

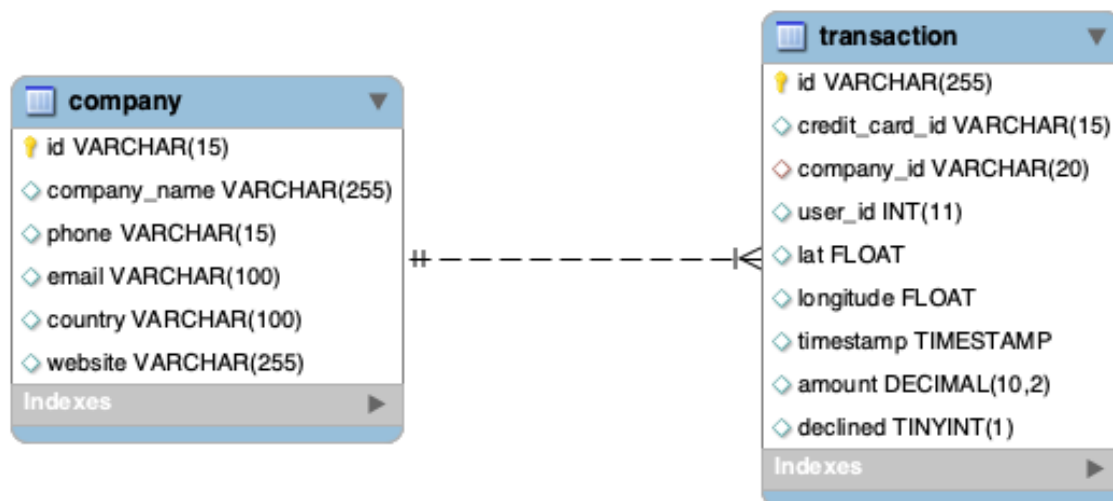
Task 2.01. Basic SQL

Level 1.

Exercise1.

The database *'transactions'* was created from the provided files *'estructura_dades.sql'* and *'dades_introduir.sql'* in MySQL Workbench. Database contains information from a company that sells products online.

ER diagram



Database has relational structure and consists from two tables:

- *'company'* - corporate information of the companies

All variables are strings of different length

Primary key - *'id'* - uniquely identify each company

- *'transaction'* - data related to the transactions performed by companies

Variables *id*, *credit_card_id* and *company_id* are strings, *user_id* and *declined* have type integer, *lat* and *longitude* are floats, *amount* has decimal format (with up to 10 digits in total and 2 decimal places), and *timestamp* has datetime format.

Primary key - *'id'* - uniquely identify each transaction

Foreign key - `'company_id'` - links this table with table `'company'` (column `'id'`), links each transaction to the company that made the transaction. Also `'user_id'` and `'credit_card_id'` could be foreign keys for tables like `user` and `credit_card` if existed.

Tables overview

`'company'`

There are 100 different companies. All company names are unique.

```
-- Table 'company'
-- Number companies
3 select count(*)
4 from company;
5
```

100%	14:10	2 errors found
Result Grid	Filter Rows:	Search
count(*)		
100		

```
-- Number of company names
9 select count(company_name), count(DISTINCT company_name)
10 from company;
```

100%	1:9	2 errors found
Result Grid	Filter Rows:	Search
Export:		
count(company_name)	count(DISTINCT company_name)	
100	100	

There are no missing values in the corporate information (email, phone, website).

```
-- Number of non-missing values
18 select count(phone), count(email), count(website)
19 from company;
20
```

100% 1:22 1 error found

Result Grid Filter Rows: Search Export:

count(phone)	count(email)	count(website)
100	100	100

'transaction'

During period from '2021-03-17' to '2022-03-16' 587 transactions were performed, only 87 of them were declined (around 15%).

```
29 -- Table 'transaction'
30 -- period of time
31 select min(date(timestamp)) as first_date, max(date(timestamp)) as last_date
32 from transaction;
```

