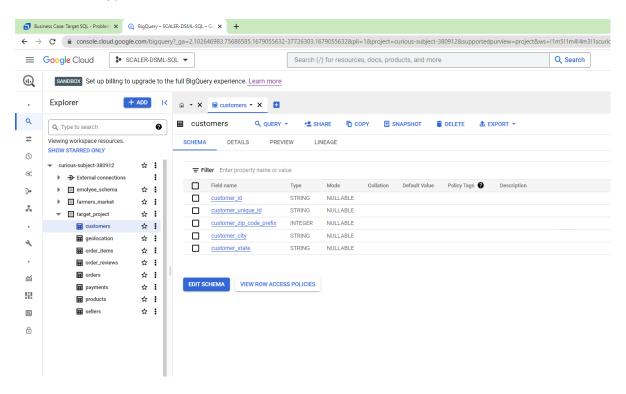
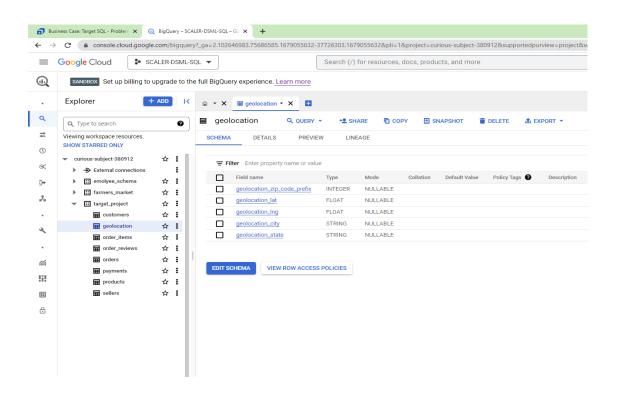
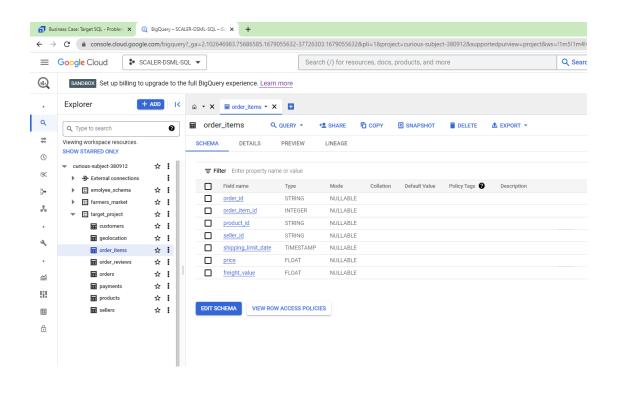
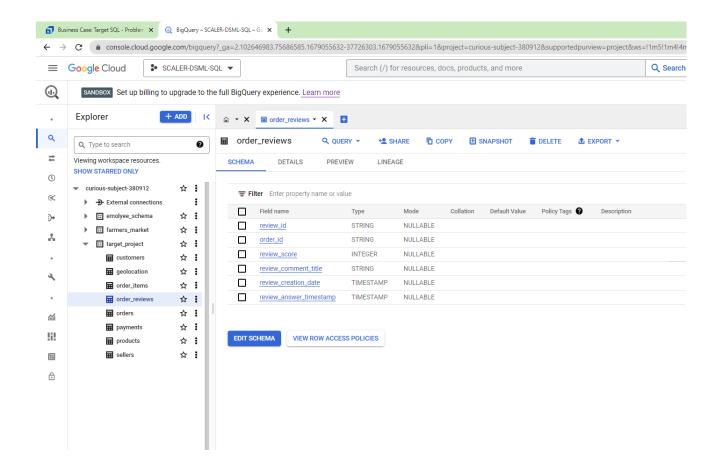
Import the dataset and do usual exploratory analysis steps like checking the structure & characteristics of the dataset

