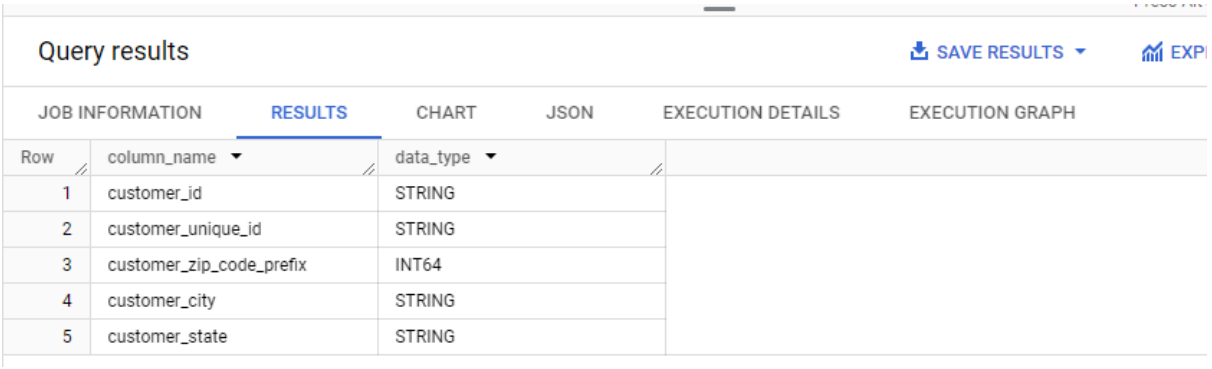
Business Case: Target SQL

Q1. 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.

Ans:

```
select column_name, data_type
from `business-case-study-415105.Ecommerce.INFORMATION_SCHEMA.COLUMNS`
where table_name = 'customers'
```



Query results

SAVE RESULTS | EXP

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	column_name	data_type
1	customer_id	STRING
2	customer_unique_id	STRING
3	customer_zip_code_prefix	INT64
4	customer_city	STRING
5	customer_state	STRING

Insights :

All columns in this example are saved as strings (VARCHAR), except customer_zip_code_prefix it is stored as integers.This shows that most of the data are string in nature

Q1. B. Get the time range between which the orders were placed.

Ans

```
 with cte as
(select time(order_purchase_timestamp)
 or_time,order_purchase_timestamp,*
 from `business-case-study-415105.Ecommerce.orders` o)
,cte2 as(
select
 case when or_time between '00:00:00' and  '06:00:00'
Then '12AM to 6AM'
when or_time between '06:0:01' and  '12:00:00'
Then '6AM to 12PM'
when or_time between '12:00:01' and  '18:00:00'
Then '12PM to 6PM'
else '6PM to 12AM'
```

```
end as Time_order,
* from cte )
select time_order as Time_Range,count(1) Range_of_time_orders_placed
from cte2 group by time_order order by 2
```

Query results

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JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DE

Row	Time_Range	Range_of_time_orde
1	12AM to 6AM	4740
2	6AM to 12PM	22240
3	6PM to 12AM	34096
4	12PM to 6PM	38365

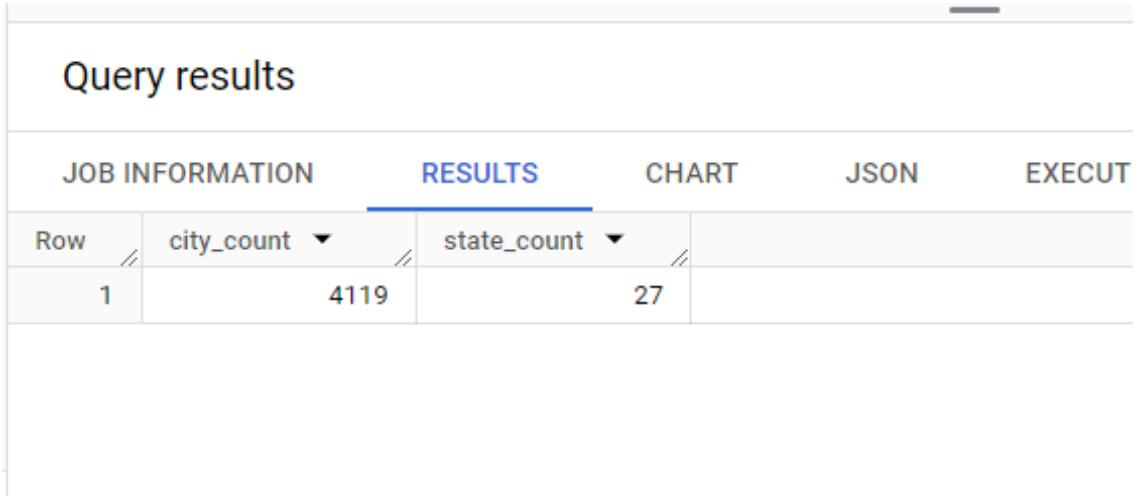
Insights :

1. It helps in identifying the period over which trends, patterns, or changes in customer behavior, sales, or other metrics can be analyzed.
2. The timestamp will be useful for analyze overall order patterns over a certain time, it can be helpful to know the time range of the orders.

