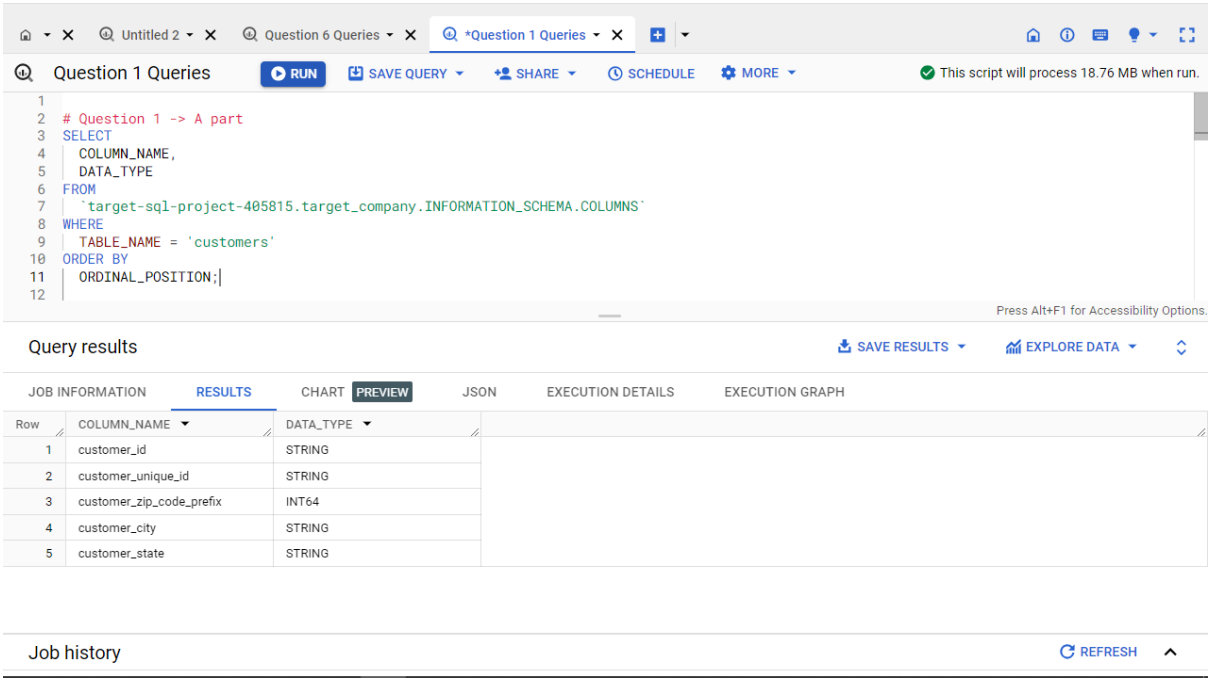
QUESTION 1 :

Import the dataset and do usual exploratory analysis steps like checking the structure & characteristics of the dataset:

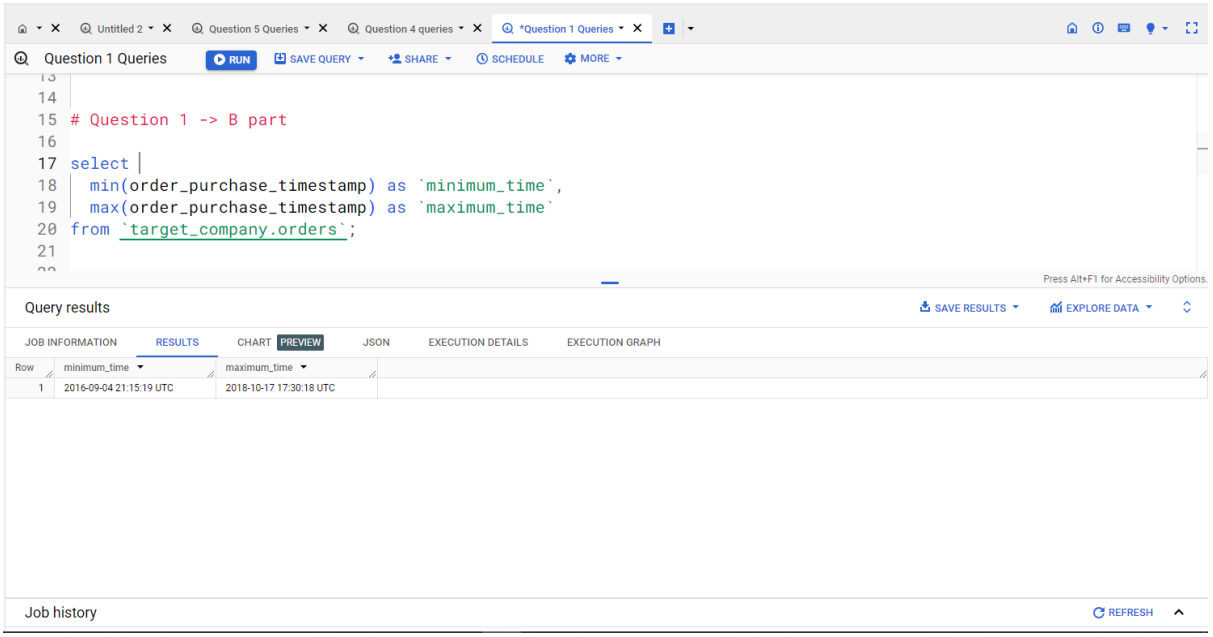
A. Data type of all columns in the "customers" table.



Insight :-

In the customers table there are 5 columns where 4 columns are of String data type and one is Integer data type.