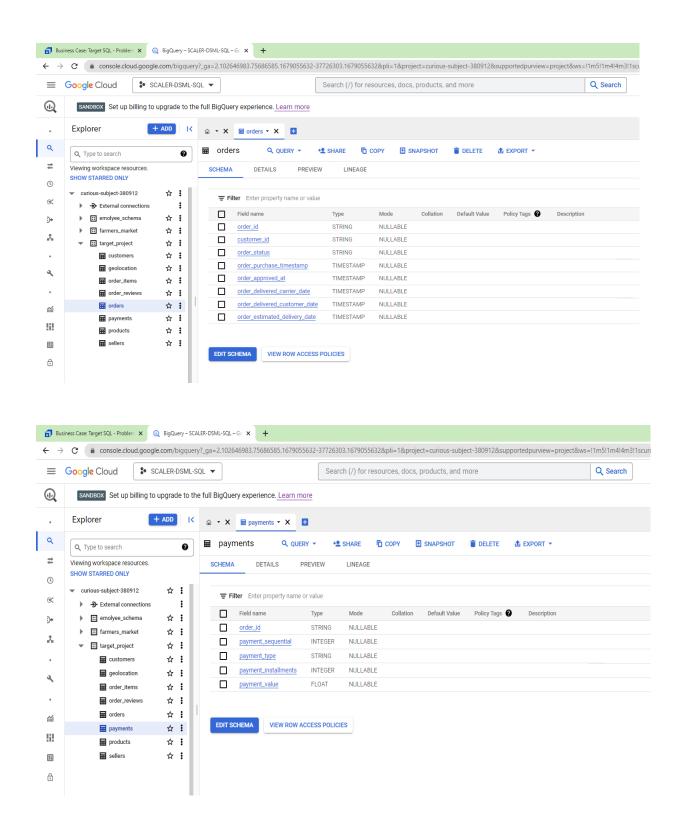
1. Data type of columns in a table

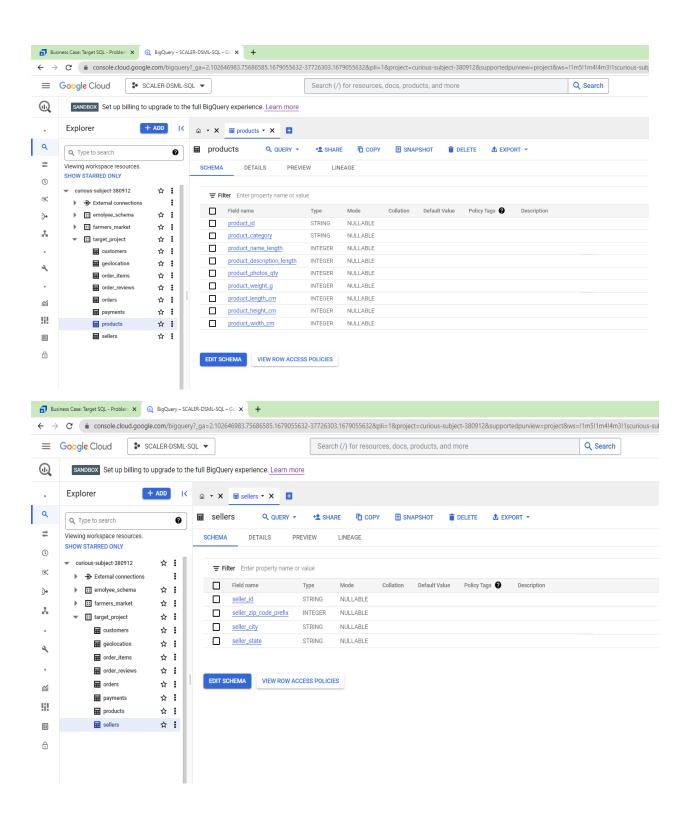








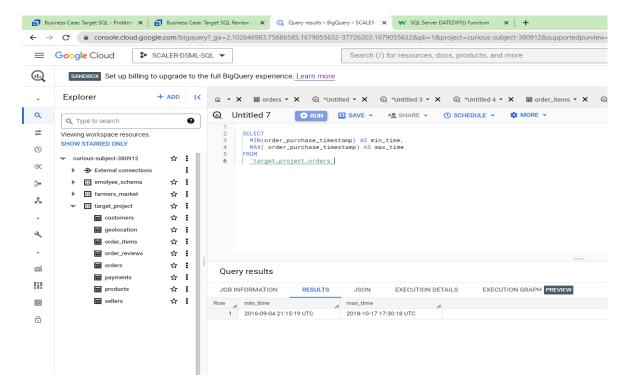




2. Time period for which the data is given

SELECT

```
MIN(order_purchase_timestamp) AS min_time,
MAX( order_purchase_timestamp) AS max_time
FROM
  `target_project.orders`
```



