**Level 1**

**Exercise 1**

Based on the attached documents (data_structure and input_data), import the two tables. Show the main features of the schema created and explain the different tables and variables that exist. Be sure to include a diagram that illustrates the relationship between the different tables and variables.

In this **schema,** there are two tables:

Tables:

- Company
- Transaction

## Company Table:

The Company table  is a main table .It contains various fields (columns) that store information about each company.

**Columns:**

1. id – This is a VARCHAR data type. It serves as the unique identifier for each company and is the primary key of the table.
2. company_name – This is a VARCHAR data type. It stores the name of the company.
3. phone – This is a VARCHAR data type. It stores the phone number of the company.
4. email – This is a VARCHAR data type. It stores the email address of the company.
5. website – This is a VARCHAR data type. It stores the website URL of the company.

| Column Name | Data Type | Description |
|---|---|---|
| Id(Primary Key) | VARCHAR | the unique identifier for each company |
| company_name | VARCHAR | name of the company. |
| phone | VARCHAR | number of the company. |
| email | VARCHAR | email address of the company |
| website | VARCHAR | website URL of the company. |

## Transaction Table:

Transaction table is a dimension table.It Stores detailed records of each transaction made by a company.

**Columns:**

1. id – This is a VARCHAR data type. It serves as the unique identifier for each transaction and is the primary key of the table.
2. credit_card_id – This is a data type. It stores the ID of the credit card used in the transaction and is a foreign key referencing credit_card(id).
3. company_id – This is a VARCHAR data type. It stores the ID of the company where the transaction took place. It is a foreign key referencing company(id).
4. user_id – This is an INT data type. It stores the ID of the user who made the transaction. It is a foreign key referencing user(id).
5. lat – This is a FLOAT data type. It stores the latitude of the location where the transaction occurred.
6. longitude – This is a FLOAT data type. It stores the longitude of the transaction location.

7. timestamp – This is a TIMESTAMP data type. It records the date and time when the transaction took place.

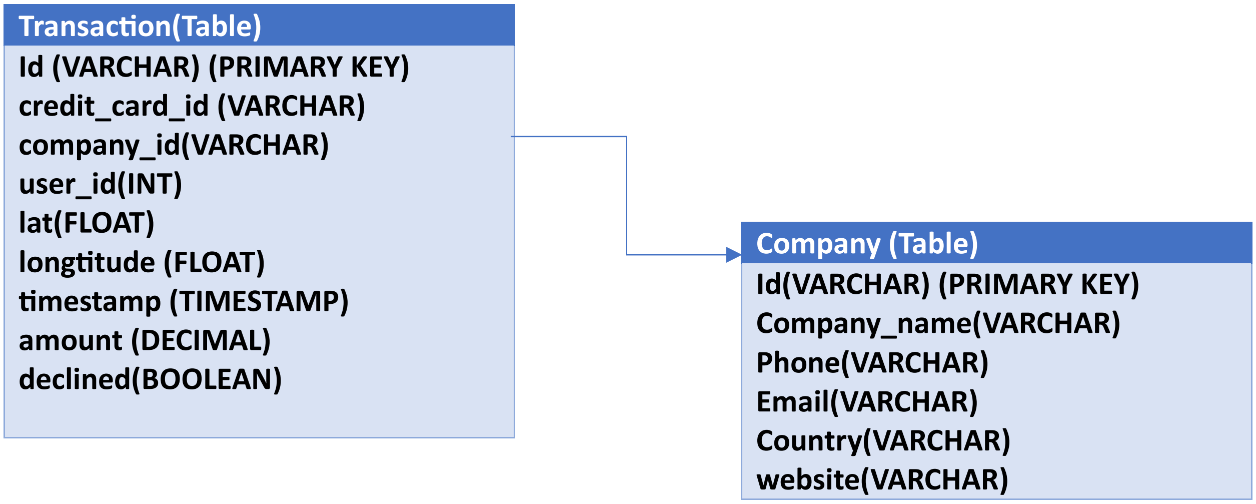
8. amount – This is a DECIMAL data type. It represents the monetary value of the transaction, with up to 10 digits in total and VARCHAR 2 digits after the decimal point.

9. declined – This is a BOOLEAN data type. It indicates whether the transaction was declined (TRUE) or approved (FALSE).

| **Column Name** | **Data Type** | **Description** |
|---|---|---|
| Id(Primary Key) | VARCHAR | unique identifier for each transaction |
| credit_card_id( Foreign Key) | VARCHAR | The ID of the credit card used in the transaction |
| company_id( Foreign Key) | VARCHAR | The ID of the company |
| user_id( Foreign Key) | INT | The ID of the user who made the transaction. |
| lat | FLOAT | The location where the transaction occurred. |
| longitude | FLOAT | The transaction location |
| timestamp | TIMESTAMP | It records the date and time when the transaction took place. |
| amount | DECIMAL | the monetary value of the transaction |
| declined | BOOLEAN | It indicates whether the transaction was declined (TRUE) or approved (FALSE). |

**Relationships**

- **One-to-Many** relationship between company and transaction.
  - One company can have zero or many transactions.
  - Each transaction belongs to exactly one company.



Transaction(Table)

Id (VARCHAR) (PRIMARY KEY)
credit_card_id (VARCHAR)
company_id(VARCHAR)
user_id(INT)
lat(FLOAT)
longtitude (FLOAT)
timestamp (TIMESTAMP)
amount (DECIMAL)
declined(BOOLEAN)

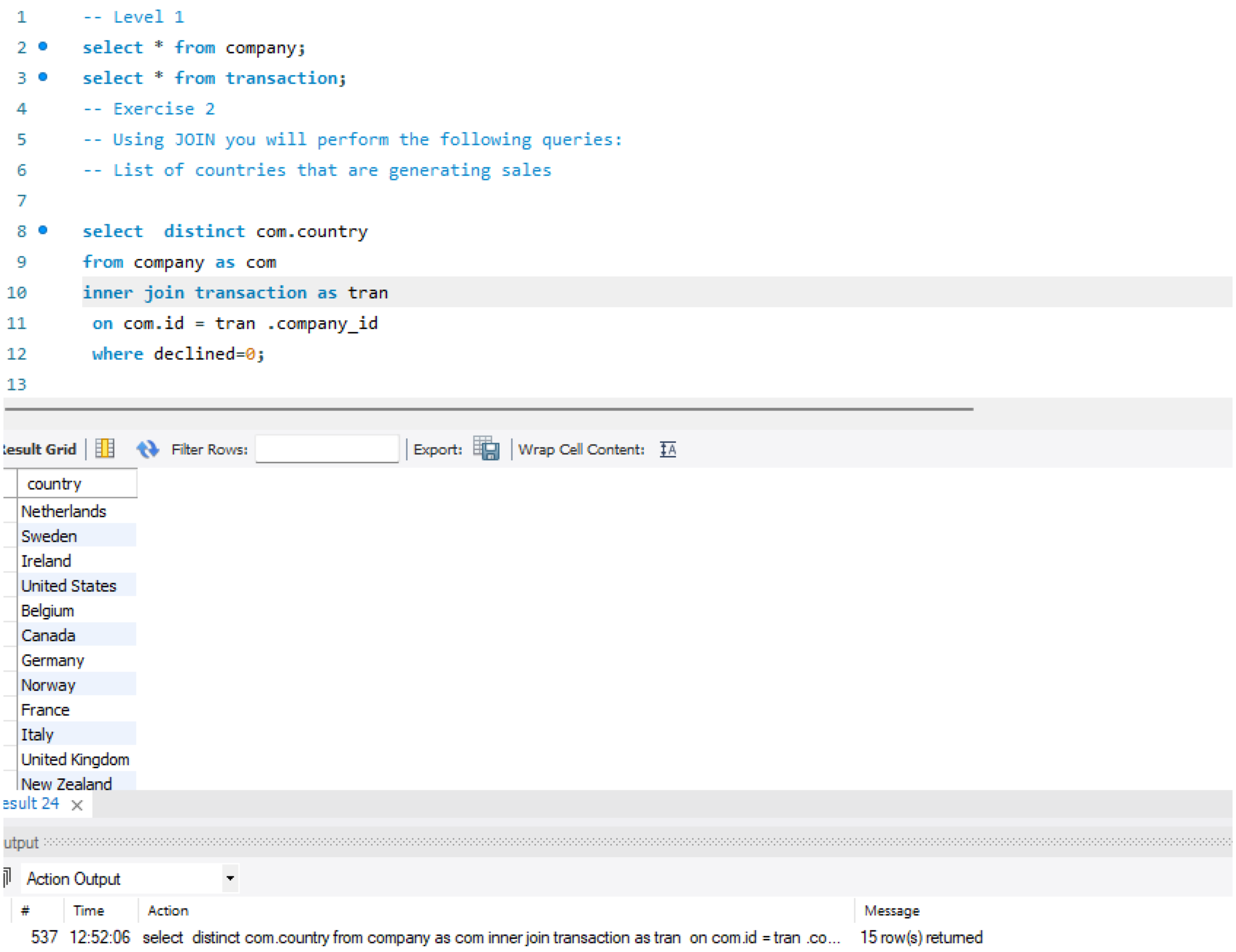
Company (Table)