B. Get the time range between which the orders were placed.

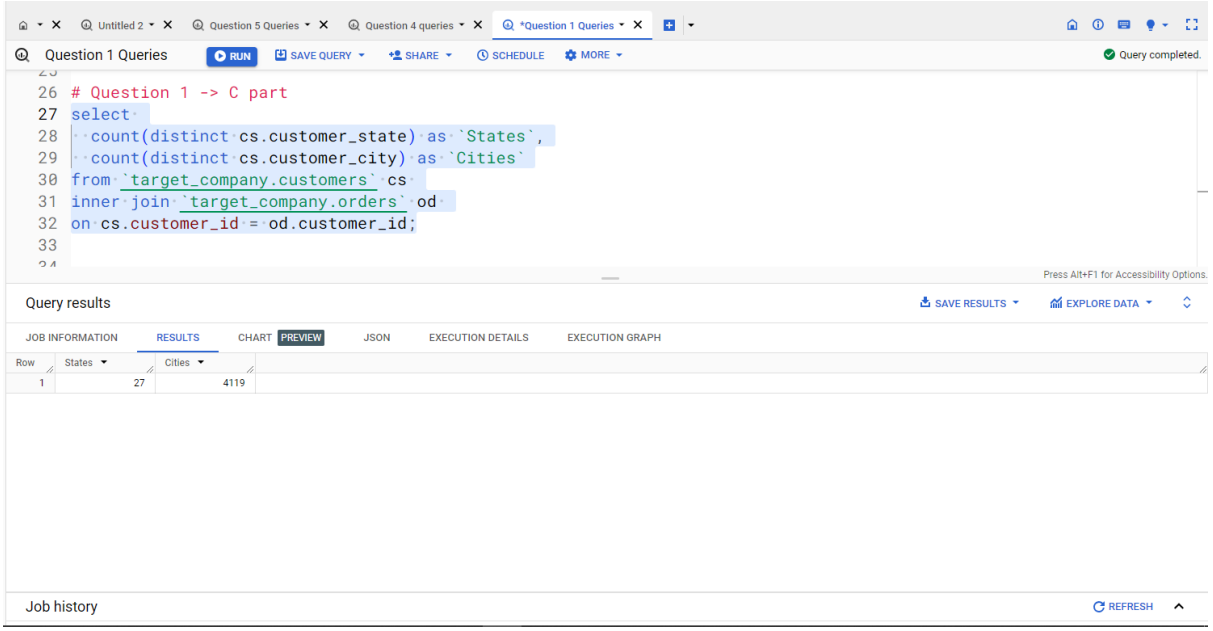


Insight :-

The minimum time on which customers purchase the order is September 2016

The maximum time on which customers purchase the order is October 2018

C. Count the Cities & States of customers who ordered during the given period

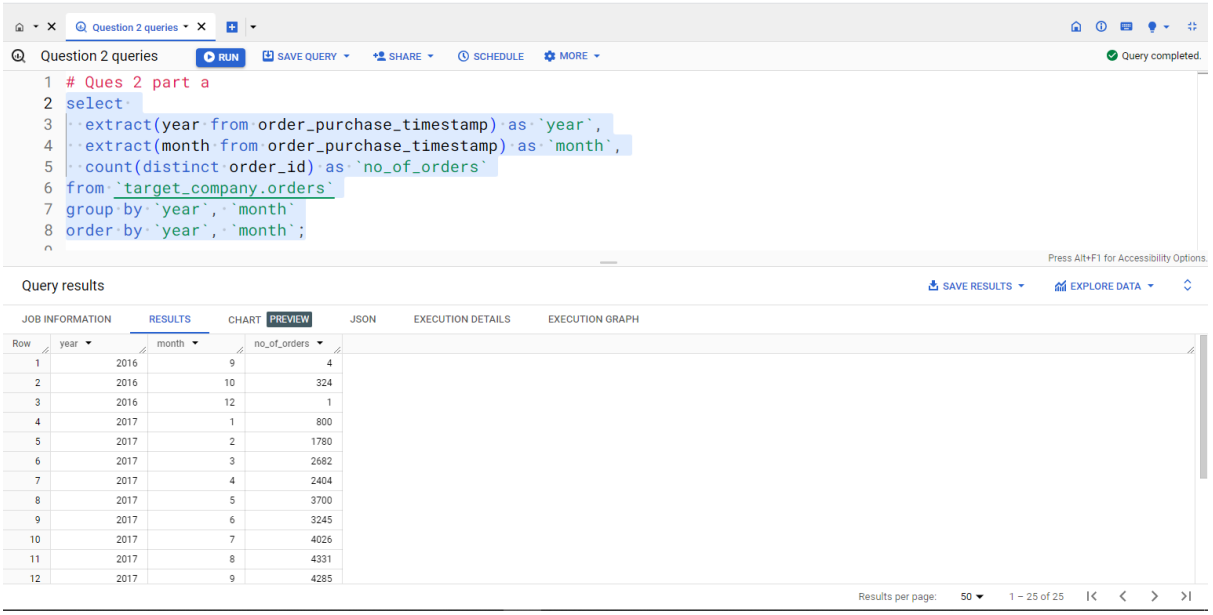


Insight :-

There are total 27 states and 4119 cities in the target dataset to extract the meaningful insights.

QUESTION 2 :
In-depth Exploration:

1. Is there a growing trend in the no. of orders placed over the past years?



Insight :-

Yes! There is a growing trend in the no. of orders placed over the past years.
The orders increased in the year 2017 as compared to 2016
And in 2018 the orders placed are increased in only 2 months.

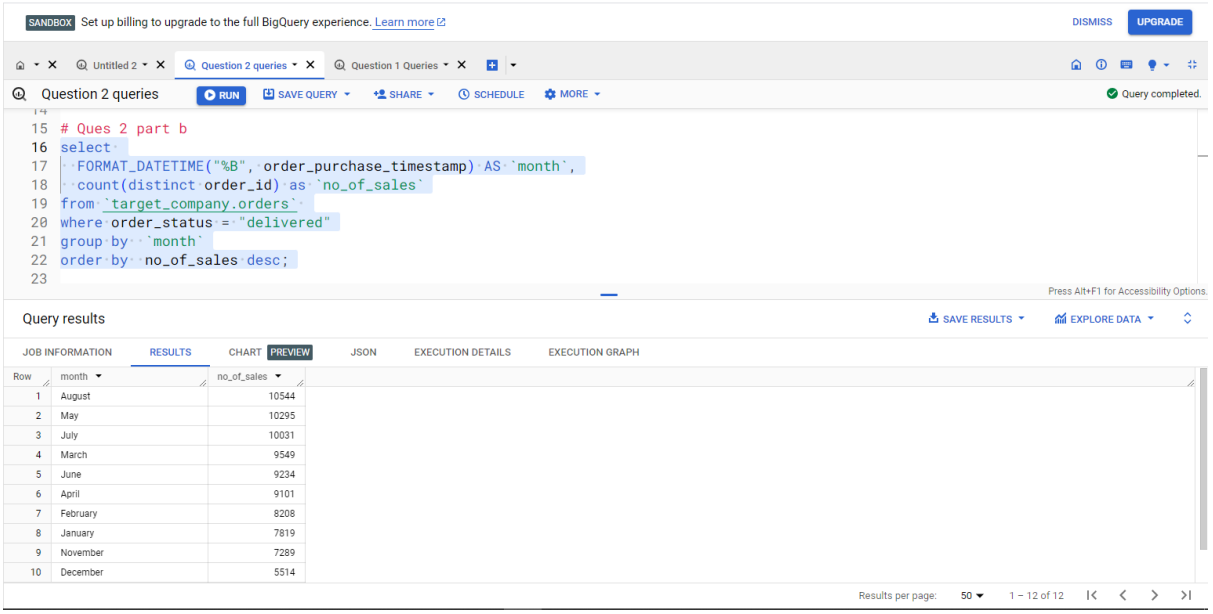
`no_of_orders` column shows a consistent increase over the years, it indicates a positive trend in the number of orders. This could be due to factors such as increased customer awareness, improved marketing strategies, or expanding product offerings.

Recommendation :-

Market Expansion: If the trend is positive, consider expanding your market reach. Explore new geographic areas or demographics to attract a wider customer base.

Customer Engagement: Focus on customer engagement and satisfaction. Collect feedback to identify areas for improvement and ensure a positive customer experience.

2.Can we see some kind of monthly seasonality in terms of the no. of orders being placed?



Insight :-

Yes we can see the monthly seasonality.
In the month of august there are maximum numbers of sales/orders are placed and in the month of september there are minimum numbers of sales/orders are placed.

