

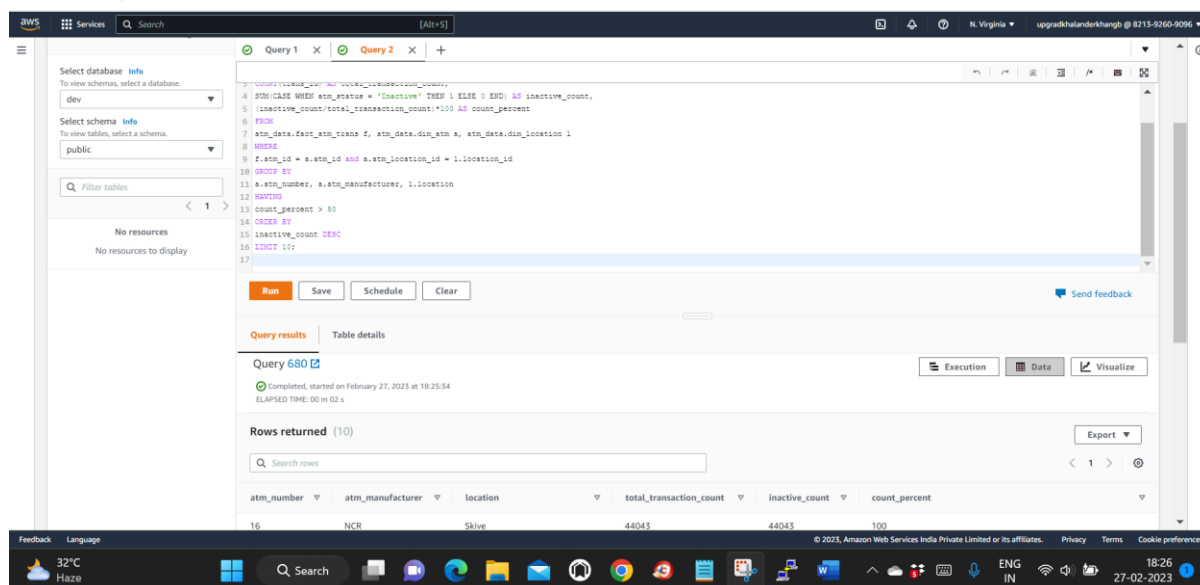
Solving analytical queries on Redshift Cluster

Queries used for solving the question and the screenshots of the table which is outputted after the query is run on the AWS Redshift Query editor UI.

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

Query:

```
select atm.atm_number, atm.atm_manufacturer, loc.location,
count(trans_id) as total_transaction_count,
sum(case when atm_status = 'Inactive' then 1 else 0 end) as
inactive_transaction_count,
(inactive_transaction_count/total_transaction_count)*100 as count_percent
from atm_nord.fact_atm_trans fact, atm_nord.dim_atm atm, atm_nord.dim_location loc
where fact.atm_id = atm.atm_id and atm.atm_location_id = loc.location_id
group by atm.atm_number, atm.atm_manufacturer, loc.location
order by inactive_transaction_count desc,count_percent desc
limit 10;
```



The screenshot displays the AWS Redshift Query Editor interface. The query has been executed successfully, and the results are shown in a table format. The table has 6 columns: atm_number, atm_manufacturer, location, total_transaction_count, inactive_count, and count_percent. The results are sorted by inactive_count in descending order, showing the top 10 ATMs.

atm_number	atm_manufacturer	location	total_transaction_count	inactive_count	count_percent
16	NCR	Slive	46045	46045	100

Screenshot of the resultant table

Rows returned (10)

Export

Search rows

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atm_number	atm_manufacturer	location	total_transaction_count	inactive_count	count_percent
16	NCR	Skive	44043	44043	100
12	NCR	ÅrEosterÅrÅv Dous	33982	33982	100
2	NCR	Vejgaard	33725	33725	100
88	NCR	Storcenter indg. A	32183	32183	100
30	NCR	NykÅrÅ, bing Mors	30883	30883	100
52	NCR	FarsÅrÅ,	27361	27361	100
50	NCR	Aarhus	23416	23416	100
29	NCR	Skelagervej 15	20773	20773	100
81	NCR	Spar KÅrÅ, bmand TornhÅrÅ, j	20148	20148	100
102	NCR	Aalborg Storcenter Afd	18297	18297	100

