SPRINT #2
RELATIONAL DATABASES AND INTRODUCTION TO SQL

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Date: 19/09/2024

SUMMARY

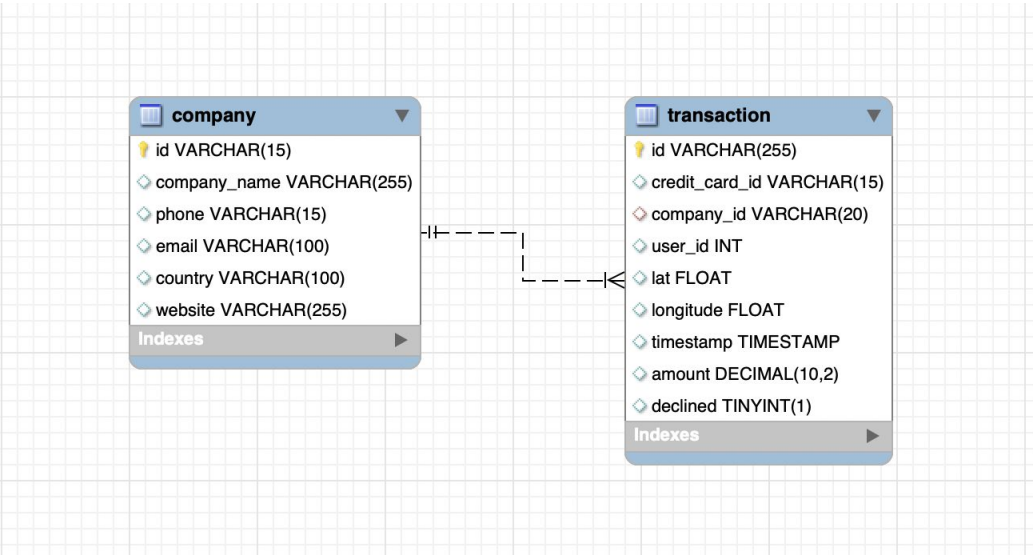
In this sprint, I will review the basic concepts of working with relational databases. I will begin hands-on experience with a database containing information from a company dedicated to selling products online. In this activity, I will focus on data related to completed transactions and the corporate information of the companies involved.

RESULT

In this folder on the GitHub repository, you will find: the file **S2_01.sql**, which contains all the scripts; **transactions_schema.pdf**, which provides the database schema (also shown in this presentation); and this file, **Sprint_2.pdf**, which includes screenshots of the work environment showing the queries I executed and the results obtained for each exercise: https://github.com/leocareer/DA_specialization/tree/main/Sprint%20%232

LEVEL 1 EXERCISE 1

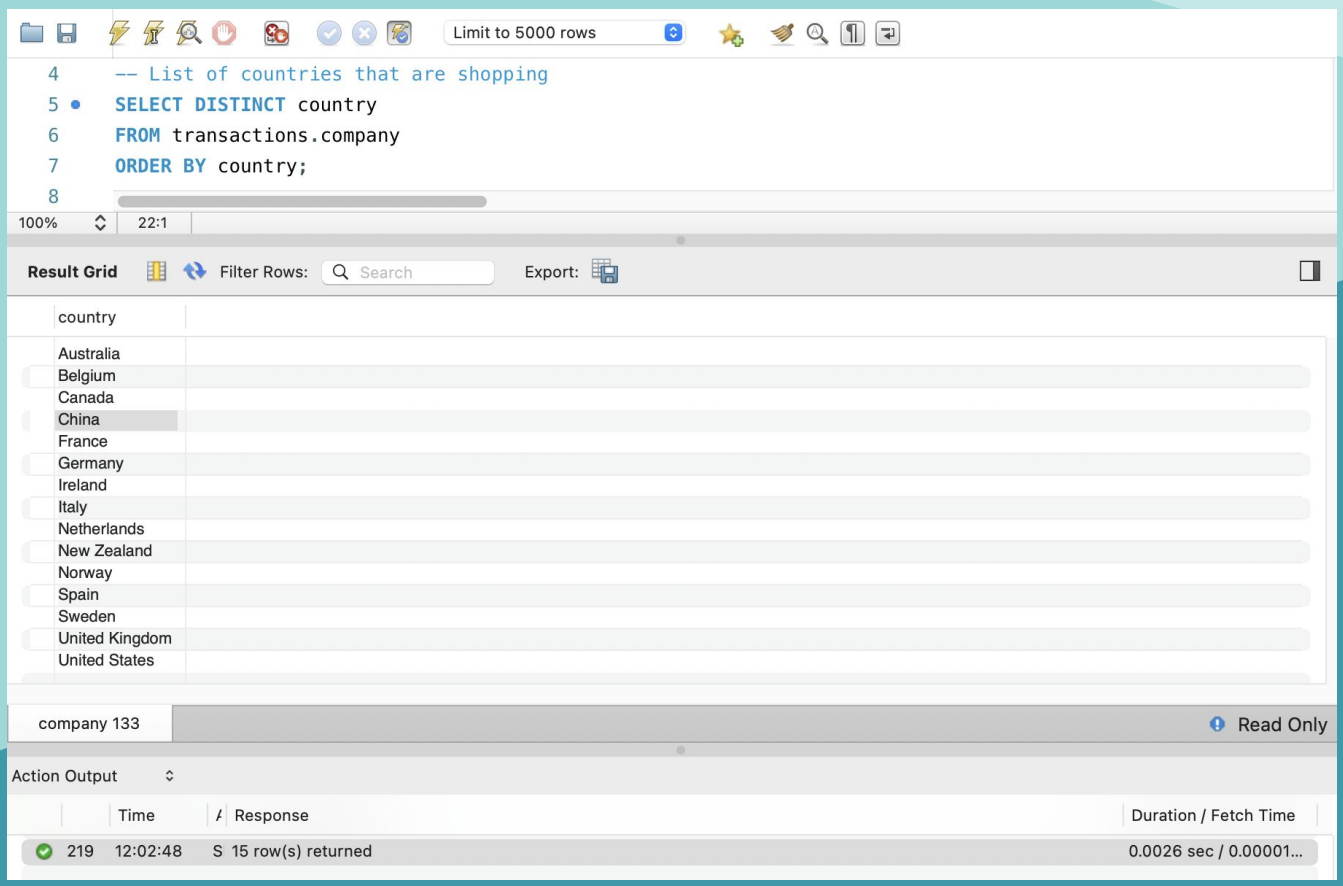
From the attached documents (data_structure.sql and input_data.sql), import the two tables. It shows the main features of the created schema and explains the different tables and variables that exist. Be sure to include a diagram that illustrates the relationship between the different tables and variables.

