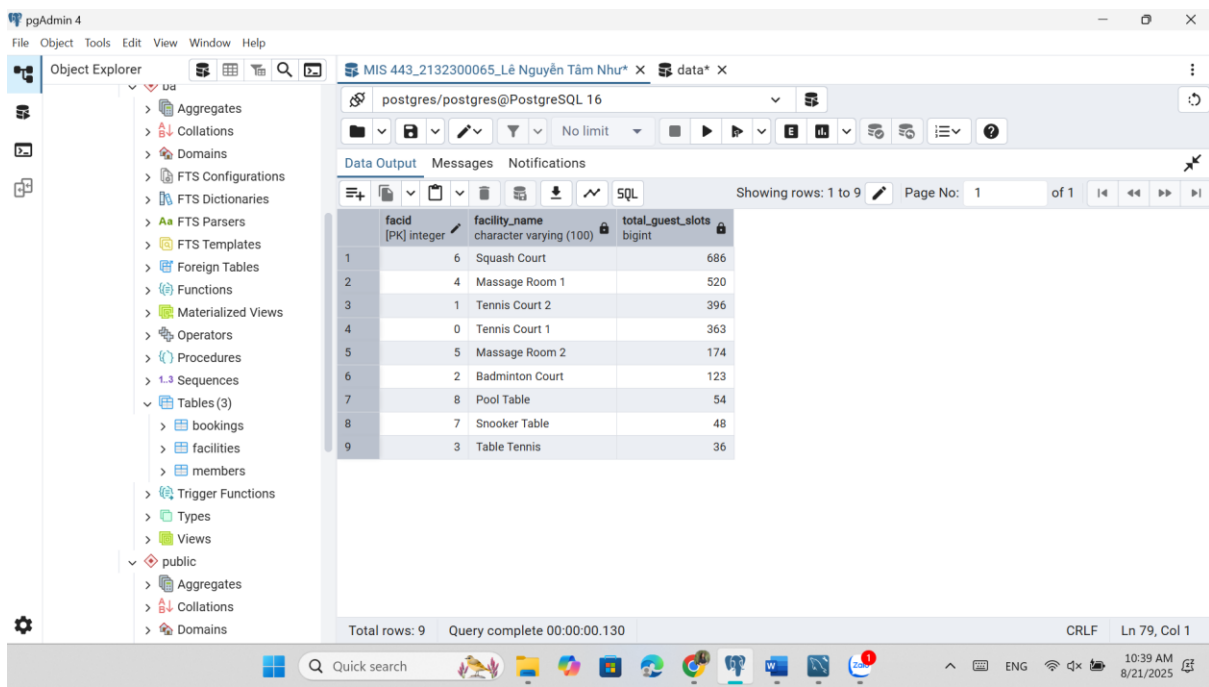
-- Your answer here
select f.facid, f.name as facility_name,
       sum(b.slots) as total_guest_slots
from ba.bookings b
join ba.facilities f on b.facid = f.facid
where b.memid = 0
group by f.facid, f.name
order by total_guest_slots desc;
-- End your answer

```

Below the query editor, the Data Output tab shows the results of the query. The output is a table with 9 rows and 3 columns: facid, facility\_name, and total\_guest\_slots. The results are sorted in descending order of total\_guest\_slots.

facid	facility_name	total_guest_slots
6	Squash Court	686
4	Massage Room 1	520
1	Tennis Court 2	396
0	Tennis Court 1	363
5	Massage Room 2	174
2	Badminton Court	123
8	Pool Table	54
7	Snooker Table	48
3	Table Tennis	36

SQL output:



The screenshot shows the pgAdmin 4 interface. The left pane displays the Object Explorer with the database structure. The right pane shows the SQL query editor with the following query:

```

-- Your answer here
select f.facid, f.name as facility_name,
       sum(b.slots) as total_guest_slots
from ba.bookings b
join ba.facilities f on b.facid = f.facid
where b.memid = 0
group by f.facid, f.name
order by total_guest_slots desc;
-- End your answer

```

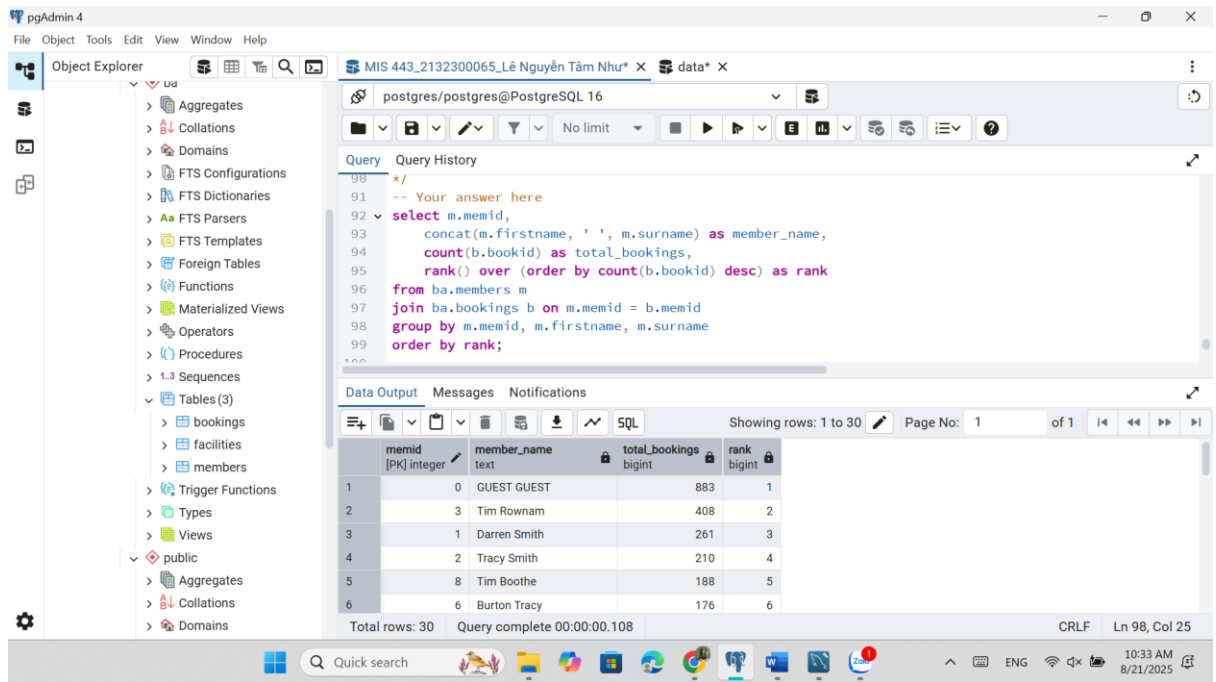
Below the query editor, the Data Output tab shows the results of the query. The output is a table with 9 rows and 3 columns: facid, facility\_name, and total\_guest\_slots. The results are sorted in descending order of total\_guest\_slots.

facid	facility_name	total_guest_slots
6	Squash Court	686
4	Massage Room 1	520
1	Tennis Court 2	396
0	Tennis Court 1	363
5	Massage Room 2	174
2	Badminton Court	123
8	Pool Table	54
7	Snooker Table	48
3	Table Tennis	36



**Question 6: Write an SQL query to rank members based on their total number of bookings. Members with the same number of bookings should have the same rank. Only include members who have made at least one booking**

SQL Query:



The screenshot shows the pgAdmin 4 interface. The SQL query is as follows:

```

-- Your answer here
select m.memid,
       concat(m.firstname, ' ', m.surname) as member_name,
       count(b.bookid) as total_bookings,
       rank() over (order by count(b.bookid) desc) as rank
from ba.members m
join ba.bookings b on m.memid = b.memid
group by m.memid, m.firstname, m.surname
order by rank;