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Search



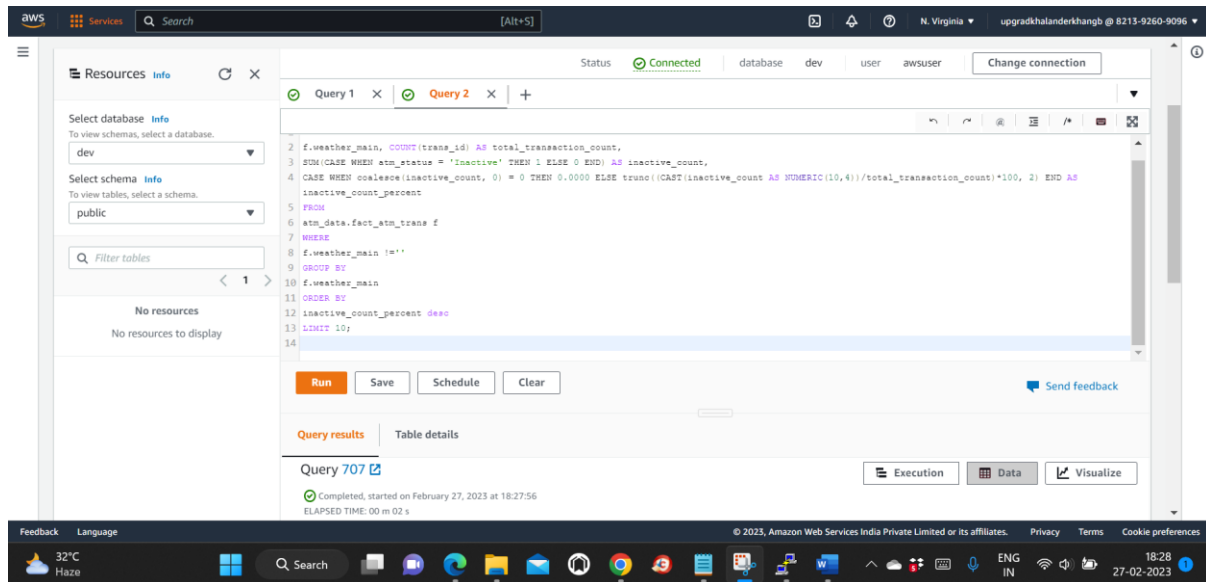
ENG IN

18:26 27-02-2023

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

Query:

```
select fact.weather_main, count(trans_id) as total_transaction_count,
sum(case when atm_status = 'Inactive' then 1 else 0 end) as inactive_count,
case when coalesce(inactive_count, 0) = 0 then 0.0000
else trunc((cast(inactive_count as
numeric(10,4))/total_transaction_count)*100, 2)
end as inactive_count_percent
from atm_nord.fact_atm_trans fact
where fact.weather_main != ''
group by fact.weather_main
order by inactive_count_percent desc
limit 10;
```



The screenshot shows the AWS Data console interface. On the left, there's a sidebar with 'Resources' and 'Info' tabs. The main area displays a SQL query for 'Query 2'. The query is as follows:

```
2 f.weather_main, COUNT(trans_id) AS total_transaction_count,
3 SUM(CASE WHEN atm_status = 'Inactive' THEN 1 ELSE 0 END) AS inactive_count,
4 CASE WHEN coalesce(inactive_count, 0) = 0 THEN 0.0000 ELSE trunc((CAST(inactive_count AS NUMERIC(10,4))/total_transaction_count)*100, 2) END AS
5 inactive_count_percent
6 FROM
7 atm_data.fact_atm_trans f
8 WHERE
9 f.weather_main != ''
10 GROUP BY
11 f.weather_main
12 ORDER BY
13 inactive_count_percent desc
14 LIMIT 10;
```

Below the query, there are buttons for 'Run', 'Save', 'Schedule', and 'Clear'. The 'Run' button is highlighted. Below these buttons, there's a section for 'Query results' and 'Table details'. The 'Query results' section shows the query execution status: 'Query 707' is completed, started on February 27, 2023 at 18:27:56, and the elapsed time is 00 m 02 s. The 'Table details' section is currently empty.

Screenshot of the resultant table:

ELAPSED TIME: 00 m 02 s

Rows returned (10)