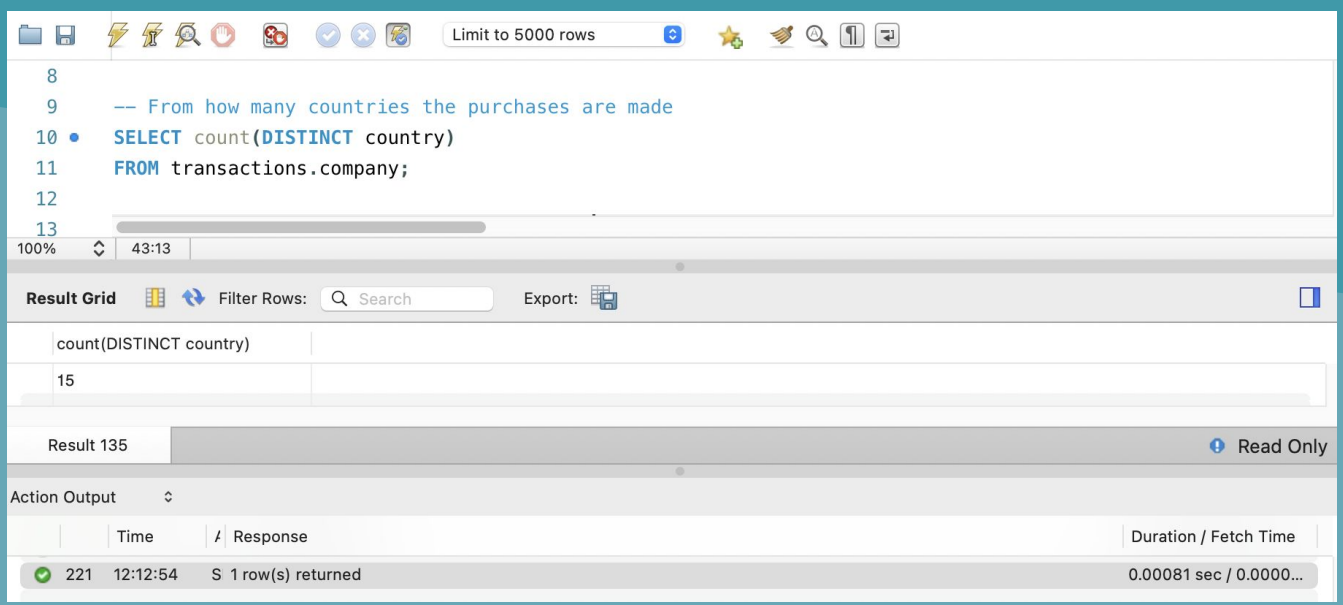


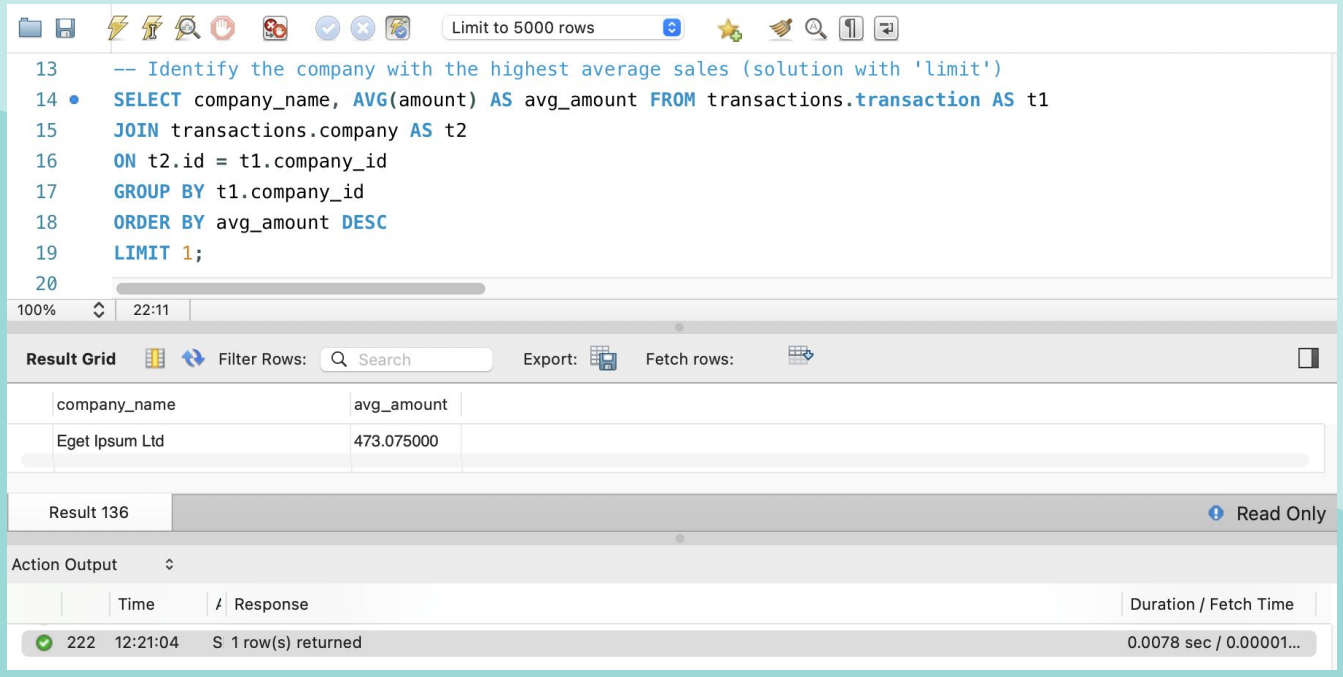
LEVEL 1 EXERCISE 2

Using JOIN you will perform the following queries:

- List of countries that are shopping;
- From how many countries the purchases are made;
- Identify the company with the highest average sales.







```sql
-- Identify the company with the highest average sales (solution with 'limit')
SELECT company_name, AVG(amount) AS avg_amount FROM transactions.transaction AS t1
JOIN transactions.company AS t2
ON t2.id = t1.company_id
GROUP BY t1.company_id
ORDER BY avg_amount DESC
LIMIT 1;
```

Limit to 5000 rows

100% 22:11

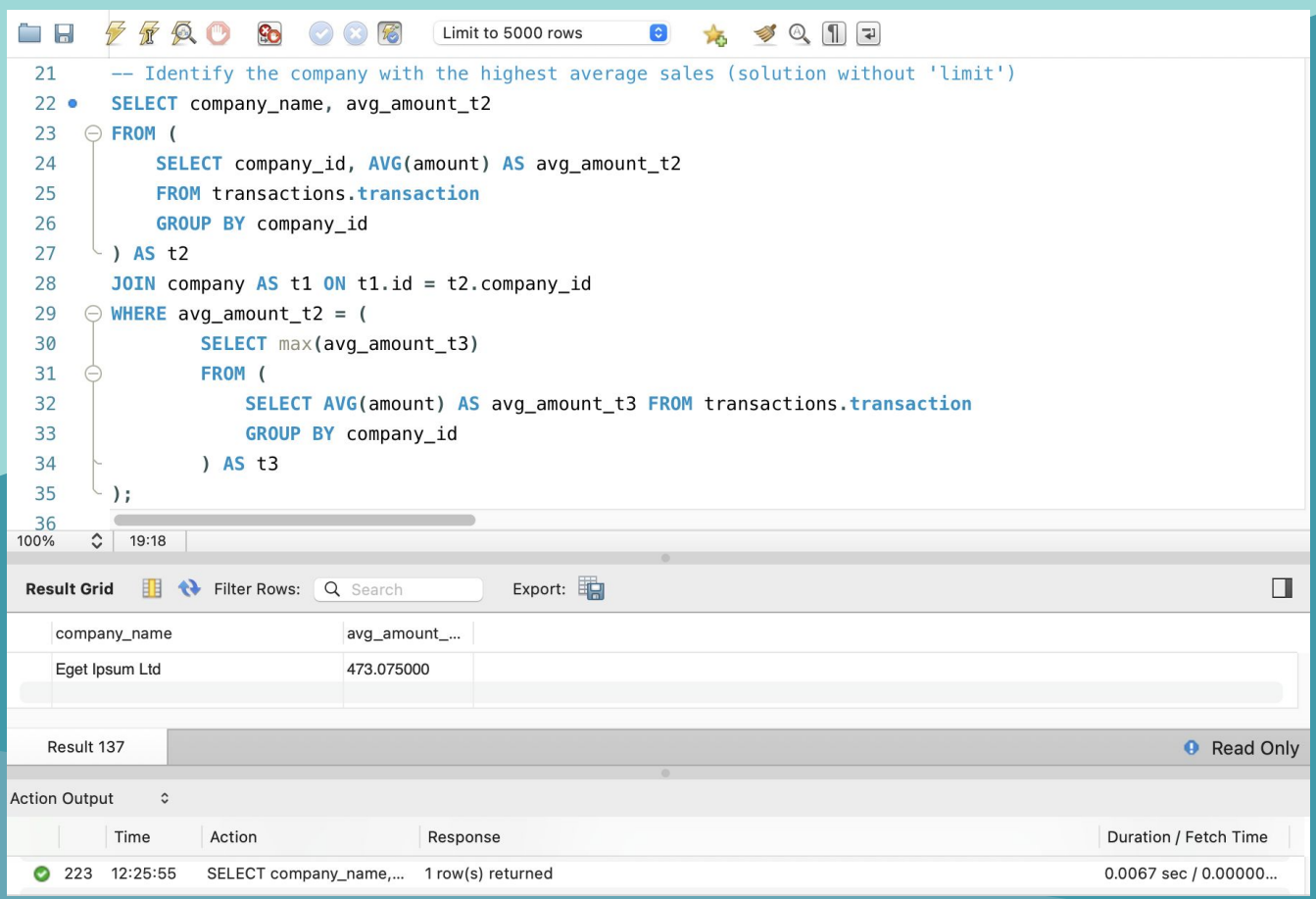
Result Grid Filter Rows: Search Export: Fetch rows:

company_name	avg_amount
Eget Ipsum Ltd	473.075000

Result 136 Read Only

Action Output

	Time	Response	Duration / Fetch Time
222	12:21:04	S 1 row(s) returned	0.0078 sec / 0.00001...



```sql
-- Identify the company with the highest average sales (solution without 'limit')
SELECT company_name, avg_amount_t2
FROM (
    SELECT company_id, AVG(amount) AS avg_amount_t2
    FROM transactions.transaction
    GROUP BY company_id
) AS t2
JOIN company AS t1 ON t1.id = t2.company_id
WHERE avg_amount_t2 = (
        SELECT max(avg_amount_t3)
        FROM (
            SELECT AVG(amount) AS avg_amount_t3 FROM transactions.transaction
            GROUP BY company_id
        ) AS t3
);
```