Id(VARCHAR) (PRIMARY KEY)
Company_name(VARCHAR)
Phone(VARCHAR)
Email(VARCHAR)
Country(VARCHAR)
website(VARCHAR)

## Level 1

## Exercise 2

### Using JOIN you will perform the following queries:  List of countries that are generating sales.

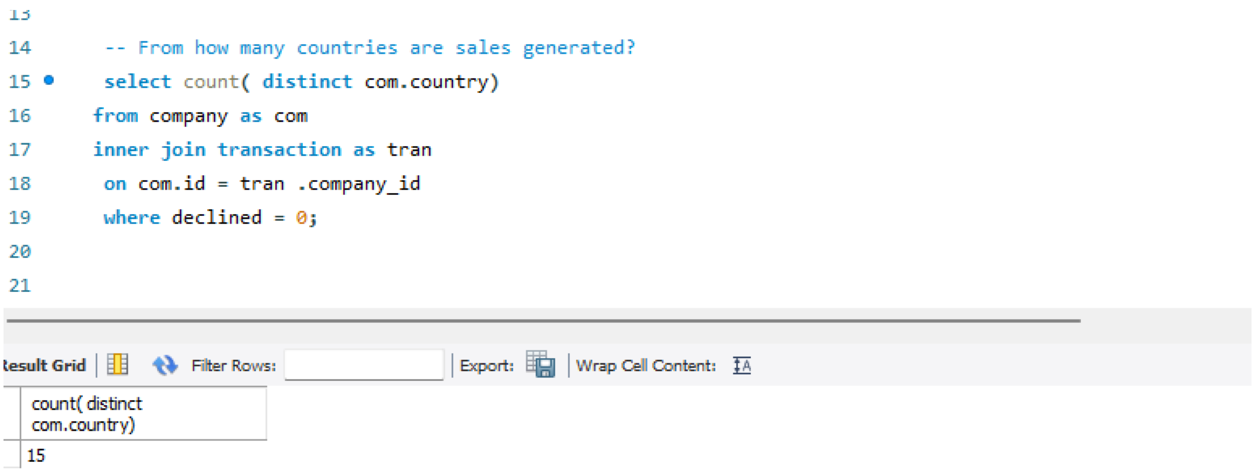


```sql
-- Level 1
select * from company;
select * from transaction;
-- Exercise 2
-- Using JOIN you will perform the following queries:
-- List of countries that are generating sales

select  distinct com.country
from company as com
inner join transaction as tran
 on com.id = tran .company_id
 where declined=0;

```

| country |
|---|
| Netherlands |
| Sweden |
| Ireland |
| United States |
| Belgium |
| Canada |
| Germany |
| Norway |
| France |
| Italy |
| United Kingdom |
| New Zealand |

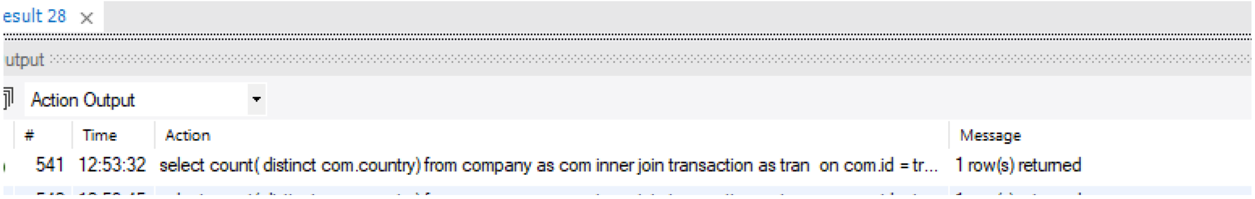
| # | Time | Action | Message |
|---|---|---|---|
| 537 | 12:52:06 | select  distinct com.country from company as com inner join transaction as tran  on com.id = tran .co... | 15 row(s) returned |

- **From how many countries are sales generated?**



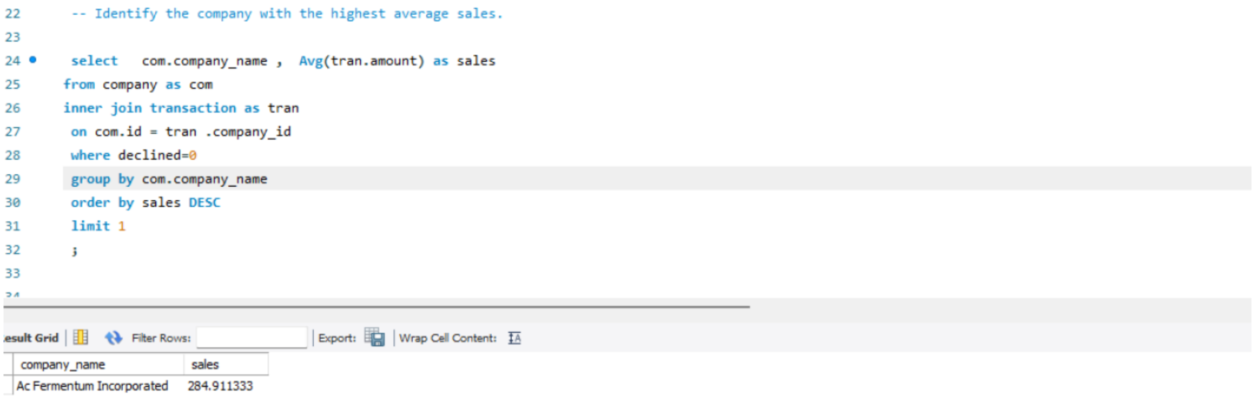
```sql
 -- From how many countries are sales generated?
 select count( distinct com.country)
from company as com
inner join transaction as tran
 on com.id = tran .company_id
 where declined = 0;
```

| count( distinct com.country) |
|---|
| 15 |



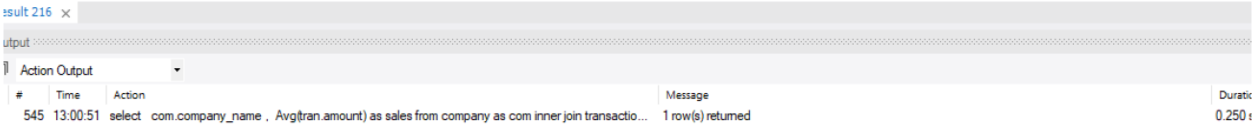
| # | Time | Action | Message |
|---|---|---|---|
| 541 | 12:53:32 | select count( distinct com.country) from company as com inner join transaction as tran  on com.id = tr... | 1 row(s) returned |

