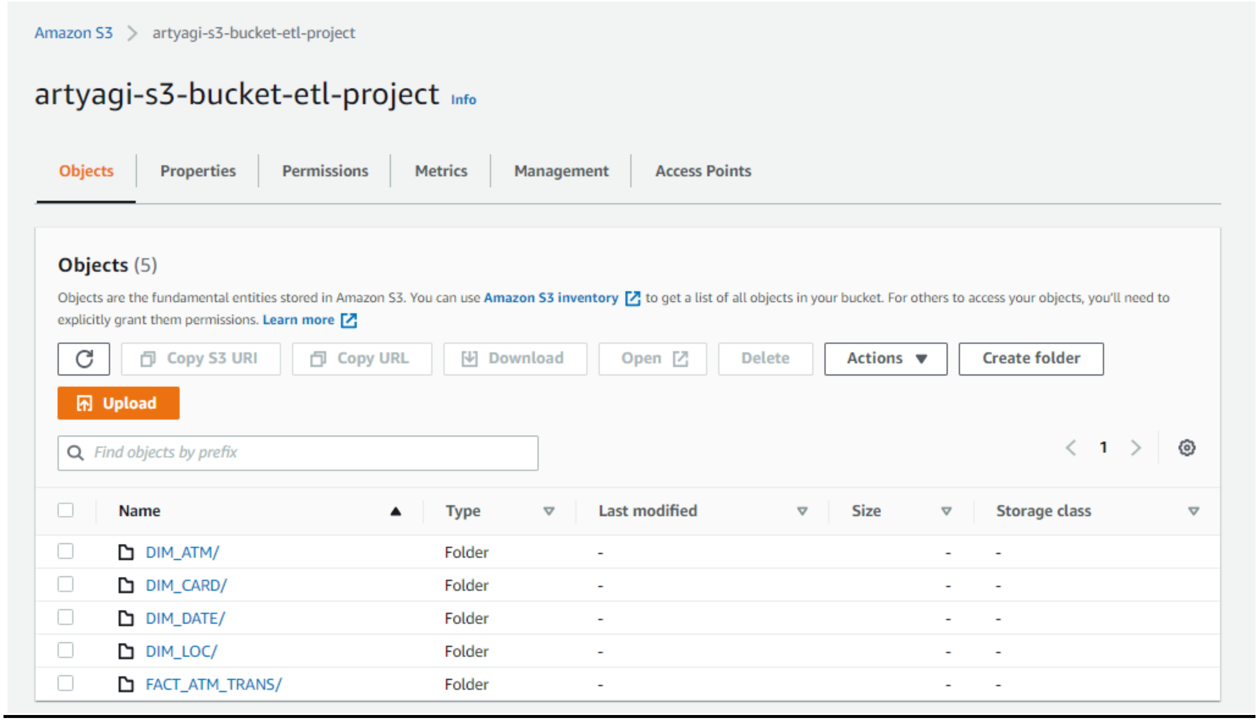
Solving Analytical Queries On RedShift Cluster

~Arun Tyagi

Screenshot of S3:



artyagi-s3-bucket-etl-project Info

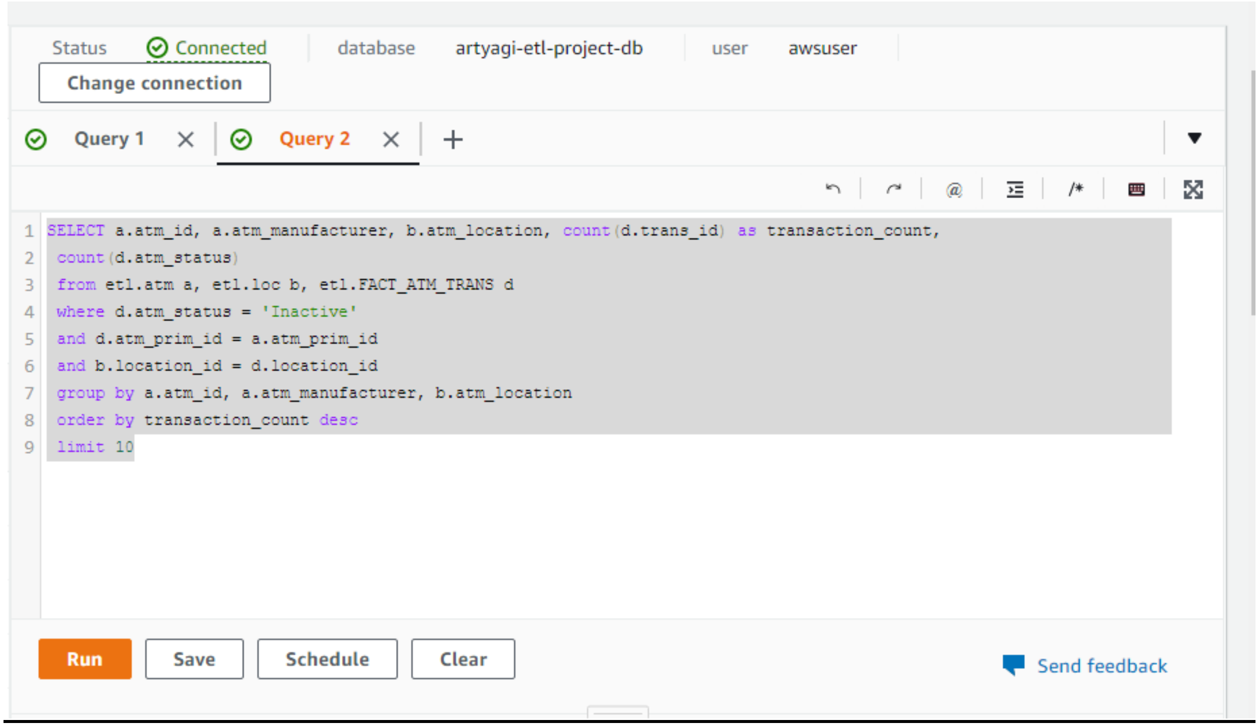
Objects (5)