Limit to 5000 rows

100% 19:18

Result Grid Filter Rows: Search Export:

company_name	avg_amount_...
Eget Ipsum Ltd	473.075000

Result 137 Read Only

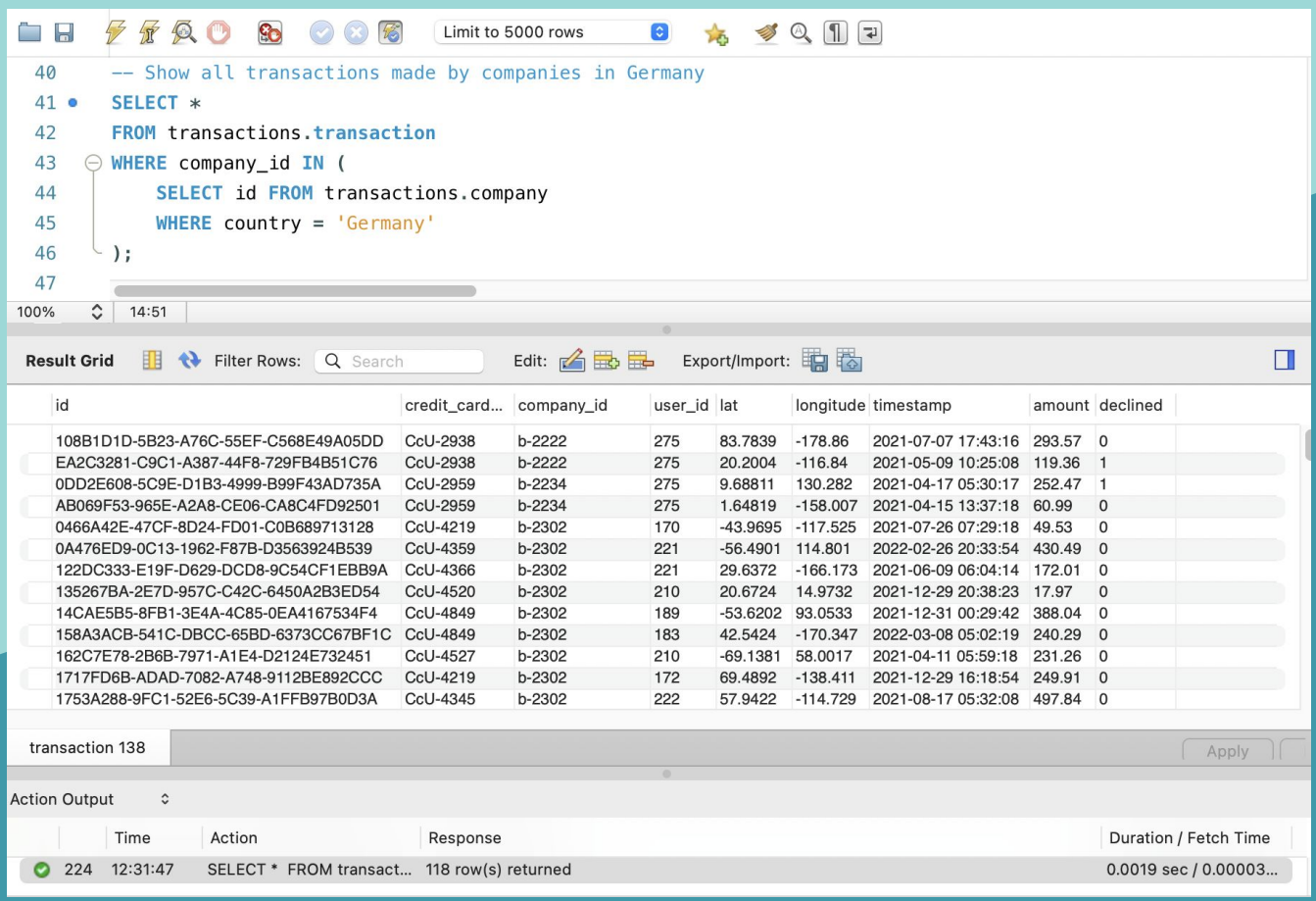
Action Output

	Time	Action	Response	Duration / Fetch Time
223	12:25:55	SELECT company_name,...	1 row(s) returned	0.0067 sec / 0.00000...

LEVEL 1 EXERCISE 3

Using only subqueries (without using JOIN):

- Show all transactions made by companies in Germany;
- List the companies that have made transactions for an amount higher than the average of all transactions;
- Companies that do not have registered transactions will be removed from the system, provide the list of these companies.



```sql
-- Show all transactions made by companies in Germany
SELECT *
FROM transactions.transaction
WHERE company_id IN (
    SELECT id FROM transactions.company
    WHERE country = 'Germany'
);
```

Limit to 5000 rows

100% 14:51

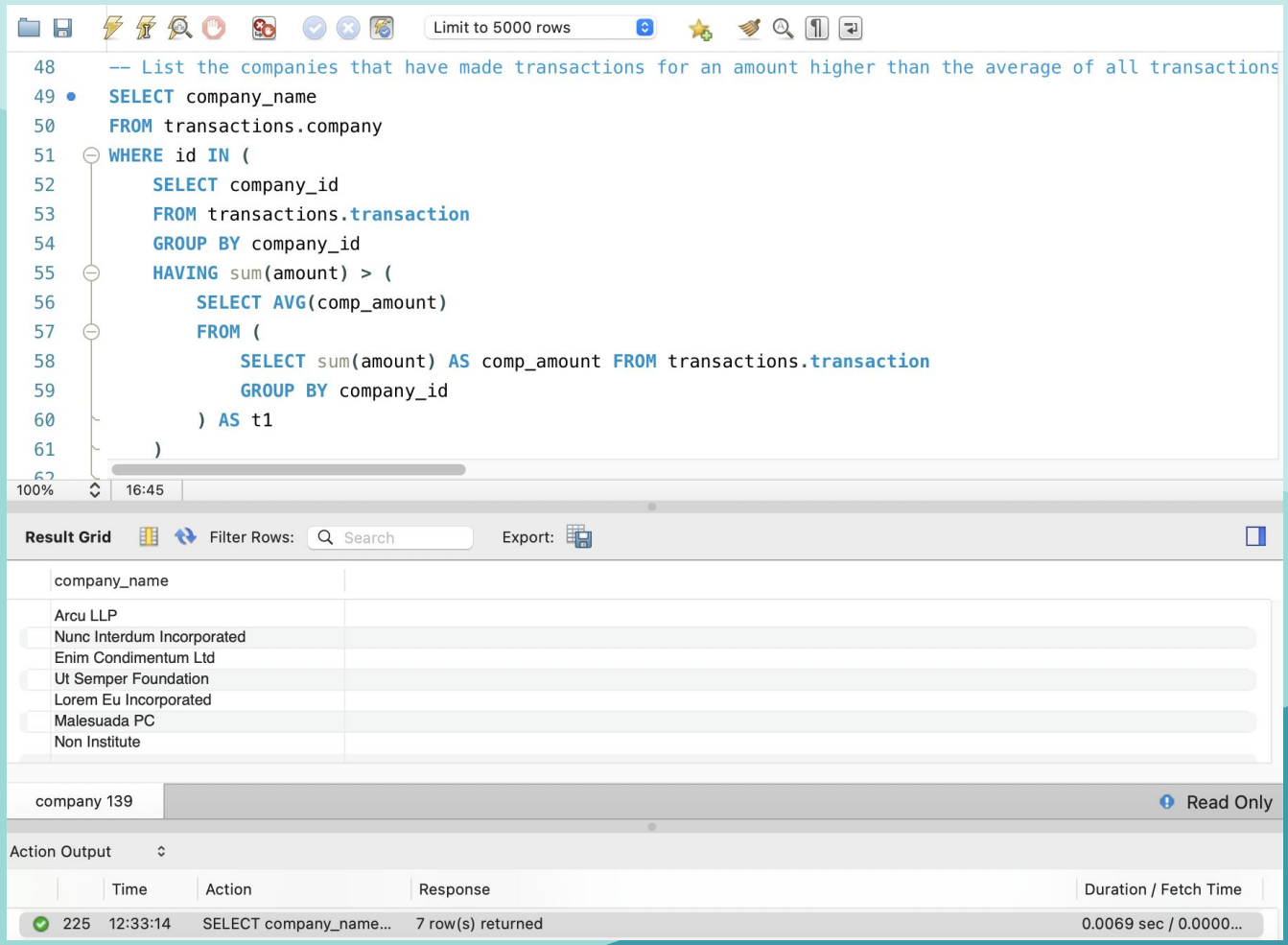
Result Grid Filter Rows: Search Edit: Export/Import:

id	credit_card...	company_id	user_id	lat	longitude	timestamp	amount	declined
108B1D1D-5B23-A76C-55EF-C568E49A05DD	CcU-2938	b-2222	275	83.7839	-178.86	2021-07-07 17:43:16	293.57	0
EA2C3281-C9C1-A387-44F8-729FB4B51C76	CcU-2938	b-2222	275	20.2004	-116.84	2021-05-09 10:25:08	119.36	1
0DD2E608-5C9E-D1B3-4999-B99F43AD735A	CcU-2959	b-2234	275	9.68811	130.282	2021-04-17 05:30:17	252.47	1
AB069F53-965E-A2A8-CE06-CA8C4FD92501	CcU-2959	b-2234	275	1.64819	-158.007	2021-04-15 13:37:18	60.99	0
0466A42E-47CF-8D24-FD01-C0B689713128	CcU-4219	b-2302	170	-43.9695	-117.525	2021-07-26 07:29:18	49.53	0
0A476ED9-0C13-1962-F87B-D3563924B539	CcU-4359	b-2302	221	-56.4901	114.801	2022-02-26 20:33:54	430.49	0
122DC333-E19F-D629-DCD8-9C54CF1EBB9A	CcU-4366	b-2302	221	29.6372	-166.173	2021-06-09 06:04:14	172.01	0
135267BA-2E7D-957C-C42C-6450A2B3ED54	CcU-4520	b-2302	210	20.6724	14.9732	2021-12-29 20:38:23	17.97	0
14CAE5B5-8FB1-3E4A-4C85-0EA4167534F4	CcU-4849	b-2302	189	-53.6202	93.0533	2021-12-31 00:29:42	388.04	0
158A3ACB-541C-DBCC-65BD-6373CC67BF1C	CcU-4849	b-2302	183	42.5424	-170.347	2022-03-08 05:02:19	240.29	0
162C7E78-2B6B-7971-A1E4-D2124E732451	CcU-4527	b-2302	210	-69.1381	58.0017	2021-04-11 05:59:18	231.26	0
1717FD6B-ADAD-7082-A748-9112BE892CCC	CcU-4219	b-2302	172	69.4892	-138.411	2021-12-29 16:18:54	249.91	0
1753A288-9FC1-52E6-5C39-A1FFB97B0D3A	CcU-4345	b-2302	222	57.9422	-114.729	2021-08-17 05:32:08	497.84	0

transaction 138 Apply

Action Output

	Time	Action	Response	Duration / Fetch Time
224	12:31:47	SELECT * FROM transact...	118 row(s) returned	0.0019 sec / 0.00003...



```sql
-- List the companies that have made transactions for an amount higher than the average of all transactions
SELECT company_name
FROM transactions.company
WHERE id IN (
    SELECT company_id
    FROM transactions.transaction
    GROUP BY company_id
    HAVING sum(amount) > (
        SELECT AVG(comp_amount)
        FROM (
            SELECT sum(amount) AS comp_amount FROM transactions.transaction
            GROUP BY company_id
        ) AS t1
    )
```

Limit to 5000 rows

100% 16:45

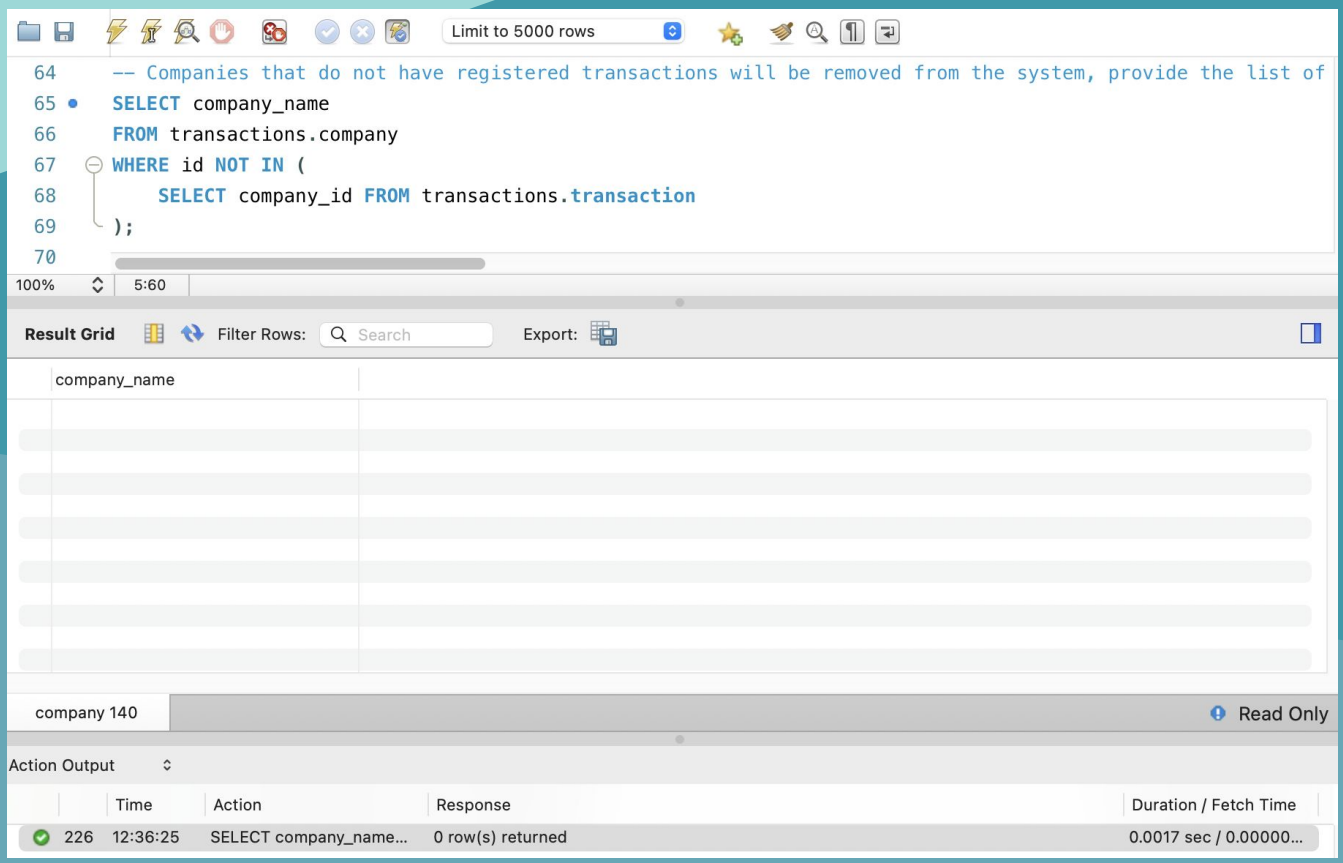
Result Grid Filter Rows: Search Export:

company_name
Arcu LLP
Nunc Interdum Incorporated
Enim Condimentum Ltd
Ut Semper Foundation
Lorem Eu Incorporated
Malesuada PC
Non Institute

company 139 Read Only

Action Output

	Time	Action	Response	Duration / Fetch Time
225	12:33:14	SELECT company_name...	7 row(s) returned	0.0069 sec / 0.0000...



```sql
-- Companies that do not have registered transactions will be removed from the system, provide the list of
SELECT company_name
FROM transactions.company
WHERE id NOT IN (
    SELECT company_id FROM transactions.transaction
);
```