- ### Identify the company with the highest average sales.



```
 -- Identify the company with the highest average sales.

 select   com.company_name ,  Avg(tran.amount) as sales
from company as com
inner join transaction as tran
 on com.id = tran .company_id
 where declined=0
 group by com.company_name
 order by sales DESC
 limit 1
 ;
```

| company_name | sales |
|---|---|
| Ac Fermentum Incorporated | 284.911333 |

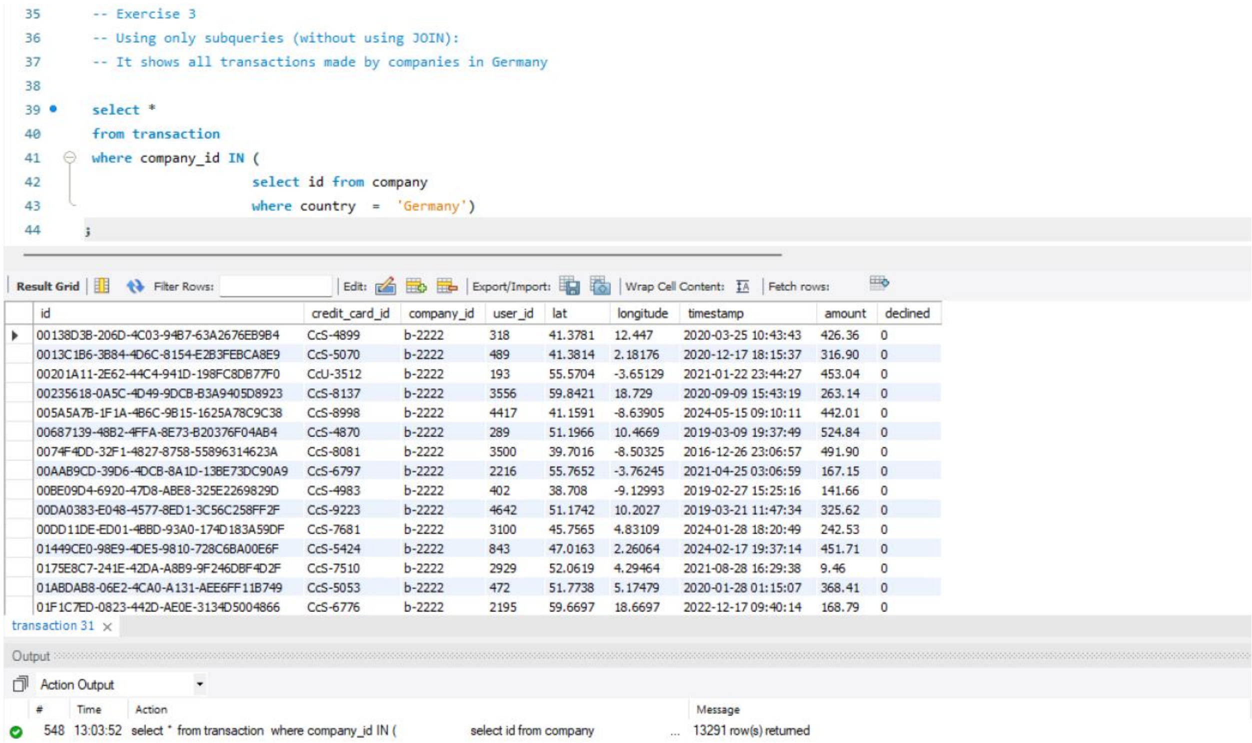


| # | Time | Action | Message | Duratio |
|---|---|---|---|---|
| 545 | 13:00:51 | select  com.company_name ,  Avg(tran.amount) as sales from company as com inner join transactio... | 1 row(s) returned | 0.250 s |

## Exercise 3

## Using only subqueries (without using JOIN):

- **It shows all transactions made by companies in Germany.**

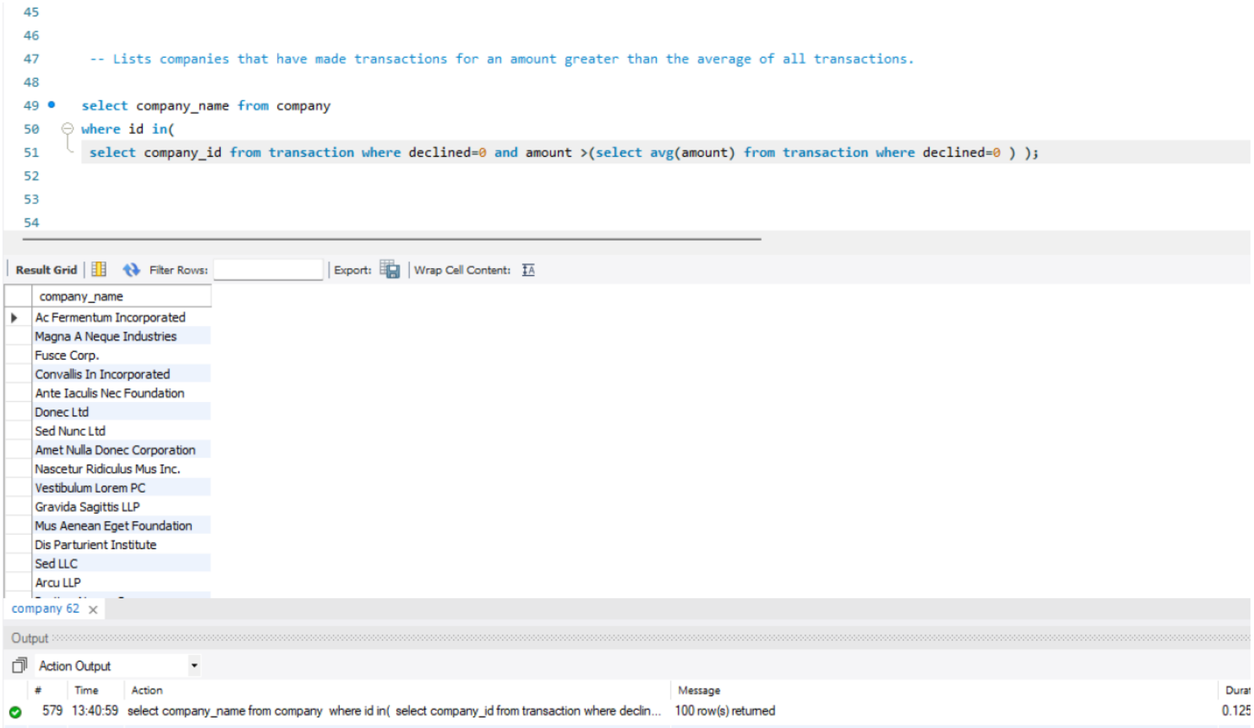


```sql
-- Exercise 3
-- Using only subqueries (without using JOIN):
-- It shows all transactions made by companies in Germany

select *
from transaction
where company_id IN (
                    select id from company
                    where country  =  'Germany')
;
```