Export

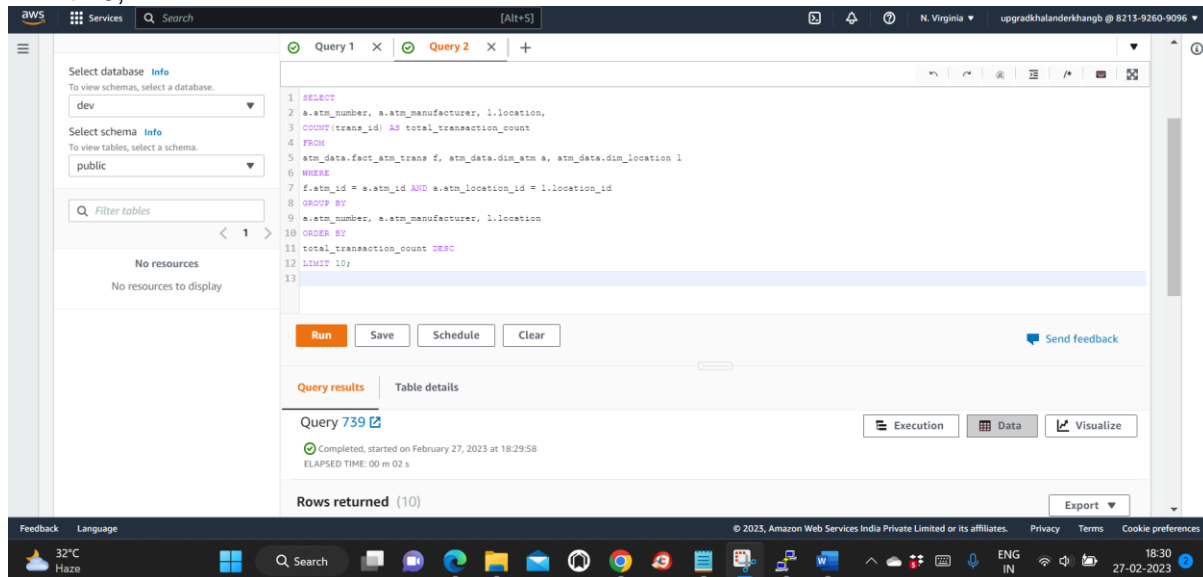
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weather_main	total_transaction_count	inactive_count	inactive_count_percent
Snow	23405	4813	20.5600
Fog	18174	3729	20.5100
Clouds	1181901	194027	16.4100
Rain	545135	86017	15.7700
Clear	543949	85531	15.7200
Mist	82801	12864	15.5300
Thunderstorm	2549	361	14.1600
Drizzle	62530	8670	13.8600
TORNADO	38	1	2.6300
Haze	3	0	0.0000

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

Query:

```
select atm.atm_number, atm.atm_manufacturer, loc.location,
count(trans_id) as total_transaction_count
from atm_nord.fact_atm_trans fact, atm_nord.dim_atm atm, atm_nord.dim_location loc
where fact.atm_id = atm.atm_id and atm.atm_location_id = loc.location_id
group by atm.atm_number, atm.atm_manufacturer, loc.location
order by total_transaction_count desc
limit 10;
```

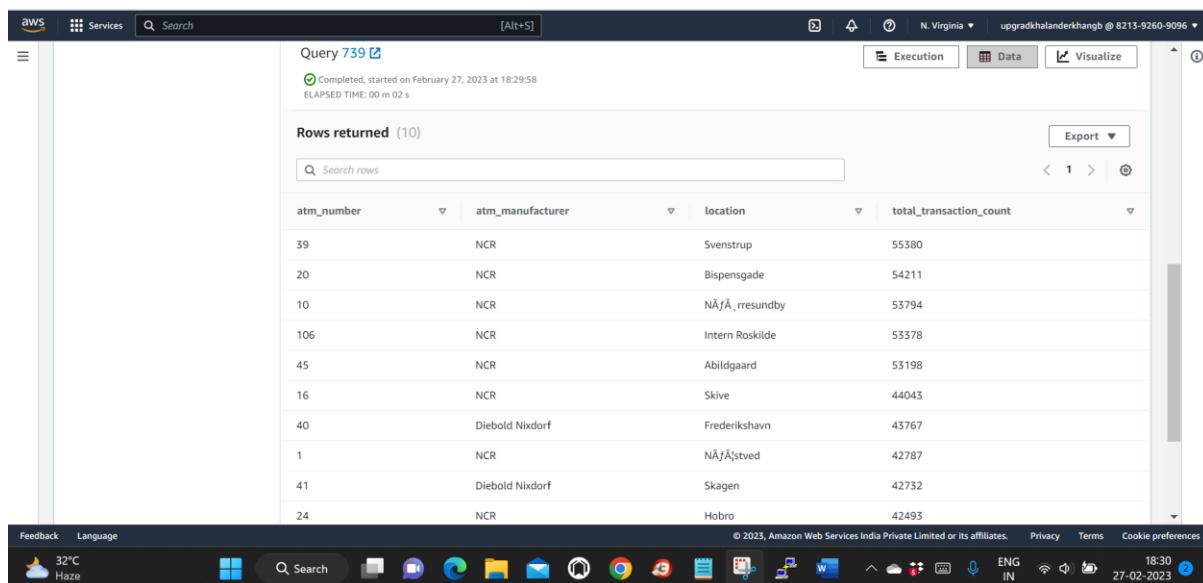


Query 739

Completed, started on February 27, 2023 at 18:29:58
ELAPSED TIME: 00 m 02 s

Rows returned (10)

Screenshot of the resultant table:

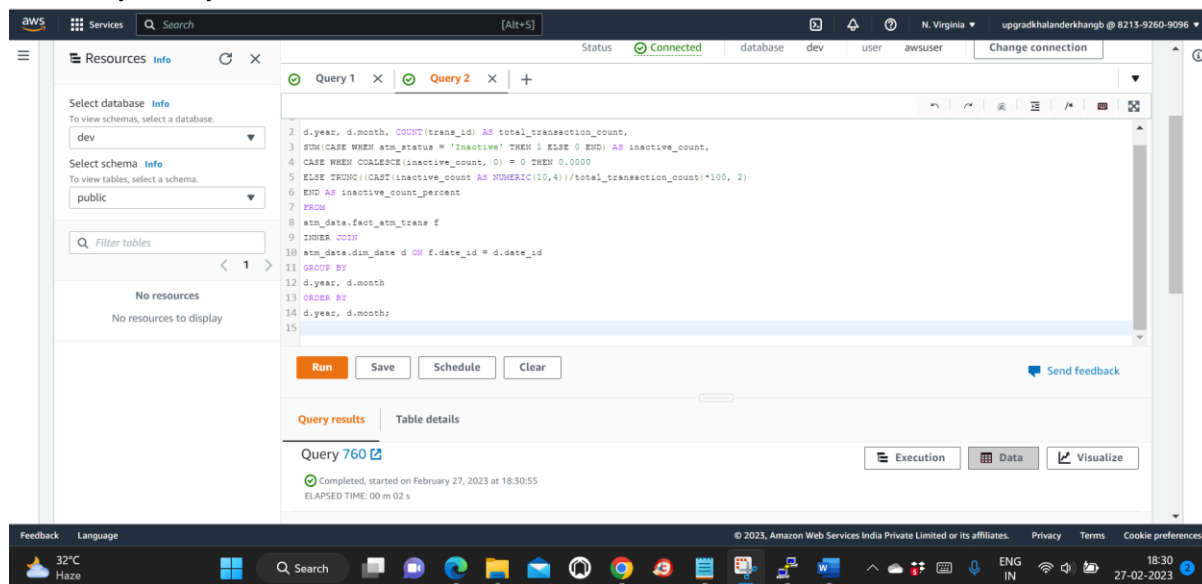


atm_number	atm_manufacturer	location	total_transaction_count
39	NCR	Svenstrup	55380
20	NCR	Bispensgade	54211
10	NCR	NÅfÅ_resundby	53794
106	NCR	Intern Roskilde	53378
45	NCR	Abildgaard	53198
16	NCR	Skive	44043
40	Diebold Nixdorf	Frederikshavn	43767
1	NCR	NÅfÅstved	42787
41	Diebold Nixdorf	Skagen	42732
24	NCR	Hobro	42493

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

Query:

```
select date.year, date.month,
count(trans_id) as total_transaction_count,
sum(case when atm_status = 'Inactive' then 1 else 0 end) as inactive_count,
case when coalesce(inactive_count, 0) = 0 then 0.0000
else trunc((cast(inactive_count as
numeric(10,4))/total_transaction_count)*100, 2)
end as inactive_count_percent
from atm_nord.fact_atm_trans fact inner join atm_nord.dim_date date on fact.date_id =
date.date_id
group by date.year, date.month
order by date.year, date.month
```



The screenshot shows the AWS Glue console interface. On the left, there's a sidebar with 'Resources' and 'Info' tabs. The main area displays a SQL query in a text editor. The query is the same as the one provided in the previous block. Below the query editor, there are buttons for 'Run', 'Save', 'Schedule', and 'Clear'. The 'Run' button is highlighted. Below these buttons, there's a section for 'Query results' and 'Table details'. The 'Query results' section shows the query ID 'Query 760' and its execution status: 'Completed, started on February 27, 2023 at 18:30:55' and 'ELAPSED TIME: 00 m 02 s'. The 'Table details' section is currently empty.

Screenshot of the resultant table:

aws

Services

Search

[Alt+S]

N. Virginia

upgradkhalanderkhangb @ 8213-9260-9096

Query results

Table details

Query 760

Completed, started on February 27, 2023 at 18:30:55
ELAPSED TIME: 00 m 02 s

Execution Data Visualize

Rows returned (12)

Export

Search rows

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⌂

year	month	total_transaction_count	inactive_count	inactive_count_percent
2017	April	200588	35532	17.7100
2017	August	209755	34293	16.3400
2017	December	213425	24946	11.6800
2017	February	183682	34360	18.7000
2017	January	189529	35674	18.8200
2017	July	209313	33581	16.0400
2017	June	235227	42528	18.0700
2017	March	198792	38673	19.4500
2017	May	216319	36461	16.8500