Data is given from 2016 to 2018

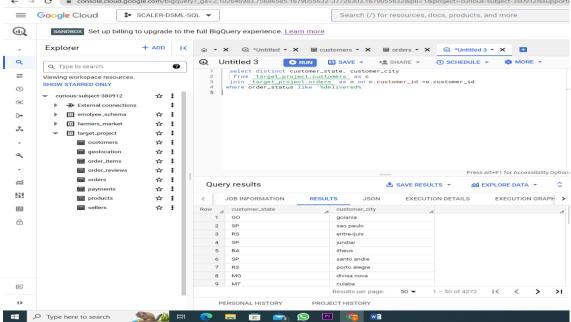
3. Cities and States of customers ordered during the given period

```
4. select distinct customer_state, customer_city
5. from `target_project.customers` as c
6. join `target_project.orders` as o on c.customer_id =o.customer_id
7. where order_status like '%delivered%'
8.

Business Case: Target SQL- Problem × Q Query results - BigQuery - SCALER- × Business Case: Target SQL Review - × C month over month meaning - Goo; x | +

- O a console.cloud.google.com/bigquery1_ga=2.102646983.75686585.1679055632-37726303.1679055632&pli=1&project=curious-subject-380912&supports

Google Cloud SCALER-DSML-SQL V Search (/) for resources, docs, products, and more
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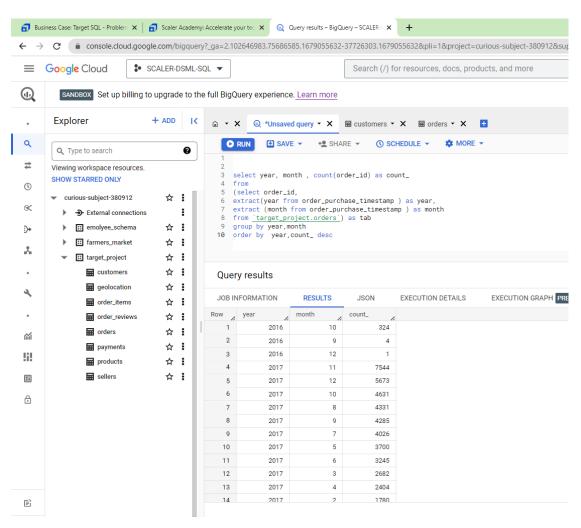


Data about city and state are obtained from customers table and to obtain customer_ids that are ordered , inner joining with orders table made and in the order status delivered are only included

2. In-depth Exploration:

1.Is there a growing trend on e-commerce in Brazil? How can we describe a complete scenario? Can we see some seasonality with peaks at specific months

```
select year, month , count(order_id) as count_
from
(select order_id,
extract(year from order_purchase_timestamp ) as year,
extract (month from order_purchase_timestamp ) as month
from `target_project.orders`) as tab
group by year,month
order by year,count_ desc
```



by referring increased order_id count as increased sales , from data it is concluded there Is a growing trend on e-commerce in Brazil from 2016 to 2018 .

in 2016, orders are high during 10th month, followed by decline in orders in 12th month.

in 2017 , orders gradually increased from $\mathbf{1}^{st}$ month to last month , peaked at 11th month followed by $\mathbf{12}^{th}$ month

in 2018 , peak orders are observed in $\mathbf{1}^{\text{st}}$ month , sustainable orders are observed upto $\mathbf{8}^{\text{th}}$ month followed by rapid decline of order count .

from 2017 to 2018, high amount of orders are seen during winter times.

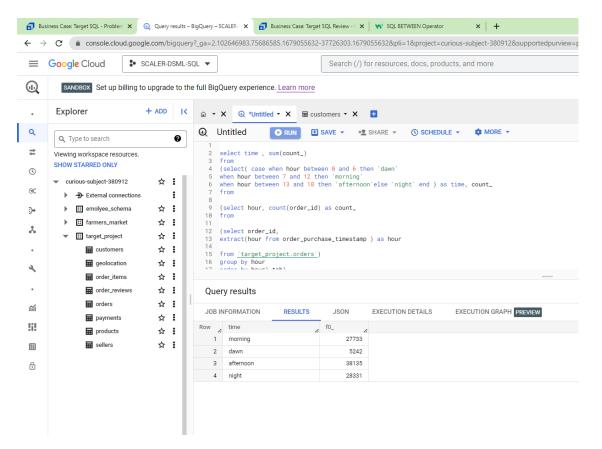
2. What time do Brazilian customers tend to buy (Dawn, Morning, Afternoon or Night)?

