

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

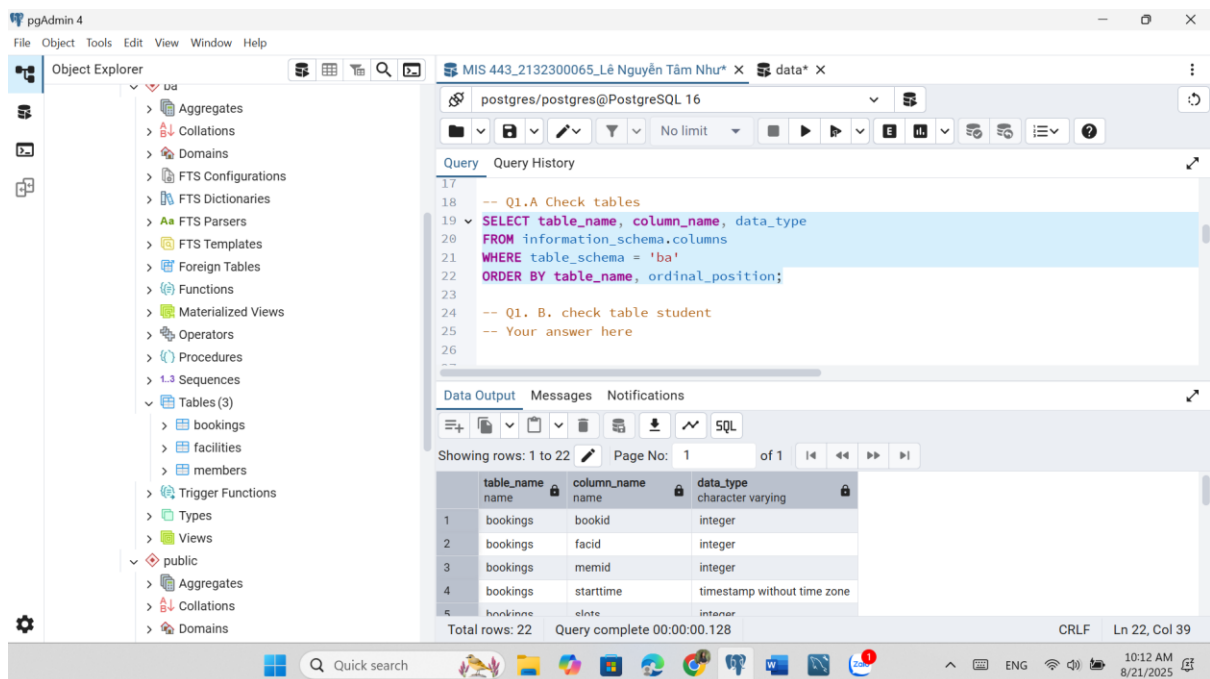
Quarter 4/2024-2025

Date Submission: 21/8/2025

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 shows the database structure, including a schema named 'ba' with three tables: bookings, facilities, and members. The main pane displays a SQL query in the Query Editor, and the Data Output pane shows the results of the query.

SQL Query:

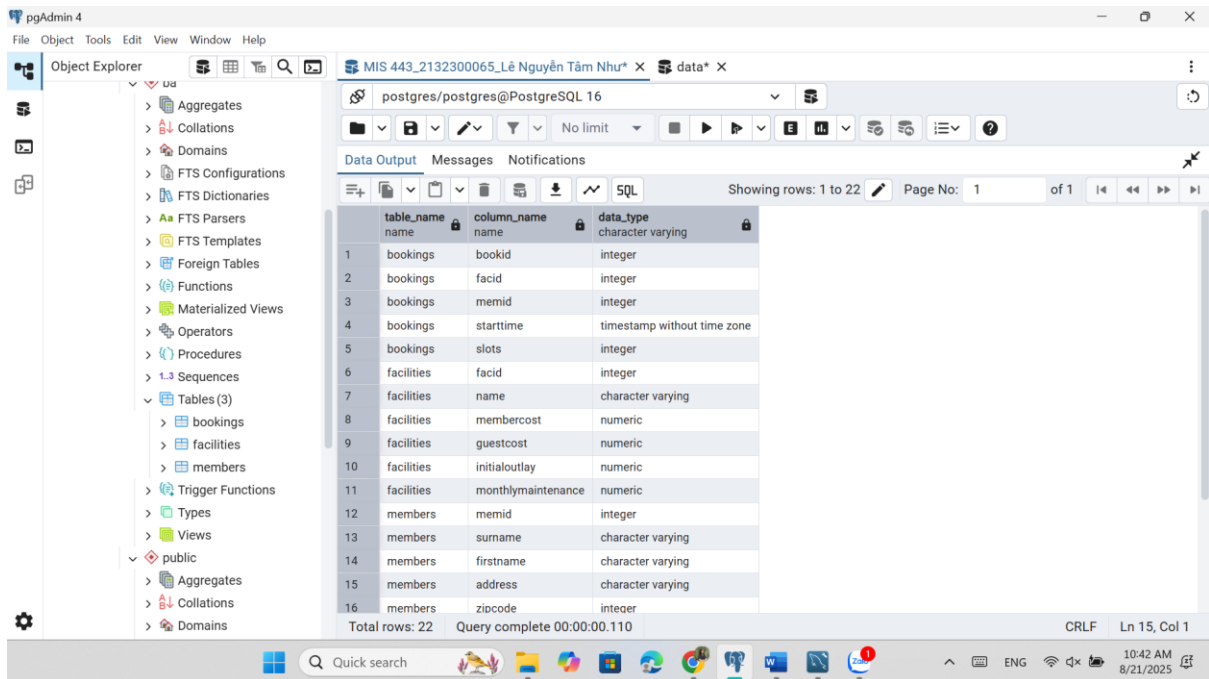
```
-- Q1.A Check tables
SELECT table_name, column_name, data_type
FROM information_schema.columns
WHERE table_schema = 'ba'
ORDER BY table_name, ordinal_position;
```