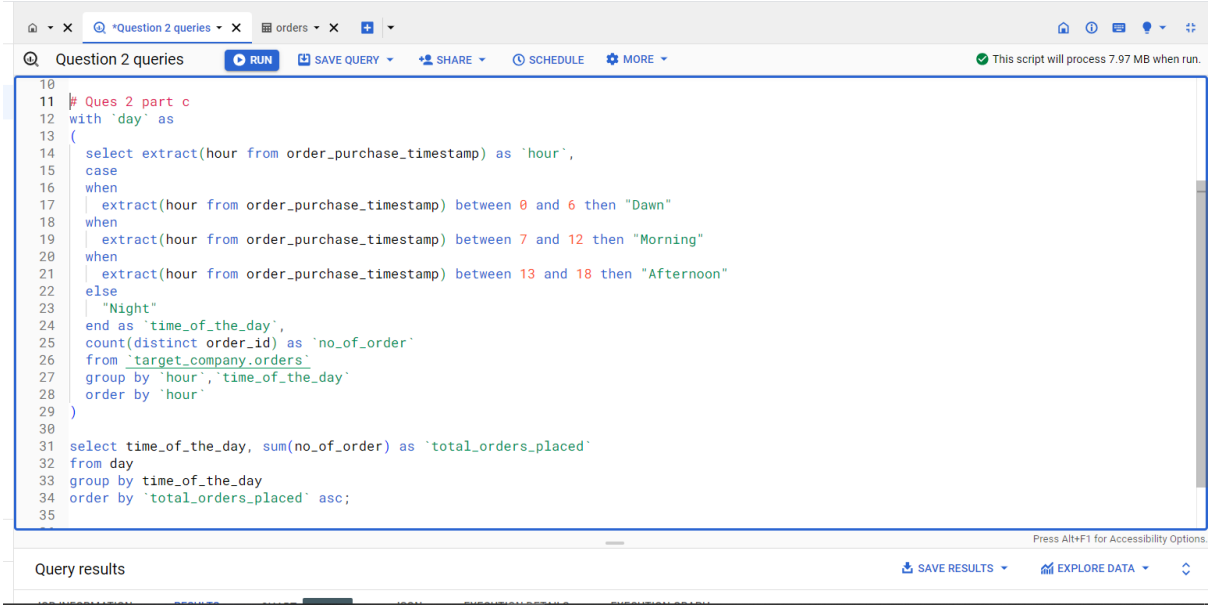
Recommendation :-

Optimize inventory management based on seasonal demand. Ensure that you have sufficient stock during peak months and avoid overstocking during slower periods.

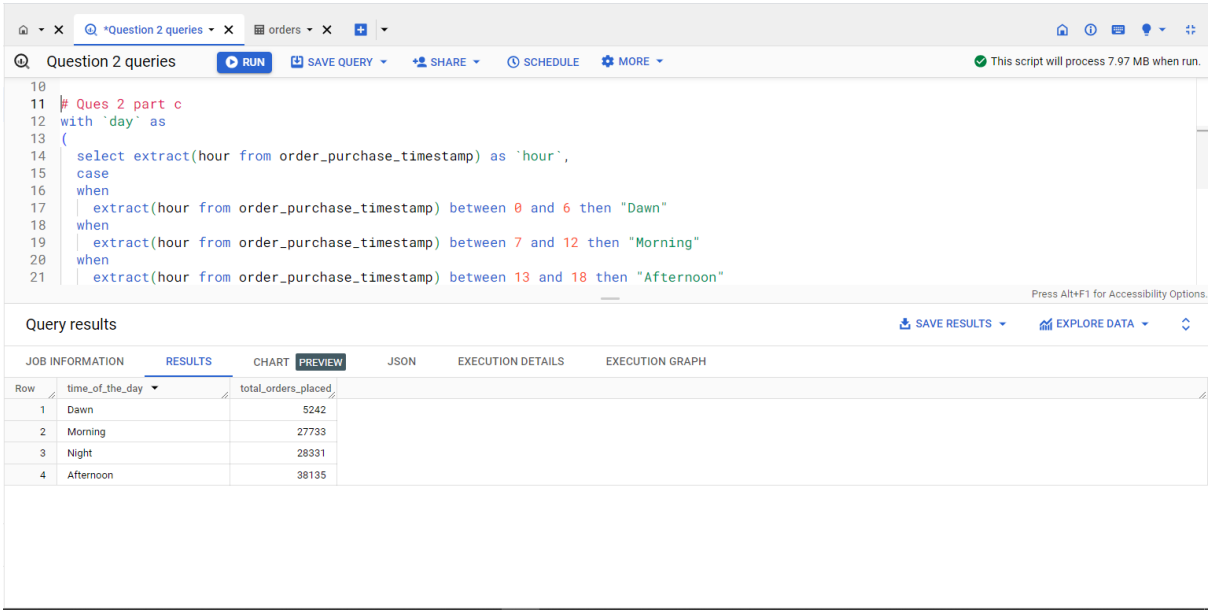
Align marketing and promotional activities with peak months to capitalize on increased customer engagement. Consider special offers or promotions during peak seasons.

3.During what time of the day, do the Brazilian customers mostly place their orders? (Dawn, Morning, Afternoon or Night)

Query



Result



Insight :-

The Brazilian customers purchases the most orders in the Afternoon then they purchases the most orders in the Night

Then they purchases the most orders in the Morning

And they purchases the least orders in the Dawn

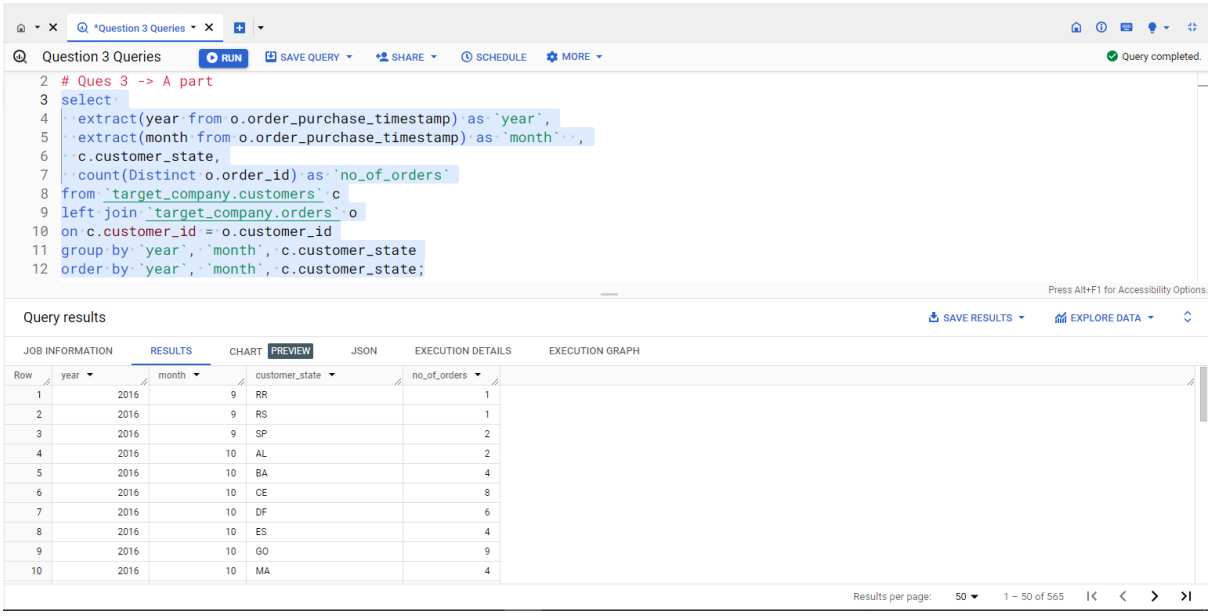
Recommendation :-

Create time-specific offers or discounts during periods with lower order activity to incentivize purchases during those times. This can help balance order distribution throughout the day.

If there are consistent peak times, ensure that your website or app provides a smooth and responsive user experience during these periods to accommodate increased traffic.