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

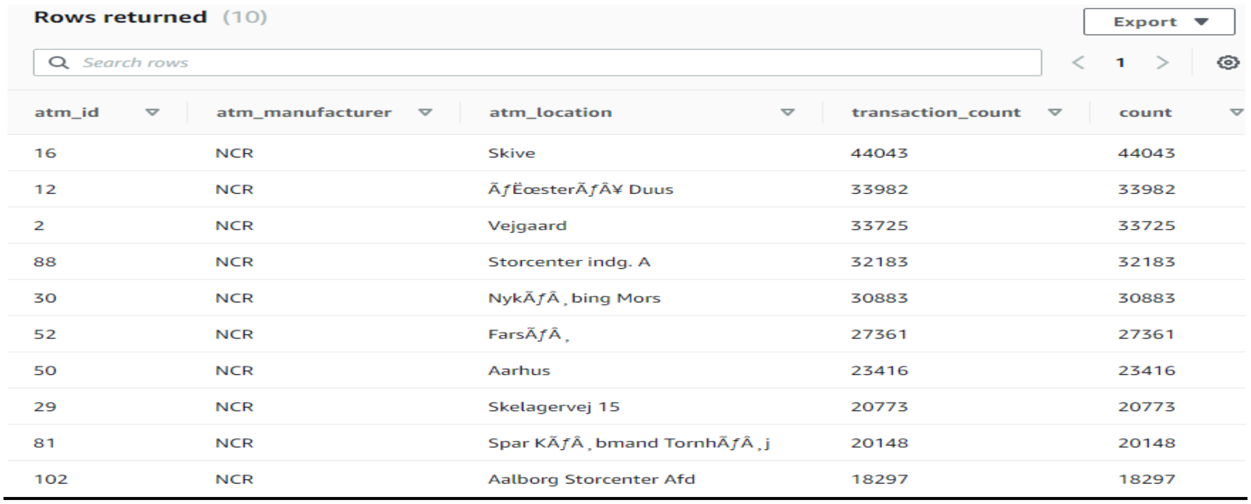
□	Name ▲	Type	Last modified	Size	Storage class
□	DIM_ATM/	Folder	-	-	-
□	DIM_CARD/	Folder	-	-	-
□	DIM_DATE/	Folder	-	-	-
□	DIM_LOC/	Folder	-	-	-
□	FACT_ATM_TRANS/	Folder	-	-	-

1. Top 10 ATMs where most transactions are in the ’inactive’ state

```
SELECT a.atm_id, a.atm_manufacturer, b.atm_location, count(d.trans_id) as transaction_count,
 count(d.atm_status)
 from etl.atm a, etl.loc b, etl.FACT_ATM_TRANS d
 where d.atm_status = 'Inactive'
 and d.atm_prim_id = a.atm_prim_id
 and b.location_id = d.location_id
 group by a.atm_id, a.atm_manufacturer, b.atm_location
 order by transaction_count desc
 limit 10
```



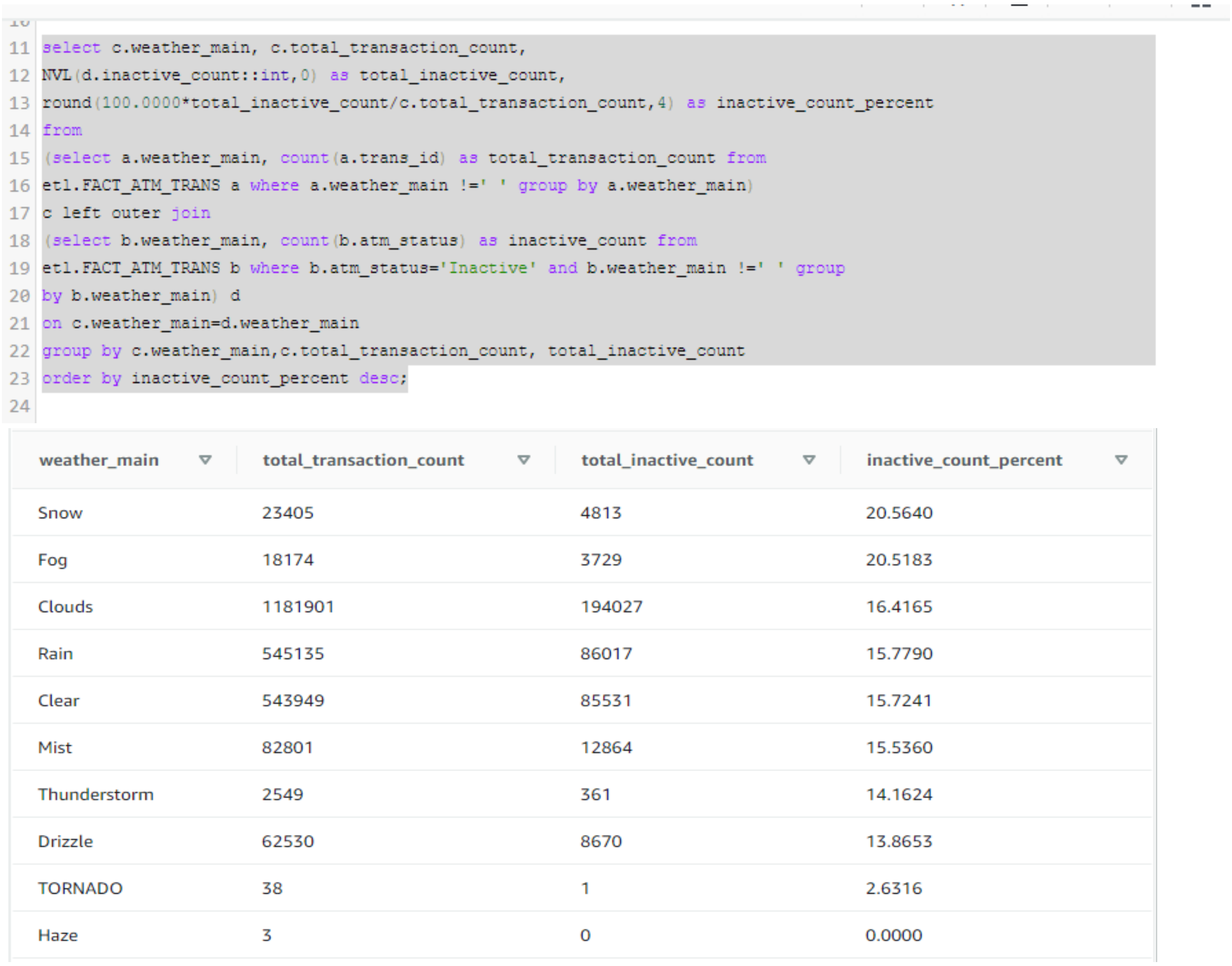
```
SELECT a.atm_id, a.atm_manufacturer, b.atm_location, count(d.trans_id) as transaction_count,
 count(d.atm_status)
 from etl.atm a, etl.loc b, etl.FACT_ATM_TRANS d
 where d.atm_status = 'Inactive'
 and d.atm_prim_id = a.atm_prim_id
 and b.location_id = d.location_id
 group by a.atm_id, a.atm_manufacturer, b.atm_location
 order by transaction_count desc
 limit 10
```



atm_id	atm_manufacturer	atm_location	transaction_count	count
16	NCR	Skive	44043	44043
12	NCR	ÃƒËœsterÃƒÂ¥ Duus	33982	33982
2	NCR	Vejgaard	33725	33725
88	NCR	Storcenter indg. A	32183	32183
30	NCR	NykÃƒÂ¸bing Mors	30883	30883
52	NCR	FarsÃƒÂ¸	27361	27361
50	NCR	Aarhus	23416	23416
29	NCR	Skelagervej 15	20773	20773
81	NCR	Spar KÃƒÂ¸bmand TornhÃƒÂ¸j	20148	20148
102	NCR	Aalborg Storcenter Afd	18297	18297