Data Output:

table_name	column_name	data_type
bookings	bookid	integer
bookings	facid	integer
bookings	memid	integer
bookings	starttime	timestamp without time zone

Total rows: 22 Query complete 00:00:00.128

SQL output:

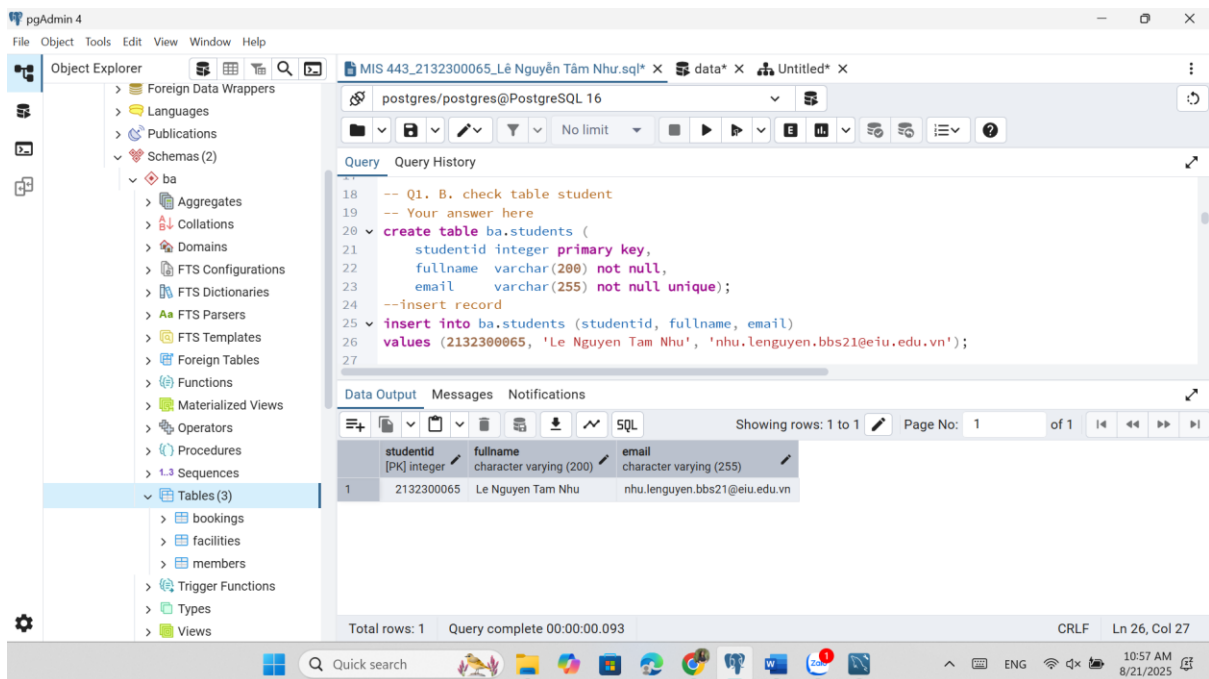


The screenshot shows the pgAdmin 4 interface. The left pane displays the Object Explorer with the 'public' schema selected. The right pane shows the SQL output of a query. The query lists the columns and data types for the 'bookings' and 'members' tables in the 'public' schema.

table_name	column_name	data_type
bookings	bookid	integer
bookings	facid	integer
bookings	memid	integer
bookings	starttime	timestamp without time zone
bookings	slots	integer
facilities	facid	integer
facilities	name	character varying
facilities	membercost	numeric
facilities	guestcost	numeric
facilities	initialoutlay	numeric
facilities	monthlymaintenance	numeric
members	memid	integer
members	surname	character varying
members	firstname	character varying
members	address	character varying
members	zipcode	integer

B. Check table student

SQL Query:

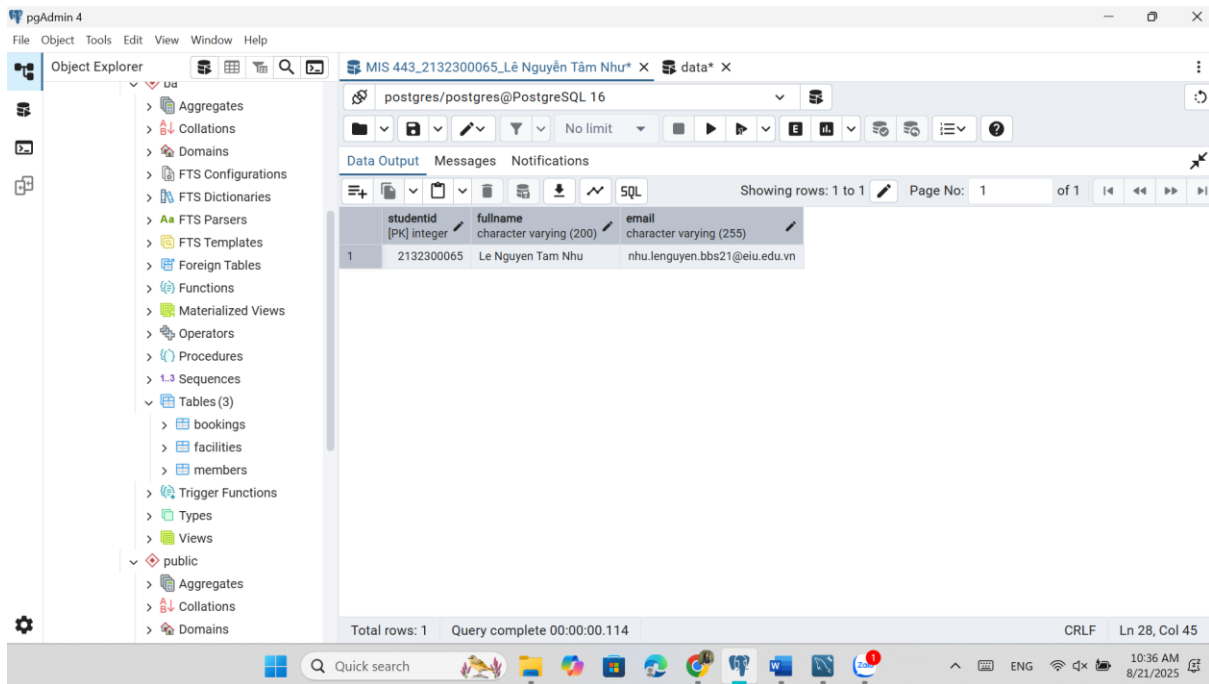


The screenshot shows the pgAdmin 4 interface. The left pane displays the Object Explorer with the 'ba' schema selected. The right pane shows the SQL query and its output. The query creates a table 'ba.students' and inserts a record.

```
-- 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');
```

studentid [PK] integer	fullname character varying (200)	email character varying (255)
2132300065	Le Nguyen Tam Nhu	nhu.lenguyen.bbs21@eiu.edu.vn

SQL output:

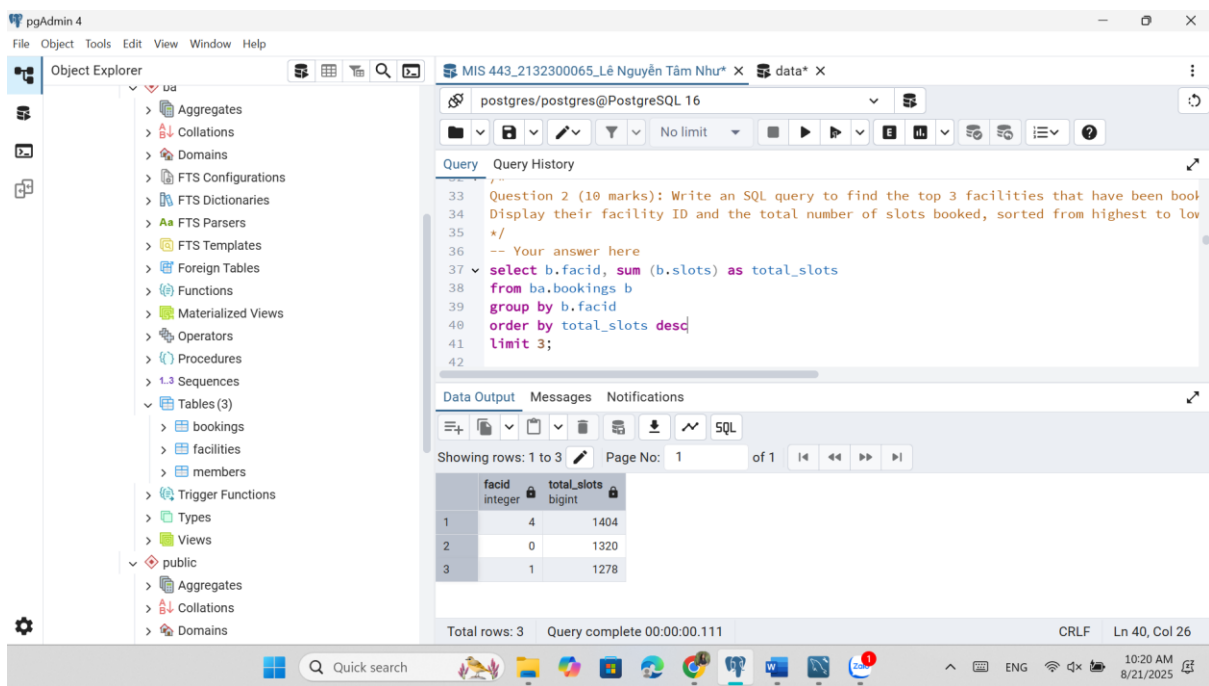


The screenshot shows the pgAdmin 4 interface. On the left, the Object Explorer displays a tree view of the database schema, including tables like 'bookings', 'facilities', and 'members'. The main pane shows the 'Data Output' tab for a query executed on the 'postgres/postgres@PostgreSQL 16' database. The query result is displayed as a table with 1 row and 3 columns: 'studentid', 'fullname', and 'email'. The data for the first row is: studentid 2132300065, fullname Le Nguyen Tam Nhu, and email nhu.lenguyen.bbs21@eiu.edu.vn.

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

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:



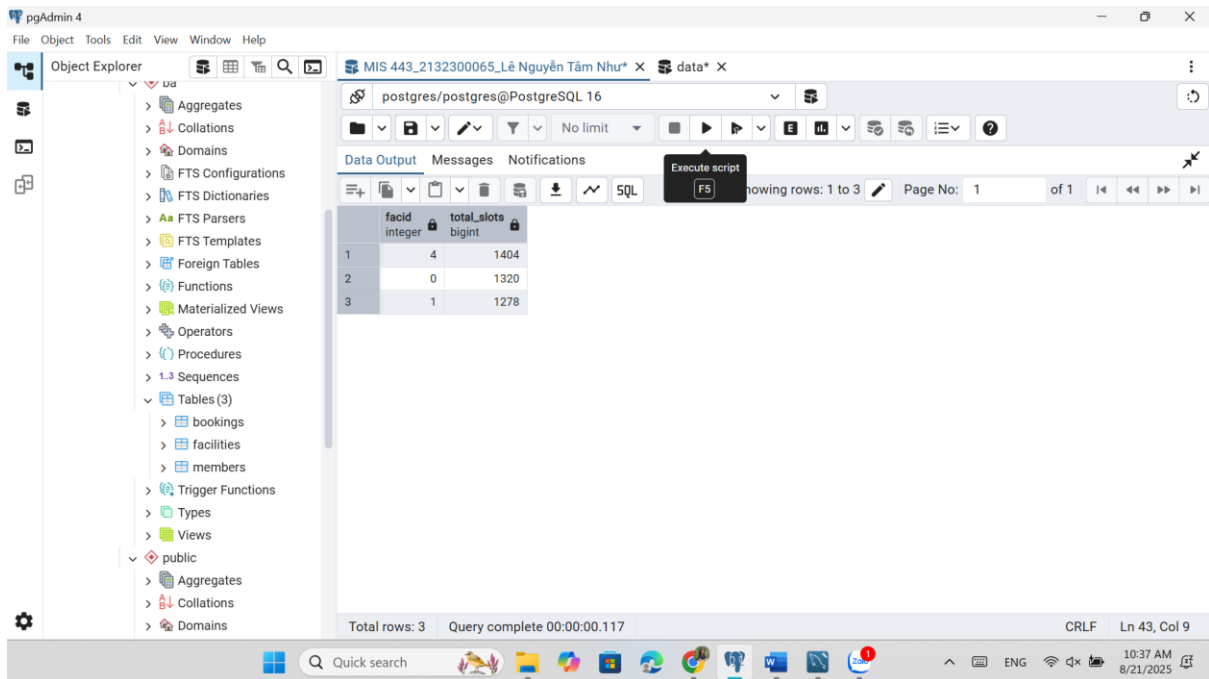
The screenshot shows the pgAdmin 4 interface with the 'Query' tab selected. The query editor contains the following SQL code:

```
33 Question 2 (10 marks): 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.
34
35 -- Your answer here
36
37 select b.facid, sum(b.slots) as total_slots
38 from ba.bookings b
39 group by b.facid
40 order by total_slots desc
41 limit 3;
```