| id | credit_card_id | company_id | user_id | lat | longitude | timestamp | amount | declined |
|---|---|---|---|---|---|---|---|---|
| 00138D3B-206D-4C03-94B7-63A2676EB9B4 | CcS-4899 | b-2222 | 318 | 41.3781 | 12.447 | 2020-03-25 10:43:43 | 426.36 | 0 |
| 0013C1B6-3B84-4D6C-8154-E2B3FEBCA8E9 | CcS-5070 | b-2222 | 489 | 41.3814 | 2.18176 | 2020-12-17 18:15:37 | 316.90 | 0 |
| 00201A11-2E62-44C4-941D-198FC8DB77F0 | CcU-3512 | b-2222 | 193 | 55.5704 | -3.65129 | 2021-01-22 23:44:27 | 453.04 | 0 |
| 00235618-0A5C-4D49-9DCB-B3A9405D8923 | CcS-8137 | b-2222 | 3556 | 59.8421 | 18.729 | 2020-09-09 15:43:19 | 263.14 | 0 |
| 005A5A7B-1F1A-4B6C-9B15-1625A78C9C38 | CcS-8998 | b-2222 | 4417 | 41.1591 | -8.63905 | 2024-05-15 09:10:11 | 442.01 | 0 |
| 00687139-48B2-4FFA-8E73-B20376F04AB4 | CcS-4870 | b-2222 | 289 | 51.1966 | 10.4669 | 2019-03-09 19:37:49 | 524.84 | 0 |
| 0074F4DD-32F1-4827-8758-55896314623A | CcS-8081 | b-2222 | 3500 | 39.7016 | -8.50325 | 2016-12-26 23:06:57 | 491.90 | 0 |
| 00AAB9CD-39D6-4DCB-8A1D-13BE73DC90A9 | CcS-6797 | b-2222 | 2216 | 55.7652 | -3.76245 | 2021-04-25 03:06:59 | 167.15 | 0 |
| 00BE09D4-6920-47D8-ABE8-325E2269829D | CcS-4983 | b-2222 | 402 | 38.708 | -9.12993 | 2019-02-27 15:25:16 | 141.66 | 0 |
| 00DA0383-E048-4577-8ED1-3C56C258FF2F | CcS-9223 | b-2222 | 4642 | 51.1742 | 10.2027 | 2019-03-21 11:47:34 | 325.62 | 0 |
| 00DD11DE-ED01-4BBD-93A0-174D183A59DF | CcS-7681 | b-2222 | 3100 | 45.7565 | 4.83109 | 2024-01-28 18:20:49 | 242.53 | 0 |
| 01449CE0-98E9-4DE5-9810-728C6BA00E6F | CcS-5424 | b-2222 | 843 | 47.0163 | 2.26064 | 2024-02-17 19:37:14 | 451.71 | 0 |
| 0175E8C7-241E-42DA-A8B9-9F246DBF4D2F | CcS-7510 | b-2222 | 2929 | 52.0619 | 4.29464 | 2021-08-28 16:29:38 | 9.46 | 0 |
| 01ABDAB8-06E2-4CA0-A131-AEE6FF11B749 | CcS-5053 | b-2222 | 472 | 51.7738 | 5.17479 | 2020-01-28 01:15:07 | 368.41 | 0 |
| 01F1C7ED-0823-442D-AE0E-3134D5004866 | CcS-6776 | b-2222 | 2195 | 59.6697 | 18.6697 | 2022-12-17 09:40:14 | 168.79 | 0 |

```
#    Time      Action                                                         Message
548  13:03:52  select * from transaction  where company_id IN (   select id from company   ...  13291 row(s) returned
```

- **Lists companies that have made transactions for an amount greater than the average of all transactions.**

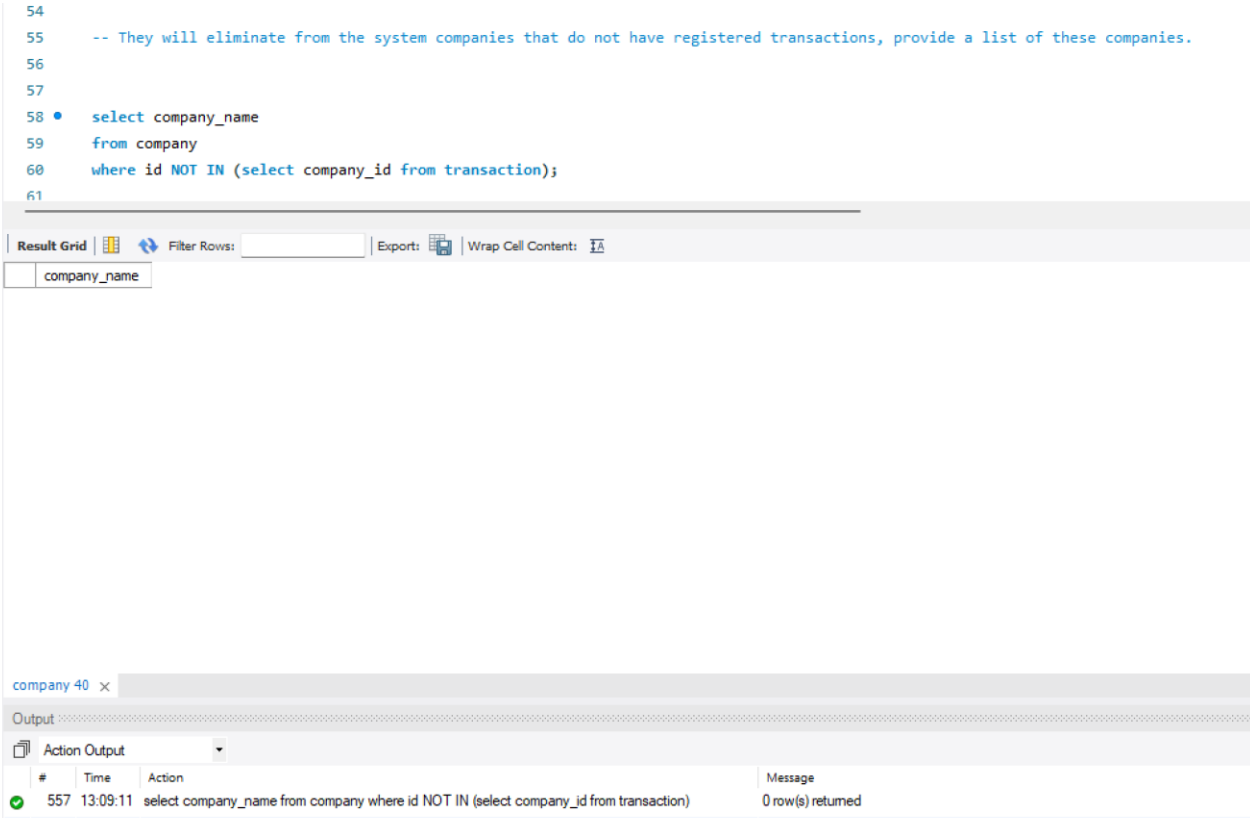


```
-- Lists companies that have made transactions for an amount greater than the average of all transactions.

select company_name from company
where id in(
 select company_id from transaction where declined=0 and amount >(select avg(amount) from transaction where declined=0 ) );
```

| company_name |
|---|
| Ac Fermentum Incorporated |
| Magna A Neque Industries |
| Fusce Corp. |
| Convallis In Incorporated |
| Ante Iaculis Nec Foundation |
| Donec Ltd |
| Sed Nunc Ltd |
| Amet Nulla Donec Corporation |
| Nascetur Ridiculus Mus Inc. |
| Vestibulum Lorem PC |
| Gravida Sagittis LLP |
| Mus Aenean Eget Foundation |
| Dis Parturient Institute |
| Sed LLC |
| Arcu LLP |

```
#    Time      Action                                                                      Message               Durat
579  13:40:59  select company_name from company  where id in(  select company_id from transaction where declin...  100 row(s) returned   0.125
```

- **They will eliminate from the system companies that do not have registered transactions, provide a list of these companies.**