2. Number of ATM failures corresponding to the different weather conditions recorded at the time of the transactions

```
select c.weather_main, c.total_transaction_count,
NVL(d.inactive_count::int,0) as total_inactive_count,
round(100.0000*total_inactive_count/c.total_transaction_count,4) as inactive_count_percent
from
(select a.weather_main, count(a.trans_id) as total_transaction_count from
etl.FACT_ATM_TRANS a where a.weather_main !=' ' group by a.weather_main)
c left outer join
(select b.weather_main, count(b.atm_status) as inactive_count from
etl.FACT_ATM_TRANS b where b.atm_status='Inactive' and b.weather_main !=' ' group
by b.weather_main) d
on c.weather_main=d.weather_main
group by c.weather_main,c.total_transaction_count, total_inactive_count
order by inactive_count_percent desc;
```

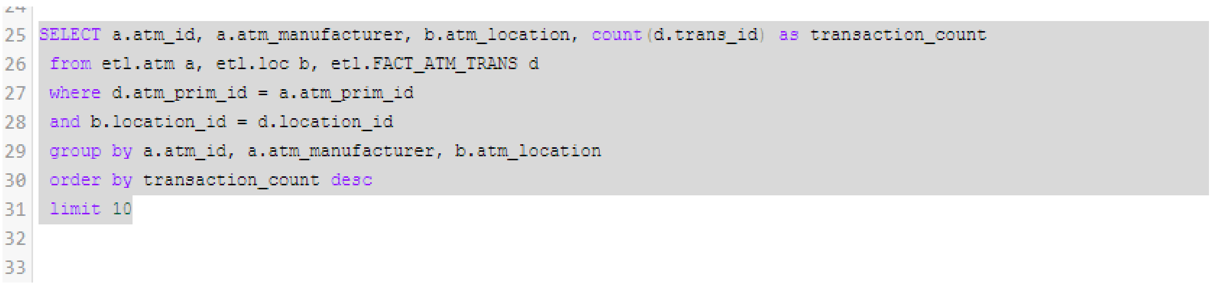


```
select c.weather_main, c.total_transaction_count,
NVL(d.inactive_count::int,0) as total_inactive_count,
round(100.0000*total_inactive_count/c.total_transaction_count,4) as inactive_count_percent
from
(select a.weather_main, count(a.trans_id) as total_transaction_count from
etl.FACT_ATM_TRANS a where a.weather_main !=' ' group by a.weather_main)
c left outer join
(select b.weather_main, count(b.atm_status) as inactive_count from
etl.FACT_ATM_TRANS b where b.atm_status='Inactive' and b.weather_main !=' ' group
by b.weather_main) d
on c.weather_main=d.weather_main
group by c.weather_main,c.total_transaction_count, total_inactive_count
order by inactive_count_percent desc;
```

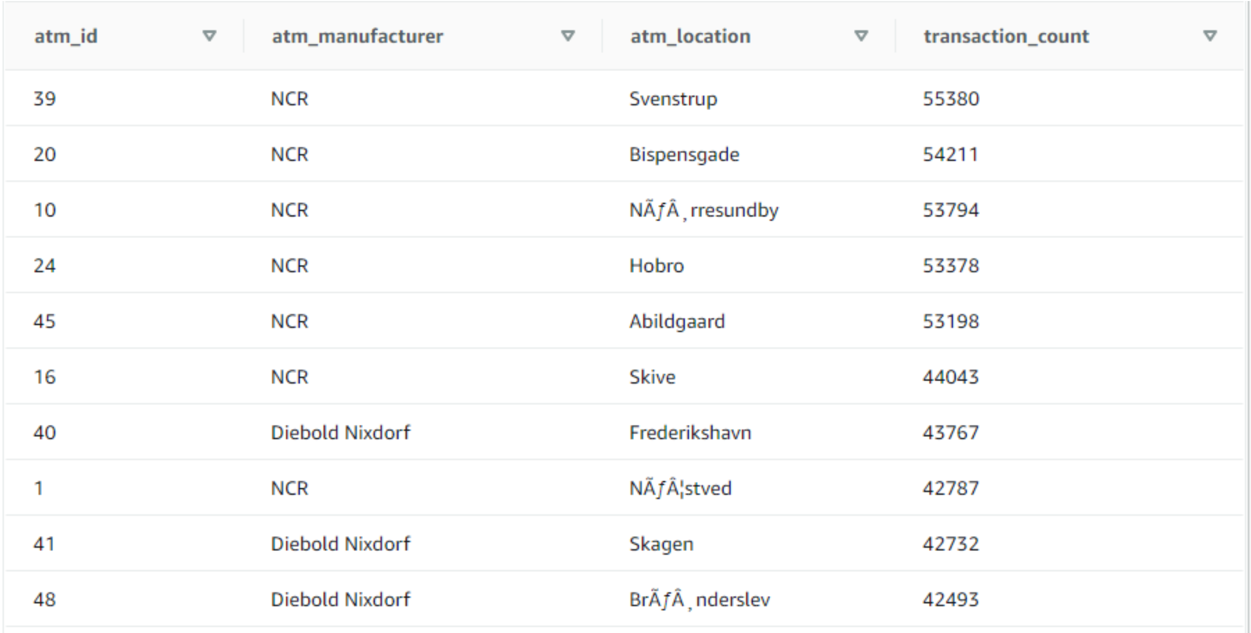
weather_main	total_transaction_count	total_inactive_count	inactive_count_percent
Snow	23405	4813	20.5640
Fog	18174	3729	20.5183
Clouds	1181901	194027	16.4165
Rain	545135	86017	15.7790
Clear	543949	85531	15.7241
Mist	82801	12864	15.5360
Thunderstorm	2549	361	14.1624
Drizzle	62530	8670	13.8653
TORNADO	38	1	2.6316
Haze	3	0	0.0000

3. Top 10 ATMs with the most number of transactions throughout the year

```
SELECT a.atm_id, a.atm_manufacturer, b.atm_location, count(d.trans_id) as
transaction_count
 from etl.atm a, etl.loc b, etl.FACT_ATM_TRANS d
 where d.atm_prim_id = a.atm_prim_id
 and b.location_id = d.location_id
 group by a.atm_id, a.atm_manufacturer, b.atm_location
 order by transaction_count desc
 limit 10
```



