

Lab 8B

ГІР 8В



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LAB SESSION: 303

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I Lab 8A - Aggregates, GROUP BY and HAVING

I Question 1

Count how many rows exist in the airports table.

```
1 SELECT COUNT(*) FROM airports;
```

The screenshot shows the pgAdmin 4 interface with a dark theme. In the top navigation bar, there are three tabs: 'Welcome' (highlighted), 'flightdb/root@pgsql...', and 'flightdb/root@pgadmin4.tufa16.home.lab*' (highlighted). Below the tabs is a toolbar with various icons. The main area is titled 'Query' and contains the following SQL code:

```
1 SELECT COUNT(*) FROM airports;
```

Below the code, the results are displayed in a table:

	count
1	8107

At the bottom right of the results area, it says 'Showing rows: 1 to 1'.

I Question 2

Calculate the average elevation in the airports table.

```
1 SELECT AVG(elevation) FROM airports;
```

A screenshot of the pgAdmin 4 interface. The title bar shows "Welcome" and the connection details "flightdb/root@pgadmin4.tufa16.home.lab*". The main area has a toolbar with various icons. A query editor window titled "Query" contains the following SQL code:

```
1 SELECT AVG(elevation) FROM airports;
```

The results pane shows a single row of data:

	avg	numeric
1	933.4493647465153571	

Below the results, status bars indicate "Showing rows: 1 to 1" and "Page No: 1".

I Question 3

Calculate the maximum and minimum elevations in the airports table.

```
1 SELECT MIN(elevation), MAX(elevation) FROM airports;
```

The screenshot shows the pgAdmin interface. In the top navigation bar, there are tabs for 'File', 'Object', 'Tools', and 'Help'. Below the navigation bar, there are two tabs: 'Welcome' and 'flighthdb/root@pgadmin4.tufa16.home.lab*'. The current tab is 'flighthdb/root@pgadmin4.tufa16.home.lab'. The main area is the 'Query' tab, which contains the following SQL code:

```
1 SELECT MIN(elevation), MAX(elevation) FROM airports;
```

Below the query, the 'Data Output' tab is selected, showing the results of the query:

	min	max
	integer	integer
1	-1266	14472

At the bottom right of the data output area, it says 'Showing rows: 1 to 1'.

I Question 4

Calculate the average elevation, grouped by country id, in the airports table.

```
1 SELECT
2     country_id,
3     AVG(elevation) AS avg_elevation
4     FROM airports GROUP BY country_id;
```



```

SELECT
    country_id,
    AVG(elevation) AS avg_elevation
FROM airports GROUP BY country_id;

```

country_id	avg_elevation
1	87
2	116
3	184
4	51
5	70
6	190
7	169
8	176
9	92
10	180

Showing rows: 1 to 240 Page No: 1 of 1

Successfully run. Total query runtime: 88 msec. 240 rows affected.

I Question 5

Calculate the average elevation, grouped by country id, in the airports table ordered by the average elevation in descending order for any country that has an average elevation of at least 300.

```

1  SELECT
2      country_id,
3      COUNT(*) AS airport_count,
4      AVG(elevation) AS avg_elevation
5  FROM airports
6  WHERE elevation >= 300
7  GROUP BY country_id
8  ORDER BY country_id DESC;

```





SQL

The screenshot shows the pgAdmin 4 interface running in a Brave browser window. The title bar reads "pgAdmin 4 - Brave". The main window has a toolbar at the top with icons for file operations, object management, tools, and help. Below the toolbar is a navigation bar showing the current connection as "flightdb/root@pgadmin4.tufa16.home.lab". The central area contains a "Query History" tab with a SQL query and a "Scratch Pad" tab.

Query History:

```
1  SELECT
2    country_id,
3    COUNT(*) AS airport_count,
4    AVG(elevation) AS avg_elevation
5  FROM airports
6  WHERE elevation >= 300
7  GROUP BY country_id
8  ORDER BY country_id DESC;
9
```

Data Output:

	country_id	airport_count	avg_elevation
1	240	1	1481.00000000000000000000
2	239	7	906.4285714285714286
3	237	27	4980.6666666666666667
4	236	3	5044.3333333333333333
5	235	11	924.3636363636363636
6	233	24	2322.4166666666666667
7	232	1	607.000000000000000000
8	231	53	2134.1698113207547170
9	230	3	7322.000000000000000000
10	229	1	550.000000000000000000