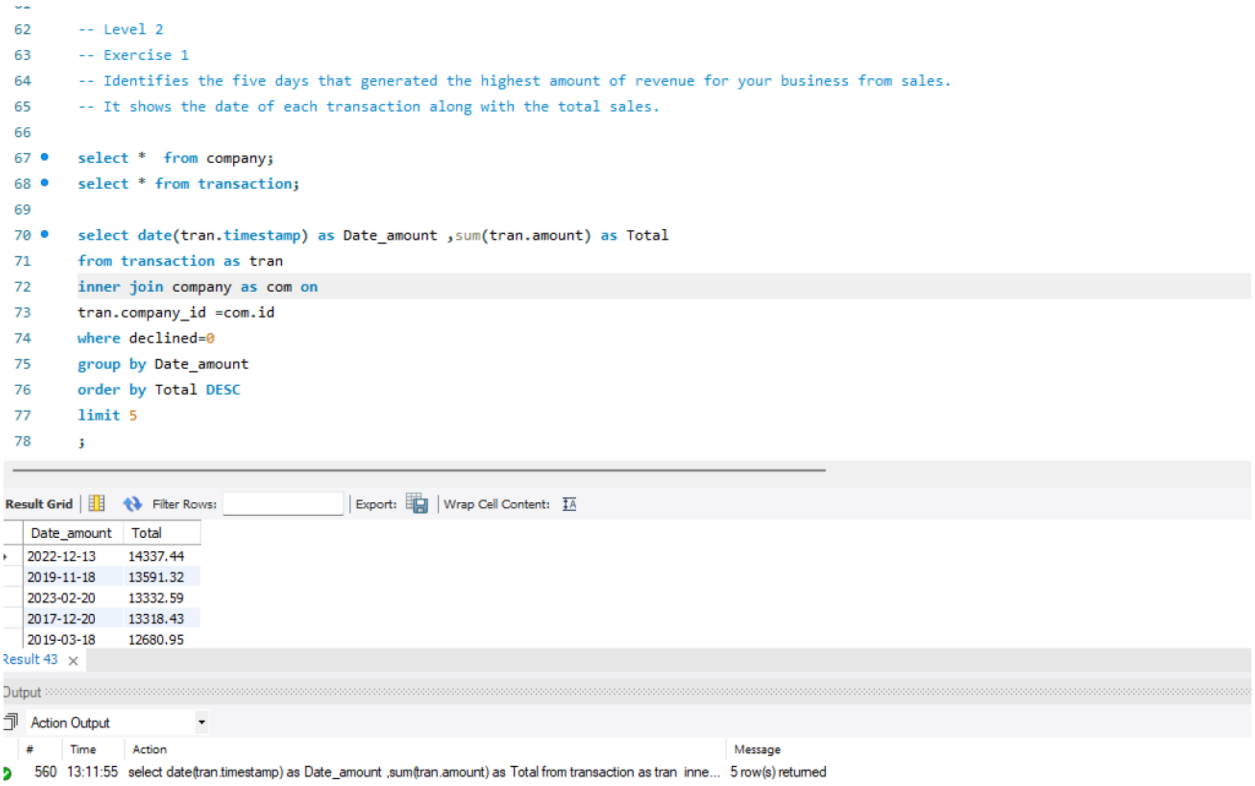
```
-- They will eliminate from the system companies that do not have registered transactions, provide a list of these companies.


select company_name
from company
where id NOT IN (select company_id from transaction);
```

```
#    Time      Action                                                                         Message
557  13:09:11  select company_name from company where id NOT IN (select company_id from transaction)  0 row(s) returned
```

## Level 2

## Exercise 1

**Identifies the five days that generated the highest amount of revenue for your business from sales. It shows the date of each transaction along with the total sales.**



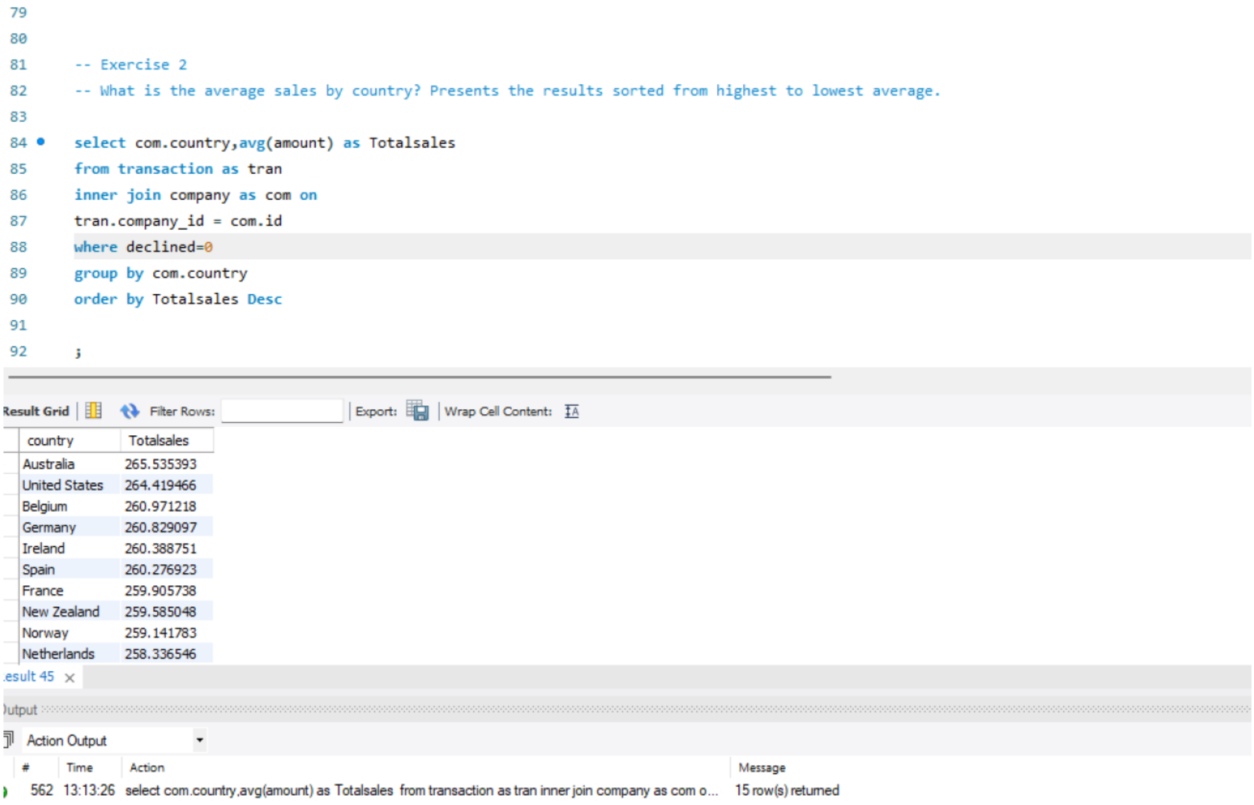
```
-- Level 2
-- Exercise 1
-- Identifies the five days that generated the highest amount of revenue for your business from sales.
-- It shows the date of each transaction along with the total sales.

select *  from company;
select * from transaction;

select date(tran.timestamp) as Date_amount ,sum(tran.amount) as Total
from transaction as tran
inner join company as com on
tran.company_id =com.id
where declined=0
group by Date_amount
order by Total DESC
limit 5
;
```

| Date_amount | Total |
|---|---|
| 2022-12-13 | 14337.44 |
| 2019-11-18 | 13591.32 |
| 2023-02-20 | 13332.59 |
| 2017-12-20 | 13318.43 |
| 2019-03-18 | 12680.95 |

```
#    Time      Action                                                                                      Message
560  13:11:55  select date(tran.timestamp) as Date_amount ,sum(tran.amount) as Total from transaction as tran  inne...  5 row(s) returned
```

