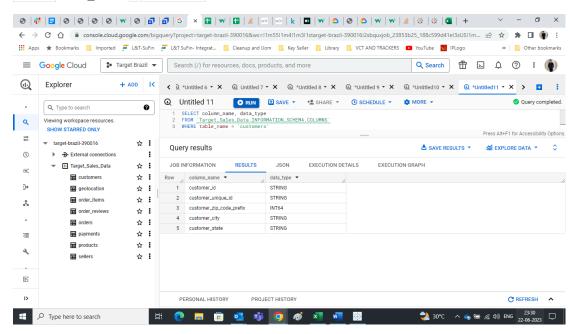
- Import the dataset and do usual exploratory analysis steps like checking the structure & characteristics of the dataset:
 - 1.1. Data type of all columns in the "customers" table.

SELECT column_name, data_type

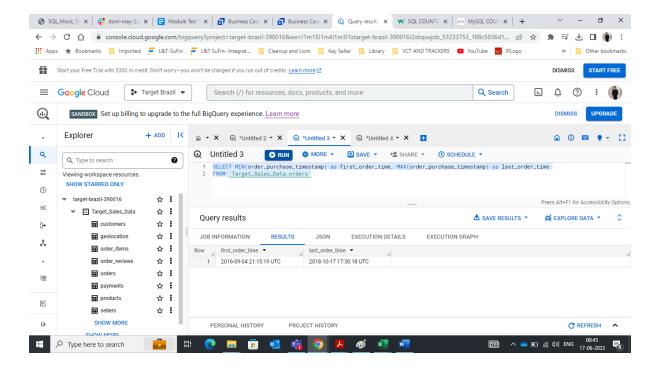
FROM 'Target_Sales_Data.INFORMATION_SCHEMA.COLUMNS'

WHERE table_name = 'customers'

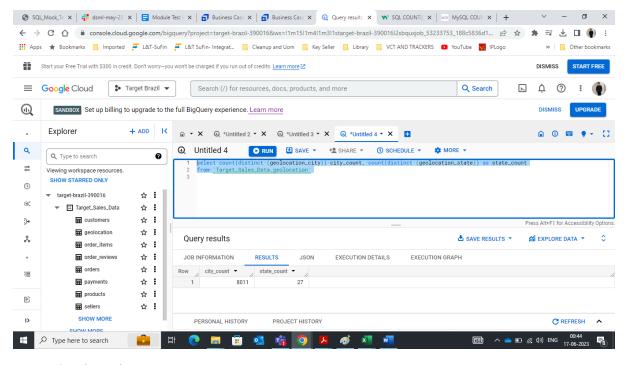


1.2. Get the time range between which the orders were placed.

SELECT MIN(order_purchase_timestamp) as first_order_time, MAX(order_purchase_timestamp) as last_order_time FROM `Target Sales Data.orders`



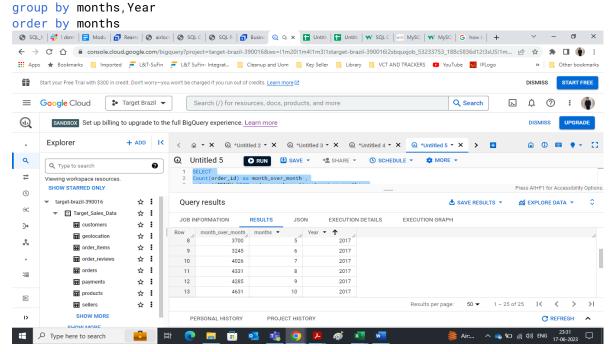
1.3. Count the number of Cities and States in our dataset.



2. In-depth Exploration:

2.1. there a growing trend in the no. of orders placed over the past years? SELECT

Count(order_id) as month_over_month ,
 extract(MONTH FROM order_purchase_timestamp) as months,
 EXTRACT(YEAR FROM order_purchase_timestamp) as Year,
from `Target_Sales_Data.orders`



Observation:

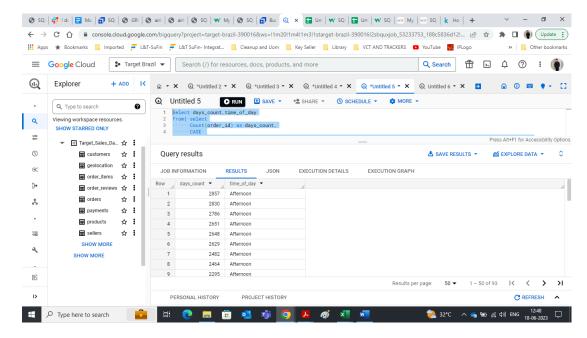
- No of Orders decline every year from march to April.
- There is continues decline in no of orders from march to June in year 2018
- 2.2 Can we see some kind of monthly seasonality in terms of the no. of orders being placed? (from above code)