Limit to 5000 rows

100% 5:60

Result Grid Filter Rows: Search Export:

company_name

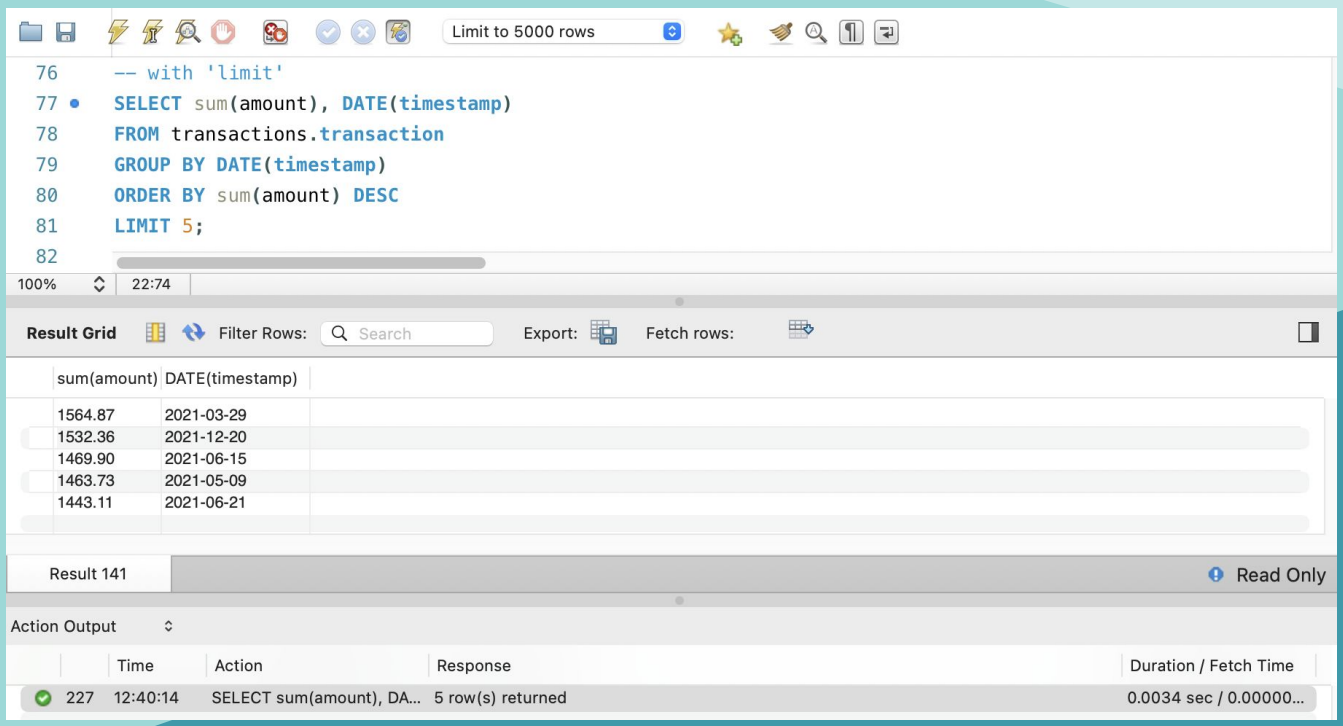
company 140 Read Only

Action Output

	Time	Action	Response	Duration / Fetch Time
226	12:36:25	SELECT company_name...	0 row(s) returned	0.0017 sec / 0.00000...

LEVEL 2 EXERCISE 1

Identify the five days that generated the largest amount of revenue for the company from sales. It shows the date of each transaction along with the sales total.

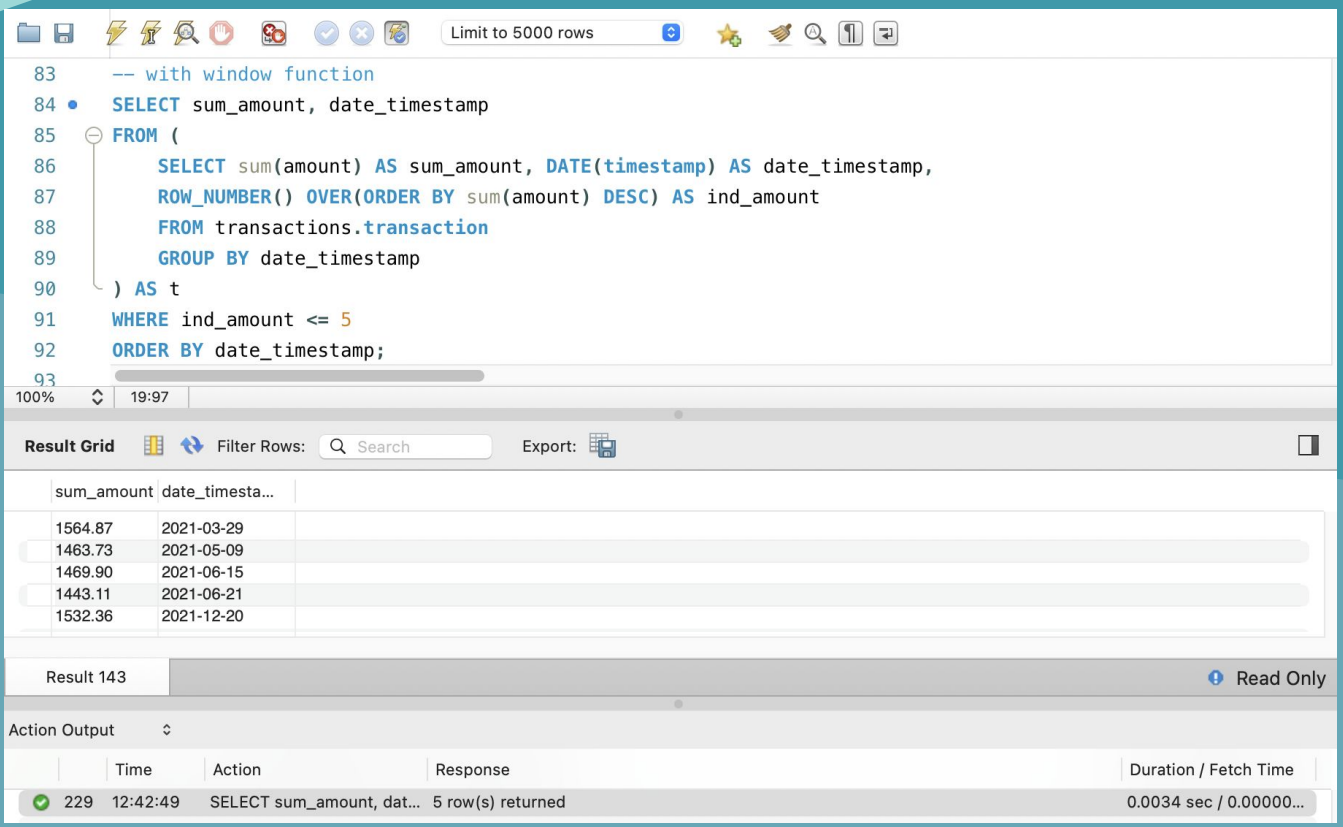


```
-- with 'limit'
SELECT sum(amount), DATE(timestamp)
FROM transactions.transaction
GROUP BY DATE(timestamp)
ORDER BY sum(amount) DESC
LIMIT 5;
```

sum(amount)	DATE(timestamp)
1564.87	2021-03-29
1532.36	2021-12-20
1469.90	2021-06-15
1463.73	2021-05-09
1443.11	2021-06-21

Result 141 — Read Only

	Time	Action	Response	Duration / Fetch Time
227	12:40:14	SELECT sum(amount), DA...	5 row(s) returned	0.0034 sec / 0.00000...



```
-- with window function
SELECT sum_amount, date_timestamp
FROM (
    SELECT sum(amount) AS sum_amount, DATE(timestamp) AS date_timestamp,
    ROW_NUMBER() OVER(ORDER BY sum(amount) DESC) AS ind_amount
    FROM transactions.transaction
    GROUP BY date_timestamp
) AS t
WHERE ind_amount <= 5
ORDER BY date_timestamp;
```