```
select time , sum(count_)
from
(select( case when hour between 0 and 6 then 'dawn'
when hour between 7 and 12 then 'morning'
when hour between 13 and 18 then 'afternoon'else 'night' end ) as time, count_
from

(select hour, count(order_id) as count_
from

(select order_id,
extract(hour from order_purchase_timestamp ) as hour

from `target_project.orders`)
group by hour
order by hour) tab)
group by time
```

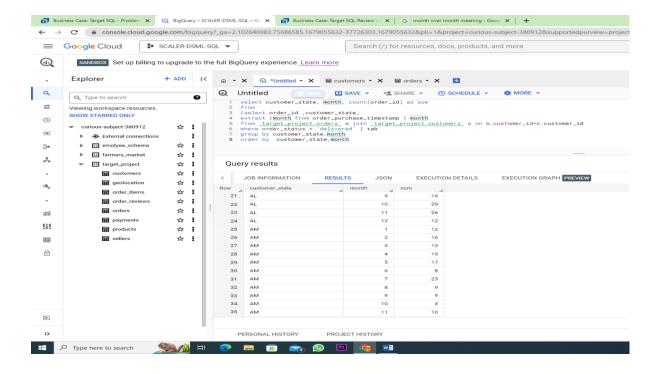


Trend suggest that , afternoon orders are high followed by night orders and morning orders and dawn orders.

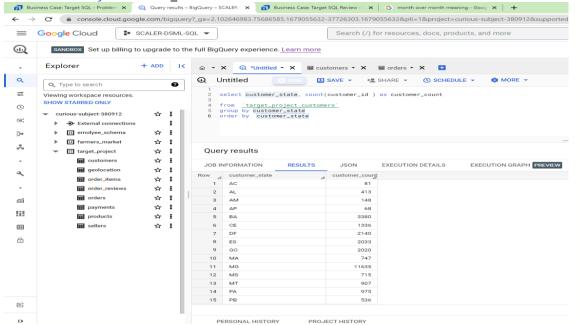
- 3. Evolution of E-commerce orders in the Brazil region:
 - 1. Get month on month orders by states
 - select customer_state, month, count(order_id) as sum
 - 3. from
 - (select order_id ,customer_state,
 - 5. extract (month from order purchase timestamp) month
 - 6. from `target_project.orders` o join `target_project.customers` c on o.customer_id=c
 .customer_id
 - 7. where order_status = 'delivered') tab
 - 8. group by customer_state,month
 - 9. order by customer_state,month

profound amounts of orders are seen in 5th month from a state 'SP' in brazil

Delivered orders are taken into consideration . group by and order by is performed on both cuatomer_state and month to know, in each state for each month number of orders delivered .



- 2. Distribution of customers across the states in Brazil
- select customer_state, count(customer_id) as customer_count
- 4.
- 5. from `target_project.customers`
- 6. group by customer_state
- 7. order by customer_state



Upon ordering by customer_count it is noticed that, Huge number of customers are from a state called 'SP' WITH WHOOPING 41746 CUSTOMERS

- 4. Impact on Economy: Analyze the money movement by e-commerce by looking at order prices, freight and others
 - Get % increase in cost of orders from 2017 to 2018 (include months between Jan to Aug only) - You can use "payment_value" column in payments table