100% 1:34 1 error found

Result Grid Filter Rows: Search Export:

first_date	last_date
2021-03-17	2022-03-16

```
35 -- Number of transactions
36 select count(*) as total_number,
37 count(*)-sum(declined) as successful_number,
38 sum(declined) as declined_number,
39 round(sum(declined)/count(*)*100, 0) as declined_percentage
40 from transaction;
```

100% 18:40 1 error found

Result Grid Filter Rows: Search Export:

total_number	successful_number	declined_number	declined_percentage
587	500	87	15

100 companies have registered transactions, what allow to assume that all companies from 'company' table may have at least 1 transaction.

```
40 -- number of companies that have registered transactions
41 select count(DISTINCT company_id)
42 from transaction;
```

100% 18:44

Result Grid Filter Rows: Search Export:

count(DISTINCT company_id)
100

There are no missing values in the information about transactions.

49

50

51

52

53

-- Number of non-missing values

select count(*) as total_rows, count(credit_card_id), count(company_id),

count(user_id), count(timestamp), count(amount)

from transaction;

100%

18:53

Result Grid

Filter Rows:

Q

Search

Export:

total_rows	count(credit_card_id)	count(company_id)	count(user_id)	count(timestamp)	count(amount)	
▶ 587	587	587	587	587	587	

Exercise 2.

- List of countries that make purchases (using JOIN)

```
6 • SELECT DISTINCT c.country
7 FROM company as c
8 JOIN transaction as t ON t.company_id = c.id;
9
```

Result Grid

country
Germany
Australia
United States
New Zealand
Norway
United Kingdom
Italy
Belgium
Sweden
Ireland
China
Canada
France
Netherlands
Spain

Result 37

Action Output

	Time	Action	Response	Duration / Fetc...
✓ 1	21:56:59	SELECT DISTINCT c.country FROM company as c JOIN transaction as t...	15 row(s) returned	0.0090 sec / 0....

- From how many countries the purchases are made? (using JOIN)

```
10 -- From how many countries the purchases are made.
11 • SELECT count(DISTINCT c.country)
12 FROM company as c
13 JOIN transaction as t ON t.company_id = c.id;
14
```

Result Grid

count(DISTINCT c.country)
15

Result 38

Action Output

	Time	Action	Response	Duration / Fetc...
✓ 1	21:59:45	SELECT count(DISTINCT c.country) FROM company as c JOIN transacti...	1 row(s) returned	0.0022 sec / 0....

- Company with the highest average sales (using JOIN).

```

15  -- Company with the highest average sales.
16  •  SELECT c.company_name, round(AVG(t.amount),2) as average_sales
17  FROM company as c
18  JOIN transaction as t ON t.company_id = c.id
19  WHERE t.declined = 0
20  GROUP BY c.company_name
21  ORDER BY average_sales DESC
22  LIMIT 1;
23

```

100% 18:17

Result Grid Filter Rows: Search Export: Fetch rows:

company_name	average_sales
Eget Ipsum Ltd	481.86

Result 3

Action Output

	Time	Action	Response	Duration / Fetch Time
✓ 1	15:02:22	SELECT c.company_name, round(AVG(t.amount),2) a...	1 row(s) returned	0.0061 sec / 0.00001...

**** Only successful transactions were considered as sales**

Exercise 3.

- All transactions made by companies in Germany (subqueries without using JOIN).

```
23 -- Exercise 3 (subqueries without using JOIN).
24 -- All transactions made by companies in Germany.
25 • SELECT *
26 FROM transaction
27 WHERE company_id IN (SELECT id FROM company WHERE country = 'Germany');
28
```