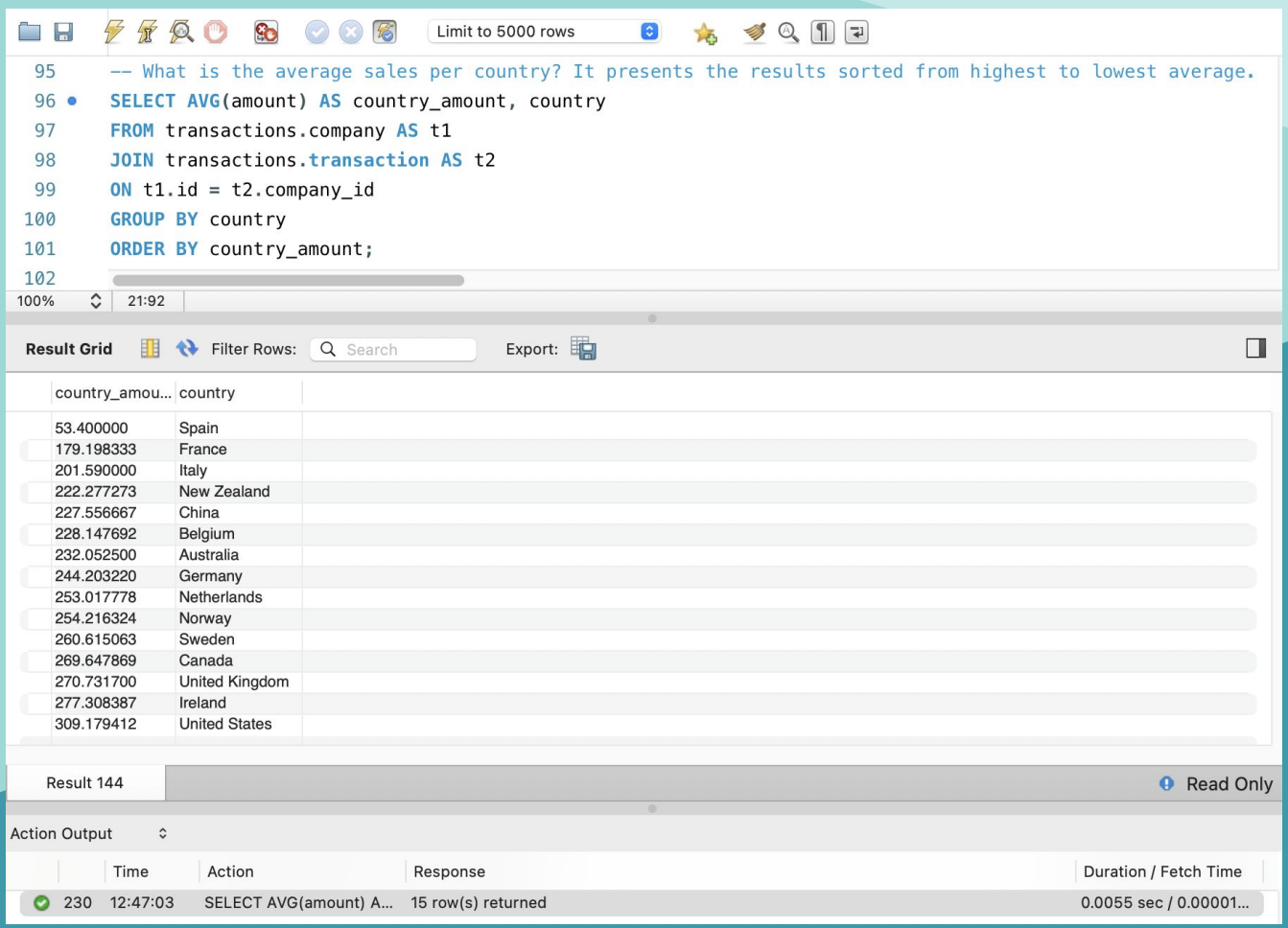
sum_amount	date_timesta...
1564.87	2021-03-29
1463.73	2021-05-09
1469.90	2021-06-15
1443.11	2021-06-21
1532.36	2021-12-20

Result 143 — Read Only

	Time	Action	Response	Duration / Fetch Time
229	12:42:49	SELECT sum_amount, dat...	5 row(s) returned	0.0034 sec / 0.00000...

LEVEL 2 EXERCISE 2

What is the average sales per country? It presents the results sorted from highest to lowest average.



```
-- What is the average sales per country? It presents the results sorted from highest to lowest average.
SELECT AVG(amount) AS country_amount, country
FROM transactions.company AS t1
JOIN transactions.transaction AS t2
ON t1.id = t2.company_id
GROUP BY country
ORDER BY country_amount;
```

Result Grid

country_amou...	country
53.400000	Spain
179.198333	France
201.590000	Italy
222.277273	New Zealand
227.556667	China
228.147692	Belgium
232.052500	Australia
244.203220	Germany
253.017778	Netherlands
254.216324	Norway
260.615063	Sweden
269.647869	Canada
270.731700	United Kingdom
277.308387	Ireland
309.179412	United States