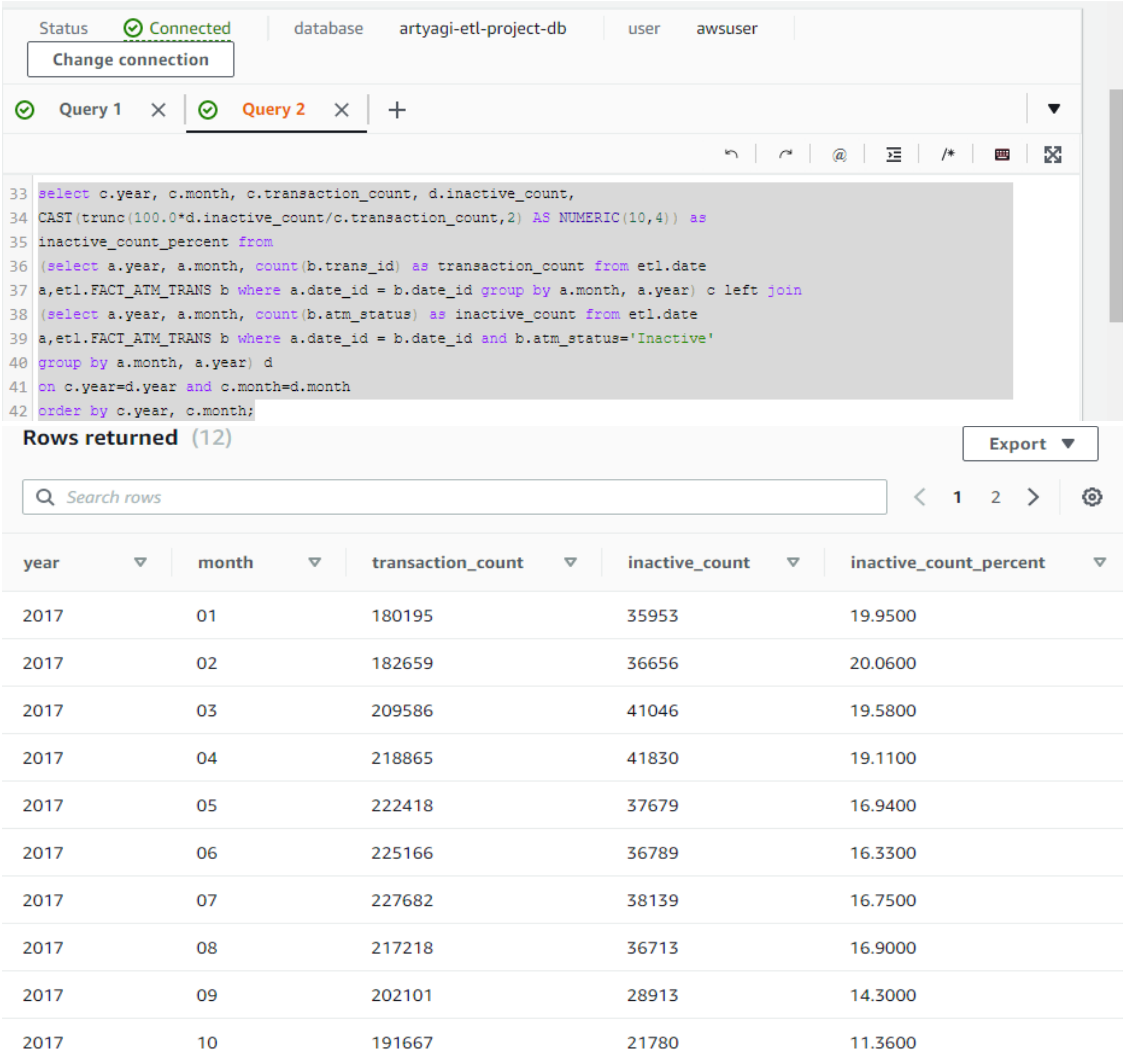
```
SELECT a.atm_id, a.atm_manufacturer, b.atm_location, count(d.trans_id) as transaction_count
 from etl.atm a, etl.loc b, etl.FACT_ATM_TRANS d
 where d.atm_prim_id = a.atm_prim_id
 and b.location_id = d.location_id
 group by a.atm_id, a.atm_manufacturer, b.atm_location
 order by transaction_count desc
 limit 10
```



atm_id	atm_manufacturer	atm_location	transaction_count
39	NCR	Svenstrup	55380
20	NCR	Bispensgade	54211
10	NCR	NÃƒÂ¸rresundby	53794
24	NCR	Hobro	53378
45	NCR	Abildgaard	53198
16	NCR	Skive	44043
40	Diebold Nixdorf	Frederikshavn	43767
1	NCR	NÃƒÂ¦stved	42787
41	Diebold Nixdorf	Skagen	42732
48	Diebold Nixdorf	BrÃƒÂ¸nderslev	42493

4. Number of overall ATM transactions going inactive per month for each month

```
select c.year, c.month, c.transaction_count, d.inactive_count,
CAST(trunc(100.0*d.inactive_count/c.transaction_count,2) AS NUMERIC(10,4)) as
inactive_count_percent from
(select a.year, a.month, count(b.trans_id) as transaction_count from etl.date
a,etl.FACT_ATM_TRANS b where a.date_id = b.date_id group by a.month, a.year) c left join
(select a.year, a.month, count(b.atm_status) as inactive_count from etl.date
a,etl.FACT_ATM_TRANS b where a.date_id = b.date_id and b.atm_status='Inactive'
group by a.month, a.year) d
on c.year=d.year and c.month=d.month
order by c.year, c.month;
```