## Exercise 2

**What is the average sales by country? Presents the results sorted from highest to lowest average.**



```sql


-- Exercise 2
-- What is the average sales by country? Presents the results sorted from highest to lowest average.

select com.country,avg(amount) as Totalsales
from transaction as tran
inner join company as com on
tran.company_id = com.id
where declined=0
group by com.country
order by Totalsales Desc

;
```

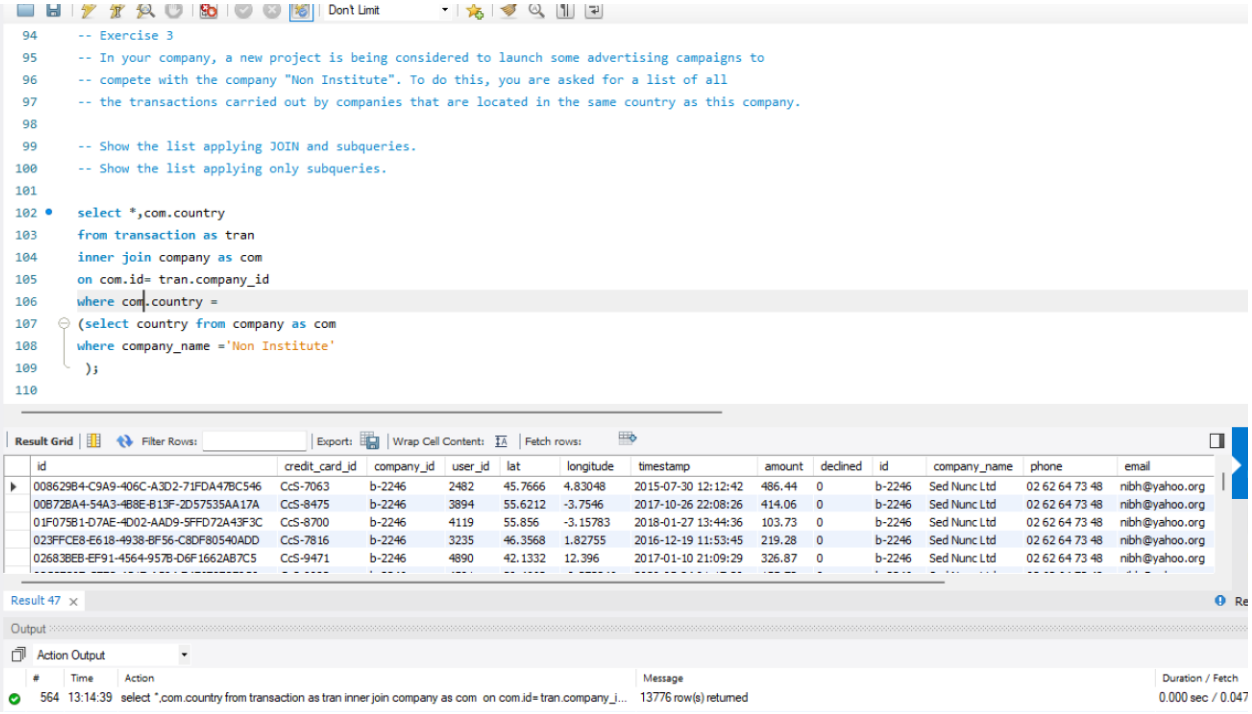
| country | Totalsales |
|---|---|
| Australia | 265.535393 |
| United States | 264.419466 |
| Belgium | 260.971218 |
| Germany | 260.829097 |
| Ireland | 260.388751 |
| Spain | 260.276923 |
| France | 259.905738 |
| New Zealand | 259.585048 |
| Norway | 259.141783 |
| Netherlands | 258.336546 |

```
#    Time      Action                                                                          Message
562  13:13:26  select com.country,avg(amount) as Totalsales  from transaction as tran inner join company as com o...   15 row(s) returned
```

## Exercise 3

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

- **Show the list applying JOIN and subqueries.**

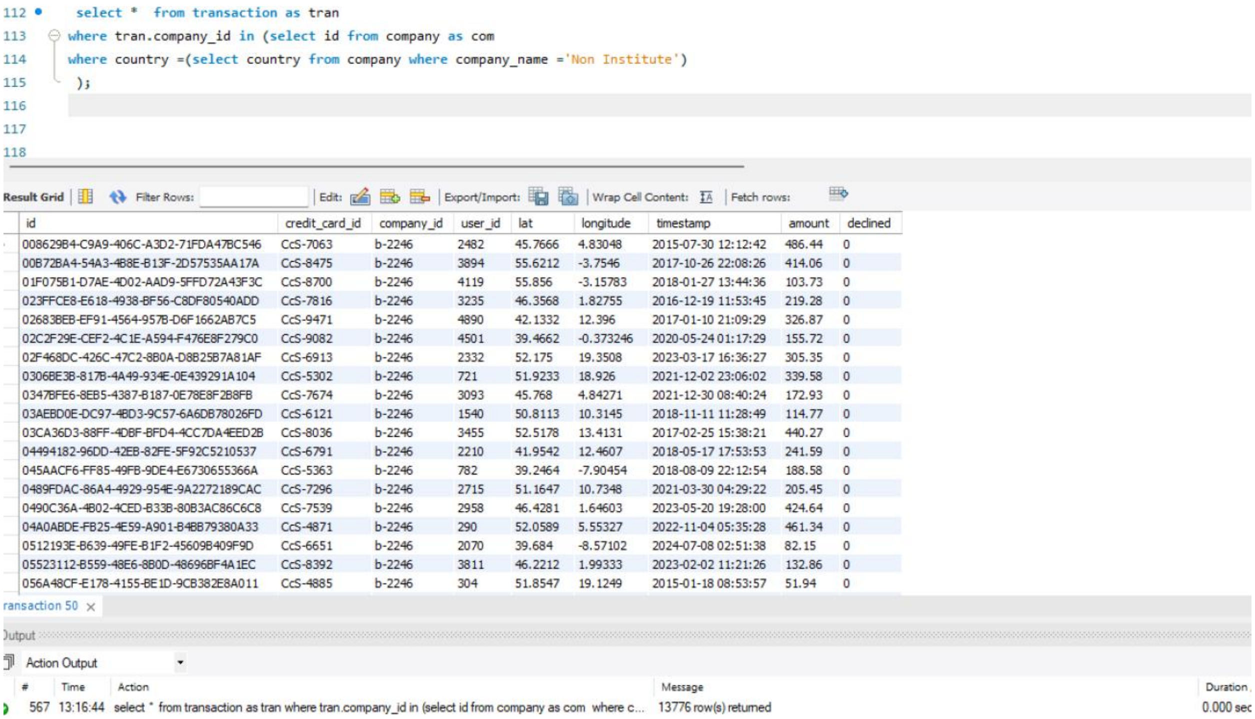


```sql
-- Exercise 3
-- In your company, a new project is being considered to launch some advertising campaigns to
-- compete with the company "Non Institute". To do this, you are asked for a list of all
-- the transactions carried out by companies that are located in the same country as this company.

-- Show the list applying JOIN and subqueries.
-- Show the list applying only subqueries.

select *,com.country
from transaction as tran
inner join company as com
on com.id= tran.company_id
where com.country =
(select country from company as com
where company_name ='Non Institute'
 );