11:4

Result Grid

id	credit_card_id	company_id	user_id	lat	longitude	timestamp	amount	declined
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
186F53DE-DE27-B1FE-B82F-15B61CEB7726	CcU-4310	b-2302	225	-72.7448	36.6211	2021-12-20 13:13:45	238.16	0
18C4E2DD-1E4C-F35E-2198-C660BD81DC25	CcU-4849	b-2302	177	68.0133	91.4839	2021-09-24 18:55:25	237.04	0
18CCBA7C-ABC1-813D-FAF3-4BA897429368	CcU-4219	b-2302	173	51.3881	-156.371	2021-06-21 03:21:34	58.16	0
19E1EC3E-2119-1EFD-8AAE-5930D4A4E63F	CcU-4219	b-2302	154	-56.0839	116.987	2021-07-06 21:40:15	29.63	0
1B117D49-936C-BA6C-E94B-30C3293AA239	CcU-4219	b-2302	163	-75.099	109.034	2021-05-09 23:56:04	371.35	0
1B521826-5860-5A86-5364-6EB6A5CC21B7	CcU-4226	b-2302	231	-53.4613	49.1484	2021-08-14 02:39:50	476.33	0
1C3B3CC4-B919-7616-6A57-EEBDD7B7B68B	CcU-4415	b-2302	217	81.1737	62.8835	2021-09-27 16:07:34	462.35	0
2075B12D-69AB-7022-57BB-33ED49B72766	CcU-4247	b-2302	229	-9.03682	88.9005	2022-02-13 04:07:29	87.44	0
241827A6-E87C-6DA3-5AC9-BBCFD42B7D2A	CcU-4849	b-2302	190	-12.1172	-175.322	2021-08-04 04:44:35	487.64	0
2585891B-C4C7-075E-358B-B575339E5177	CcU-4450	b-2302	215	32.9171	-40.6059	2021-08-24 05:32:36	253.49	0
262035AA-8758-F413-8CCA-6D8F81BBF589	CcU-4338	b-2302	223	26.61	83.1953	2021-06-21 11:23:01	499.23	0

transaction 41

Action Output

	Time	Action	Response	Duration / Fetc...
✓ 1	22:03:32	SELECT * FROM transaction WHERE company_id IN (SELECT id FROM c...	118 row(s) returned	0.0050 sec / 0...

- List of companies that have made transactions for an amount higher than the average of all transactions (subqueries without using JOIN).

```

29  -- Companies that have made transactions for an amount higher than the average of all transactions.
30  • SELECT *
31  FROM company
32  WHERE id IN (SELECT company_id FROM transaction WHERE amount > (SELECT AVG(amount) FROM transaction));
33

```

72:27

Result Grid Filter Rows: Edit: Export/Import:

id	company_name	phone	email	country	website
b-2230	Fusce Corp.	08 14 97 58 85	risus@protonmail.edu	United States	https://pinterest.com/sub/cars
b-2238	Ante Iaculis Nec Foundation	08 23 04 99 53	sed.dictum.proin@outlook.ca	New Zealand	https://netflix.com/settings
b-2242	Donec Ltd	01 25 51 37 37	at.iaculis@hotmail.couk	Norway	https://nytimes.com/user/110
b-2246	Sed Nunc Ltd	02 62 64 73 48	nibh@yahoo.org	United Kingdom	https://cnn.com/one
b-2254	Nascetur Ridiculus Mus Inc.	06 26 87 61 84	suspendisse.dui@icloud.net	United States	https://ebay.com/sub
b-2258	Vestibulum Lorem PC	02 02 87 33 40	aenean.massa.integer@aol.net	Belgium	https://pinterest.com/sub/cars
b-2262	Gravida Sagittis LLP	03 81 28 33 97	turpis.vitae@google.ca	Sweden	https://naver.com/site
b-2266	Mus Aenean Eget Foundation	06 25 15 52 43	mi.duis@hotmail.net	Sweden	https://instagram.com/group/9
b-2270	Dis Parturient Institute	05 36 29 78 74	purus@protonmail.org	Ireland	https://google.com/one
b-2274	Sed LLC	01 63 16 26 52	at@outlook.com	Belgium	https://reddit.com/fr
b-2278	Arcu LLP	06 46 04 41 45	dui@aol.ca	Norway	https://yahoo.com/sub
b-2286	Fringilla LLC	08 29 15 93 57	gravida@protonmail.couk	New Zealand	https://reddit.com/user/110
b-2298	Elit Etiam Laoreet Associates	07 69 74 17 45	ultrices@google.couk	Canada	https://yahoo.com/fr
b-2302	Nunc Interdum Incorporated	05 18 15 48 13	non@outlook.com	Germany	https://wikipedia.org/en-us
b-2306	Augue Foundation	06 88 43 15 63	mauris@yahoo.com	Germany	https://baidu.com/sub/cars
b-2310	Non Magna LLC	06 71 73 13 17	nisl.quisque.fringilla@hotmail.ca	United Kingdom	https://whatsapp.com/site
b-2314	A Institute	03 34 91 68 65	metus.aliquam@google.edu	Belgium	https://reddit.com/fr
b-2318	Quam A Felis Industries	04 87 10 27 16	proin.veleit@icloud.edu	Italy	https://ebay.com/settings
b-2322	Integer Mollis Corp.	03 12 20 45 24	eu.eros@protonmail.ca	Italy	https://netflix.com/group/9
b-2326	Enim Condimentum Ltd	09 55 51 66 25	imperdiet.non.vestibulum@yahoo.net	United Kingdom	https://cnn.com/group/9
b-2330	Donec Fringilla PC	01 51 58 14 44	ut.tincidunt@hotmail.ca	France	https://google.com/fr
b-2334	Amet Institute	06 33 40 21 33	nullam.lobortis.quam@outlook.net	Australia	https://nytimes.com/one
b-2338	Magna Incorporated	07 73 69 44 18	non@qoogle.net	New Zealand	https://twitter.com/en-us
company 42					