```
WITH
cte AS (
SELECT
EXTRACT(year
FROM
order_purchase_timestamp) AS year_,
SUM(payment_value) AS revenue
`target_project.orders` AS o
INNER JOIN
`target_project.payments` AS p
p.order_id=o.order_id
WHERE
order status='delivered'
AND EXTRACT(month
FROM
order_purchase_timestamp) BETWEEN ∅
GROUP BY
year_),
lastRev AS (
SELECT
LAG(revenue) OVER(ORDER BY year ASC) AS prev rev
FROM
cte)
SELECT
(revenue-prev rev)/prev rev*100 AS per inc
lastRev
Business Case: Target SQL - Problem X Business Case: Target SQL Review - X Q Query results - BigQuery - SCALER X +
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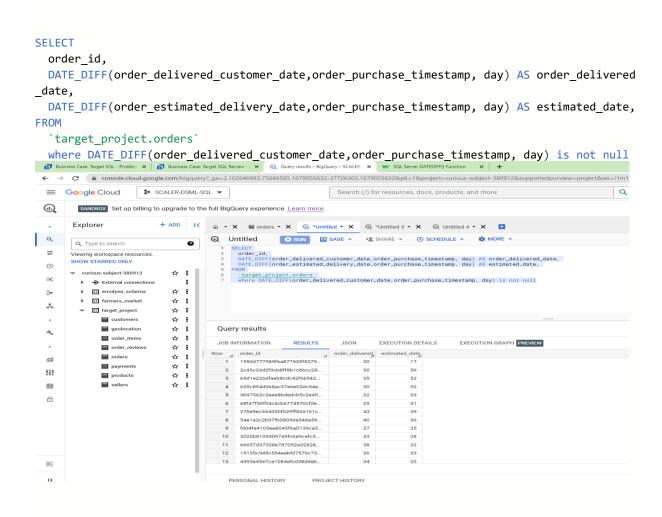
143% growth of revenue is observed

2. Mean & Sum of price and freight value by customer state 3. SELECT 4. c.customer_state, SUM(price) AS sum price, 5. SUM(freight value) AS sum freight value, 6. 7. AVG(price) AS mean_price, 8. AVG(freight_value) AS mean_freight_value 9. FROM `target_project.customers` c 11. LEFT JOIN `target_project.orders` o 13. ON 14. c.customer_id=o.customer_id 15. JOIN 16. `target_project.order_items` AS ot 17. ON 18. o.order_id=ot.order_id 19. GROUP BY 20. c.customer_state : Target SQL - Problem 🗴 | 🙃 Business Case: Target SQL Review - 🤇 👿 Query results – BigQuery – SCALER- 🗴 🕂 console.cloud.google.com/bigquery7_ga=2.102646983.75686585.1679055632-37726303.1679055632&pli=1&project=curious-subject-380912&supportedpurview=proj Search (/) for resources, docs, products, and more **①** SANDBOX Set up billing to upgrade to the full BigQuery experience. Learn more Q Untitled 3 ORUN SAVE + ** SHARE + (S SCHEDULE + ** MORE +

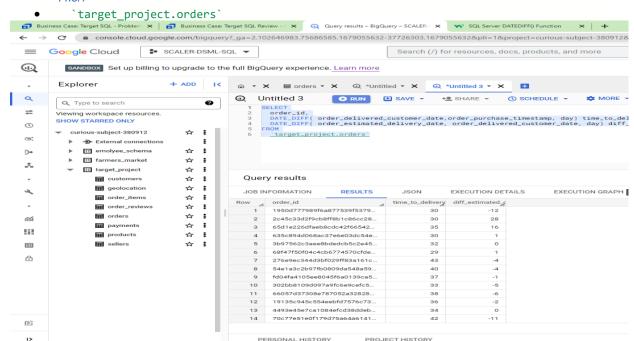
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C.customer_state,
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SUM(fresjpht_value) AS sum_freight_value,
AVC(price) AS mean_price,
AVC(freight_value) AS mean_freight_value
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8 | 'target_project.customers' c
9 LEFT JOIN
18 | 'target_project.orders' o
1 ON
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sum and mean are performed in select clause and as they are asked according to customer state multiple joins are performed followed by customer state grouping

- 5. Analysis on sales, freight and delivery time
 - 5.1 Calculate days between purchasing, delivering and estimated delivery