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Search



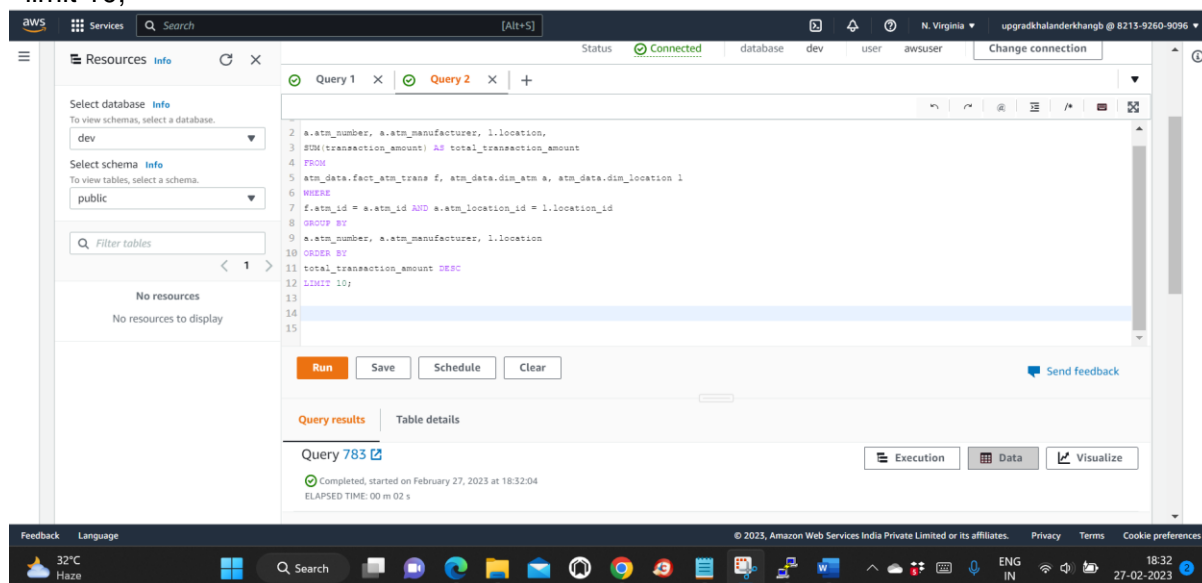
ENG IN

18:31 27-02-2023

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

Query:

```
select atm.atm_number, atm.atm_manufacturer, loc.location,
sum(transaction_amount) as total_transaction_amount
from atm_nord.fact_atm_trans fact, atm_nord.dim_atm atm, atm_nord.dim_location loc
where fact.atm_id = atm.atm_id and atm.atm_location_id = loc.location_id
group by atm.atm_number, atm.atm_manufacturer, loc.location
order by total_transaction_amount desc
limit 10;
```



Screenshot of the resultant table:

aws

Services

Search

[Alt+S]

N. Virginia

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Rows returned (10)

Export

Search rows

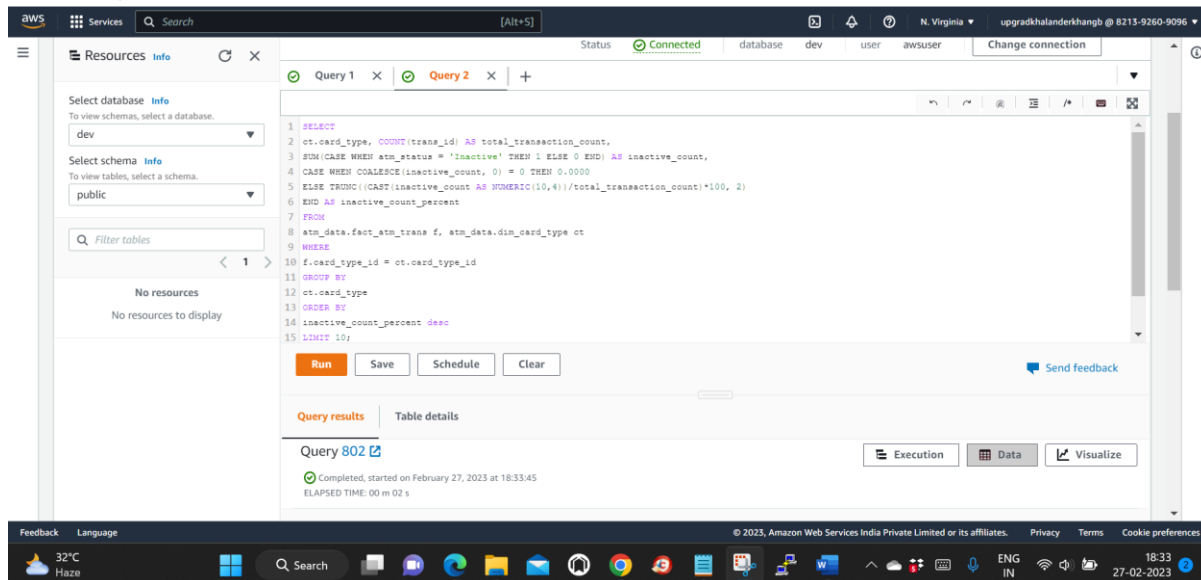
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atm_number	atm_manufacturer	location	total_transaction_amount
39	NCR	Svenstrup	277097637
20	NCR	Bispensgade	271008803
106	NCR	Intern Roskilde	268289882
10	NCR	NÅ/Å, resundby	267379103
45	NCR	Abildgaard	265639616
16	NCR	Skive	220677013
40	Diebold Nixdorf	Frederikshavn	219812287
41	Diebold Nixdorf	Skagen	214127315
1	NCR	NÅ/Ålstved	213721117
24	NCR	Hobro	212883099