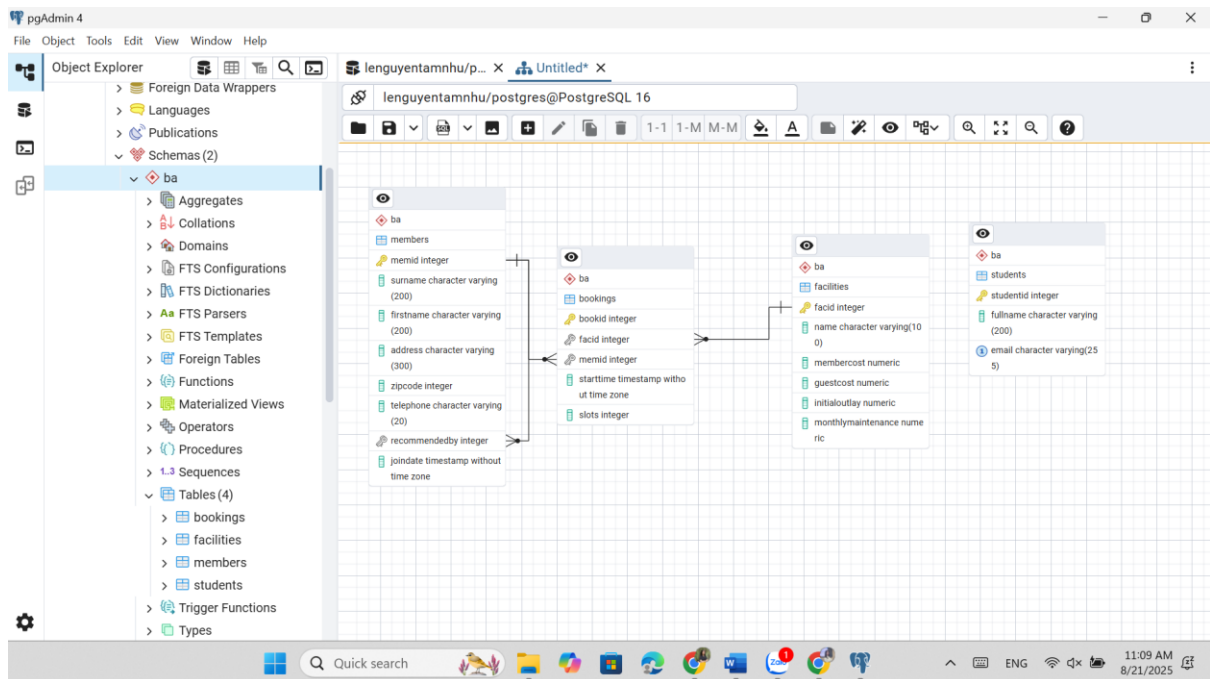
The 'Data Output' tab shows the result of the query, which is a table with 3 rows and 2 columns: 'facid' and 'total_slots'. The data for the first three rows is: facid 1, total_slots 1404; facid 2, total_slots 1320; and facid 3, total_slots 1278.

facid	total_slots
1	1404
2	1320
3	1278

SQL output:



	facid integer	total_slots bigint
1	4	1404
2	0	1320
3	1	1278



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:

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

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postgres/postgres@PostgreSQL 16

Query History

```

45 Question 3 (20 marks): Write an SQL query to display all bookings that lasted more than 2 slots, along
46 sorted by member ID and then by start time (ascending).
47 */
48 -- Your answer here
49 select b.bookid, b.memid, b.facid, f.name as facility_name, b.starttime, b.slots
50 from ba.bookings b
51 join ba.facilities f on b.facid = f.facid
52 where b.slots > 2
53 order by b.memid, b.starttime;
54

```

Data Output Messages Notifications

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

Total rows: 1358 Query complete 00:00:00.145 CRLF Ln 53, Col 31

Quick search

10:33 AM 8/21/2025

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
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postgres/postgres@PostgreSQL 16

Data Output Messages Notifications

Execute script FS

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

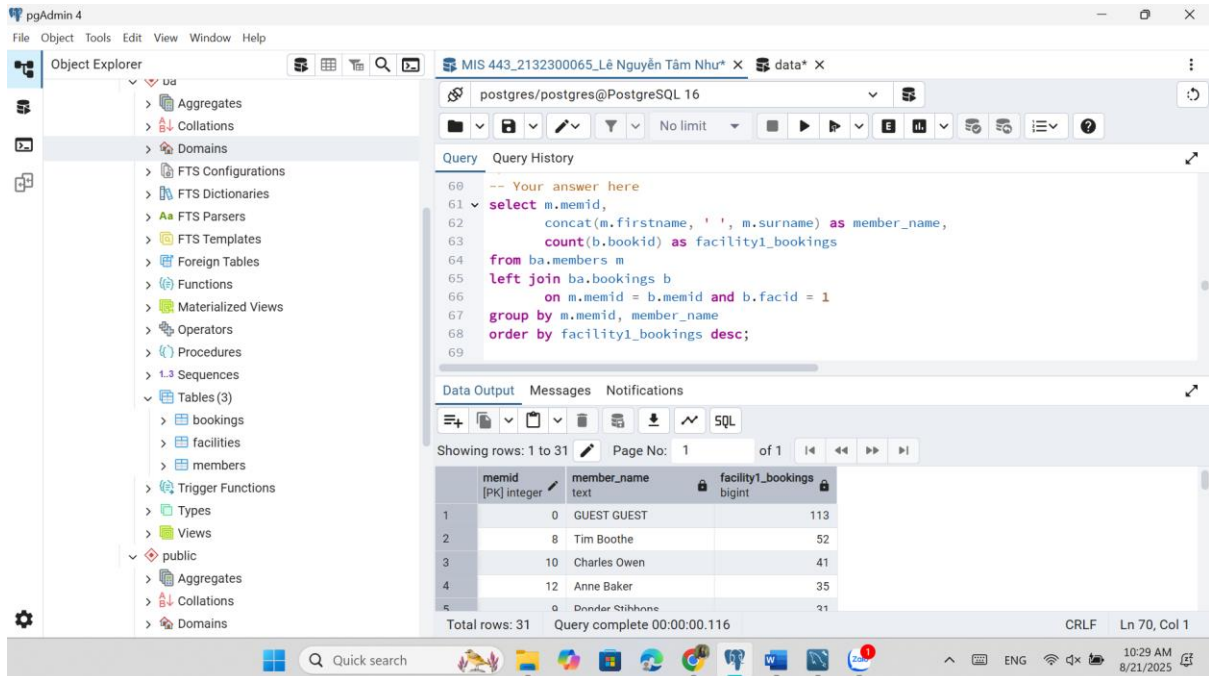
Total rows: 1358 Query complete 00:00:00.117 CRLF Ln 51, Col 1