Q1. C. Count the Cities & States of customers who ordered during the given period.

Ans

```
select
       count(distinct c.customer_city) as city_count,
       count(distinct c.customer_state) as state_count
from `business-case-study-415105.Ecommerce.customers`c
inner join `business-case-study-415105.Ecommerce.orders` o
on c.customer_id = o.customer_id
```



Insights :

City Count:

1. The dataset consists of 4119 cities.
2. The "city_count" represents the number of unique cities from which customers have placed orders.
3. A higher count indicates a broader geographical distribution of customers across different cities.

State Count:

1. The dataset consists of 27 states.
2. The "state_count" signifies the number of unique states from which customers have placed orders.
3. A larger state count indicates a presence in multiple regions, highlighting the brand's reach and penetration into different states within Brazil.

Q2. In-depth Exploration:

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

Ans.

```
SELECT
    EXTRACT(year FROM order_purchase_timestamp) AS year,
    COUNT(*) AS num_orders
from `business-case-study-415105.Ecommerce.orders`
GROUP BY 1
```

```
ORDER BY 1
```

Query results

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS

Row	year	num_orders
1	2016	329
2	2017	45101
3	2018	54011

Insight :

1. By extracting the year from the "order_purchase_timestamp" and counting the total number of orders placed for each year, the query allows us to analyze the trend in order volume over time.
2. The resulting dataset will display the number of orders placed for each year, providing a visual representation of any growth or decline in order volume over the specified period.
3. There has been an upward trend in the number of orders over the past few years after examining the results. A favorable trend can be seen if the order number regularly rises in year over year.

Recommendation :

1. Customer Experience Enhancement: Prioritize customer satisfaction by providing seamless shopping experiences, fast delivery, and responsive customer support. Implement feedback mechanisms to gather insights and continuously improve service quality.
2. Market Expansion: Explore opportunities for further market penetration, considering factors driving significant order growth in specific years.
3. Product Diversification: Expand the product range to cater to evolving customer preferences and capitalize on the growing demand. Conduct market research to identify emerging trends and introduce new products or variations to meet customer needs.

Q2.b. Can we see some kind of monthly seasonality in terms of the no. of orders being placed?

Ans

```
SELECT
    EXTRACT(year FROM order_purchase_timestamp) AS year,
    EXTRACT(month FROM order_purchase_timestamp) AS month,
COUNT(*) AS num_orders
from `business-case-study-415105.Ecommerce.orders`
GROUP BY 1,2
ORDER BY 1,2
```

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	year	month	num_orders
1	2016	9	4
2	2016	10	324
3	2016	12	1
4	2017	1	800
5	2017	2	1780
6	2017	3	2682
7	2017	4	2404
8	2017	5	3700
9	2017	6	3245
10	2017	7	4026

Results per page: 50 1 – 25 of 25

Insight:

1. The data is grouped by year and month, providing a breakdown of the number of orders made each month over the years.
2. The analysis can help identify seasonal trends in order volumes, which can be valuable for planning operations, marketing campaigns, and inventory management.
3. Peaks and troughs in the number of orders may indicate periods of high demand, which can be utilized for targeted promotional activities or adjustments to supply chain operations.
4. By comparing order volumes across different months and years, businesses can identify patterns and adjust strategies accordingly to capitalize on peak seasons and mitigate challenges during slower periods.

Recommendation:

1. Seasonal Promotions:
   Target can capitalize on peak months by offering targeted promotions and discounts to attract customers during high-demand periods. For example, offering special deals during holiday seasons or back-to-school months can drive sales and enhance customer engagement.

2. Inventory Management:
   Anticipating fluctuations in order volume allows Target to adjust inventory levels accordingly. By stocking up on popular items before peak months and reducing inventory during slower periods, Target can minimize stockouts and excess inventory, optimizing its supply chain efficiency.