```

| id | credit_card_id | company_id | user_id | lat | longitude | timestamp | amount | declined | id | company_name | phone | email |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008629B4-C9A9-406C-A3D2-71FDA47BC546 | CcS-7063 | b-2246 | 2482 | 45.7666 | 4.83048 | 2015-07-30 12:12:42 | 486.44 | 0 | b-2246 | Sed Nunc Ltd | 02 62 64 73 48 | nibh@yahoo.org |
| 00B72BA4-54A3-4B8E-B13F-2D57535AA17A | CcS-8475 | b-2246 | 3894 | 55.6212 | -3.7546 | 2017-10-26 22:08:26 | 414.06 | 0 | b-2246 | Sed Nunc Ltd | 02 62 64 73 48 | nibh@yahoo.org |
| 01F075B1-D7AE-4D02-AAD9-5FFD72A43F3C | CcS-8700 | b-2246 | 4119 | 55.856 | -3.15783 | 2018-01-27 13:44:36 | 103.73 | 0 | b-2246 | Sed Nunc Ltd | 02 62 64 73 48 | nibh@yahoo.org |
| 023FFCE8-E618-4938-BF56-C8DF80540ADD | CcS-7816 | b-2246 | 3235 | 46.3568 | 1.82755 | 2016-12-19 11:53:45 | 219.28 | 0 | b-2246 | Sed Nunc Ltd | 02 62 64 73 48 | nibh@yahoo.org |
| 02683BEB-EF91-4564-957B-D6F1662AB7C5 | CcS-9471 | b-2246 | 4890 | 42.1332 | 12.396 | 2017-01-10 21:09:29 | 326.87 | 0 | b-2246 | Sed Nunc Ltd | 02 62 64 73 48 | nibh@yahoo.org |

```
#    Time      Action                                                                          Message                  Duration / Fetch
564  13:14:39  select *,com.country from transaction as tran inner join company as com  on com.id= tran.company_i...  13776 row(s) returned  0.000 sec / 0.047
```

- **Show the list applying only subqueries.**



```
  select *  from transaction as tran
where tran.company_id in (select id from company as com
where country =(select country from company where company_name ='Non Institute')
 );
```

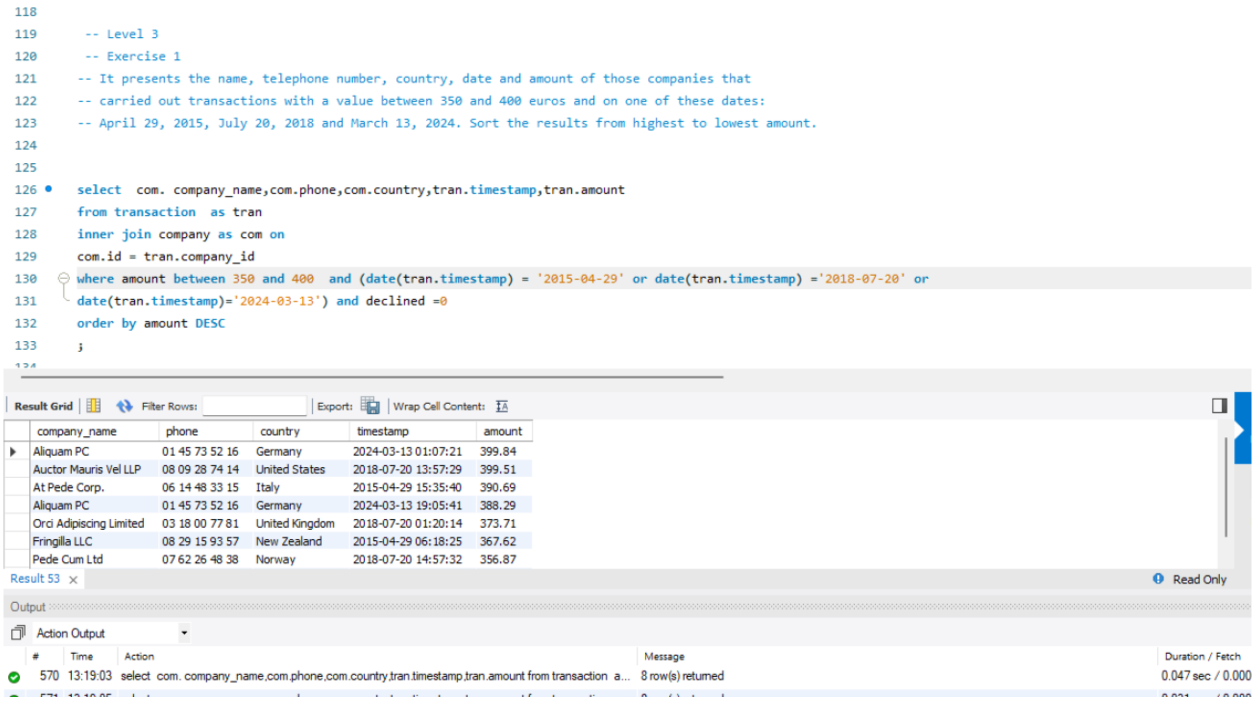
| id | credit_card_id | company_id | user_id | lat | longitude | timestamp | amount | declined |
|---|---|---|---|---|---|---|---|---|
| 008629B4-C9A9-406C-A3D2-71FDA47BC546 | CcS-7063 | b-2246 | 2482 | 45.7666 | 4.83048 | 2015-07-30 12:12:42 | 486.44 | 0 |
| 00B72BA4-54A3-4B8E-B13F-2D57535AA17A | CcS-8475 | b-2246 | 3894 | 55.6212 | -3.7546 | 2017-10-26 22:08:26 | 414.06 | 0 |
| 01F075B1-D7AE-4D02-AAD9-5FFD72A43F3C | CcS-8700 | b-2246 | 4119 | 55.856 | -3.15783 | 2018-01-27 13:44:36 | 103.73 | 0 |
| 023FFCE8-E618-4938-BF56-C8DF80540ADD | CcS-7816 | b-2246 | 3235 | 46.3568 | 1.82755 | 2016-12-19 11:53:45 | 219.28 | 0 |
| 02683BEB-EF91-4564-957B-D6F1662AB7C5 | CcS-9471 | b-2246 | 4890 | 42.1332 | 12.396 | 2017-01-10 21:09:29 | 326.87 | 0 |
| 02C2F29E-CEF2-4C1E-A594-F476E8F279C0 | CcS-9082 | b-2246 | 4501 | 39.4662 | -0.373246 | 2020-05-24 01:17:29 | 155.72 | 0 |
| 02F468DC-426C-47C2-8B0A-D8B25B7A81AF | CcS-6913 | b-2246 | 2332 | 52.175 | 19.3508 | 2023-03-17 16:36:27 | 305.35 | 0 |
| 0306BE3B-817B-4A49-934E-0E439291A104 | CcS-5302 | b-2246 | 721 | 51.9233 | 18.926 | 2021-12-02 23:06:02 | 339.58 | 0 |
| 0347BFE6-8EB5-4387-B187-0E78E8F2B8FB | CcS-7674 | b-2246 | 3093 | 45.768 | 4.84271 | 2021-12-30 08:40:24 | 172.93 | 0 |
| 03AEBD0E-DC97-4BD3-9C57-6A6DB78026FD | CcS-6121 | b-2246 | 1540 | 50.8113 | 10.3145 | 2018-11-11 11:28:49 | 114.77 | 0 |
| 03CA36D3-88FF-4DBF-BFD4-4CC7DA4EED2B | CcS-8036 | b-2246 | 3455 | 52.5178 | 13.4131 | 2017-02-25 15:38:21 | 440.27 | 0 |
| 04494182-96DD-42EB-82FE-5F92C5210537 | CcS-6791 | b-2246 | 2210 | 41.9542 | 12.4607 | 2018-05-17 17:53:53 | 241.59 | 0 |
| 045AACF6-FF85-49FB-9DE4-E6730655366A | CcS-5363 | b-2246 | 782 | 39.2464 | -7.90454 | 2018-08-09 22:12:54 | 188.58 | 0 |
| 0489FDAC-86A4-4929-954E-9A2272189CAC | CcS-7296 | b-2246 | 2715 | 51.1647 | 10.7348 | 2021-03-30 04:29:22 | 205.45 | 0 |
| 0490C36A-4B02-4CED-B33B-80B3AC86C6C8 | CcS-7539 | b-2246 | 2958 | 46.4281 | 1.64603 | 2023-05-20 19:28:00 | 424.64 | 0 |
| 04A0ABDE-FB25-4E59-A901-B4BB79380A33 | CcS-4871 | b-2246 | 290 | 52.0589 | 5.55327 | 2022-11-04 05:35:28 | 461.34 | 0 |
| 0512193E-B639-49FE-B1F2-45609B409F9D | CcS-6651 | b-2246 | 2070 | 39.684 | -8.57102 | 2024-07-08 02:51:38 | 82.15 | 0 |
| 05523112-B559-48E6-8B0D-48696BF4A1EC | CcS-8392 | b-2246 | 3811 | 46.2212 | 1.99333 | 2023-02-02 11:21:26 | 132.86 | 0 |
| 056A48CF-E178-4155-BE1D-9CB382E8A011 | CcS-4885 | b-2246 | 304 | 51.8547 | 19.1249 | 2015-01-18 08:53:57 | 51.94 | 0 |