QUESTION 3 :
Evolution of E-commerce orders in the Brazil region:

1. Get the month on month no. of orders placed in each state.



Insight :-

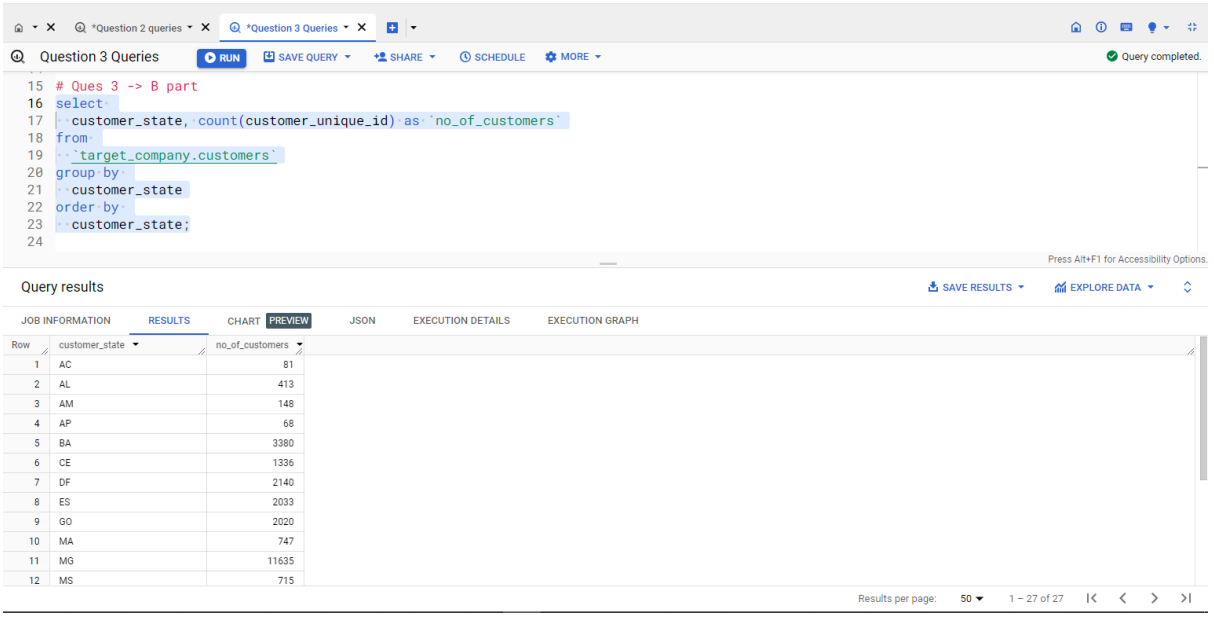
The number of highest orders placed in each month is SP state.
The number of lowest orders placed in each month is AP, RR state.

Recommendation :-

Optimize inventory levels in each state to meet demand. Adjust stock levels based on historical data to avoid stockouts during high-demand periods.

Ensure that customer support and logistics are well-equipped to handle variations in demand across different states. Provide adequate support during peak periods to maintain customer satisfaction.

2. How are the customers distributed across all the states?



Insight :-

The customers are distributed across different different states with
the highest number of customers are in the state of SP (41746 customers)
The lowest number of customers are in the state of AP (68 customers).

Recommendation :-

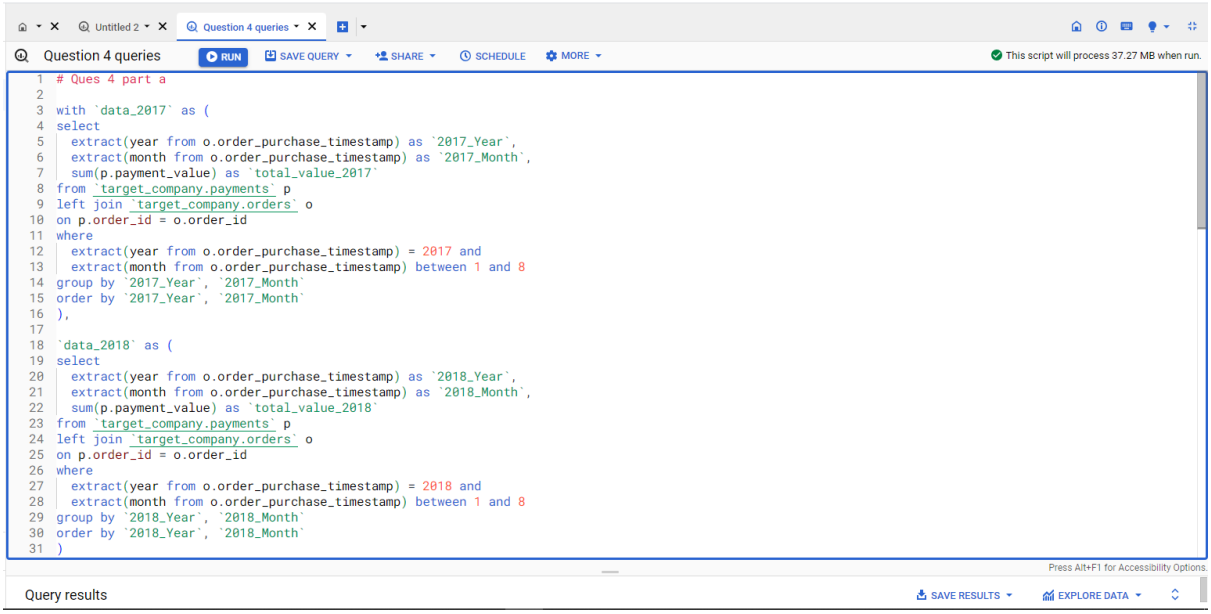
Develop targeted marketing strategies for states with lower customer counts. This could include localized advertising, promotions, or other initiatives to increase brand awareness.

Explore opportunities for market expansion in states where there is untapped potential. Conduct market research to understand local preferences and adapt your offerings accordingly.

QUESTION 4 : Impact on Economy : Analyze the money movement by e-commerce by looking at order prices, freight and others.

1.Get the % increase in the cost of orders from year 2017 to 2018 (include months between Jan to Aug only).
You can use the "payment_value" column in the payments table to get the cost of orders.