Q2.c. During what time of the day, do the Brazilian customers mostly place their orders?
(Dawn, Morning, Afternoon or Night)

- 0-6 hrs : Dawn
- 7-12 hrs : Mornings
- 13-18 hrs : Afternoon
- 19-23 hrs : Night

Ans

```
SELECT
    CASE
        WHEN EXTRACT(HOUR from order_purchase_timestamp) BETWEEN 0 AND 6 THEN 'Dawn'
        WHEN EXTRACT(HOUR from order_purchase_timestamp) BETWEEN 7 AND 12 THEN
'Morning'
        WHEN EXTRACT(HOUR from order_purchase_timestamp) BETWEEN 13 AND 18 THEN
'Afternoon'
        WHEN EXTRACT(HOUR from order_purchase_timestamp) BETWEEN 19 AND 23 THEN
'Night'
    END AS time_of_day,
    COUNT(*) AS num_orders
FROM `business-case-study-415105.Ecommerce.orders`
GROUP BY time_of_day
ORDER BY time_of_day
```

Query results

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS

Row	time_of_day	num_orders
1	Afternoon	38135
2	Dawn	5242
3	Morning	27733
4	Night	28331

Insights:

1. Order Distribution by Time of Day:
   - The majority of orders are placed during the afternoon and evening hours, with the highest count observed during the "Afternoon" and "Night" time periods.
   - Orders placed during the "Morning" and "Dawn" periods are relatively lower compared to the afternoon and evening, indicating a gradual increase in order volume as the day progresses.

2. Consumer Behavior Patterns:
- Customers tend to engage in online shopping activities more frequently during the later parts of the day, possibly after completing their daily tasks or work commitments.
- The lower order count during the early morning hours suggests that fewer customers engage in online shopping activities during this time, potentially due to sleeping or other morning routines.

Recommendations:

1. Staffing Optimization: Target can adjust staffing levels based on the time of day with the highest order volume. For example, increasing staffing during peak hours can improve order processing efficiency and customer service.
2. Promotional Timing: Schedule marketing campaigns and promotions to coincide with peak hours, maximizing visibility and engagement among customers.
3. Customer Support: Enhance customer support availability during peak hours to address inquiries, resolve issues, and provide assistance promptly.
4. Delivery Optimization: Optimize delivery schedules to accommodate peak order times, minimizing delivery lead times and enhancing customer satisfaction.

Q3. **Evolution of E-commerce orders in the Brazil region:**

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

Ans

```
SELECT c.customer_state,
       FORMAT_DATE('%Y-%m',order_purchase_timestamp)AS order_purcahes_YM,
       COUNT(o.order_id) AS num_orders
FROM `business-case-study-415105.Ecommerce.customers` c
inner join `business-case-study-415105.Ecommerce.orders` o
on c.customer_id = o.customer_id
GROUP BY 1,2
ORDER BY 1,2
```

Query results

SAVE RESULTS | EXP

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION G

Row	customer_state	order_purcahes_YM	num_orders
1	AC	2017-01	2
2	AC	2017-02	3
3	AC	2017-03	2
4	AC	2017-04	5
5	AC	2017-05	8
6	AC	2017-06	4
7	AC	2017-07	5
8	AC	2017-08	4
9	AC	2017-09	5
10	AC	2017-10	6

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Insights:

1. Order Distribution Across States, Months, and Years:
   - The output shows how many orders were placed in each state, categorized by month and year.
2. Identifying Seasonal Trends:
   - By looking at the order counts over different months and years, we can spot any seasonal trends in customer purchasing behavior.

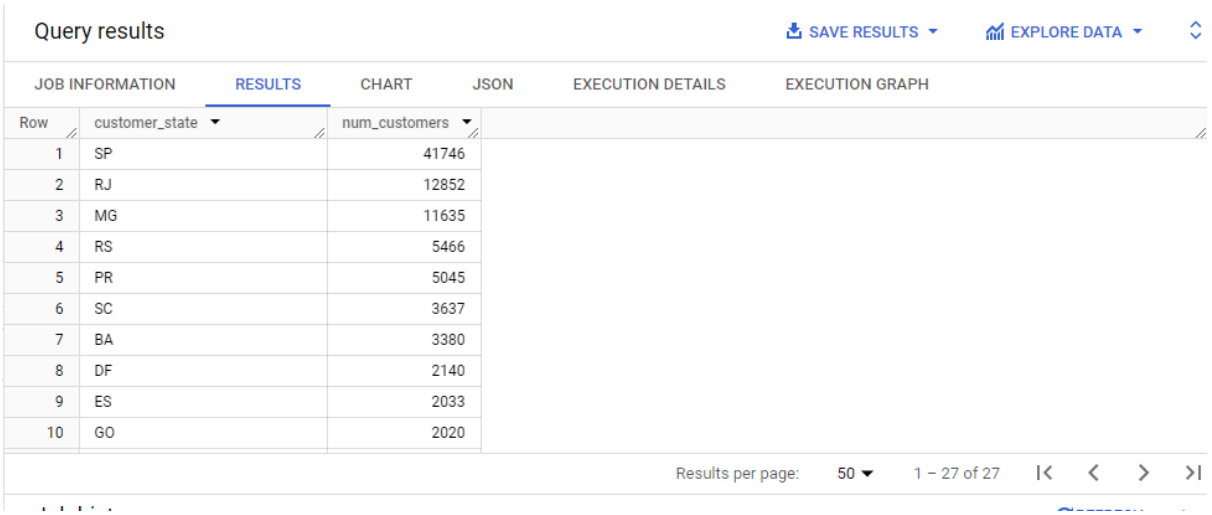
Recommendations:

1. Efficient Inventory Management:
   - Understanding seasonal variations helps Target manage inventory more effectively, ensuring the right products are available at the right times.
2. Localized Strategies:
   - Target can develop localized strategies by analyzing order distribution across states, focusing resources on regions with higher demand.
3. Improved Customer Engagement:
   - Leveraging insights from seasonal and geographical trends, Target can enhance customer engagement efforts, offering relevant promotions and recommendations.

Q3 b.How are the customers distributed across all the states?
Ans

```
SELECT
    customer_state,
    COUNT(DISTINCT customer_id) AS num_customers
FROM `business-case-study-415105.Ecommerce.customers`
```

```
GROUP BY customer_state
ORDER BY num_customers desc
```



Query results

SAVE RESULTS | EXPLORE DATA

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	customer_state	num_customers
1	SP	41746
2	RJ	12852
3	MG	11635
4	RS	5466
5	PR	5045
6	SC	3637
7	BA	3380
8	DF	2140
9	ES	2033
10	GO	2020

Results per page: 50 | 1 – 27 of 27

Insight:

Analyzing the query results reveals the distribution of clients across states, with SP having the highest client base and RR having the fewest. This information aids in market targeting, expansion opportunities, and optimizing company strategy.

Q4. Impact on Economy: Analyze the money movement by e-commerc looking at order prices, freight and others.

A . Get the % increase in the cost of orders from year 2017 to 2018 *(include months between Jan to Aug only).*

```
WITH CTE AS (
  SELECT
     EXTRACT(YEAR FROM o.order_purchase_timestamp) AS YEAR,
     ROUND(SUM(p.payment_value),2) PAYMENT_VALUE
  FROM `business-case-study-415105.Ecommerce.orders` o
  INNER JOIN `business-case-study-415105.Ecommerce.customers`  c
  ON o.customer_id = c.customer_id
  INNER JOIN `business-case-study-415105.Ecommerce.payments` p
  ON p.order_id = o.order_id
     WHERE
     EXTRACT(MONTH FROM o.order_purchase_timestamp) in (1,2,3,4,5,6,7,8)
     AND EXTRACT(YEAR FROM o.order_purchase_timestamp) in (2017,2018)
     GROUP BY year
     ORDER by  year
)
,CTE1 as(
SELECT
```

```
    CTE.YEAR,
    PAYMENT_VALUE,
    LAG(PAYMENT_VALUE) OVER (ORDER BY YEAR) AS PREV_PAYMENT_VALUE,
    PAYMENT_VALUE - LAG(PAYMENT_VALUE) OVER (ORDER BY YEAR) AS GROWTH,
  FROM CTE
  ORDER BY YEAR
)

SELECT * , ROUND(((PAYMENT_VALUE-PREV_PAYMENT_VALUE)/PREV_PAYMENT_VALUE)*100,2) as
GROWTH_PERCENTAGE
FROM CTE1 ORDER BY YEAR
```

Query results

SAVE RESULTS | EXPL

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GR

Row	YEAR	PAYMENT_VALUE	PREV_PAYMENT_VA	GROWTH	GROWTH_PERCENTA
1	2017	3669022.12	null	null	null
2	2018	8694733.84	3669022.12	5025711.72	136.98

Insight:

The output of the query reveals the growth in payment values for orders placed between January and August of the years 2017 and 2018 and the growth rate of approximately 137%

Q4.b.Calculate the Total & Average value of order price for each state.

Ans

```
SELECT customer_state,
       SUM(oi.price) as Total_amunt,
       AVG(oi.price) as avg_value
FROM `business-case-study-415105.Ecommerce.customers` c
INNER JOIN `business-case-study-415105.Ecommerce.orders` o
ON o.customer_id = c.customer_id
INNER JOIN `business-case-study-415105.Ecommerce.payments` p
ON p.order_id = o.order_id
GROUP BY 1
ORDER BY 2 desc
```

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION G

Row	customer_state	total_order_price	average_order_price
1	SP	5202955.050001...	109.6536291597...
2	RJ	1824092.669999...	125.1178180945...
3	MG	1585308.029999...	120.7485741488...
4	RS	750304.0200000...	120.3374530874...
5	PR	683083.7600000...	119.0041393728...
6	SC	520553.3400000...	124.6535775862...
7	BA	511349.9900000...	134.6012082126...
8	DF	302603.9399999...	125.7705486284...
9	GO	294591.9499999...	126.2717316759...
10	ES	275037.3099999...	121.9137012411...