II Lab 8B - Aggregates, GROUP BY and HAVING

II Question 6

Calculate the number of airports in each country (i.e., grouped by country id), arrange the output in descending order of number of airports.

```
1 -- Long hand
2 SELECT
3     c.name AS country_name,
4     AVG(a.elevation) AS avg_elevation
5 FROM airports AS a
6     INNER JOIN countries AS c ON a.country_id = c.id
7     GROUP BY c.name
8     ORDER BY c.name ASC;
9
10 -- short hand
11 SELECT
12     c.name AS country_name,
13     AVG(a.elevation) AS avg_elevation
14 FROM airports a
15     JOIN countries c ON a.country_id = c.id
16     GROUP BY c.name
17     ORDER BY c.name ASC;
```





```

1 -- Long hand
2   SELECT
3     c.name AS country_name,
4       AVG(a.elevation) AS avg_elevation
5   FROM airports AS a
6     INNER JOIN countries AS c ON a.country_id = c.id
7   GROUP BY c.name
8   ORDER BY c.name ASC;
9
10 -- short hand
11   SELECT
12     c.name AS country_name,
13       AVG(a.elevation) AS avg_elevation
14   FROM airports AS a
15     JOIN countries c ON a.country_id = c.id
16   GROUP BY c.name
17   ORDER BY c.name ASC;
18

```

country_name	avg_elevation
Afghanistan	3750.8095238095238095
Albania	126.000000000000000000
Algeria	1331.590909090909090909
American Samoa	50.333333333333333333
Angola	2161.92074923076769231
Anguilla	127.000000000000000000
Antarctica	1509.94738842105245316
Antigua and Barbuda	38.500000000000000000
Argentina	1124.456310796111505
Armenia	3905.500000000000000000
Anuba	60.000000000000000000
Australia	459.1825095057034221
Austria	1332.2069965517241579
Azerbaijan	563.3636363636363636
Bahamas	8.6486486486486486486

II Question 7

Calculate the number of airports in each city of country id 160 and arrange the output in descending order.

```

1  SELECT
2    city,
3    COUNT(*) AS airport_count
4  FROM airports
5    WHERE country_id = 160
6    GROUP BY city
7    ORDER BY airport_count DESC;

```





The screenshot shows the pgAdmin 4 interface running in a Brave browser window. The title bar reads "pgAdmin 4 - Brave". The pgAdmin menu bar includes File, Object, Tools, Help, and a user icon for "nex@home.lab (internal)". The left sidebar has a "New Tab" button and a connection list with "flightdb/root@pgadmin4.tufa16.home.lab" selected. The main area has tabs for "Query" (selected) and "Scratch Pad". The "Query" tab contains the following SQL code:

```
1 SELECT
2     city,
3     COUNT(*) AS airport_count
4 FROM airports
5     WHERE country_id = 160
6     GROUP BY city
7     ORDER BY airport_count DESC;
```

The "Data Output" tab is selected, displaying the results of the query:

	city	airport_count
1	New York	13
2	Seattle	9
3	Chicago	9
4	San Diego	8
5	Philadelphia	6
6	Houston	6
7	Atlanta	5
8	Denver	5
9	Sacramento	5

At the bottom, status bars show "Successfully run. Total query runtime: 77 msec. 1343 rows affected." and a navigation bar with icons for back, forward, search, and refresh.

II Question 8

Edit Query #7 to show only those cities where the number of airports is more than 5. Hint: When using all SQL predicates in one statement, follow the sequence:

```
1 SELECT
2     city,
3     COUNT(*) AS airport_count
4 FROM airports
5     WHERE country_id = 160 AND airport_count > 5
6     GROUP BY city
7     ORDER BY airport_count DESC;
```





```

SELECT
    city,
    COUNT(*) AS airport_count
FROM airports
    WHERE country_id = 160
    GROUP BY city
    HAVING COUNT(*) > 5
    ORDER BY airport_count DESC;

```

	city	airport_count
1	New York	13
2	Chicago	9
3	Seattle	9
4	San Diego	8
5	Philadelph...	6
6	Houston	6

Successfully run. Total query runtime: 74 ms, 6 rows affected.