Action Output

	Time	Action	Response	Duration / Fetc...
✓ 1	22:10:56	SELECT * FROM company WHERE id IN (SELECT company_id FROM tran...	70 row(s) returned	0.0050 sec / 0...

- [illegible]

Level 2.

Exercise1.

Five days that generated the largest amount of revenue for the company (date of each transaction along with the total sales)

```
40 -- Level 2.
41 -- Exercise 1. Five days that generated the largest amount of revenue for the company.
42 -- Date of each transaction along with the total sales
43 • select date(timestamp) as date, sum(amount) as total_sales
44 from transaction
45 where declined = 0
46 group by date(timestamp)
47 order by total_sales desc
48 limit 5;
49
```

100% 9:48

Result Grid Filter Rows: Search Export: Fetch rows:

date	total_sales
2021-12-20	1532.36
2021-04-22	1397.96
2021-05-09	1344.37
2022-02-26	1337.62
2021-03-29	1325.12

Result 4

Action Output

	Time	Action	Response	Duration / Fetch Time
✓ 1	15:06:47	select date(timestamp) as date, sum(amount) as total...	5 row(s) returned	0.0032 sec / 0.00002...

**** Declined transactions were not taking into account because they did not generate any profit for the company.**

Exercise2.

Average sales per country.

Results are sorted from highest to lowest average sale.

```
50  -- Exercise 2. Average sales per country.
51  -- Results are sorted from highest to lowest average sale.
52 • select c.country, round(AVG(t.amount), 2) as average_sales
53    from transaction as t
54   join company as c on t.company_id=c.id
55  where t.declined = 0
56  group by c.country
57  order by average_sales desc;
```

100% 23:53

Result Grid Filter Rows: Search Export:

country	average_sales
United States	287.53
Ireland	285.83
Sweden	276.67
United Kingdom	271.77
Canada	261.94
Belgium	255.22
Norway	251.11
Italy	243.34
Germany	242.24
Netherlands	240.94
China	222.24
Australia	177.33
France	169.41
New Zealand	167.06
Spain	26.22

Result 5

Action Output

	Time	Action	Response	Duration / Fetch Time
✓ 1	15:09:42	select c.country, round(AVG(t.amount), 2) as average...	15 row(s) returned	0.0074 sec / 0.00002...

Exercise3.

Transactions carried out by companies that are located in the same country as "Non Institute" company.