Results per page: 50 1 – 27 of 27

Insight:

1. The "total_order_price" column displays the total order prices for each state, while the "average_order_price" column gives an indication of the purchasing behavior in each state.Higher average order values may indicate that customers in those states have more purchasing power or are interested in higher-priced products, suggesting potentially wealthier or specialized markets.
2. States with high total amounts but low average values might represent opportunities for targeted marketing or product promotions to increase individual transaction values.

Q4.C. Calculate the Total & Average value of order freight for each state.

Ans.

```
SELECT customer_state,
       SUM(oi.freight_value) as Total_freight_value ,
       AVG(oi.freight_value ) as avg_freight_value
FROM `business-case-study-415105.Ecommerce.orders` o
INNER JOIN `business-case-study-415105.Ecommerce.customers` c
ON o.customer_id = c.customer_id
INNER JOIN `business-case-study-415105.Ecommerce.order_items` oi
ON o.order_id = oi.order_id
GROUP BY 1
ORDER BY 1
```

Query results

SAVE RESULTS

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION

Row	customer_state	Total_freight_value	avg_freight_value
1	AC	3686.749999999...	40.07336956521...
2	AL	15914.58999999...	35.84367117117...
3	AM	5478.889999999...	33.20539393939...
4	AP	2788.500000000...	34.00609756097...
5	BA	100156.6799999...	26.36395893656...
6	CE	48351.58999999...	32.71420162381...
7	DF	50625.49999999...	21.04135494596...
8	ES	49764.59999999...	22.05877659574...
9	GO	53114.97999999...	22.76681525932...
10	MA	31523.77000000...	38.25700242718...

Results per page: 50 1 – 27 of 27

Insights:

We can find states with high total freight costs,by analyzing the results, which could point to regions with higher shipping prices or logistical difficulties.Understanding the differences in order freight rates between states can offer information about local shipping habits, supplier locations.

Recommendations:

1. Analyze states with higher freight costs to identify opportunities for optimizing logistics routes, negotiating better shipping rates, or investing in local distribution centers.
2. Implement measures to reduce shipping times and costs, such as partnering with local carriers or leveraging technology for route optimization.
3. Offer incentives such as free or discounted shipping to customers in states with higher freight costs, incentivizing purchases and improving customer satisfaction.

Q5.Analysis based on sales, freight and delivery time.

a. 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.

You can calculate the delivery time and the difference between the estimated & actual delivery date using the given formula:

- time_to_deliver = order_delivered_customer_date - order_purchase_timestamp
- diff_estimated_delivery = order_delivered_customer_date - order_estimated_delivery_date

Ans.

```
SELECT order_id,
     DATETIME_DIFF(order_delivered_customer_date,order_purchase_timestamp,day) as
time_to_deliver,
     DATETIME_DIFF(order_estimated_delivery_date,order_delivered_customer_date,day)
as diff_estimated_delivery
FROM `business-case-study-415105.Ecommerce.orders`
WHERE order_status = 'delivered'
ORDER BY order_id
```

Query results

SAVE RESULTS | EXPLORE DA

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	order_id	time_to_deliver	diff_estimated_delive
1	00010242fe8c5a6d1ba2dd792...	7	8
2	00018f77f2f0320c557190d7a1...	16	2
3	000229ec398224ef6ca0657da...	7	13
4	00024acbcdf0a6daa1e931b03...	6	5
5	00042b26cf59d7ce69dfabb4e...	25	15
6	00048cc3ae777c65dbb7d2a06...	6	14
7	00054e8431b9d7675808bcb8...	8	16
8	000576fe39319847cbb9d288c...	5	15
9	0005a1a1728c9d785b8e2b08...	9	0
10	0005f50442cb953dcd1d21e1f...	2	18

Results per page: 50 | 1 – 50 of 96478

Insights:

Analysing information on the time it took for orders to be delivered and the difference between the estimated delivery date and the actual delivery date. This analysis helps in understanding the efficiency of the delivery process and identifying any delays in meeting estimated delivery times for orders that have been successfully delivered.

Recommendations:

1. Improve Delivery Efficiency: Identify areas where delivery times are longer than expected and take measures to streamline the delivery process, such as optimizing logistics routes or increasing delivery capacity during peak times.
2. Enhance Estimated Delivery Accuracy: Evaluate the accuracy of estimated delivery dates and ensure they align closely with actual delivery times. This can help manage customer expectations and improve satisfaction.