Status: Connected | database: artyagi-etl-project-db | user: awsuser

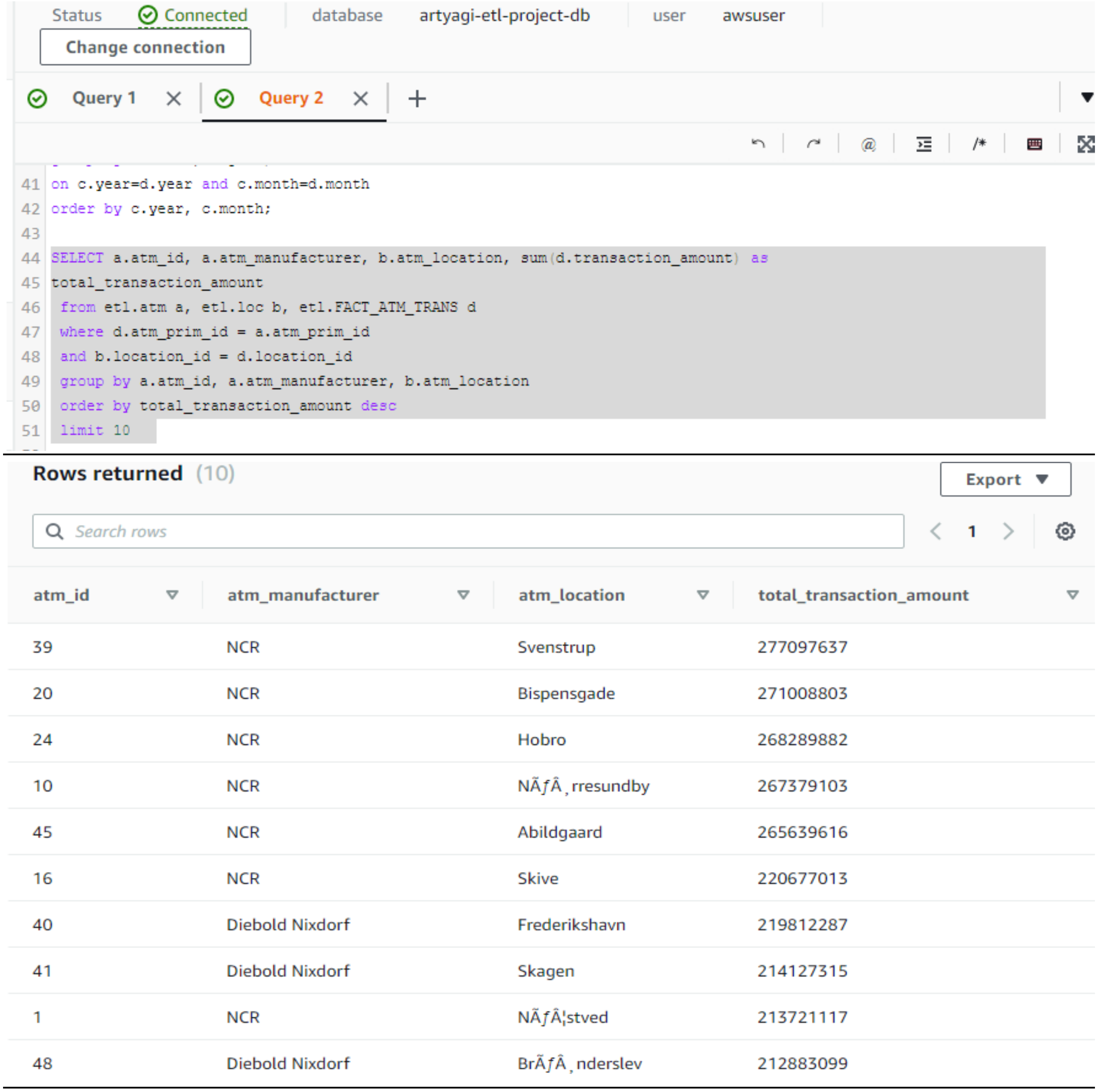
```
select c.year, c.month, c.transaction_count, d.inactive_count,
CAST(trunc(100.0*d.inactive_count/c.transaction_count,2) AS NUMERIC(10,4)) as
inactive_count_percent from
(select a.year, a.month, count(b.trans_id) as transaction_count from etl.date
a,etl.FACT_ATM_TRANS b where a.date_id = b.date_id group by a.month, a.year) c left join
(select a.year, a.month, count(b.atm_status) as inactive_count from etl.date
a,etl.FACT_ATM_TRANS b where a.date_id = b.date_id and b.atm_status='Inactive'
group by a.month, a.year) d
on c.year=d.year and c.month=d.month
order by c.year, c.month;
```

Rows returned (12)

year	month	transaction_count	inactive_count	inactive_count_percent
2017	01	180195	35953	19.9500
2017	02	182659	36656	20.0600
2017	03	209586	41046	19.5800
2017	04	218865	41830	19.1100
2017	05	222418	37679	16.9400
2017	06	225166	36789	16.3300
2017	07	227682	38139	16.7500
2017	08	217218	36713	16.9000
2017	09	202101	28913	14.3000
2017	10	191667	21780	11.3600

5. Top 10 ATMs with the highest total withdrawn amount throughout the year

```
SELECT a.atm_id, a.atm_manufacturer, b.atm_location, sum(d.transaction_amount) as
total_transaction_amount
 from etl.atm a, etl.loc b, etl.FACT_ATM_TRANS d
 where d.atm_prim_id = a.atm_prim_id
 and b.location_id = d.location_id
 group by a.atm_id, a.atm_manufacturer, b.atm_location
 order by total_transaction_amount desc
 limit 10
```



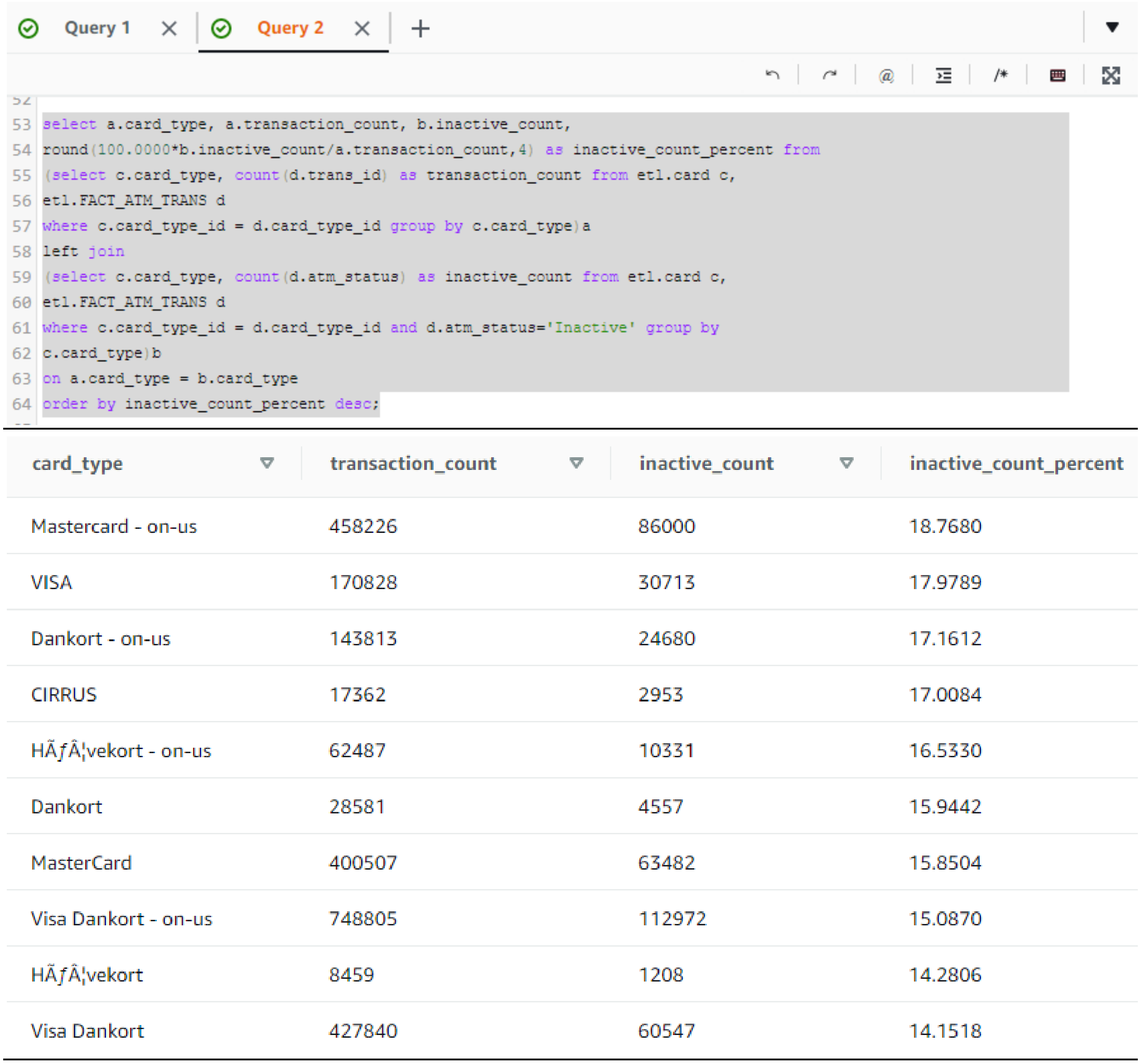
```
on c.year=d.year and c.month=d.month
order by c.year, c.month;

SELECT a.atm_id, a.atm_manufacturer, b.atm_location, sum(d.transaction_amount) as
total_transaction_amount
 from etl.atm a, etl.loc b, etl.FACT_ATM_TRANS d
 where d.atm_prim_id = a.atm_prim_id
 and b.location_id = d.location_id
 group by a.atm_id, a.atm_manufacturer, b.atm_location
 order by total_transaction_amount desc
 limit 10
```