- using only subqueries

```
59 -- Exercise 3. Transactions carried out by companies that are located in the same country as "Non Institute" company.
60 -- Using subqueries
61 • select *
62 from transaction
63 where company_id IN (
64     select id
65     from company
66     where country = (select country from company where company_name = 'Non Institute')
67     and company_name != 'Non Institute')
68 order by id;
```

id	credit_card_id	company_id	user_id	lat	longitude	timestamp	amount	declined
1479B3D2-B7BA-C7BB-4CE3-8D7C2DE85ABB	CcU-2994	b-2326	133	66.2672	172.399	2021-08-09 00:58:07	309.45	0
152598C2-029D-D684-4B66-91EDF393EBFF	CcU-2994	b-2326	126	-67.0189	-141.672	2021-07-05 03:10:00	395.43	0
1B636B58-A2E8-7C69-D9C9-C54535DAFD3B	CcU-2994	b-2326	131	70.2543	-13.1336	2021-07-06 08:48:46	195.06	0
20418DE5-B804-BE9B-BD7A-A95C1BFDBF5C	CcU-2994	b-2326	126	-79.1145	1.51481	2022-01-03 15:59:29	479.52	0
239B8576-6C0E-137A-C2F6-3180A188A2D3	CcU-2994	b-2326	126	23.6174	137.222	2021-08-26 06:04:05	43.90	0
267C4A86-7BA7-1C5E-0718-2824983C87DD	CcU-2994	b-2326	126	-17.5259	104.915	2021-10-01 21:08:53	122.63	0
2A5A3001-104F-1D1F-7852-5BA801869B6F	CcU-3169	b-2354	272	-67.2525	-142.557	2022-02-27 18:35:15	30.76	0
2B928E1C-EC14-A760-0A75-871477649D6A	CcU-2980	b-2246	275	-41.0496	161.685	2021-08-10 08:14:49	383.73	0
3142C93E-B3B7-49E4-EE2D-29CA834B198D	CcU-2994	b-2326	126	-67.8476	-119.978	2021-04-06 17:24:44	91.59	0
3578688E-7B1D-B887-3BC7-20B8673AA31E	CcU-2994	b-2326	126	87.0665	-22.7339	2021-07-26 22:59:24	303.60	0
360C7814-F7AF-B43A-0946-AB38D2683C86	CcU-2994	b-2326	116	-7.93005	-79.0733	2021-08-21 10:19:58	494.82	0
391E1CFD-D653-E45B-A729-F2EB93247B58	CcU-2994	b-2326	118	60.5512	103.904	2021-10-09 00:50:38	271.27	0

Time	Action	Response	Duration / Fetch Time
15:13:55	select * from transaction where company_id IN (sele...	70 row(s) returned	0.0023 sec / 0.0000...

- Using JOIN and Subqueries

```
70 -- Using JOIN and subqueries
71 • select t.*
72 from transaction as t
73 join company as c on t.company_id=c.id
74 where country = (select country from company where company_name = 'Non Institute')
75 and company_name != 'Non Institute'
76 order by id;
77
```