3. Customer Communication: Keep customers informed about their order status and any potential delays in delivery. Proactive communication can help manage expectations and mitigate dissatisfaction resulting from delays.

Q5.B.Find out the top 5 states with the highest & lowest average freight value.

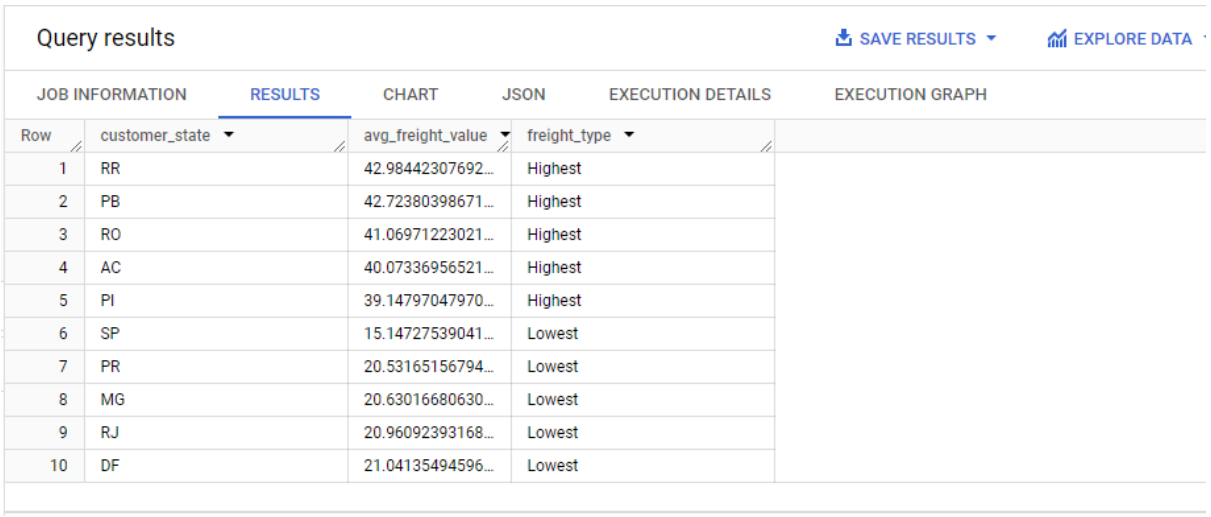
Ans

```
WITH CET AS
(SELECT c.customer_state,
       AVG(oi.freight_value) AS avg_freight_value
FROM `business-case-study-415105.Ecommerce.orders` o
INNER JOIN `business-case-study-415105.Ecommerce.order_items` oi
ON o.order_id = oi.order_id
INNER JOIN `business-case-study-415105.Ecommerce.customers` c
ON o.customer_id = c.customer_id
GROUP BY 1)

(SELECT customer_state,
       avg_freight_value,
       'Highest' AS freight_type
FROM CET
ORDER BY avg_freight_value DESC
LIMIT 5)

UNION ALL

(SELECT customer_state,
       avg_freight_value,
       'Lowest' AS freight_type
FROM CET
ORDER BY avg_freight_value
LIMIT 5)
```



Query results

SAVE RESULTS | EXPLORE DATA

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	customer_state	avg_freight_value	freight_type
1	RR	42.98442307692...	Highest
2	PB	42.72380398671...	Highest
3	RO	41.06971223021...	Highest
4	AC	40.07336956521...	Highest
5	PI	39.14797047970...	Highest
6	SP	15.14727539041...	Lowest
7	PR	20.53165156794...	Lowest
8	MG	20.63016680630...	Lowest
9	RJ	20.96092393168...	Lowest
10	DF	21.04135494596...	Lowest

Insights:

States with high average freight values, such as RR and PB, may face higher shipping prices due to remote locations, higher transportation costs, or supply chain issues. Companies can optimize logistics operations by locating places with lower shipping prices, such as SP and PR. This data can help develop focused initiatives, bargain freight costs, and identify cost reduction opportunities.