Result 144 — Read Only

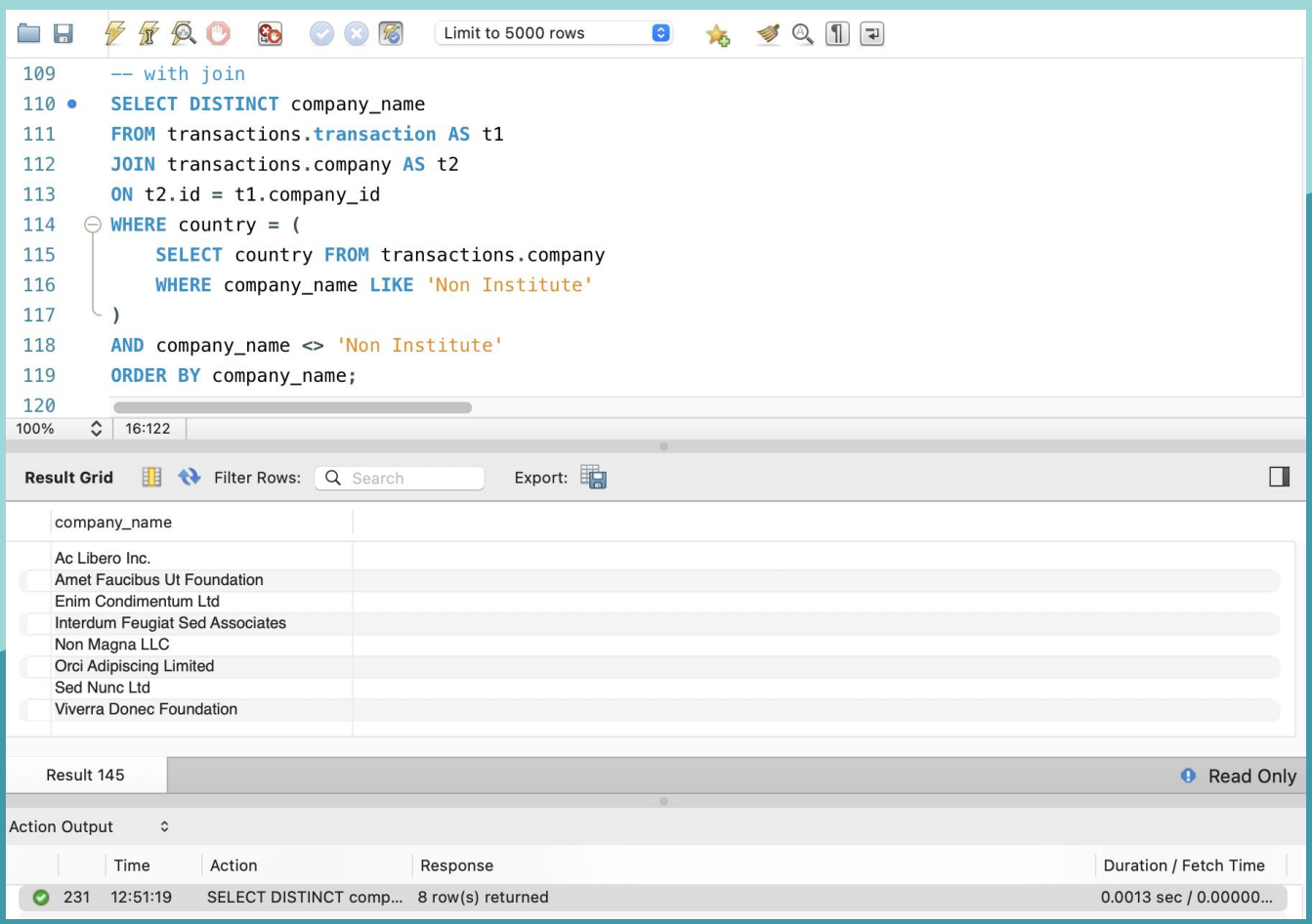
Action Output

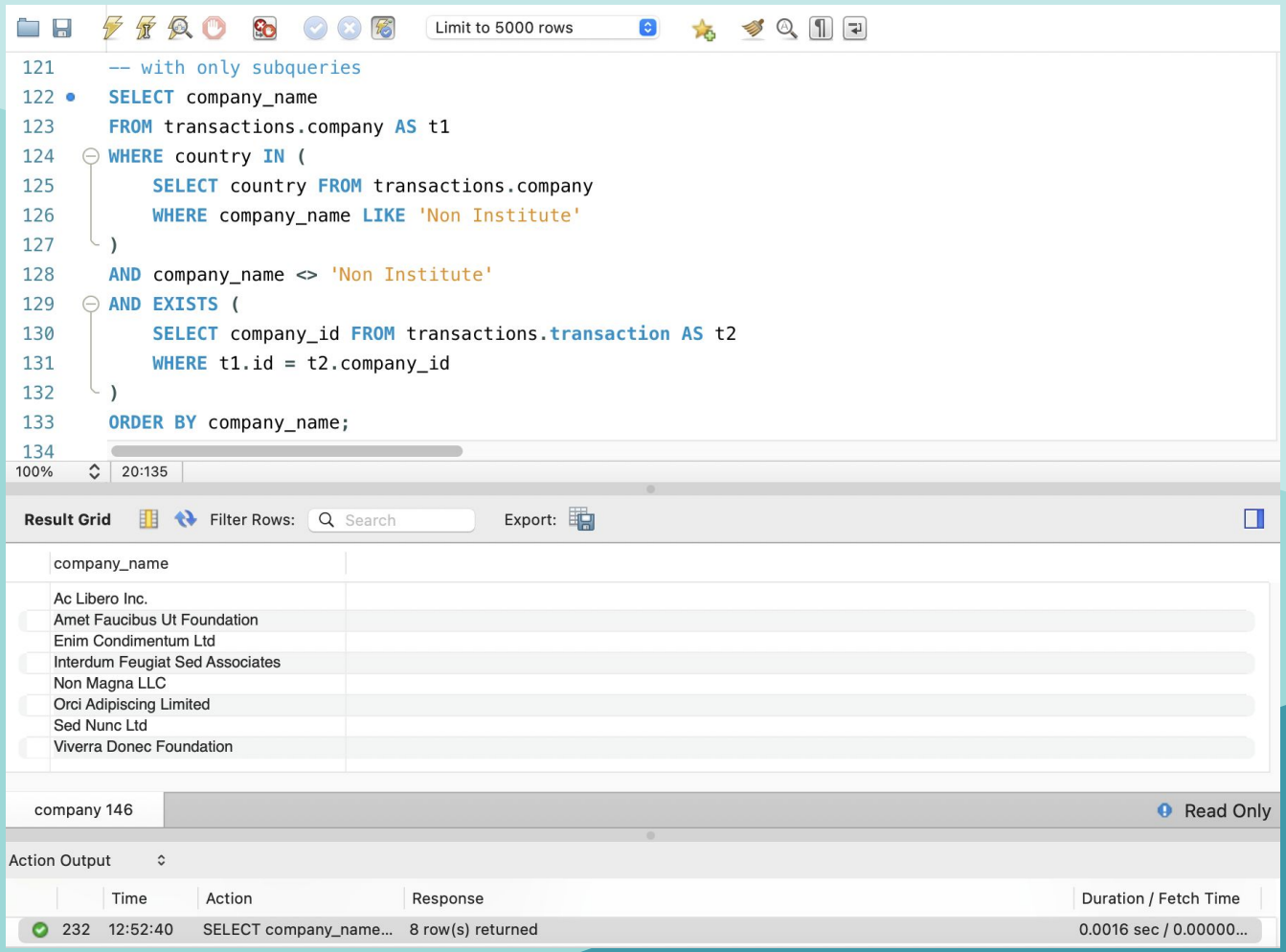
	Time	Action	Response	Duration / Fetch Time
230	12:47:03	SELECT AVG(amount) A...	15 row(s) returned	0.0055 sec / 0.00001...

LEVEL 2 EXERCISE 3

In your company, a new project is being considered to launch some advertising campaigns to compete with the 'Non Institute' company. For this, they ask you for the list of all transactions carried out by companies that are located in the same country as this company.

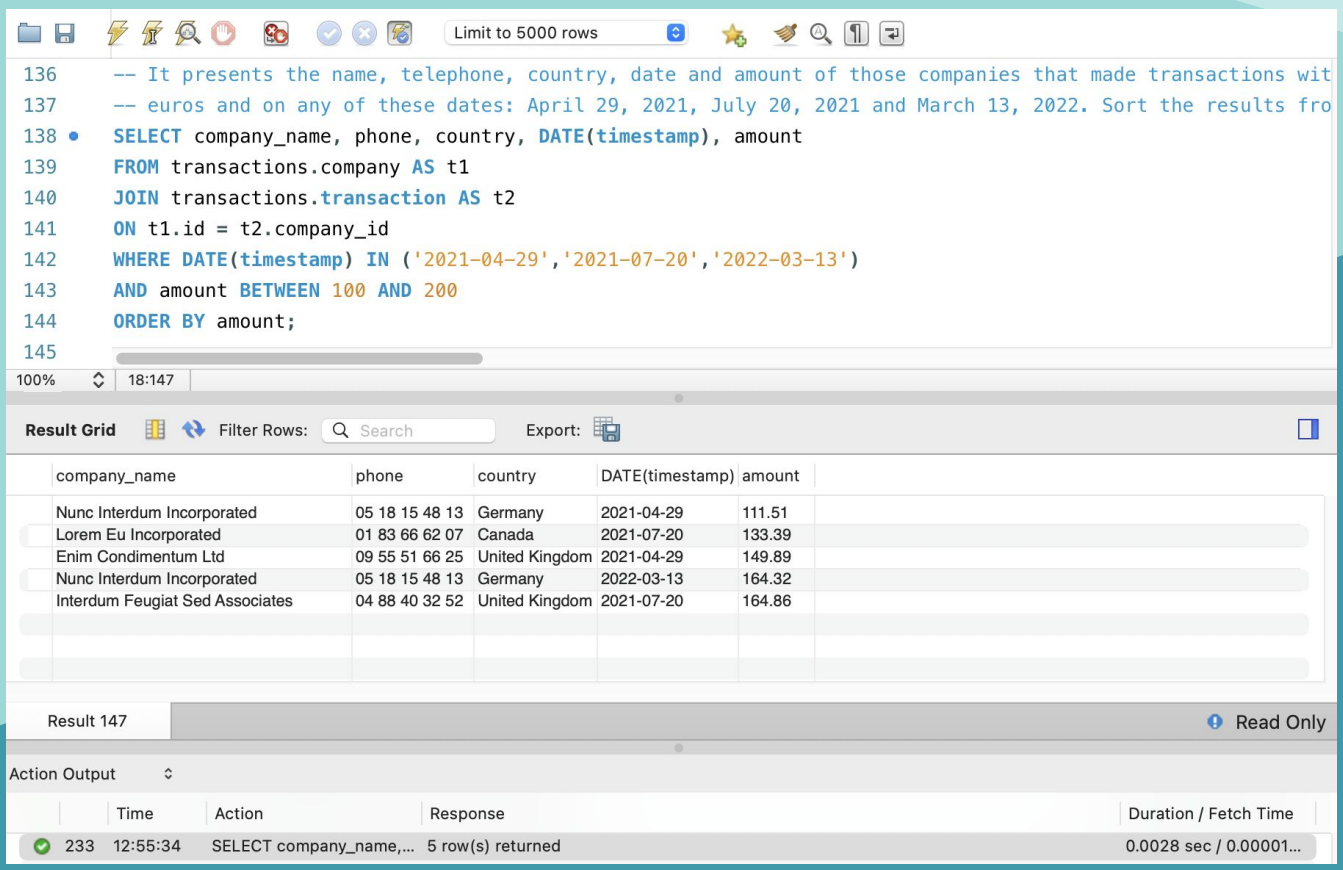
- Display the list by applying JOIN and subqueries;
- Display the listing by applying only subqueries.