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:



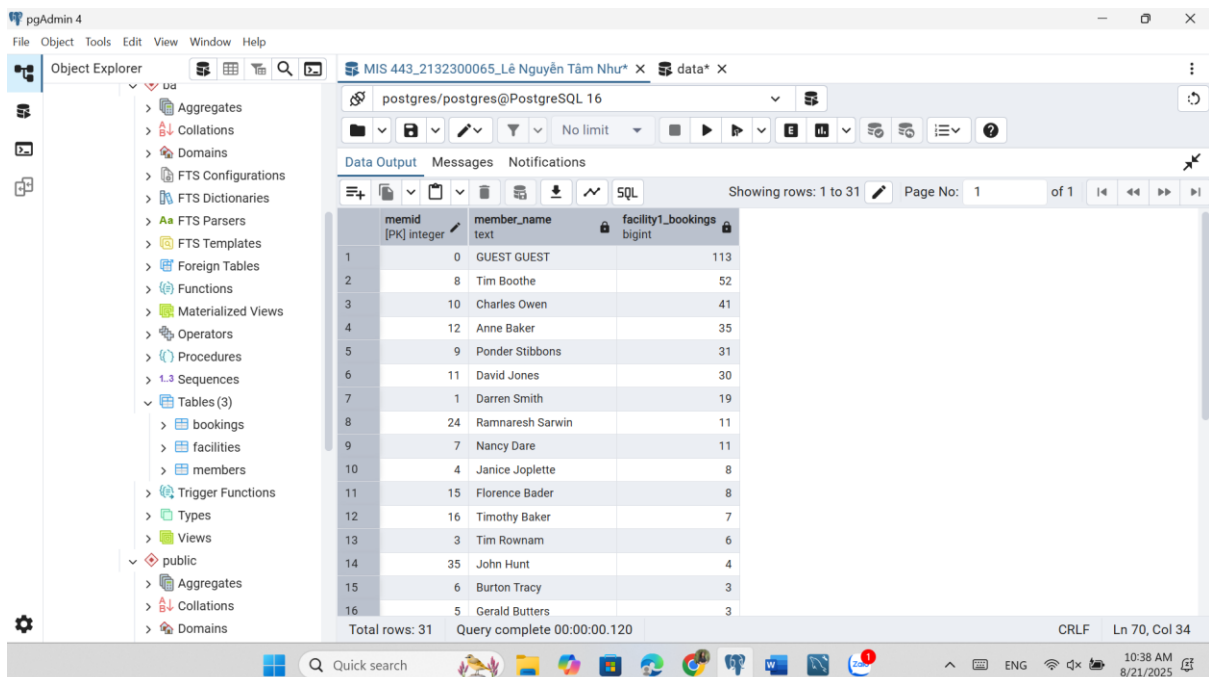
The screenshot shows the pgAdmin 4 interface. The SQL query is as follows:

```
-- 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 results are 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:

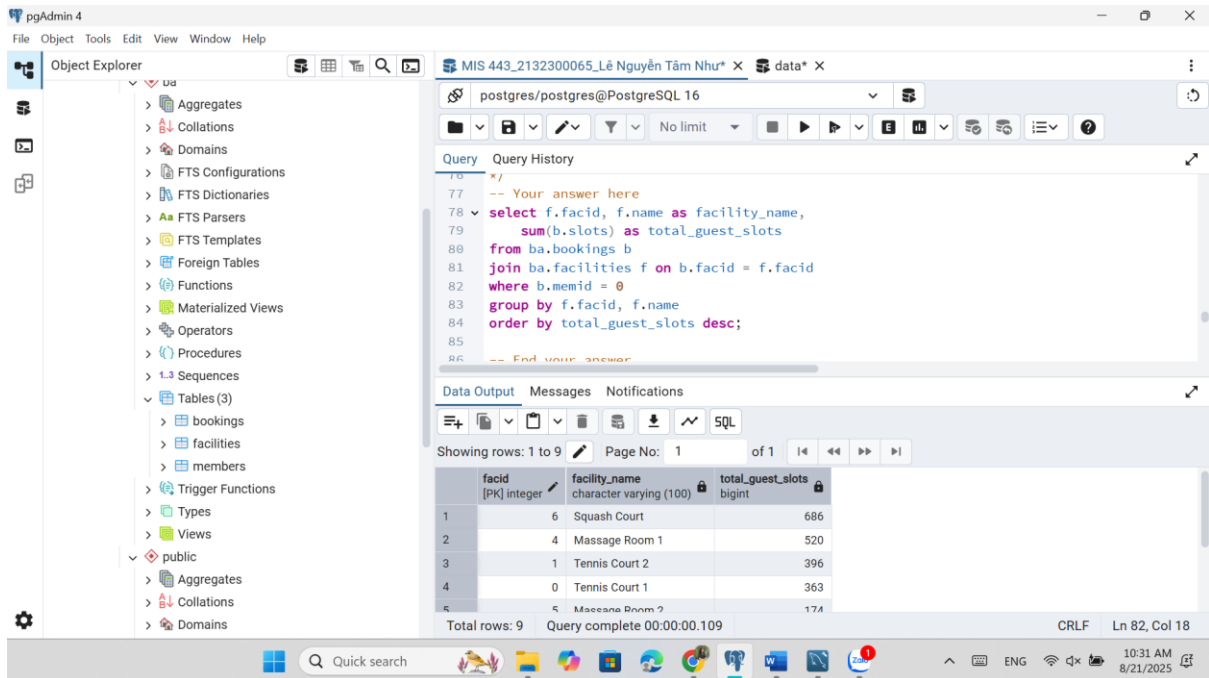


The screenshot shows the full SQL output table in pgAdmin 4. The table contains 31 rows of data, sorted by the number of bookings for facility 1 in descending order.

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:

```

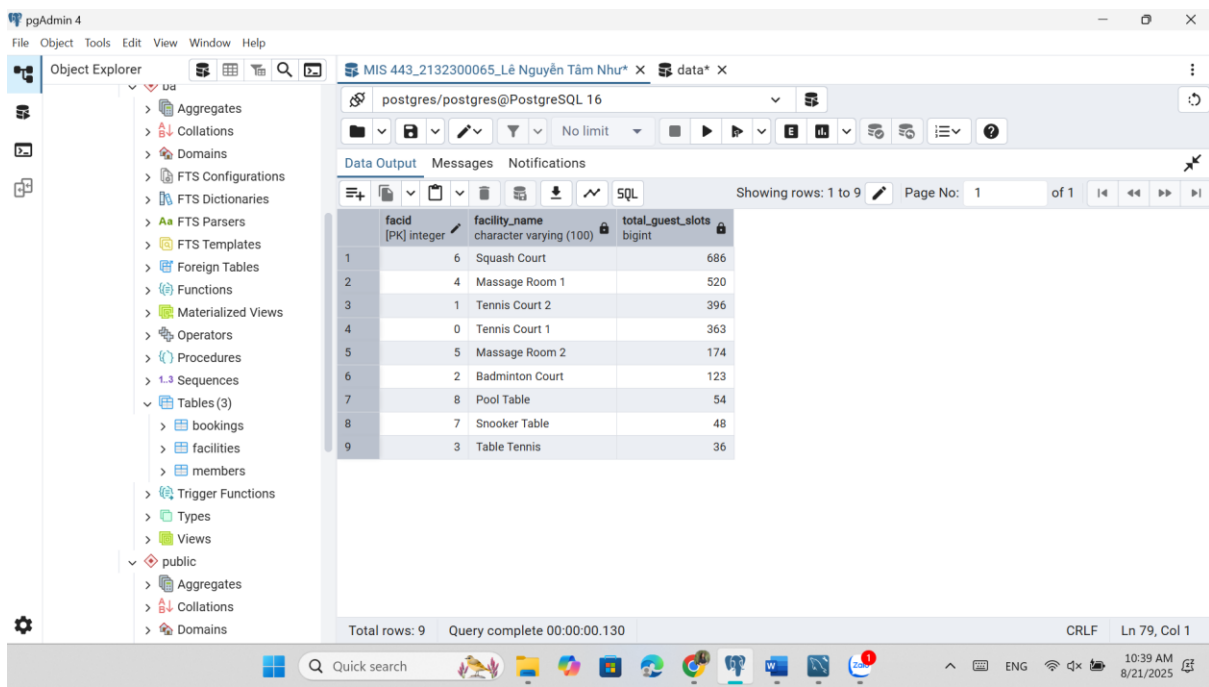
-- Your answer here
select f.facid, f.name as facility_name,
       sum(b.slots) as total_guest_slots
from ba.bookings b
join ba.facilities f on b.facid = f.facid
where b.memid = 0
group by f.facid, f.name
order by total_guest_slots desc;
-- End your answer

```

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 ordered by total_guest_slots in descending order.

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

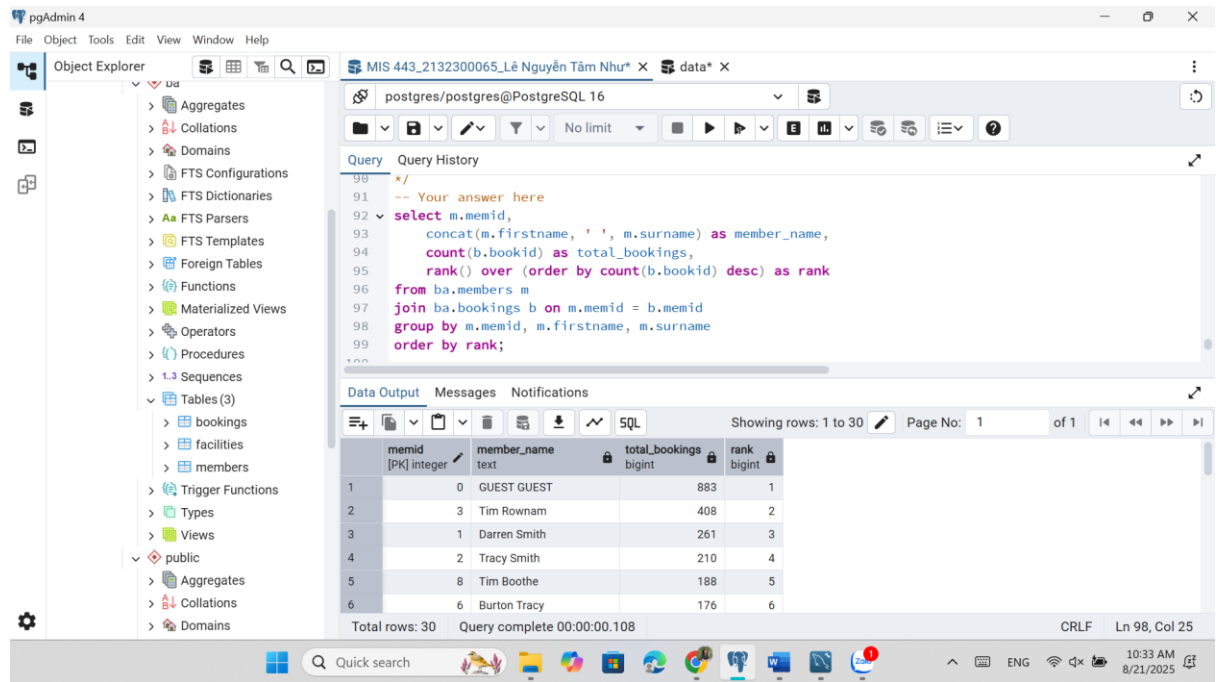
```