Q5.c. Find out the top 5 states with the highest & lowest average delivery time.
Ans

```
WITH CET AS
(SELECT c.customer_state,
       AVG(DATETIME_DIFF(order_delivered_customer_date,
order_purchase_timestamp,DAY)) AS avg_delivery_time
FROM `business-case-study-415105.Ecommerce.orders` o
INNER JOIN `business-case-study-415105.Ecommerce.customers` c
ON o.customer_id = c.customer_id
GROUP BY 1)

(SELECT
    customer_state,
    avg_delivery_time,
    'Highest' AS Delivery_time
FROM CET
ORDER BY avg_delivery_time DESC
LIMIT 5)

UNION ALL

(SELECT
    customer_state,
    avg_delivery_time,
    'Lowest' AS Delivery_time
FROM CET
ORDER BY avg_delivery_time
limit 5)
```

Query results

SAVE RESULTS | EXPLORE DATA

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	customer_state	avg_delivery_time	Delivery_time
1	RR	28.97560975609...	Highest
2	AP	26.73134328358...	Highest
3	AM	25.98620689655...	Highest
4	AL	24.04030226700...	Highest
5	PA	23.31606765327...	Highest
6	SP	8.298061489072...	Lowest
7	PR	11.52671135486...	Lowest
8	MG	11.54381329810...	Lowest
9	DF	12.50913461538...	Lowest
10	SC	14.47956019171...	Lowest

Insights:

The study identifies areas with efficient delivery operations, faster transit times, and solid logistics networks in states like RR and AP, with high average delivery times. These insights can help improve customer satisfaction, operational efficiency, and delivery process optimization. This helps the company focus on areas for improvement and in enhancing customer experiences.

Q5.d.

Find out the top 5 states where the order delivery is really fast as compared to the estimated date of delivery.You can use the difference between the averages of actual & estimated delivery date to figure out how fast the delivery was for each state.

Ans

```
WITH final AS (
SELECT *,
       DENSE_RANK() OVER(ORDER BY fastest_delivery) AS rnk
FROM
(SELECT customer_state AS state,
         AVG(DATETIME_DIFF(order_delivered_customer_date, order_purchase_timestamp,
DAY))
       - AVG(DATETIME_DIFF(order_estimated_delivery_date, order_purchase_timestamp,
DAY)) AS fastest_delivery
FROM `business-case-study-415105.Ecommerce.orders` o
INNER JOIN `business-case-study-415105.Ecommerce.customers` c
ON o.customer_id = c.customer_id
WHERE order_delivered_customer_date IS NOT null
       AND o.order_status = 'delivered'
GROUP BY 1)
)

SELECT state, fastest_delivery
FROM final
WHERE rnk <= 5
order by 2
```

Query results

SAVE RESU

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS

Row	state	fastest_delivery
1	AC	-20.0874999999...
2	RO	-19.4732510288...
3	AP	-19.1343283582...
4	AM	-18.9379310344...
5	RR	-16.6585365853...

Insight:

- Based in AC, RO, AP, and AM states where orders are delivered faster than initially estimated, indicating efficient delivery operations and logistics management.
- It highlights areas where customers may experience shorter wait times for their orders, potentially leading to higher satisfaction levels and repeat business.

Recommendation:

- Evaluate the delivery processes and logistics strategies employed in the top-performing states to identify best practices and areas for improvement.
- Implement similar efficient delivery practices in regions with longer delivery times to enhance customer satisfaction and loyalty.
- Continuously monitor delivery performance metrics and customer feedback to ensure consistent and reliable service across all states.

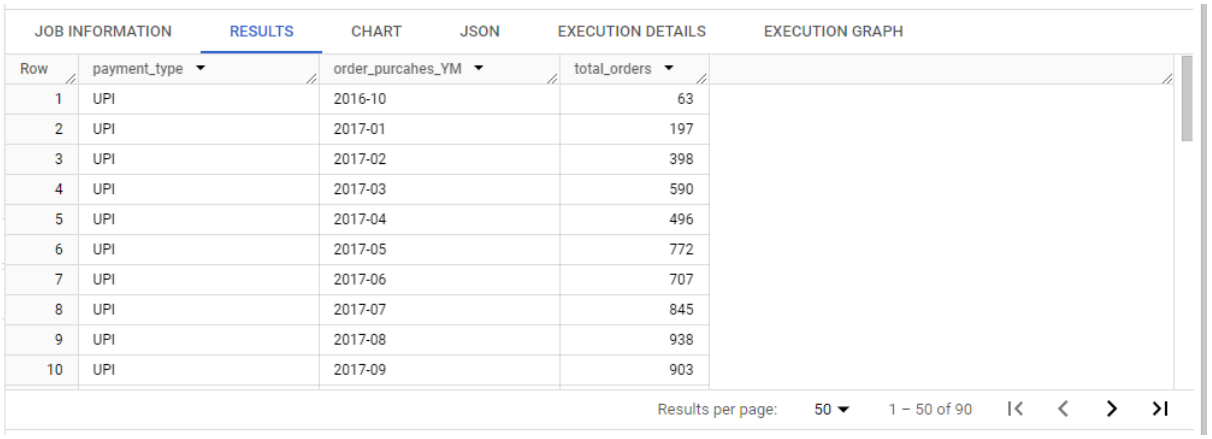
Q6.Analysis based on the payments:

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

Ans

```
SELECT  p.payment_type,
```

```
        FORMAT_DATE('%Y-%m',o.order_purchase_timestamp)AS order_purcahes_YM,
        COUNT(o.order_id) AS total_orders
FROM `business-case-study-415105.Ecommerce.orders` o
INNER JOIN `business-case-study-415105.Ecommerce.payments`p
ON p.order_id = o.order_id
GROUP BY 1, 2
ORDER BY 1, 2
```



JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS | EXECUTION GRAPH

Row	payment_type	order_purcahes_YM	total_orders
1	UPI	2016-10	63
2	UPI	2017-01	197
3	UPI	2017-02	398
4	UPI	2017-03	590
5	UPI	2017-04	496
6	UPI	2017-05	772
7	UPI	2017-06	707
8	UPI	2017-07	845
9	UPI	2017-08	938
10	UPI	2017-09	903

Results per page: 50 1 – 50 of 90

Insights:

2016: Modest order volume with a gradual increase. Credit card orders are present but not dominant, with emerging usage of UPI.

2017: Significant growth in orders. Credit card orders dominate, followed by increasing usage of UPI and steady growth in voucher orders.

2018: Continued growth, especially in credit card and UPI orders. Slight decrease towards the end of the year compared to previous months.

Recommendation:

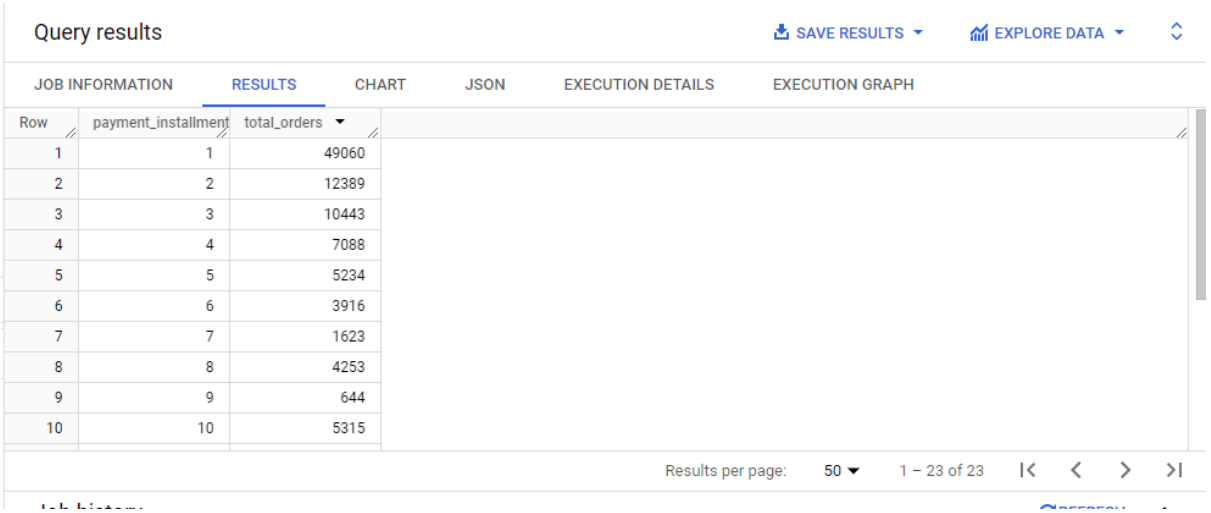
Identify the most popular payment methods across different months and years. Consider optimizing the checkout process to prioritize these payment methods, making them more prominent and user-friendly.

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

Ans

```
SELECT p.payment_installments,
       COUNT(DISTINCT o.order_id) AS total_orders
FROM `business-case-study-415105.Ecommerce.orders` o
INNER JOIN `business-case-study-415105.Ecommerce.payments`p
ON p.order_id = o.order_id
```

```
WHERE p.payment_installments >0
GROUP BY 1
ORDER BY 1
```



Insights:

The analysis of 49060 orders with payment installment 1 can reveal customer preferences for budgeting and financing. The distribution of orders based on payment installments can reveal buying habits,indicating the popularity of payment installment alternatives

Recommendation:

1. Flexible Payment Options: Offer a variety of payment options, including installment plans, to cater to diverse customer preferences. Providing flexibility in payment methods can attract more customers and enhance their shopping experience.
2. Payment Security: Ensure that installment payment processes are secure and transparent to instill confidence in customers. Clear communication about payment terms, interest rates (if applicable), and repayment schedules can help build trust with customers.