atm_id	atm_manufacturer	atm_location	total_transaction_amount
39	NCR	Svenstrup	277097637
20	NCR	Bispensgade	271008803
24	NCR	Hobro	268289882
10	NCR	NÃƒÂ¸rresundby	267379103
45	NCR	Abildgaard	265639616
16	NCR	Skive	220677013
40	Diebold Nixdorf	Frederikshavn	219812287
41	Diebold Nixdorf	Skagen	214127315
1	NCR	NÃƒÂ¦stved	213721117
48	Diebold Nixdorf	BrÃƒÂ¸nderslev	212883099

6. Number of failed ATM transactions across various card types

select a.card_type, a.transaction_count, b.inactive_count, round(100.0000*b.inactive_count/a.transaction_count,4) as inactive_count_percent from (select c.card_type, count(d.trans_id) as transaction_count from etl.card c, etl.FACT_ATM_TRANS d where c.card_type_id = d.card_type_id group by c.card_type)a left join (select c.card_type, count(d.atm_status) as inactive_count from etl.card c, etl.FACT_ATM_TRANS d where c.card_type_id = d.card_type_id and d.atm_status='Inactive' group by c.card_type)b on a.card_type = b.card_type order by inactive_count_percent desc;

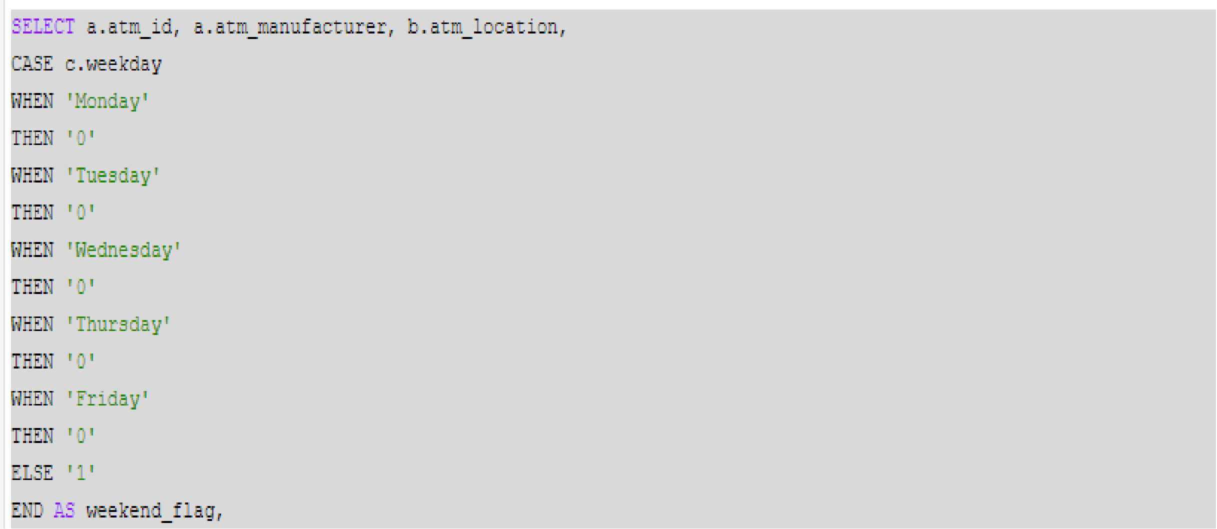


```
select a.card_type, a.transaction_count, b.inactive_count,
round(100.0000*b.inactive_count/a.transaction_count,4) as inactive_count_percent from
(select c.card_type, count(d.trans_id) as transaction_count from etl.card c,
etl.FACT_ATM_TRANS d
where c.card_type_id = d.card_type_id group by c.card_type)a
left join
(select c.card_type, count(d.atm_status) as inactive_count from etl.card c,
etl.FACT_ATM_TRANS d
where c.card_type_id = d.card_type_id and d.atm_status='Inactive' group by
c.card_type)b
on a.card_type = b.card_type
order by inactive_count_percent desc;
```