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 ordered by total_guest_slots in descending order.

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;

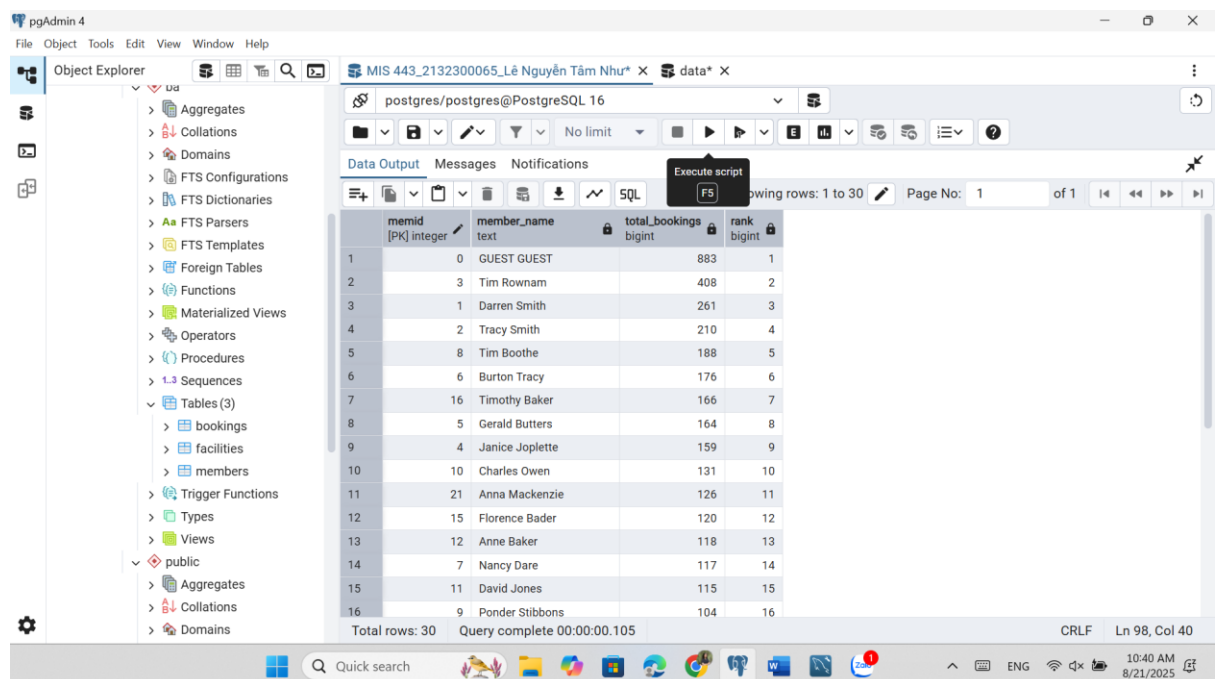
```

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