II Question 9

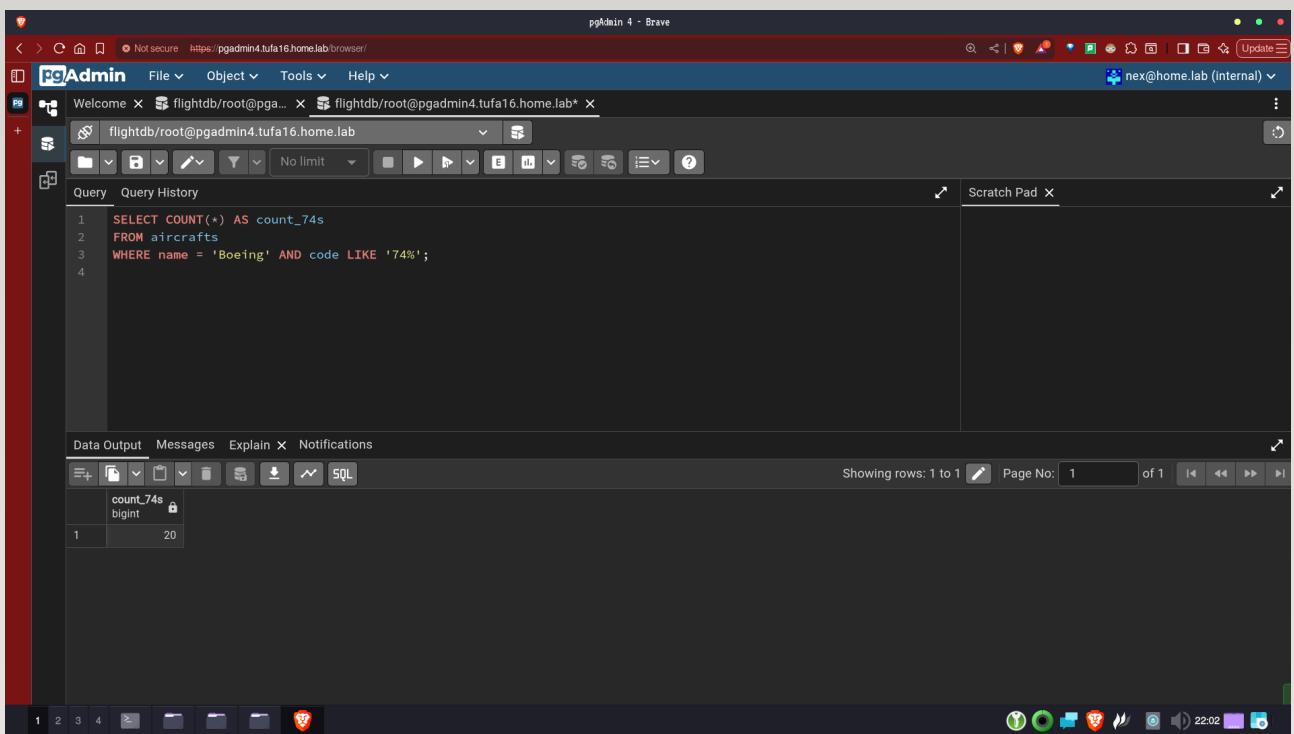
Provide the query to determine how many aircrafts "Boeing" has that start with "74".

```

1 SELECT COUNT(*) AS count_74s
2 FROM aircrafts
3 WHERE name = 'Boeing' AND code LIKE '74%';

```





II Question 10

Provide the query to determine how many different wake sizes “Boeing” and “Airbus” have.

```
1 SELECT
2     name,
3     COUNT(DISTINCT wake_size) AS wake_sizes
4 FROM aircrafts
5 WHERE name IN ('Boeing', 'Airbus')
6 GROUP BY name;
```

A screenshot of the pgAdmin 4 interface. The top navigation bar shows "pgAdmin 4 - Brave" and the URL "https://pgadmin4.tufa16.home.lab/browser/". The left sidebar has a "+ Add" button and a tree view for databases. The main area has tabs for "Query" and "Query History". A query window contains the following SQL code:

```
1 SELECT
2     name,
3     COUNT(DISTINCT wake_size) AS wake_sizes
4 FROM aircrafts
5 WHERE name IN ('Boeing', 'Airbus')
6 GROUP BY name;
```

The results pane shows a table with two rows:

	name	wake_sizes
1	Airbus	2
2	Boeing	2

At the bottom right of the results pane, there is a green success message: "Successfully run. Total query runtime: 58 msec. 2 rows affected." Below the results pane is a toolbar with various icons for file operations and a system status bar at the bottom.