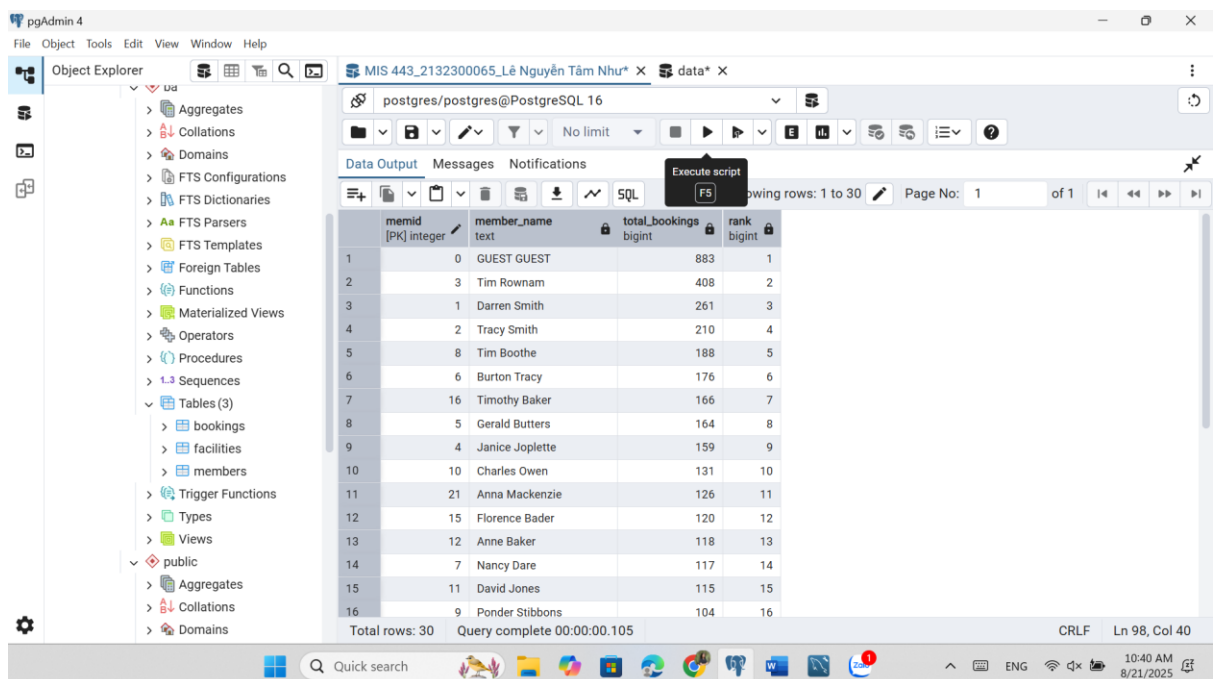
```

The Data Output tab shows the following results:

memid [PK] integer	member_name text	total_bookings bigint	rank bigint
1	0 GUEST GUEST	883	1
2	3 Tim Rownam	408	2
3	1 Darren Smith	261	3
4	2 Tracy Smith	210	4
5	8 Tim Boothe	188	5
6	6 Burton Tracy	176	6

Total rows: 30 Query complete 00:00:00.108

SQL output:



The screenshot shows the pgAdmin 4 interface with the SQL output displayed. The results are as follows:

memid [PK] integer	member_name text	total_bookings bigint	rank bigint
1	0 GUEST GUEST	883	1
2	3 Tim Rownam	408	2
3	1 Darren Smith	261	3
4	2 Tracy Smith	210	4
5	8 Tim Boothe	188	5
6	6 Burton Tracy	176	6
7	16 Timothy Baker	166	7
8	5 Gerald Butters	164	8
9	4 Janice Joplette	159	9
10	10 Charles Owen	131	10
11	21 Anna Mackenzie	126	11
12	15 Florence Bader	120	12
13	12 Anne Baker	118	13
14	7 Nancy Dare	117	14
15	11 David Jones	115	15
16	9 Ponder Stibbons	104	16

Total rows: 30 Query complete 00:00:00.105