- time_to_delivery = order_purchase_timestamporder_delivered_customer_date
- diff_estimated_delivery = order_estimated_delivery_dateorder_delivered_customer_date
- SELECT
- order_id,
- DATE_DIFF(order_delivered_customer_date,order_purchase_timestamp, day) time_to_d elivery,
- DATE_DIFF(order_estimated_delivery_date, order_delivered_customer_date, day) dif f_estimated_delivery
- FROM



```
/*
Group data by state, take mean of freight_value, time_to_delivery, diff_estimated_delivery
SELECT
            c.customer_state,
            avg(freight_value) AS mean_freight_value,
               avg(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time
   avg( DATE_DIFF( order_estimated_delivery_date, order_delivered_customer_date, day)) mean_d
iff_estimated_delivery
      FROM
             `target_project.customers` c
   JOIN
             `target_project.orders` o
ON
            c.customer_id=o.customer_id
      JOTN
              `target_project.order_items` AS ot
            o.order_id=ot.order_id
      GROUP BY
            c.customer_state
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```

5.5. Top 5 states with highest/lowest average freight value - sort in desc/asc limit 5

(Top 5 states with highest average freight value)

```
SELECT
      c.customer_state,
      avg(freight_value) AS mean_freight_value,
        avg(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean time
_to_delivery,
 avg( DATE_DIFF( order_estimated_delivery_date, order_delivered_customer_date, day)) mean_d
iff estimated delivery
   FROM
       `target_project.customers` c
       `target_project.orders` o
ON
      c.customer_id=o.customer_id
   JOIN
       target_project.order_items` AS ot
      o.order_id=ot.order_id
   GROUP BY
      c.customer_state
      order by mean_freight_value desc
👩 Business Case: Target SQL - Problem 🗴 👩 Business Case: Target SQL Review - 🗴 Q Query results - BigQuery - SCALER: 🗴 💜 SQL Server DATEDIFF() Function 🗴 🕂
     Search (/) for resources, docs, products, and more

          SANDBOX Set up billing to upgrade to the full BigQuery experience. Learn more
                                Q
                                                SELECT

c.customer_state,
avg(freight_value) AS mean_freight_value,
avg(freight_value) AS mean_freight_value,
avg(OATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time_to_delivery,
avg(OATE_DIFF(order_estimated_delivery_date, order_delivered_customer_date, day)) mean_diff_estimated
FROM
target_project.customers' c

JOIN
target_project.customers' o
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                                                     Join target_project.orders o
            ▶ ⊞ farmers_market
   ٨.
                                                     ON

| c.customer_id=o.customer_id
| JOIN
| target_project.order_items' AS ot
| ON
| o.order_id=ot.order_id
| GROUP_BY|
| c.customer_state
| order_by mean_freight_value desc
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                 payments products
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    19.0805860...

    40.0733695...
    20.3296703...
    20.0109890...

    39.1479704...
    18.9311663...
    10.6826003...

   œ;
```

(Top 5 states with lowest average freight value)

```
SELECT
             c.customer state,
             avg(freight_value) AS mean_freight_value,
                 avg(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time
_to_delivery,
   avg( DATE DIFF( order estimated delivery date, order delivered customer date, day)) mean d
iff_estimated_delivery
      FROM
              `target_project.customers` c
   JOIN
              `target_project.orders` o
ON
             c.customer id=o.customer id
      TOTN
               `target_project.order_items` AS ot
             o.order_id=ot.order_id
      GROUP BY
             c.customer_state
             order by mean_freight_value
             limit 5
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avg(fresight_value) AS mean_freight_value,
avg(oATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time_to_delivery,
avg( DATE_DIFF( order_estimated_delivery_date, order_delivered_customer_date, day)) mean_diff_estimated_delivery
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Country

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ON

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     PERSONAL HISTORY
                                                                                                                                          PROJECT HISTORY
```

5.6. Top 5 states with highest/lowest average time to delivery

```
(Top 5 states with highest average time to delivery)
SELECT
      c.customer_state,
      avg(freight_value) AS mean_freight_value,
       avg(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time
_to_delivery,
 avg( DATE_DIFF( order_estimated_delivery_date, order_delivered_customer_date, day)) mean_d
iff_estimated_delivery
  FROM
      `target project.customers` c
      `target_project.orders` o
ON
     c.customer_id=o.customer_id
      `target_project.order_items` AS ot
  ON
     o.order_id=ot.order_id
  GROUP BY
     c.customer_state
      order by mean time to delivery desc
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avg(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time_to_delivery,
avg(DATE_DIFF(order_delivered_customer_date, order_delivered_customer_date, day)) mean_diff_estimated_delivery