6. Number of failed ATM transactions across various card types

Query:

```
select card.card_type,
count(trans_id) as total_transaction_count,
sum(case when atm_status = 'Inactive' then 1 else 0 end) as inactive_count,
case when coalesce(inactive_count, 0) = 0 then 0.0000
else trunc((cast(inactive_count as
numeric(10,4))/total_transaction_count)*100, 2)
end as inactive_count_percent
from atm_nord.fact_atm_trans fact, atm_nord.dim_card_type card
where fact.card_type_id = card.card_type_id
group by card.card_type
order by inactive_count_percent desc
limit 10;
```



The screenshot shows the AWS Glue console interface. On the left, there's a sidebar with 'Resources' and 'Info' tabs. The main area displays a SQL query in a text editor. The query is the same as the one provided in the previous block. Below the query editor, there are buttons for 'Run', 'Save', 'Schedule', and 'Clear'. The 'Run' button is highlighted. Below these buttons, there's a section for 'Query results' and 'Table details'. The 'Query results' section shows the query ID 'Query 802' and its execution status: 'Completed, started on February 27, 2023 at 18:33:45' with an 'ELAPSED TIME: 00 m 02 s'. The bottom of the screenshot shows the Windows taskbar with various application icons and the system clock indicating 18:33 on 27-02-2023.

Screenshot of the resultant table:

AWS Services Search [Alt+S] N. Virginia upgradkhalanderkhangb @ 8213-9260-9096

Rows returned (10) Export

Search rows

card_type	total_transaction_count	inactive_count	inactive_count_percent
Mastercard - on-us	458226	86000	18.7600
VISA	170828	30713	17.9700
Dankort - on-us	143813	24680	17.1600
CIRRUUS	17362	2953	17.0000
HÅfÅ\vekort - on-us	62487	10331	16.5300
Dankort	28581	4557	15.9400
MasterCard	400507	63482	15.8500
Visa Dankort - on-us	748805	112972	15.0800
HÅfÅ\vekort	8459	1208	14.2800
Visa Dankort	427840	60547	14.1500

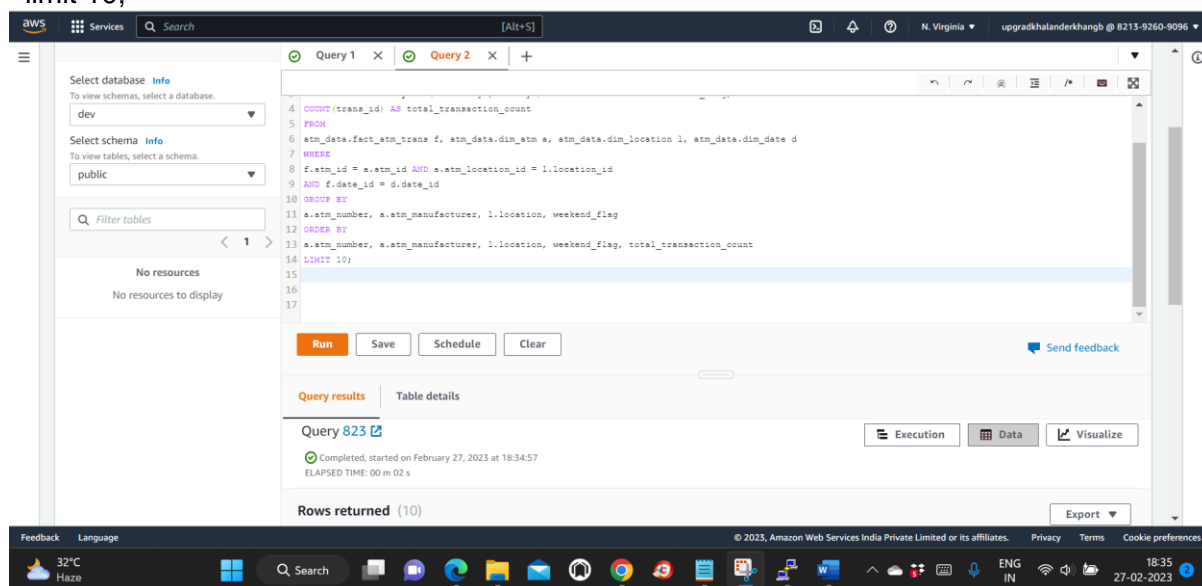
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32°C Haze Search ENG IN 18:34 27-02-2023