Query

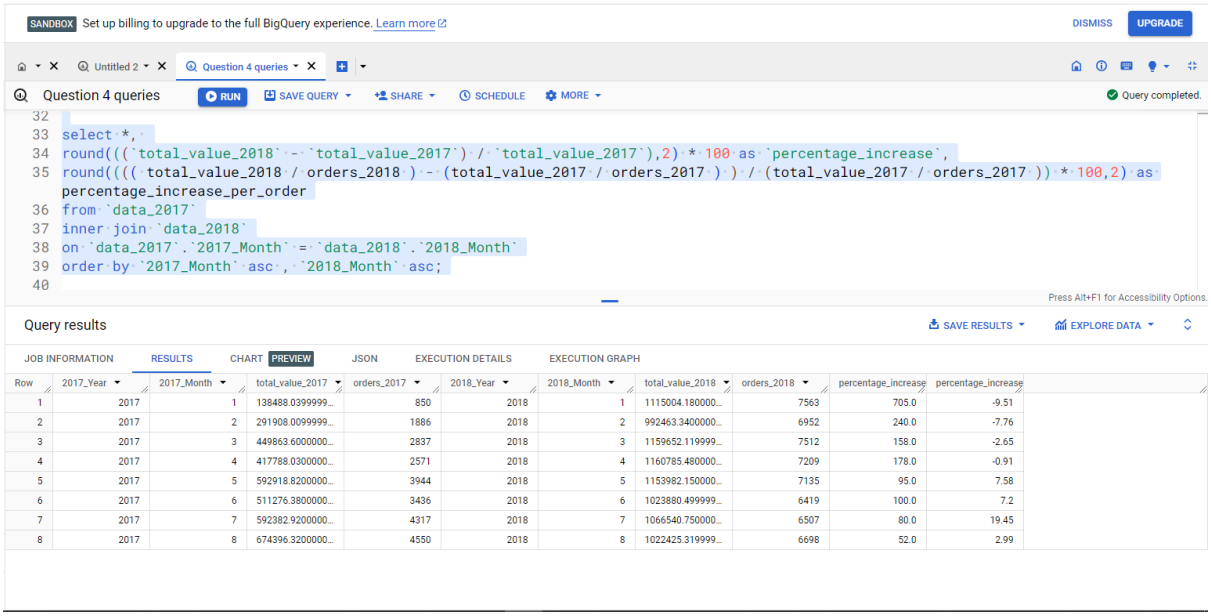


```
# Ques 4 part a

with `data_2017` as (
select
  extract(year from o.order_purchase_timestamp) as `2017_Year`,
  extract(month from o.order_purchase_timestamp) as `2017_Month`,
  sum(p.payment_value) as `total_value_2017`
from `target_company.payments` p
left join `target_company.orders` o
on p.order_id = o.order_id
where
  extract(year from o.order_purchase_timestamp) = 2017 and
  extract(month from o.order_purchase_timestamp) between 1 and 8
group by `2017_Year`, `2017_Month`
order by `2017_Year`, `2017_Month`
),

`data_2018` as (
select
  extract(year from o.order_purchase_timestamp) as `2018_Year`,
  extract(month from o.order_purchase_timestamp) as `2018_Month`,
  sum(p.payment_value) as `total_value_2018`
from `target_company.payments` p
left join `target_company.orders` o
on p.order_id = o.order_id
where
  extract(year from o.order_purchase_timestamp) = 2018 and
  extract(month from o.order_purchase_timestamp) between 1 and 8
group by `2018_Year`, `2018_Month`
order by `2018_Year`, `2018_Month`
)
```

Result



```
select *,
round((`total_value_2018` - `total_value_2017`) / `total_value_2017`,2) * 100 as `percentage_increase`,
round((( total_value_2018 / orders_2018 ) - (total_value_2017 / orders_2017 )) / (total_value_2017 / orders_2017 )) * 100,2) as
percentage_increase_per_order
from `data_2017`
inner join `data_2018`
on `data_2017`.`2017_Month` = `data_2018`.`2018_Month`
order by `2017_Month` asc , `2018_Month` asc;
```

Row	2017_Year	2017_Month	total_value_2017	orders_2017	2018_Year	2018_Month	total_value_2018	orders_2018	percentage_increase	percentage_increase
1	2017	1	138488.0399999...	850	2018	1	1115004.180000...	7563	705.0	-9.51
2	2017	2	291908.0099999...	1886	2018	2	992463.3400000...	6952	240.0	-7.76
3	2017	3	449863.6000000...	2837	2018	3	1159652.119999...	7512	158.0	-2.65
4	2017	4	417788.0300000...	2571	2018	4	1160785.480000...	7209	178.0	-0.91
5	2017	5	592918.8200000...	3944	2018	5	1153982.150000...	7135	95.0	7.58
6	2017	6	511276.3800000...	3436	2018	6	1023880.499999...	6419	100.0	7.2
7	2017	7	592382.9200000...	4317	2018	7	1066540.750000...	6507	80.0	19.45
8	2017	8	674396.3200000...	4550	2018	8	1022425.319999...	6698	52.0	2.99

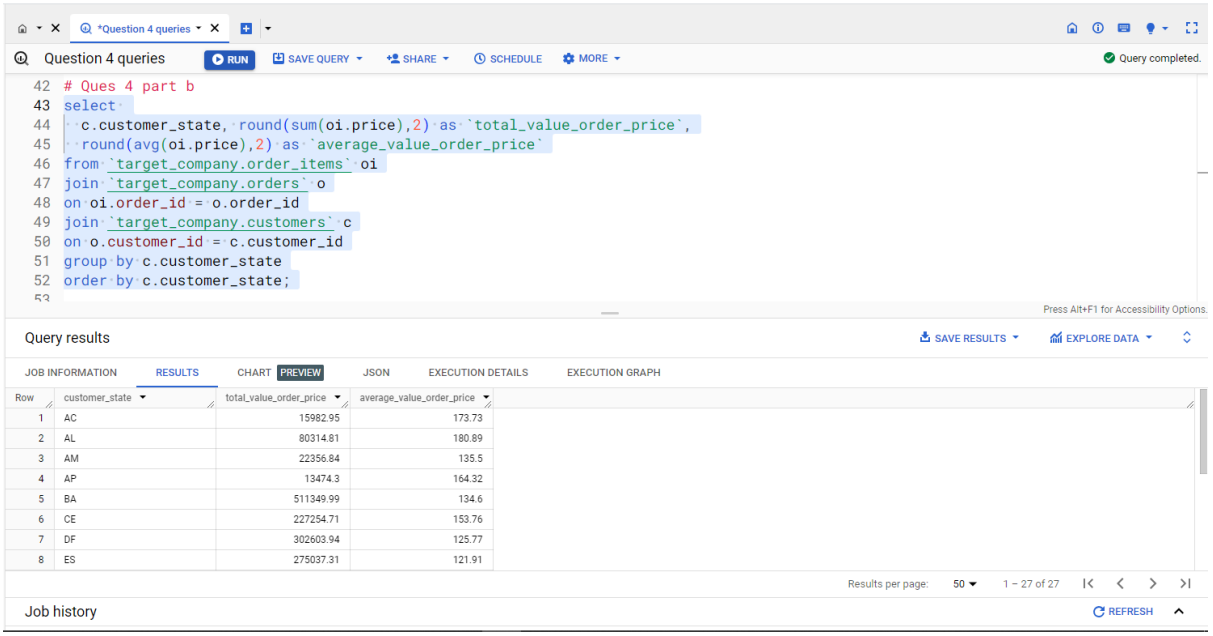
Insight :-

In the year of 2018 the orders of every month is increase as compared to the year of 2017 of every month.
In the year of 2018 the month between 3 and 5 the number of orders are maximum as compared to other months.
In the year 2018 the total value is increased in every month as compared to the year 2017.

Recommendation :-

Focus on enhancing the overall customer experience. Satisfied customers are more likely to place larger orders and become repeat customers.
Analyze customer feedback during the period of growth. Identify areas of improvement and implement changes based on customer suggestions.

2.Calculate the Total & Average value of order price for each state.