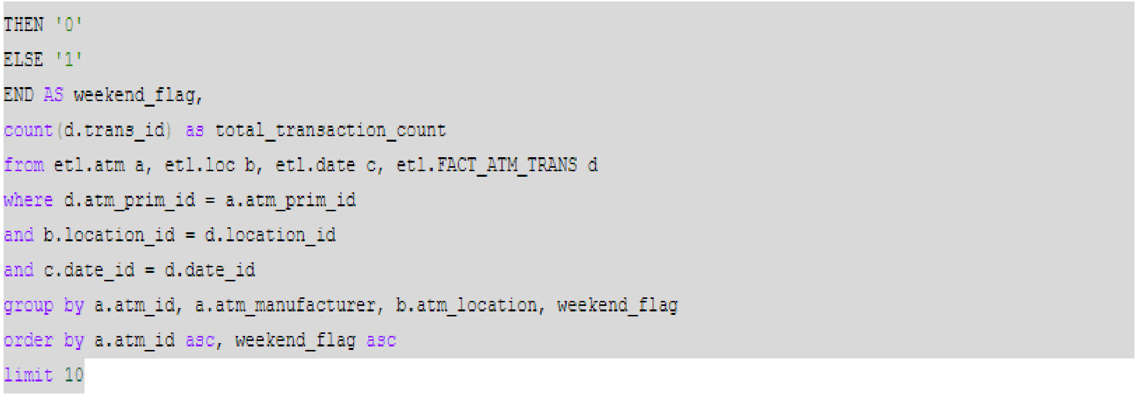
card_type	transaction_count	inactive_count	inactive_count_percent
Mastercard - on-us	458226	86000	18.7680
VISA	170828	30713	17.9789
Dankort - on-us	143813	24680	17.1612
CIRRUS	17362	2953	17.0084
HÃƒÂ¦vekort - on-us	62487	10331	16.5330
Dankort	28581	4557	15.9442
MasterCard	400507	63482	15.8504
Visa Dankort - on-us	748805	112972	15.0870
HÃƒÂ¦vekort	8459	1208	14.2806
Visa Dankort	427840	60547	14.1518

7. **Number of transactions happening on an ATM on weekdays and on weekends throughout the year. Order this by the ATM_number, ATM_manufacturer, location, weekend_flag and then total_transaction_count**

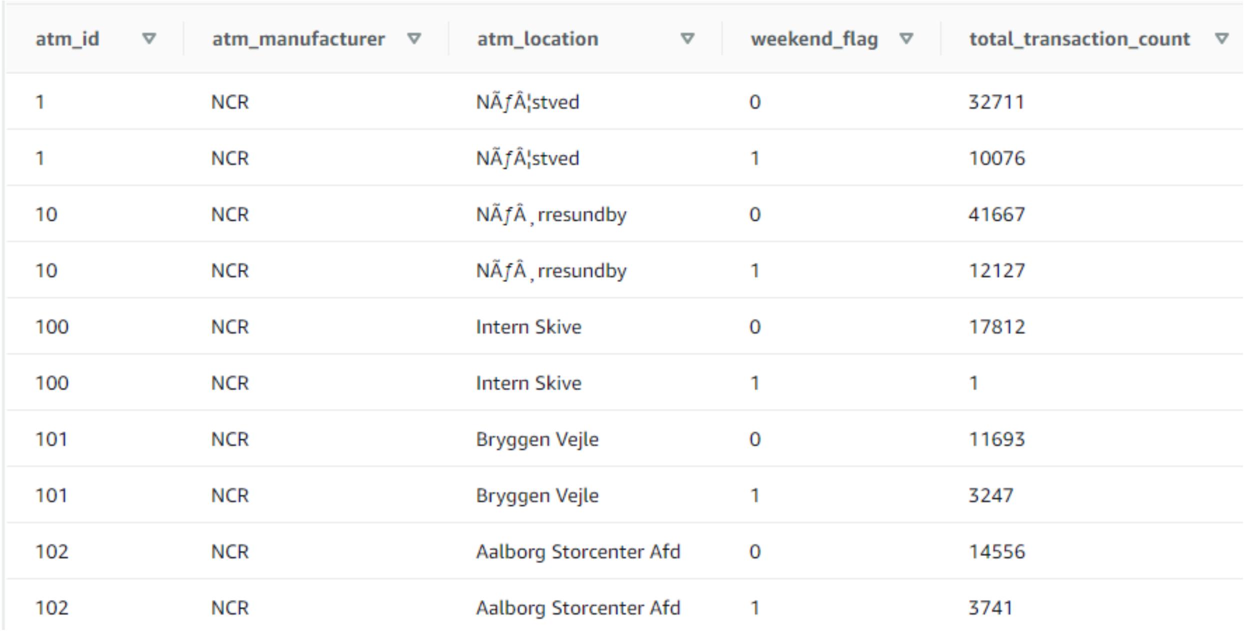
```
SELECT a.atm_id, a.atm_manufacturer, b.atm_location,
CASE c.weekday
WHEN 'Monday'
THEN '0'
WHEN 'Tuesday'
THEN '0'
WHEN 'Wednesday'
THEN '0'
WHEN 'Thursday'
THEN '0'
WHEN 'Friday'
THEN '0'
ELSE '1'
END AS weekend_flag,
count(d.trans_id) as total_transaction_count
from etl.atm a, etl.loc b, etl.date c, etl.FACT_ATM_TRANS d
where d.atm_prim_id = a.atm_prim_id
and b.location_id = d.location_id
and c.date_id = d.date_id
group by a.atm_id, a.atm_manufacturer, b.atm_location, weekend_flag
order by a.atm_id asc, weekend_flag asc
limit 10
```



```
SELECT a.atm_id, a.atm_manufacturer, b.atm_location,
CASE c.weekday
WHEN 'Monday'
THEN '0'
WHEN 'Tuesday'
THEN '0'
WHEN 'Wednesday'
THEN '0'
WHEN 'Thursday'
THEN '0'
WHEN 'Friday'
THEN '0'
ELSE '1'
END AS weekend_flag,
```



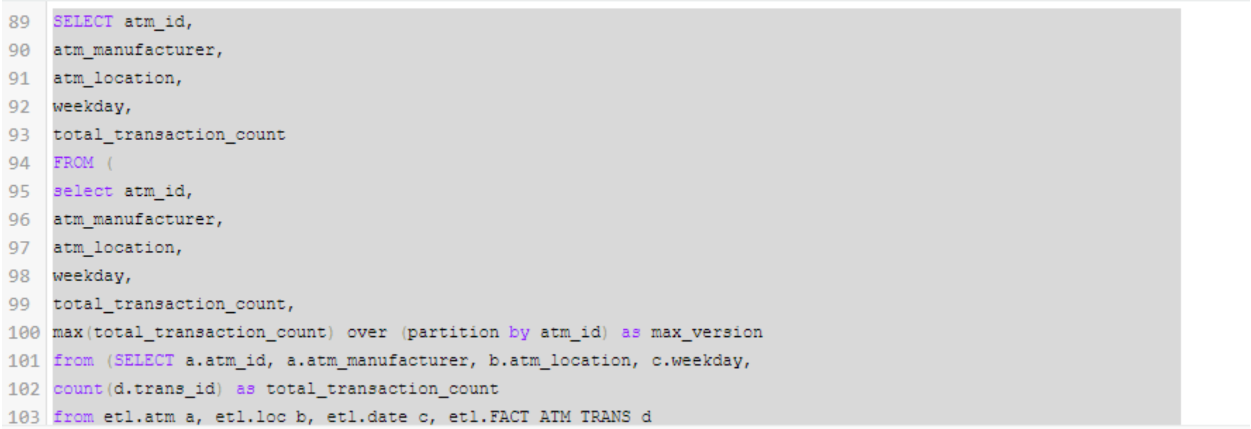
```
THEN '0'
ELSE '1'
END AS weekend_flag,
count(d.trans_id) as total_transaction_count
from etl.atm a, etl.loc b, etl.date c, etl.FACT_ATM_TRANS d
where d.atm_prim_id = a.atm_prim_id
and b.location_id = d.location_id
and c.date_id = d.date_id
group by a.atm_id, a.atm_manufacturer, b.atm_location, weekend_flag
order by a.atm_id asc, weekend_flag asc
limit 10
```