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```

```
(Top 5 states with lowest average time to delivery)
SELECT
      c.customer_state,
      avg(freight_value) AS mean_freight_value,
       avg(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time
 avg( DATE_DIFF( order_estimated_delivery_date, order_delivered_customer_date, day)) mean_d
iff_estimated_delivery
  FROM
      `target_project.customers` c
 JOIN
      `target_project.orders` o
     c.customer_id=o.customer_id
  JOIN
       'target project.order items' AS ot
     o.order_id=ot.order_id
  GROUP BY
     c.customer_state
     order by mean_time_to_delivery
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```

5.7.Top 5 states where delivery is really fast/ not so fast compared to estimated date

Top 5 states where delivery is really not so fast compared to estimated date

```
SELECT
                    c.customer_state,
                    avg(freight_value) AS mean_freight_value,
                         avg(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time
to delivery,
   avg( DATE DIFF( order estimated delivery date, order delivered customer date, day)) mean d
iff estimated delivery
         FROM
                     `target_project.customers` c
    JOIN
                     `target_project.orders` o
ON
                   c.customer_id=o.customer_id
         JOIN
                       `target_project.order_items` AS ot
                   o.order_id=ot.order_id
         GROUP BY
                   c.customer_state
                   order by mean_diff_estimated_delivery desc
📆 Business Case: Target SQL - Problem 🗴 | 👩 Business Case: Target SQL Review - C 🗴 | Q. Query results - BigQuery - SCALER: 🗴 🙌 SQL Server DATEDIFF() Function 💢 | +
               → C (a console.cloud.google.com/bigquery?_ga=2.102646983.75686585.1679055632-37726303.1679055632&pli=1&project=curious-subject-380912&supportedpurview=project&ws=11m2511m414m311
       Search (/) for resources, docs, products, and more
      Œ,
                            SANDBOX Set up billing to upgrade to the full BigQuery experience. Learn more
                                                                                     ② Untitled 4 ○ RUN □ SAVE ▼ ◆ SHARE ▼ ○ SCHEDULE ▼ ★ MORE ▼
      Q
                                                                                                                                      S SELECT

c.customer_state,
avg(freight_value) AS mean_freight_value,
av
                         ### and the content of the content o
        œ
       Ð*
        2.
                                                 m customers
                                                 geolocation
        عد
                                                order_items
                                                 order_reviews
                                                orders
       160
                                                                                                                                      Query results
                                                 sellers
        21
                                                                                                                                                                                             mean_freight_vs mean_time_to_d mean_diff_estiry
40.0733695. 20.3296703. 20.0109890. 41.0697122. 19.2820512. 19.0806860. 19.0806860.
        ⇧
                                                                                                                                                                                                                              40.0733695. 20.3296703. 20.0109890.
41.0697122. 19.2820512. 19.0805860.
33.2053939. 25.9631901. 18.9754601.
34.0060975. 27.7530864. 17.4444444.
42.9844230. 27.8260869. 17.4347826.
                                                                                                                                                 PERSONAL HISTORY
                                                                                                                                                                                                               PROJECT HISTORY
```

Top 5 states where delivery is really fast compared to estimated date

PERSONAL HISTORY

PROJECT HISTORY

```
SELECT
      c.customer_state,
      avg(freight value) AS mean freight value,
        avg(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time
_to_delivery,
 avg( DATE_DIFF( order_estimated_delivery_date, order_delivered_customer_date, day)) mean_d
iff_estimated_delivery
   FROM
       `target project.customers` c
 JOIN
      `target_project.orders` o
      c.customer_id=o.customer_id
      `target_project.order_items` AS ot
   ON
      o.order_id=ot.order_id
   GROUP BY
      c.customer state
      order by mean diff estimated delivery
      limit 5
3 Business Case: Target SQL - Problem: X | 3 Business Case: Target SQL Review - C X Q Query results - BigQuery - SCALER: X W SQL Server DATEDIFFQ Function X | +
 ← → 🖰 🐞 console.cloud.google.com/bjgquery7_ga=2.102646983.75686585.1679055632-37726303.1679055632&pli=1&project=curious-subject-380912&supportedpurview=project&ws=11m2511m414m3
 ■ Google Cloud
                      SCALER-DSML-SQL ▼
                                                                       Search (/) for resources, docs, products, and more
 ①
        SANDBOX Set up billing to upgrade to the full BigQuery experience. Learn more
                            Q
                                            SELECT