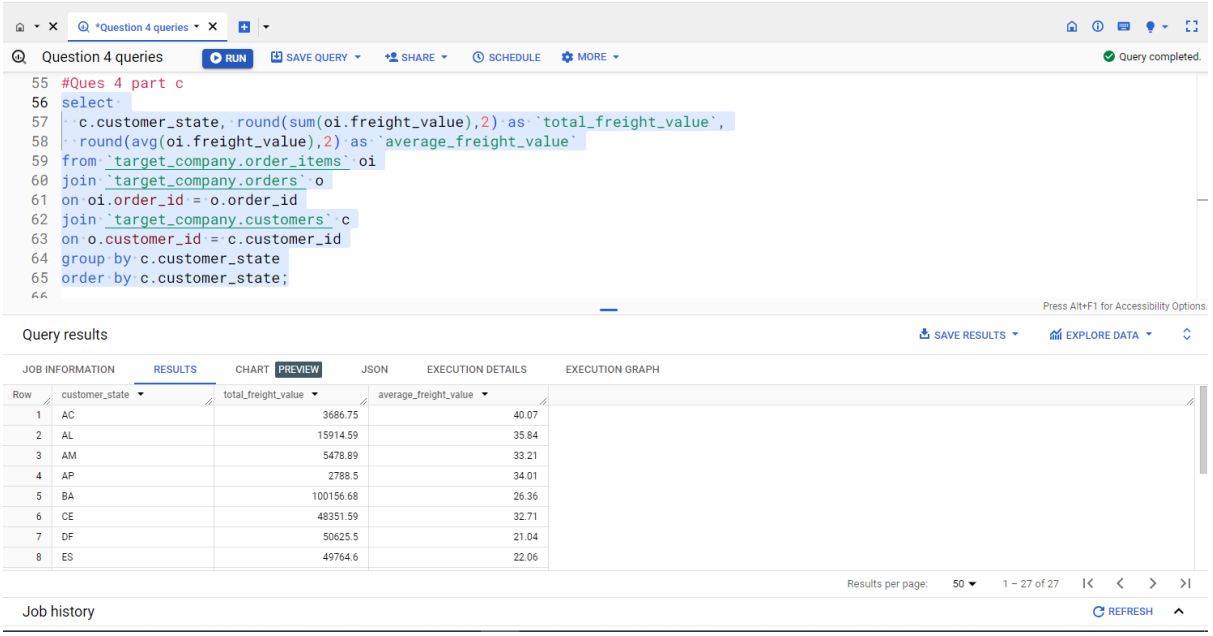


Insight :-

The maximum total value of order price in the state of SP with the amount of 5202955.05 and the minimum total value of order price in the state of RR with the amount of 7829.43.

The maximum average value of order price in the state of PB with the average amount of 216.67
And the minimum average value of order price in the state of SP with the average amount of 125.75.

3.Calculate the Total & Average value of order freight for each state.



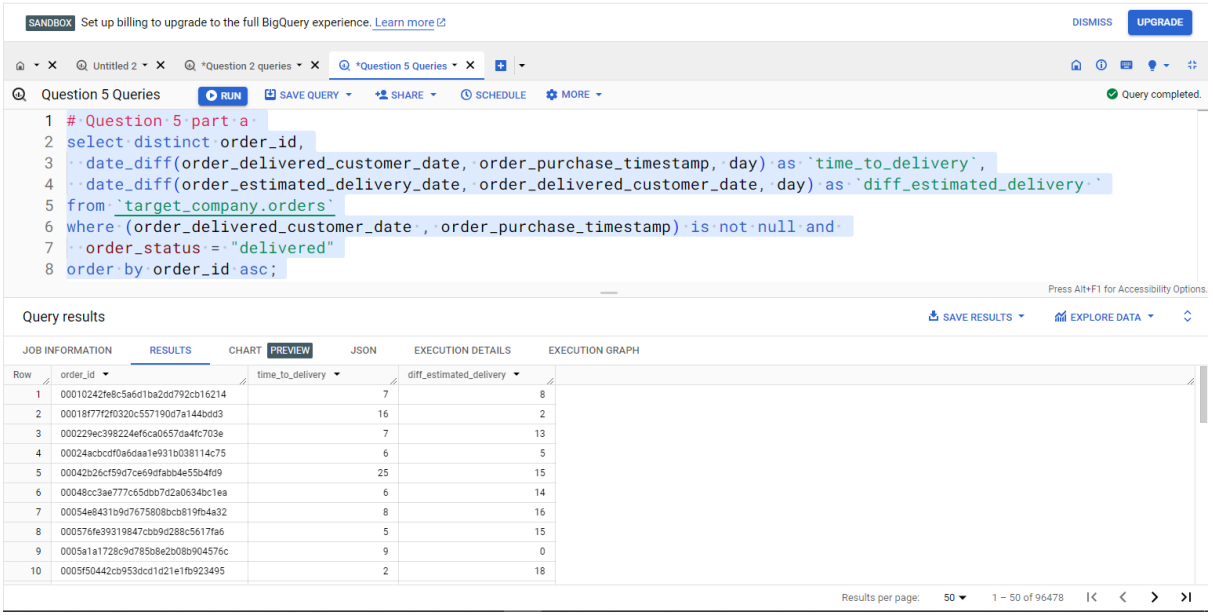
Insight :-

The maximum total value of order freight price in the state of SP with the amount of 718723.07 and the minimum total value of order price in the state of RR with the amount of 2235.19.

The maximum average value of order price in the state of RR with the average amount of 48.59
And the minimum average value of order price in the state of SP with the average amount of 17.27.

QUESTION 5 : Analysis based on sales, freight and delivery time.

1.Find the no. of days taken to deliver each order from the order’s purchase date as delivery time.
Also, calculate the difference (in days) between the estimated & actual delivery date of an order.
Do this in a single query.



Insight :-

These are the differences of estimated delivery time and actual delivery time .
In some case the orders are delivered before the estimated delivery time but in some cases the orders are delivered after the estimated delivery time.

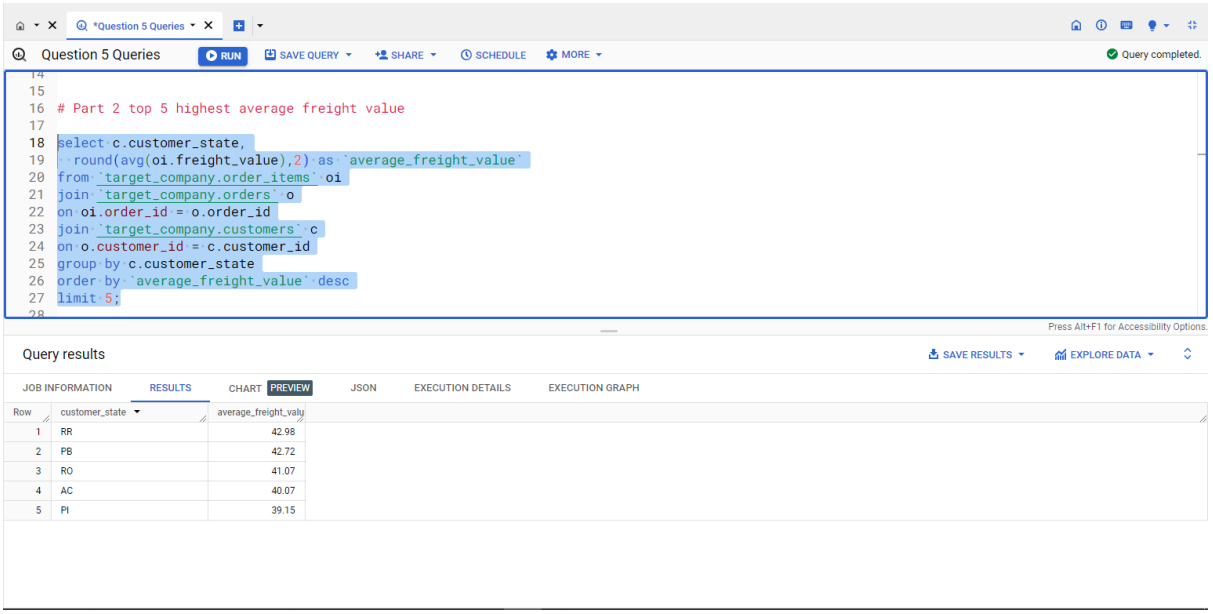
Recommendation :-

If there are consistent delays, assess and optimize the delivery processes. Consider improvements in logistics, transportation, and order fulfillment to reduce delivery times.