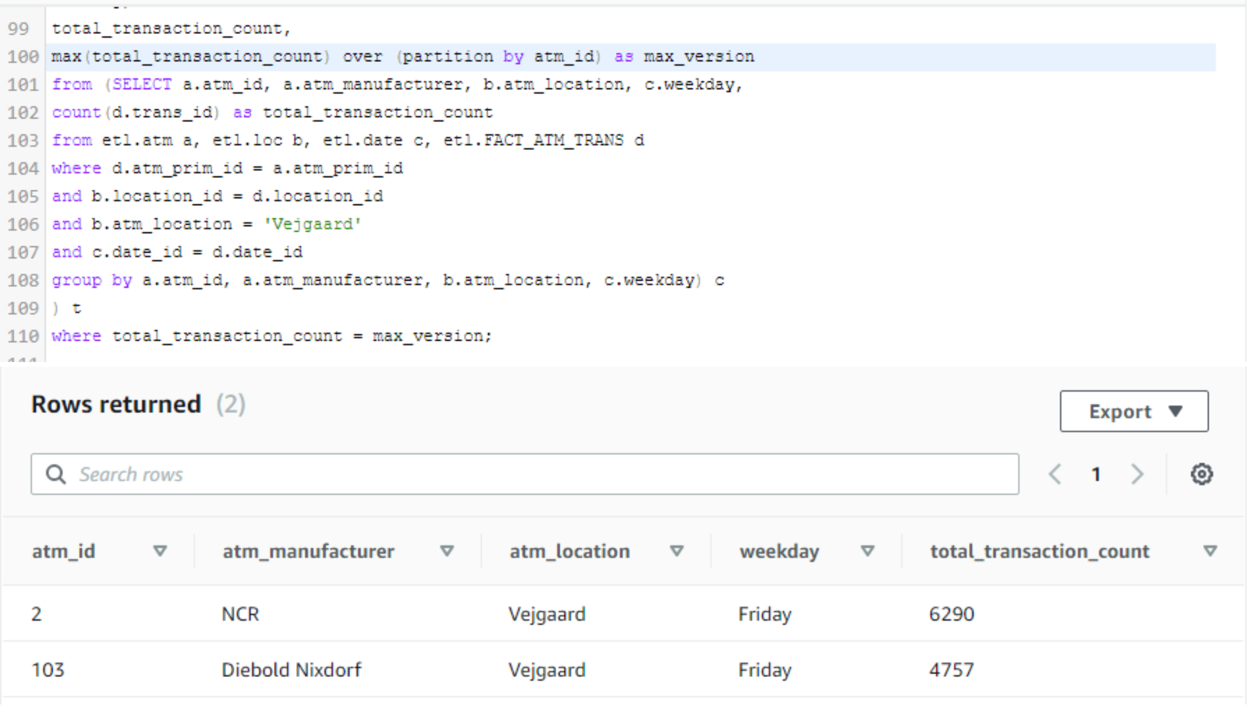
atm_id ▽	atm_manufacturer ▽	atm_location ▽	weekend_flag ▽	total_transaction_count ▽
1	NCR	NÃƒÂ¦stved	0	32711
1	NCR	NÃƒÂ¦stved	1	10076
10	NCR	NÃƒÂ¸rresundby	0	41667
10	NCR	NÃƒÂ¸rresundby	1	12127
100	NCR	Intern Skive	0	17812
100	NCR	Intern Skive	1	1
101	NCR	Bryggen Vejle	0	11693
101	NCR	Bryggen Vejle	1	3247
102	NCR	Aalborg Storcenter Afd	0	14556
102	NCR	Aalborg Storcenter Afd	1	3741

8. Most active day in each ATMs from location "Vejgaard"

```
SELECT atm_id,
atm_manufacturer,
atm_location,
weekday,
total_transaction_count
FROM (
select atm_id,
atm_manufacturer,
atm_location,
weekday,
total_transaction_count,
max(total_transaction_count) over (partition by atm_id) as max_version
from (SELECT a.atm_id, a.atm_manufacturer, b.atm_location, c.weekday,
count(d.trans_id) as total_transaction_count
from etl.atm a, etl.loc b, etl.date c, etl.FACT_ATM_TRANS d
where d.atm_prim_id = a.atm_prim_id
and b.location_id = d.location_id
and b.atm_location = 'Vejgaard'
and c.date_id = d.date_id
group by a.atm_id, a.atm_manufacturer, b.atm_location, c.weekday) c
) t
where total_transaction_count = max_version;
```



```
SELECT atm_id,
atm_manufacturer,
atm_location,
weekday,
total_transaction_count
FROM (
select atm_id,
atm_manufacturer,
atm_location,
weekday,
total_transaction_count,
max(total_transaction_count) over (partition by atm_id) as max_version
from (SELECT a.atm_id, a.atm_manufacturer, b.atm_location, c.weekday,
count(d.trans_id) as total_transaction_count
from etl.atm a, etl.loc b, etl.date c, etl.FACT_ATM_TRANS d
```



```
total_transaction_count,
max(total_transaction_count) over (partition by atm_id) as max_version
from (SELECT a.atm_id, a.atm_manufacturer, b.atm_location, c.weekday,
count(d.trans_id) as total_transaction_count
from etl.atm a, etl.loc b, etl.date c, etl.FACT_ATM_TRANS d
where d.atm_prim_id = a.atm_prim_id
and b.location_id = d.location_id
and b.atm_location = 'Vejgaard'
and c.date_id = d.date_id
group by a.atm_id, a.atm_manufacturer, b.atm_location, c.weekday) c
) t
where total_transaction_count = max_version;
```

Rows returned (2)

atm_id	atm_manufacturer	atm_location	weekday	total_transaction_count
2	NCR	Vejgaard	Friday	6290
103	Diebold Nixdorf	Vejgaard	Friday	4757