id	credit_card_id	company_id	user_id	lat	longitude	timestamp	amount	declined
1479B3D2-B7BA-C7BB-4CE3-8D7C2DE85ABB	CcU-2994	b-2326	133	66.2672	172.399	2021-08-09 00:58:07	309.45	0
152598C2-029D-D684-4B66-91EDF393EBFF	CcU-2994	b-2326	126	-67.0189	-141.672	2021-07-05 03:10:00	395.43	0
1B636B58-A2E8-7C69-D9C9-C54535DAFD3B	CcU-2994	b-2326	131	70.2543	-13.1336	2021-07-06 08:48:46	195.06	0
20418DE5-B804-BE9B-BD7A-A95C1BFDBF5C	CcU-2994	b-2326	126	-79.1145	1.51481	2022-01-03 15:59:29	479.52	0
239B8576-6C0E-137A-C2F6-3180A188A2D3	CcU-2994	b-2326	126	23.6174	137.222	2021-08-26 06:04:05	43.90	0
267C4A86-7BA7-1C5E-0718-2824983C87DD	CcU-2994	b-2326	126	-17.5259	104.915	2021-10-01 21:08:53	122.63	0
2A5A3001-104F-1D1F-7852-5BA801869B6F	CcU-3169	b-2354	272	-67.2525	-142.557	2022-02-27 18:35:15	30.76	0
2B928E1C-EC14-A760-0A75-871477649D6A	CcU-2980	b-2246	275	-41.0496	161.685	2021-08-10 08:14:49	383.73	0
3142C93E-B3B7-49E4-EE2D-29CA834B198D	CcU-2994	b-2326	126	-67.8476	-119.978	2021-04-06 17:24:44	91.59	0
3578688E-7B1D-B887-3BC7-20B8673AA31E	CcU-2994	b-2326	126	87.0665	-22.7339	2021-07-26 22:59:24	303.60	0
360C7814-F7AF-B43A-0946-AB38D2683C86	CcU-2994	b-2326	116	-7.93005	-79.0733	2021-08-21 10:19:58	494.82	0
391E1CFD-D653-E45B-A729-F2EB93247B58	CcU-2994	b-2326	118	60.5512	103.904	2021-10-09 00:50:38	271.27	0

Time	Action	Response	Duration / Fetch Time
15:15:46	select t.* from transaction as t join company as c on t....	70 row(s) returned	0.0018 sec / 0.00004...

Level 3.

Exercise1.

List of companies (name, telephone, country, date and amount) 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 (results are sorted from highest to lowest amount).

```
72 -- Level 3.
73 -- Exercise 1. Companies (name, telephone, country, date and amount) that made transactions with a value between 1
74 -- and on any of these dates: April 29, 2021, July 20, 2021 and March 13, 2022.
75 -- Results are sirted from highest to lowest amount. |
76 • select c.company_name, c.phone, c.country, date(t.timestamp) as date, t.amount
77 from company as c
78 join transaction as t on t.company_id=c.id
79 where t.amount between 100 and 200
80 and date(t.timestamp) IN ('2021-04-29', '2021-07-20', '2022-03-13')
81 order by t.amount desc;
82
```

54:75

Result Grid

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

Result 51

Action Output

	Time	Action	Response	Duration / Fetc...
✓ 1	22:46:04	select c.company_name, c.phone, c.country, date(t.timestamp) as date,...	5 row(s) returned	0.0061 sec / 0....

**** Values 100 and 200 are included**

Exercise2.

List of companies with the amount of transactions they have made, specifying whether they have made more than 4 transactions or less.

```
83 -- Amount of transactions that the companies carry out, specifying if they have more than 4 transactions or less
84 • select c.company_name, count(t.id) as number_transactions,
85 CASE
86     when count(t.id) > 4 then 1
87     else 0
88 END as more_than_4_transactions
89 from company as c
90 left join transaction as t on t.company_id=c.id
91 group by c.company_name
92 order by number_transactions desc;
93
```

93:83

Result Grid

company_name	number_transactions	more_than_4_transactions
Nunc Interdum Incorporated	105	1
Ut Semper Foundation	59	1
Enim Condimentum Ltd	57	1
Arcu LLP	56	1
Lorem Eu Incorporated	54	1
Malesuada PC	52	1
Non Institute	30	1
Amet Nulla Donec Corporation	2	0
Nascetur Ridiculus Mus Inc.	2	0
Vestibulum Lorem PC	2	0
Gravida Sagittis LLP	2	0
Mus Aenean Eget Foundation	2	0
Dis Parturient Institute	2	0
Sed LLC	2	0
Sed Nunc Ltd	2	0
Pretium Neque Corp.	2	0
Fringilla LLC	2	0
Quisque Libero LLC	2	0

Result 52

Action Output

	Time	Action	Response	Duration / Fetc...
✓ 1	22:53:19	select c.company_name, count(t.id) as number_transactions, CASE w...	100 row(s) returned	0.0045 sec / 0....

**** Left JOIN** was used to provide information about all the companies from the 'company' table, regardless of whether they made any transaction.