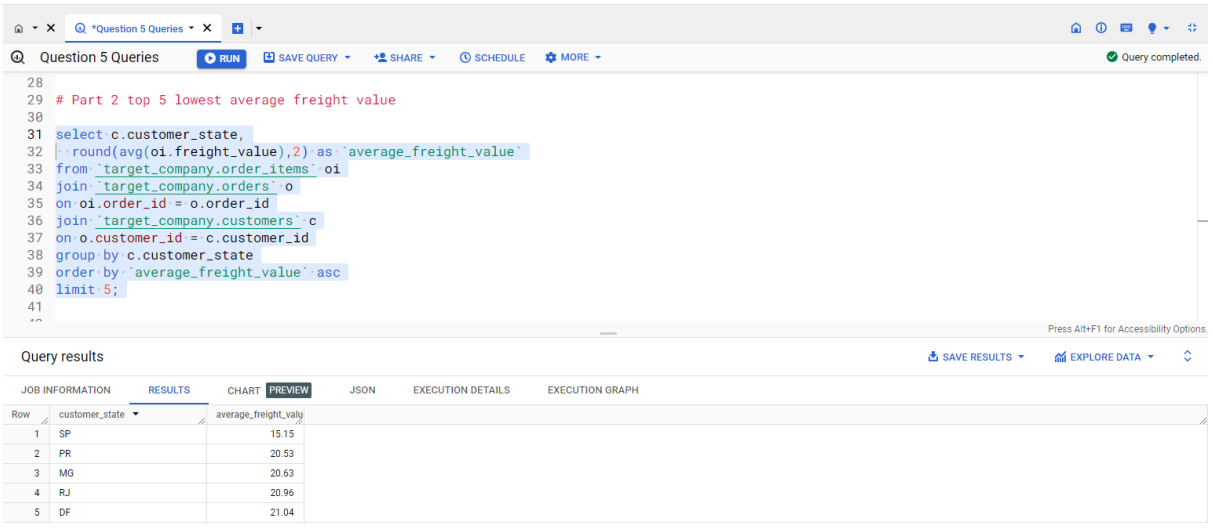
Communicate estimated delivery dates transparently to customers. Manage expectations by providing accurate delivery estimates to minimize dissatisfaction due to delays.

2.Find out the top 5 states with the highest & lowest average freight value.

(A)Top 5 states with Highest Average Freight Value



(B)Top 5 states with Lowest Average Freight Value

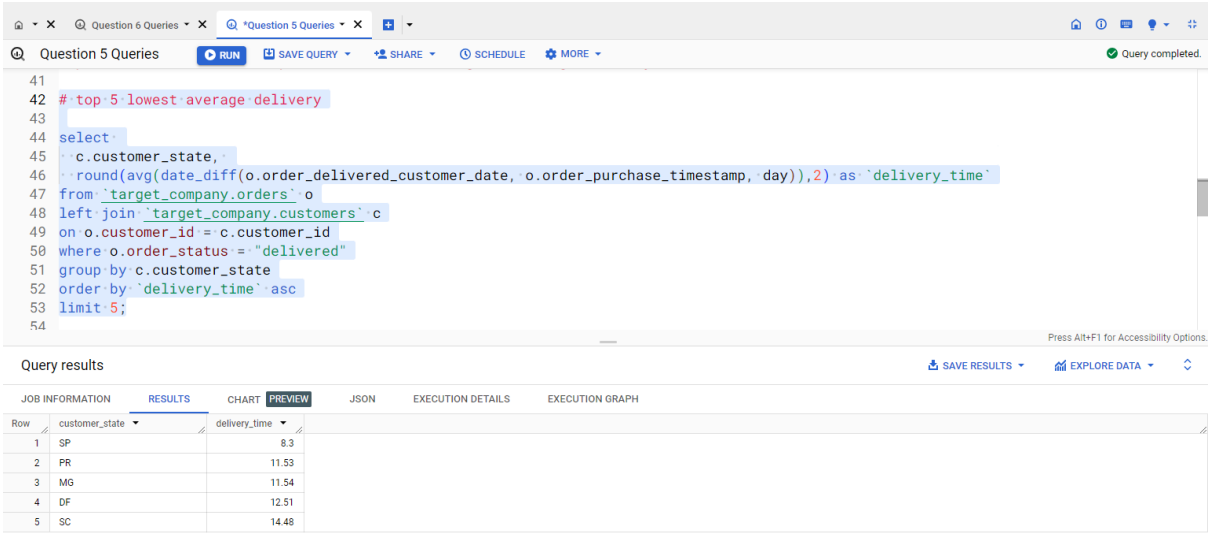


Insight :-

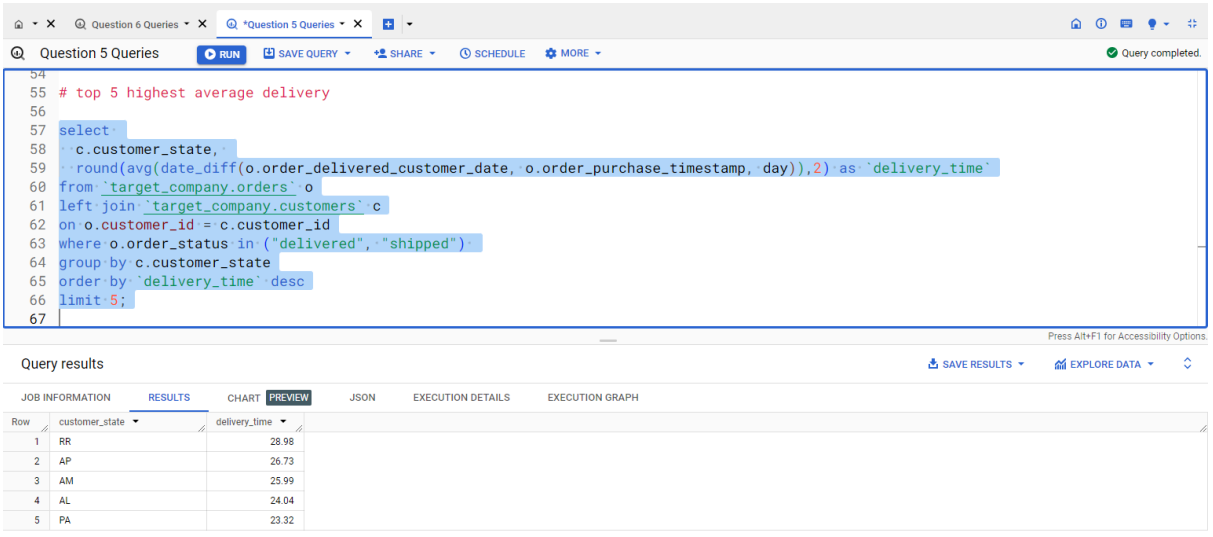
The details are extracted to get the top 5 states for highest and lowest average freight value.

3.Find out the top 5 states with the highest & lowest average delivery time.

