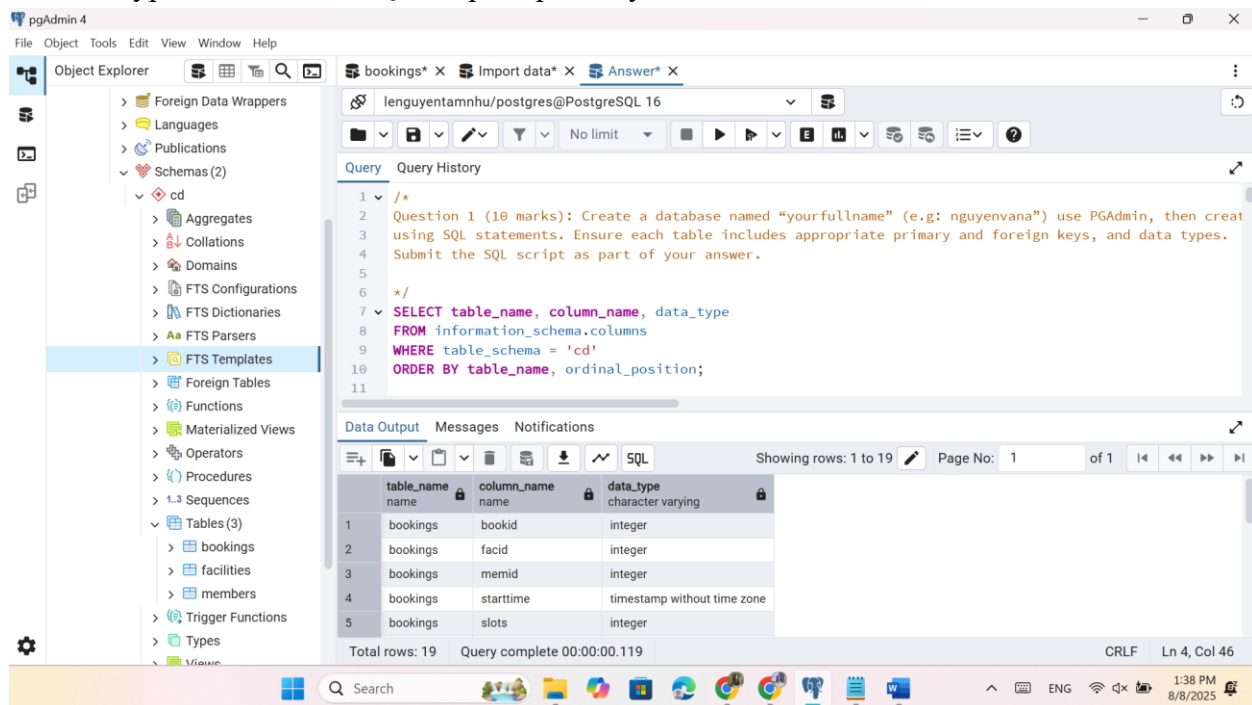


Name: Lê Nguyễn Tâm Như

IRN: 2132300065

Question 1 (10 marks): Create a database named “yourfullname” (e.g: nguyenvana”) use PGAdmin, then create a schema name “cd” that has three tables: *members*, *bookings* and *facilities* using SQL statements. Ensure each table includes appropriate primary and foreign keys, and data types. Submit the SQL script as part of your answer



The screenshot shows the pgAdmin 4 interface. The left sidebar displays the Object Explorer with the 'cd' schema selected under 'Schemas (2)'. The main pane shows a SQL query window with the following content:

```
1 /*
2 Question 1 (10 marks): Create a database named “yourfullname” (e.g: nguyenvana”) use PGAdmin, then creat
3 using SQL statements. Ensure each table includes appropriate primary and foreign keys, and data types.
4 Submit the SQL script as part of your answer.
5 */
6
7 SELECT table_name, column_name, data_type
8 FROM information_schema.columns
9 WHERE table_schema = 'cd'
10 ORDER BY table_name, ordinal_position;
11
```

The 'Data Output' tab shows the results of the query, displaying a table with 5 rows and 3 columns: table_name, column_name, and data_type. The data is as follows:

	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

The status bar at the bottom indicates 'Total rows: 19' and 'Query complete 00:00:00.119'.