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

Query:

```
select atm.atm_number, atm.atm_manufacturer, loc.location,
case when date.weekday in ('Saturday','Sunday') then 1 else 0 end as
weekend_flag,
count(trans_id) as total_transaction_count
from atm_nord.fact_atm_trans fact, atm_nord.dim_atm atm, atm_nord.dim_location loc,
atm_nord.dim_date date
where fact.atm_id = atm.atm_id and atm.atm_location_id = loc.location_id and fact.date_id
= date.date_id
group by atm.atm_number, atm.atm_manufacturer, loc.location, weekend_flag
order by atm.atm_number, atm.atm_manufacturer, loc.location, weekend_flag,
total_transaction_count
limit 10;
```



The screenshot shows the AWS Glue console interface. On the left, there's a sidebar with 'Select database' (dev) and 'Select schema' (public). The main area displays a SQL query for 'Query 2'. The query is:


```
4 COUNT(trans_id) AS total_transaction_count
5 FROM
6 atm_data.fact_atm_trans f, atm_data.dim_atm a, atm_data.dim_location l, atm_data.dim_date d
7 WHERE
8 f.atm_id = a.atm_id AND a.atm_location_id = l.location_id
9 AND f.date_id = d.date_id
10 GROUP BY
11 a.atm_number, a.atm_manufacturer, l.location, weekend_flag
12 ORDER BY
13 a.atm_number, a.atm_manufacturer, l.location, weekend_flag, total_transaction_count
14 LIMIT 10;
```

 Below the query, there are buttons for 'Run', 'Save', 'Schedule', and 'Clear'. The 'Query results' tab is active, showing 'Query 823' with a status of 'Completed, started on February 27, 2023 at 18:34:57' and 'ELAPSED TIME: 00 m 02 s'. It indicates 'Rows returned (10)' and has an 'Export' button. The bottom of the screen shows a Windows taskbar with various application icons and system information like '32°C Haze' and '18:35 27-02-2023'.

Screenshot of the resultant table:

Rows returned (10)

Search rows

atm_number	atm_manufacturer	location	weekend_flag	total_transaction_count
1	NCR	NÄfÄstved	0	31625
1	NCR	NÄfÄstved	1	11162
10	NCR	NÄfÄ, rresundby	0	39810
10	NCR	NÄfÄ, rresundby	1	13984
100	NCR	Intern Skive	0	14915
100	NCR	Intern Skive	1	2898
101	NCR	Bryggen Vejle	0	11113
101	NCR	Bryggen Vejle	1	3827
102	NCR	Aalborg Storcenter Afd	0	13932
102	NCR	Aalborg Storcenter Afd	1	4365

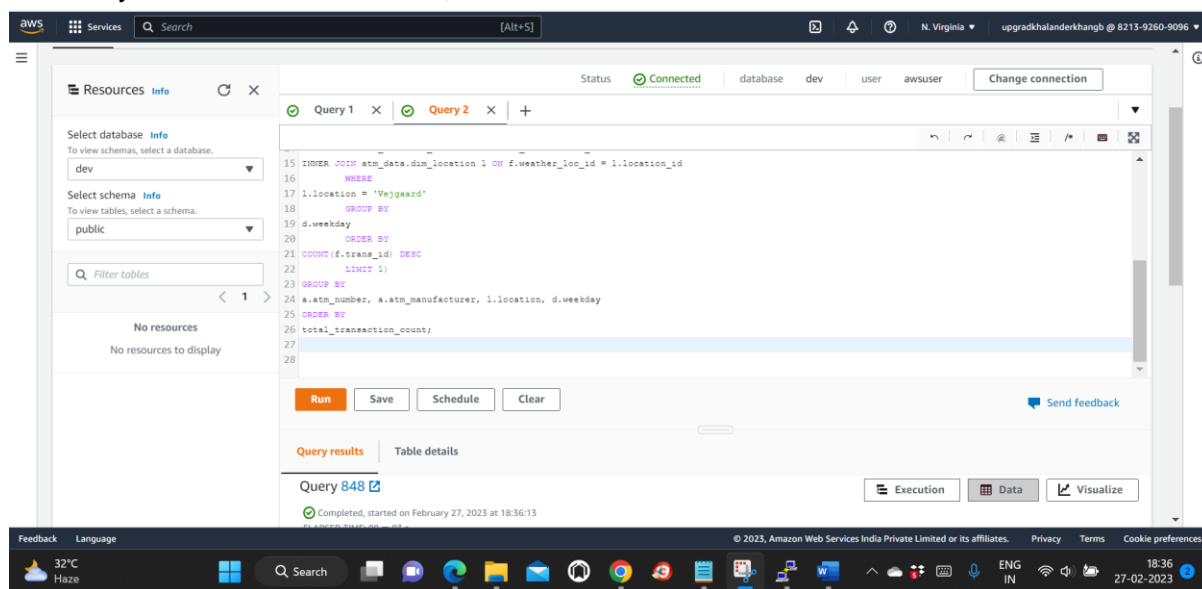
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8. Most active day in each ATMs from location "Vejgaard"