6 | c.customer_state,
avg(freight_value) AS mean_freight_value,
| avg(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, day)) mean_time_to_delivery,
| avg(DATE_DIFF(order_delivered_customer_date, order_delivered_customer_date, day)) mean_diff_estimated_delivery
        Viewing workspace resources.
SHOW STARRED ONLY
 (3)
        curious-subject-380912
                                               | 'target_project.customers' c
 Ð+
          ▶ schema
            farmers_market
                                ☆ I
                                                   'target_project.orders' o
 ...
                                                c.customer_id=o.customer_id
            :: target_project
                                              JOIN

target_project_order_items AS ot

ON

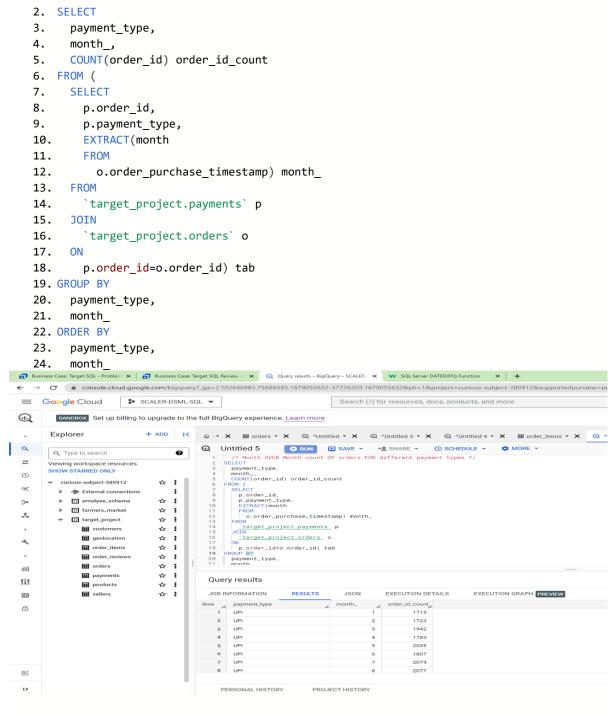
o.order_id=ot.order_id

GROUP BY

C.customer_state
order by mean_diff_estimated_delivery
limit S
               customers
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               order_items
               order_reviews
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               orders
 mi
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                                                                                   EXECUTION DETAILS
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                                                                         nean_freight_va mean_time_to_d n
                                                                        35.8436711..
                                                                                    23.9929742...
                                                                                                7.97658079
                                                                                   23.9929742...
21.2037500...
20.9786666...
                                                                        38.2570024...
                                                                        36.6531688...
                                                                        26.3639589...
```

6. Payment type analysis:

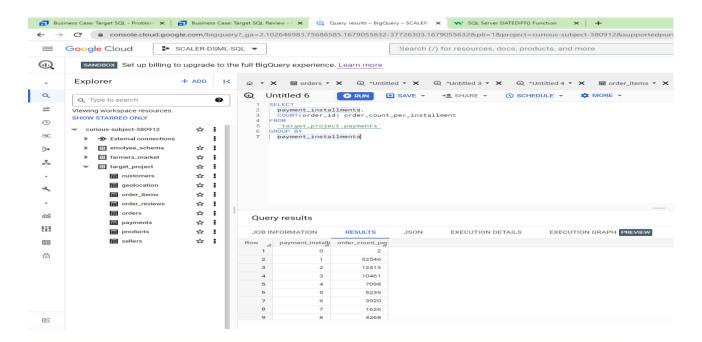
1. Month over Month count of orders for different payment types



Upon sorting data through ordercounts it is established that, Huge number of orders are placed in 5th month through creditcards

2. Count of orders based on the no. of payment instalments

```
    SELECT
    payment_installments,
    COUNT(order_id) order_count_per_installment
    FROM
    `target_project.payments`
    GROUP BY
    payment_installments
```



Order count is huge for 1st payment_installment 18 orders took most number of payment instalments that are 24