Top 5 states with lowest average delivery time



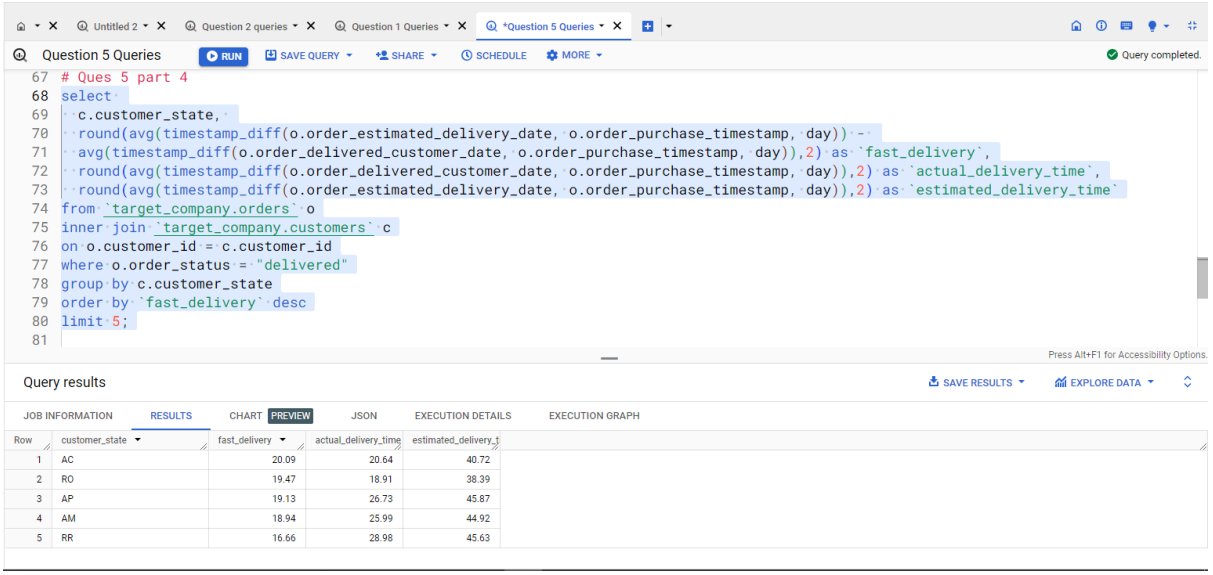
Top 5 states with highest average delivery time



Insight :-

The details are extracted to get the top 5 states with highest and lowest average delivery time.

4.Find out the top 5 states where the order delivery is really fast as compared to the estimated date of delivery.



Insight :-

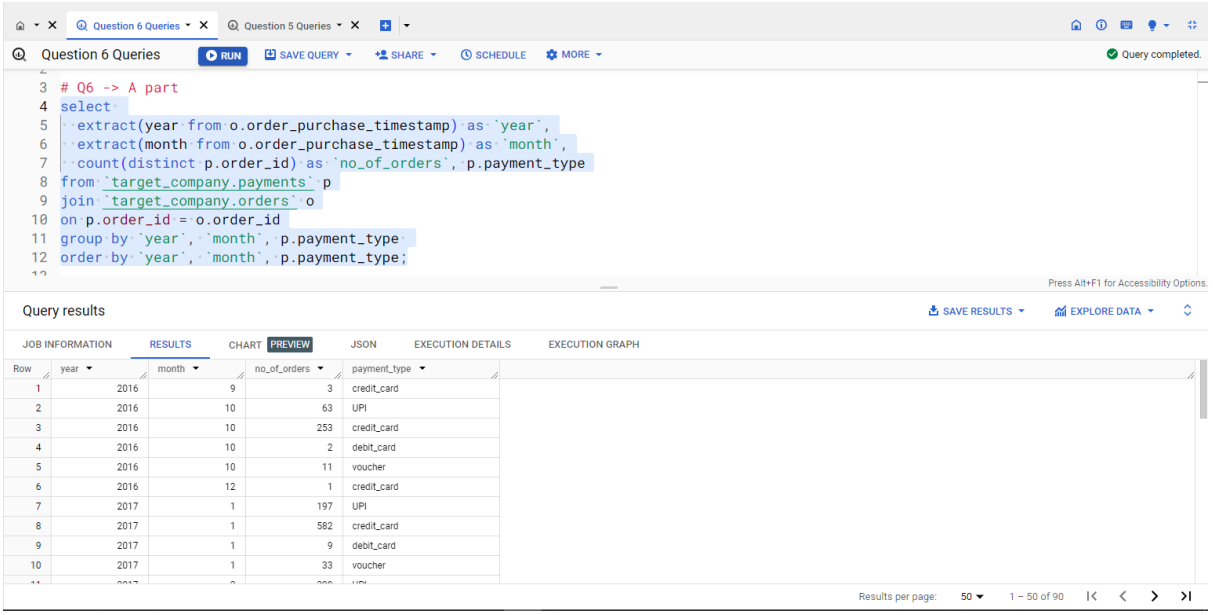
These are the top 5 states where the delivery is really fast as compared to the estimated date of delivery .

The states are

a. AC
b. RO
c. AP
d. AM
e. RR

QUESTION 6 : Analysis based on the payments:

1.Find the month on month no. of orders placed using different payment types.



Insight :-

The query provides a breakdown of the number of orders placed each month, categorized by payment type.

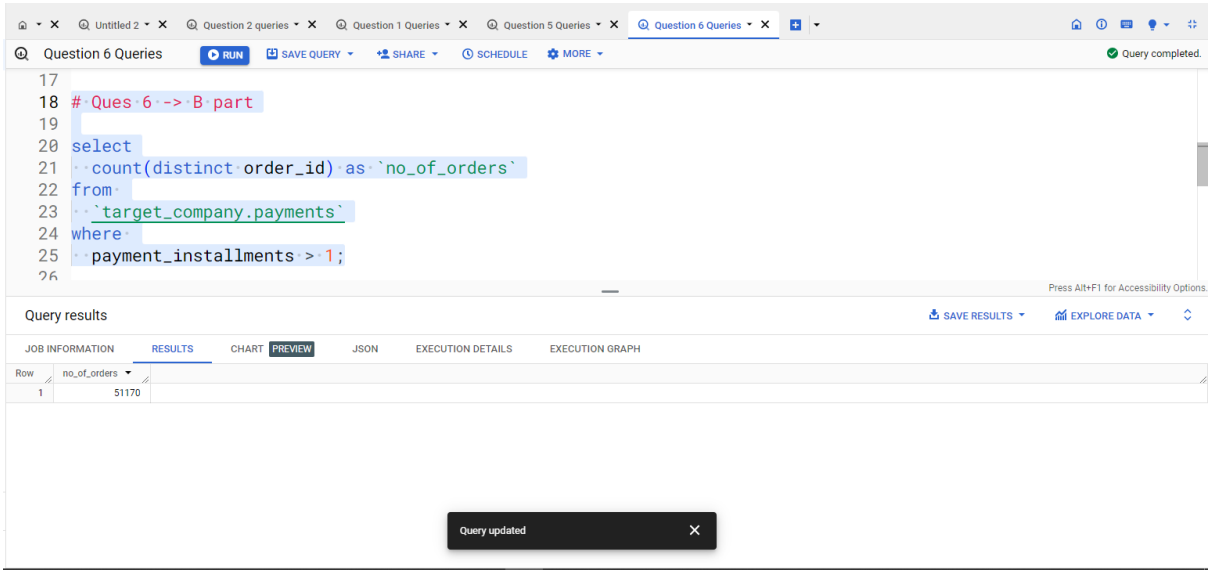
There are 5 types of payment

a. Credit Card
b. Debit Card
c. UPI
d. Voucher
e. Not Defined

The most used payment type are Credit Card, UPI and Voucher.

The least used payment type are Debit Card and Not Defined.

2.Find the no. of orders placed on the basis of the payment installments that have been paid.



Insight :-

The no. of orders placed on the basis of payment installments is 51170.