| # | Time | Action | Message | Duration |
|---|---|---|---|---|
| 567 | 13:16:44 | select * from transaction as tran where tran.company_id in (select id from company as com  where c... | 13776 row(s) returned | 0.000 sec |

## Level 3

### Exercise 1

**It presents the name, telephone number, country, date and amount of those companies that carried out transactions with a value between 350 and 400 euros and on one of these dates: April 29, 2015, July 20, 2018 and March 13, 2024. Sort the results from highest to lowest amount.**



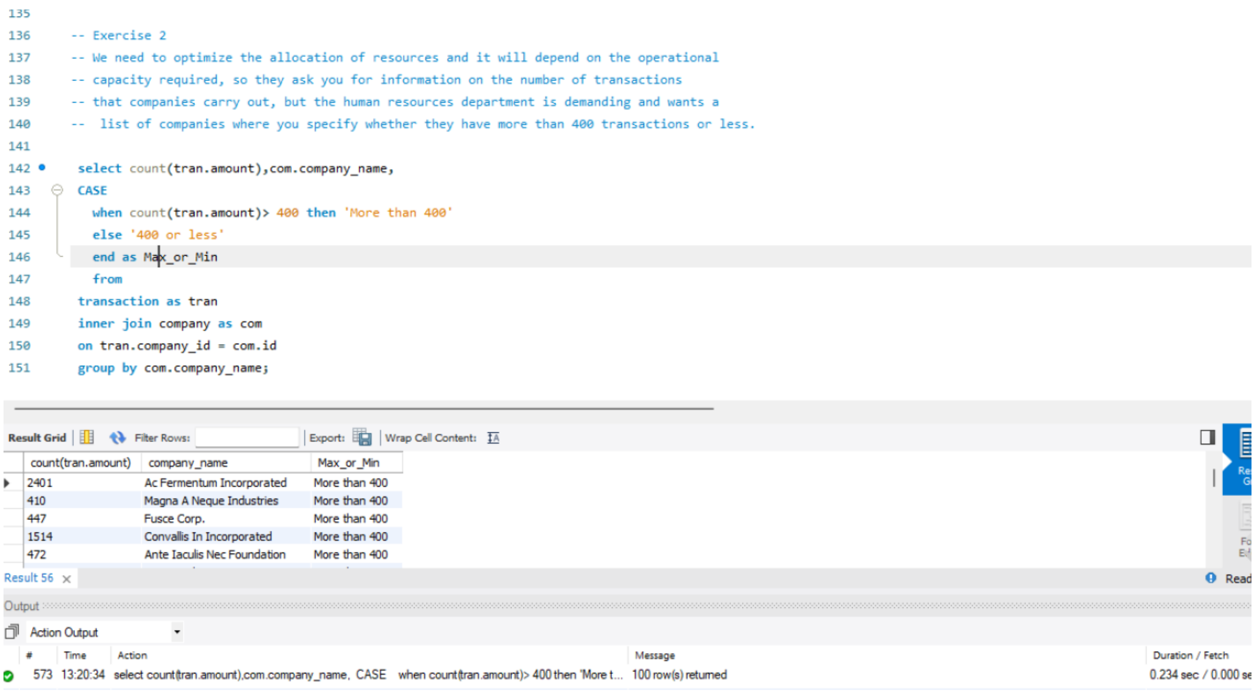
```
 -- Level 3
 -- Exercise 1
-- It presents the name, telephone number, country, date and amount of those companies that
-- carried out transactions with a value between 350 and 400 euros and on one of these dates:
-- April 29, 2015, July 20, 2018 and March 13, 2024. Sort the results from highest to lowest amount.


select  com. company_name,com.phone,com.country,tran.timestamp,tran.amount
from transaction  as tran
inner join company as com on
com.id = tran.company_id
where amount between 350 and 400  and (date(tran.timestamp) = '2015-04-29' or date(tran.timestamp) ='2018-07-20' or
date(tran.timestamp)='2024-03-13') and declined =0
order by amount DESC
;
```

| company_name | phone | country | timestamp | amount |
|---|---|---|---|---|
| Aliquam PC | 01 45 73 52 16 | Germany | 2024-03-13 01:07:21 | 399.84 |
| Auctor Mauris Vel LLP | 08 09 28 74 14 | United States | 2018-07-20 13:57:29 | 399.51 |
| At Pede Corp. | 06 14 48 33 15 | Italy | 2015-04-29 15:35:40 | 390.69 |
| Aliquam PC | 01 45 73 52 16 | Germany | 2024-03-13 19:05:41 | 388.29 |
| Orci Adipiscing Limited | 03 18 00 77 81 | United Kingdom | 2018-07-20 01:20:14 | 373.71 |
| Fringilla LLC | 08 29 15 93 57 | New Zealand | 2015-04-29 06:18:25 | 367.62 |
| Pede Cum Ltd | 07 62 26 48 38 | Norway | 2018-07-20 14:57:32 | 356.87 |

| # | Time | Action | Message | Duration / Fetch |
|---|---|---|---|---|
| 570 | 13:19:03 | select com. company_name,com.phone,com.country,tran.timestamp,tran.amount from transaction a... | 8 row(s) returned | 0.047 sec / 0.000 |

## Exercise 2

**We need to optimize the allocation of resources and it will depend on the operational capacity required, so they ask you for information on the number of transactions that companies carry out, but the human resources department is demanding and wants a list of companies where you specify whether they have more than 400 transactions or less.**



```

-- Exercise 2
-- We need to optimize the allocation of resources and it will depend on the operational
-- capacity required, so they ask you for information on the number of transactions
-- that companies carry out, but the human resources department is demanding and wants a
--  list of companies where you specify whether they have more than 400 transactions or less.

 select count(tran.amount),com.company_name,
 CASE
   when count(tran.amount)> 400 then 'More than 400'
   else '400 or less'
   end as Max_or_Min
   from
 transaction as tran
 inner join company as com
 on tran.company_id = com.id
 group by com.company_name;
```

| count(tran.amount) | company_name | Max_or_Min |
|---|---|---|
| 2401 | Ac Fermentum Incorporated | More than 400 |
| 410 | Magna A Neque Industries | More than 400 |
| 447 | Fusce Corp. | More than 400 |
| 1514 | Convallis In Incorporated | More than 400 |
| 472 | Ante Iaculis Nec Foundation | More than 400 |

```
#    Time      Action                                                                              Message               Duration / Fetch
573  13:20:34  select count(tran.amount),com.company_name,  CASE   when count(tran.amount)> 400 then 'More t...  100 row(s) returned  0.234 sec / 0.000 se
```