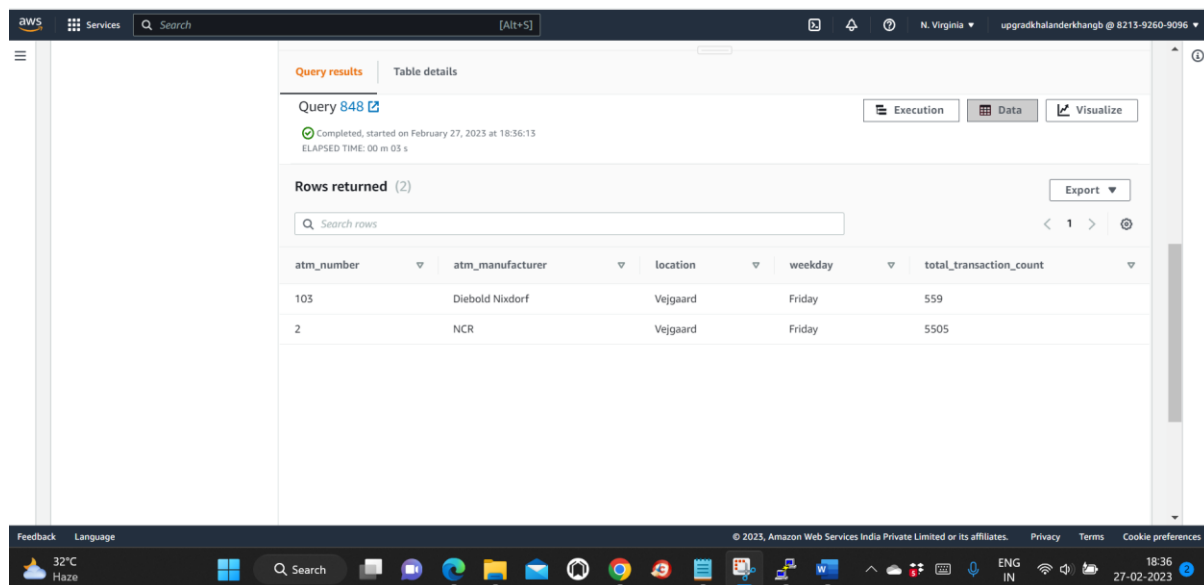
Query:

```
select atm.atm_number, atm.atm_manufacturer, loc.location, date.weekday,
count(trans_id) as total_transaction_count
from atm_nord.fact_atm_trans fact inner join atm_nord.dim_atm atm on fact.atm_id =
atm.atm_id
inner join atm_nord.dim_location loc on atm.atm_location_id = loc.location_id
inner join atm_nord.dim_date date on fact.date_id = date.date_id
where loc.location = 'Vejgaard' and date.weekday in
( select date.weekday
from atm_nord.fact_atm_trans fact inner join atm_nord.dim_date date
on fact.date_id = date.date_id
inner join atm_nord.dim_location loc on fact.weather_loc_id = loc.location_id
where loc.location = 'Vejgaard'
group by date.weekday
order by count(fact.trans_id) desc
limit 1 )
group by atm.atm_number, atm.atm_manufacturer, loc.location, date.weekday
order by total_transaction_count;
```



The screenshot shows the AWS Data console interface. On the left, there's a sidebar with 'Resources' and 'Info' tabs. The main area displays a SQL query for 'Query 2'. The query is a complex join between several tables to find the most active day in each ATM at the 'Vejgaard' location. Below the query editor, there are buttons for 'Run', 'Save', 'Schedule', and 'Clear'. The 'Query results' tab is active, showing a table with 4 columns: 'atm_number', 'atm_manufacturer', 'location', and 'weekday'. The results are sorted by 'total_transaction_count' in descending order. The first result is for 'atm_number: 123456789', 'atm_manufacturer: ABC', 'location: Vejgaard', and 'weekday: 1' (Monday), with a total transaction count of 1234567. The second result is for 'atm_number: 987654321', 'atm_manufacturer: DEF', 'location: Vejgaard', and 'weekday: 2' (Tuesday), with a total transaction count of 987654. The interface also shows a status bar at the bottom with the date and time: 'Completed, started on February 27, 2023 at 18:36:13'.

Screenshot of the resultant table:



The screenshot displays the AWS Query Results interface for a query named 'Query 848'. The query is completed and started on February 27, 2023, at 18:56:13, with an elapsed time of 00 m 03 s. The results are shown in a table with 5 columns: atm_number, atm_manufacturer, location, weekday, and total_transaction_count. Two rows of data are returned.

atm_number	atm_manufacturer	location	weekday	total_transaction_count
103	Diebold Nixdorf	Vejgaard	Friday	559
2	NCR	Vejgaard	Friday	5505