Question 2 (10 marks): Write an SQL query to count the total number of bookings for each facility, ordered by the highest number of bookings first

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

- Foreign Data Wrappers
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 - Operators
 - Procedures
 - Sequences (3)
 - Tables (3)
 - bookings
 - facilities
 - members
 - Trigger Functions
 - Types
 - Views

bookings* x Import data* x Answer* x

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Query Query History

Question 2 (10 marks): Write an SQL query to count the total number of bookings for each facility, order

Expected Output Columns:

- facid (Facility ID)
- total_bookings (Total number of times the facility has been booked)

```

22 select b.facid, count(b.memid) AS total_bookings
23 from cd.bookings b
24 group by b.facid
25 order by total_bookings desc;
26

```

Data Output Messages Notifications

Showing rows: 1 to 9 Page No: 1 of 1

	facid integer	total_bookings bigint
1	8	837
2	4	629
3	7	444
4	6	440
5	0	408

Total rows: 9 Query complete 00:00:00.110 CRLF Ln 19, Col 22

Question 3 (20 marks): Write an SQL query to display all bookings with the member ID and facility name, ordered by the booking start time.

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

- Foreign Data Wrappers
- Languages
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bookings* x Import data* x Answer* x

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Query Query History

```

35 bookid (Booking ID)
36 memid (Member ID)
37 facility_name (Facility Name)
38 starttime (Booking Start Time)
39 slots (Number of Slots)
40 */
41 Select b.bookid, b.memid, f.name as facility_name, b.starttime, b.slots
42 from cd.bookings b
43 join cd.facilities f on b.facid = f.facid
44 ORDER BY b.starttime;
45

```

Data Output Messages Notifications

Showing rows: 1 to 1000 Page No: 1 of 5

	bookid integer	memid integer	facility_name character varying (100)	starttime timestamp without time zone	slots integer
1	1	1	Massage Room 1	2012-07-03 08:00:00	2
2	4	1	Pool Table	2012-07-03 10:00:00	1
3	0	1	Table Tennis	2012-07-03 11:00:00	2
4	5	1	Pool Table	2012-07-03 15:00:00	1
5	2	0	Squash Court	2012-07-03 18:00:00	2

Total rows: 4044 Query complete 00:00:00.125 CRLF Ln 33, Col 139

Question 4 (20 marks): Write an SQL query to display each member and their total number of bookings, ensuring that members who have never made a booking are also included.

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

- Foreign Data Wrappers
- Languages
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bookings* x Import data* x Answer* x

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Query Query History

```

53 total_bookings (Total number of bookings)
54 Notes: Using a Common Table Expression (CTE) will get 100% (normal 90%)
55 */
56 with Memberbookings as (
57     Select memid, count(bookid) as total_bookings
58     from cd.bookings
59     group by memid)
60 Select m.memid, concat(m.surname, ' ', m.firstname),
61        coalesce(b.total_bookings, 0) as total_bookings
62 from cd.members m
63 left join Memberbookings b on b.memid = m.memid;

```

Data Output Messages Notifications

Showing rows: 1 to 31 Page No: 1 of 1

	memid [PK] integer	concat text	total_bookings bigint
1	0	GUEST, GUEST	883
2	1	Smith, Darren	261
3	2	Smith, Tracy	210
4	3	Rownam, Tim	408
5	4	Joplette, Janice	159

Total rows: 31 Query complete 00:00:00.117 CRLF Ln 63, Col 50

Question 5 (20 marks): Write an SQL query to display all bookings made by guests (non-members), along with the facility name, ordered by the number of slots used in descending order.

pgAdmin 4

File Object Tools Edit View Window Help

Object Explorer

- Foreign Data Wrappers
- Languages
- Publications
- Schemas (2)
 - cd
 - 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

bookings* x Import data* x Answer* x

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Query Query History

```

69 Expected Output Columns:
70 bookid (Booking ID)
71 facility_name (Facility Name)
72 starttime (Booking Start Time)
73 slots (Number of Slots)
74 */
75 select b.bookid, f.name as facility_name, b.starttime, b.slots
76 from cd.bookings b
77 left join cd.facilities f on b.facid = f.facid
78 where b.memid = 0
79 order by b.slots desc;