Limit to 5000 rows
-- with only subqueries
SELECT company_name
FROM transactions.company AS t1
WHERE country IN (
SELECT country FROM transactions.company
WHERE company_name LIKE 'Non Institute'
)
AND company_name <> 'Non Institute'
AND EXISTS (
SELECT company_id FROM transactions.transaction AS t2
WHERE t1.id = t2.company_id
)
ORDER BY company_name;
100%
20:135
Result Grid
Filter Rows:
Search
Export:
company_name
Ac Libero Inc.
Amet Faucibus Ut Foundation
Enim Condimentum Ltd
Interdum Feugiat Sed Associates
Non Magna LLC
Orci Adipiscing Limited
Sed Nunc Ltd
Viverra Donec Foundation
company 146
Read Only
Action Output
Time
Action
Response
Duration / Fetch Time
232
12:52:40
SELECT company_name...
8 row(s) returned
0.0016 sec / 0.00000...

LEVEL 3 EXERCISE 1

It presents the name, telephone, country, date and amount of those companies that made transactions with a value between 100 and 200 euros and on any of these dates: April 29, 2021, July 20, 2021 and March 13, 2022. Sort the results from highest to lowest amount.



```
Limit to 5000 rows

136  -- It presents the name, telephone, country, date and amount of those companies that made transactions wit
137  -- euros and on any of these dates: April 29, 2021, July 20, 2021 and March 13, 2022. Sort the results fro
138  SELECT company_name, phone, country, DATE(timestamp), amount
139  FROM transactions.company AS t1
140  JOIN transactions.transaction AS t2
141  ON t1.id = t2.company_id
142  WHERE DATE(timestamp) IN ('2021-04-29','2021-07-20','2022-03-13')
143  AND amount BETWEEN 100 AND 200
144  ORDER BY amount;
145
```

100% 18:147

Result Grid Filter Rows: Search Export:

company_name	phone	country	DATE(timestamp)	amount
Nunc Interdum Incorporated	05 18 15 48 13	Germany	2021-04-29	111.51
Lorem Eu Incorporated	01 83 66 62 07	Canada	2021-07-20	133.39
Enim Condimentum Ltd	09 55 51 66 25	United Kingdom	2021-04-29	149.89
Nunc Interdum Incorporated	05 18 15 48 13	Germany	2022-03-13	164.32
Interdum Feugiat Sed Associates	04 88 40 32 52	United Kingdom	2021-07-20	164.86

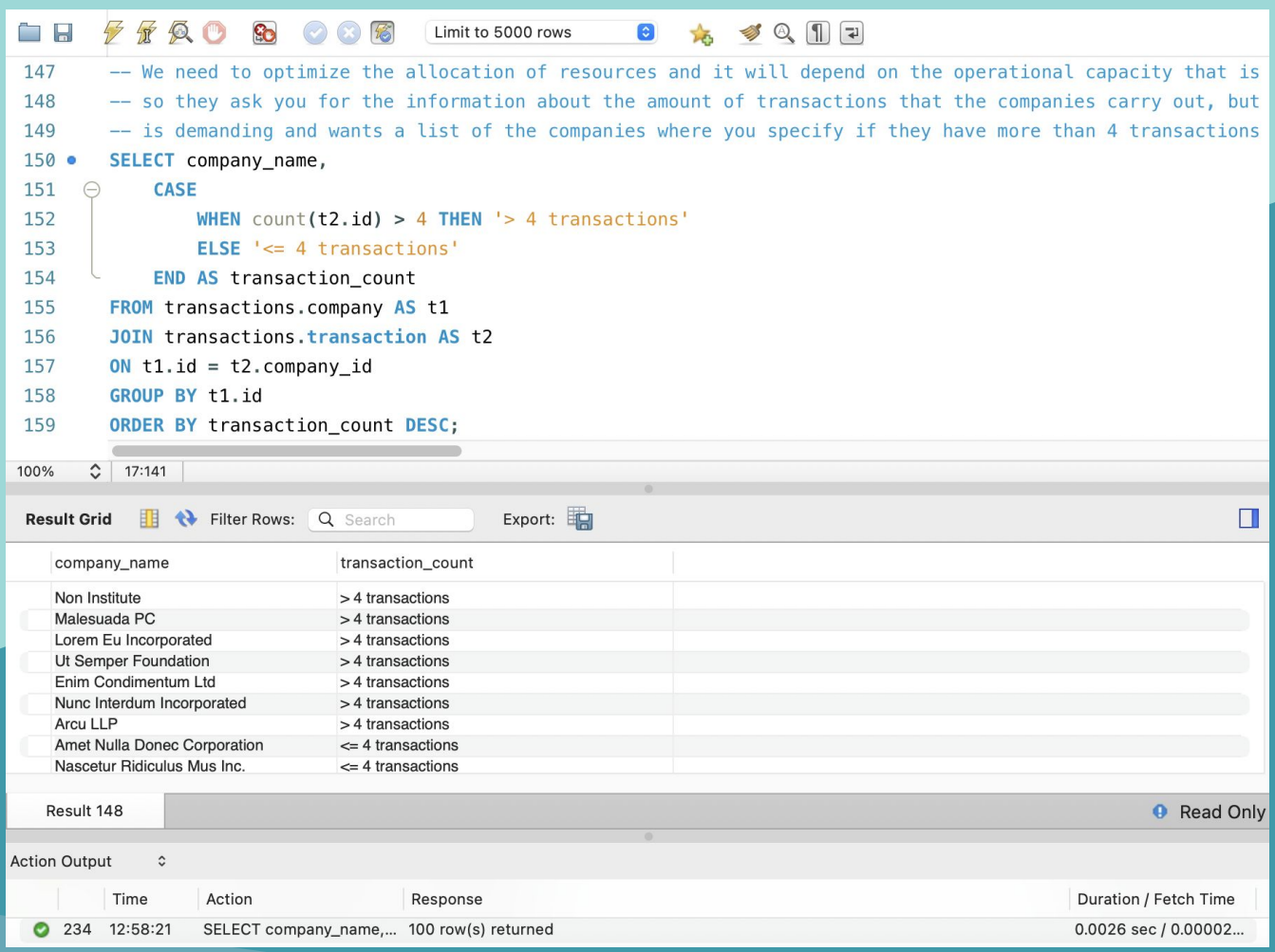
Result 147 Read Only

Action Output

	Time	Action	Response	Duration / Fetch Time
233	12:55:34	SELECT company_name,...	5 row(s) returned	0.0028 sec / 0.00001...

LEVEL 3 EXERCISE 2

We need to optimize the allocation of resources and it will depend on the operational capacity that is required, so they ask you for the information about the amount of transactions that the companies carry out, but the HR department is demanding and wants a list of the companies where you specify if they have more than 4 transactions or less.



```
147  -- We need to optimize the allocation of resources and it will depend on the operational capacity that is
148  -- so they ask you for the information about the amount of transactions that the companies carry out, but
149  -- is demanding and wants a list of the companies where you specify if they have more than 4 transactions
150  SELECT company_name,
151      CASE
152          WHEN count(t2.id) > 4 THEN '> 4 transactions'
153          ELSE '<= 4 transactions'
154      END AS transaction_count
155  FROM transactions.company AS t1
156  JOIN transactions.transaction AS t2
157  ON t1.id = t2.company_id
158  GROUP BY t1.id
159  ORDER BY transaction_count DESC;
```

Result Grid

company_name	transaction_count
Non Institute	> 4 transactions
Malesuada PC	> 4 transactions
Lorem Eu Incorporated	> 4 transactions
Ut Semper Foundation	> 4 transactions
Enim Condimentum Ltd	> 4 transactions
Nunc Interdum Incorporated	> 4 transactions
Arcu LLP	> 4 transactions
Amet Nulla Donec Corporation	<= 4 transactions
Nascetur Ridiculus Mus Inc.	<= 4 transactions

Result 148 — Read Only

Action Output

	Time	Action	Response	Duration / Fetch Time
234	12:58:21	SELECT company_name,...	100 row(s) returned	0.0026 sec / 0.00002...