```

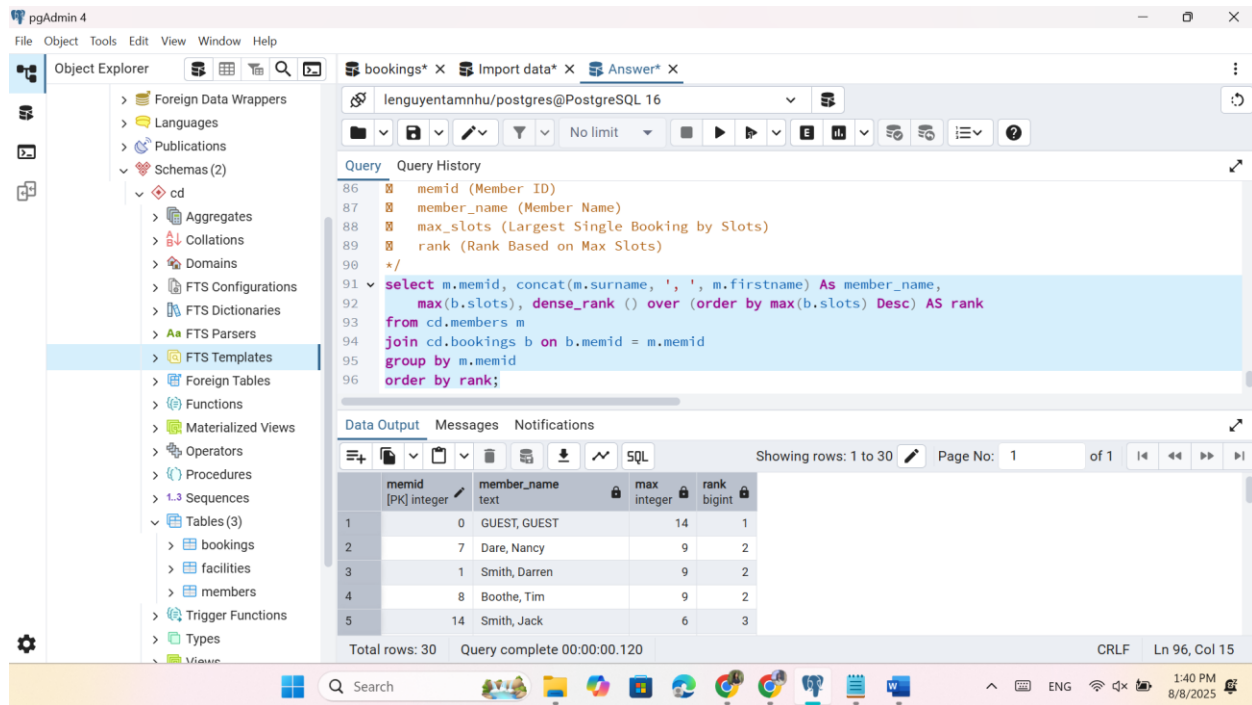
Data Output Messages Notifications

Showing rows: 1 to 883 Page No: 1 of 1

	bookid integer	facility_name character varying (100)	starttime timestamp without time zone	slots integer
1	2888	Squash Court	2012-09-13 10:30:00	14
2	2978	Tennis Court 1	2012-09-15 08:00:00	12
3	3041	Tennis Court 1	2012-09-16 08:00:00	9
4	1757	Tennis Court 2	2012-08-25 13:30:00	9
5	3768	Tennis Court 2	2012-09-27 08:00:00	9

Total rows: 883 Query complete 00:00:00.115 CRLF Ln 74, Col 3

Question 6 (20 marks): Write an SQL query to rank members based on their largest single booking (most slots in one booking), displaying their rank alongside their largest booking. If multiple members have the same largest booking, they should have the same rank (use Window function)



The screenshot shows the pgAdmin 4 interface. The left sidebar displays the Object Explorer with the 'cd' schema selected, showing tables like 'bookings' and 'members'. The main pane shows a query window with the following SQL code:

```

86  memid (Member ID)
87  member_name (Member Name)
88  max_slots (Largest Single Booking by Slots)
89  rank (Rank Based on Max Slots)
90  */
91  select m.memid, concat(m.surname, ' ', m.firstname) As member_name,
92         max(b.slots), dense_rank () over (order by max(b.slots) Desc) AS rank
93  from cd.members m
94  join cd.bookings b on b.memid = m.memid
95  group by m.memid
96  order by rank;

```

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

	memid [PK] integer	member_name text	max integer	rank bigint
1	0	GUEST, GUEST	14	1
2	7	Dare, Nancy	9	2
3	1	Smith, Darren	9	2
4	8	Boothe, Tim	9	2
5	14	Smith, Jack	6	3

Total rows: 30 | Query complete 00:00:00.120 | CRLF | Ln 96, Col 15