Observation- No of orders increase in jan in new-year

2.3 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
```

```
Select days_count, time_of_day
from( select
      Count(order_id) as days_count,
      CASE
      WHEN EXTRACT(HOUR FROM order_purchase_timestamp) >= 0 AND EXTRACT(HOUR FROM
order_purchase_timestamp) <= 6 THEN 'Dawn'</pre>
        WHEN EXTRACT(HOUR FROM order_purchase_timestamp) >= 7 AND EXTRACT(HOUR FROM
order_purchase_timestamp) <= 12 THEN 'Morning'
        WHEN EXTRACT(HOUR FROM order_purchase_timestamp) >= 13 AND EXTRACT(HOUR
FROM order_purchase_timestamp) <= 18 THEN 'Afternoon'
        WHEN EXTRACT(HOUR FROM order_purchase_timestamp) >= 19 AND EXTRACT(HOUR
FROM order_purchase_timestamp) <= 23 THEN 'Night'
    END AS time_of_day,
      extract(MONTH FROM order_purchase_timestamp) as months,
      EXTRACT(YEAR FROM order_purchase_timestamp) as Year,
      from `Target_Sales_Data.orders`
      GROUP BY time_of_day, months, Year ) AS A
order by A.days_count desc
```



Observation - most orders are placed in after noon

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

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

```
SELECT total, customer_state, months, month_Nme
            from( SELECT count(order_id) as total,customer_state,FORMAT_DATE('%B',
           order_purchase_timestamp) AS month_Nme,
           EXTRACT(MONTH FROM order_purchase_timestamp) as months,
          EXTRACT(YEAR FROM order_purchase_timestamp) as Year
           from `Target_Sales_Data.orders` as o
           Join `Target_Sales_Data.customers` as c
           on o.customer_id = c.customer_id
            group by months, Year, customer_state, month_Nme) as a
order by total desc,customer_state asc
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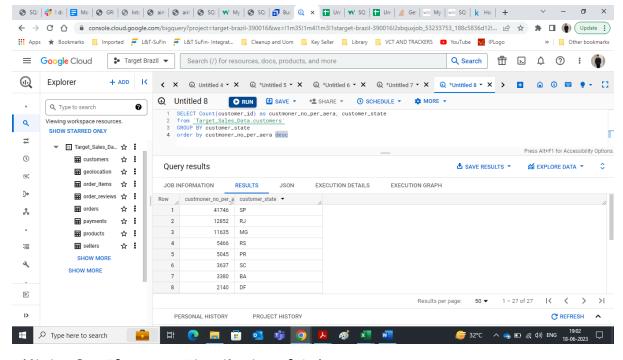
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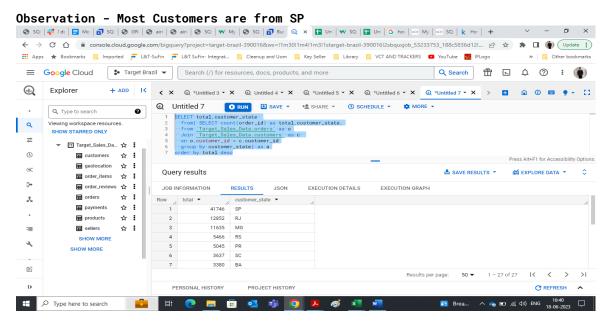
3.2. How are the customers distributed across all the states?

```
SELECT Count(customer_id) as custmoner_no_per_aera, customer_state
from `Target_Sales_Data.customers`
GROUP BY customer_state
order by custmoner_no_per_aera desc
```



Additional - If we want Distribution of Order across states -

```
SELECT total,customer_state
  from( SELECT count(order_id) as total,customer_state,
  from `Target_Sales_Data.orders` as o
  Join `Target_Sales_Data.customers` as c
  on o.customer_id = c.customer_id
  group by customer_state) as a
order by total desc
```



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

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

```
SELECT
                      ((SUM(CASE WHEN EXTRACT (YEAR from order_purchase_timestamp) = 2018 THEN
         payment_value ELSE 0 END)
                      - SUM(CASE WHEN EXTRACT (YEAR from order_purchase_timestamp) = 2017 THEN
         payment_value ELSE 0 END))
                      / SUM(CASE WHEN EXTRACT (YEAR from order_purchase_timestamp) = 2017 THEN
         payment_value ELSE 0 END)) * 100 AS percentage_increase
         FROM `Target_Sales_Data.orders` as o
          join `Target_Sales_Data.payments` as p
         on o.order_id=p.order_id
                      EXTRACT (MONTH FROM order_purchase_timestamp) BETWEEN 1 AND 8;
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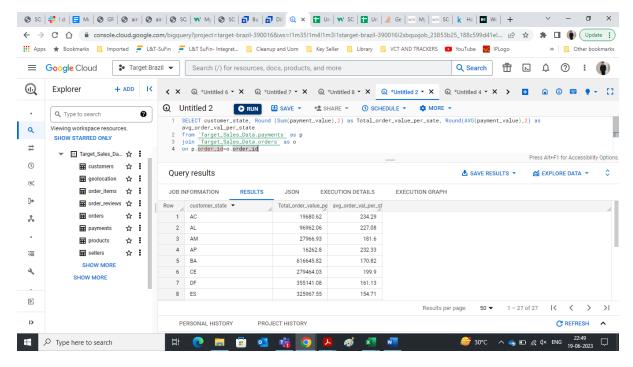
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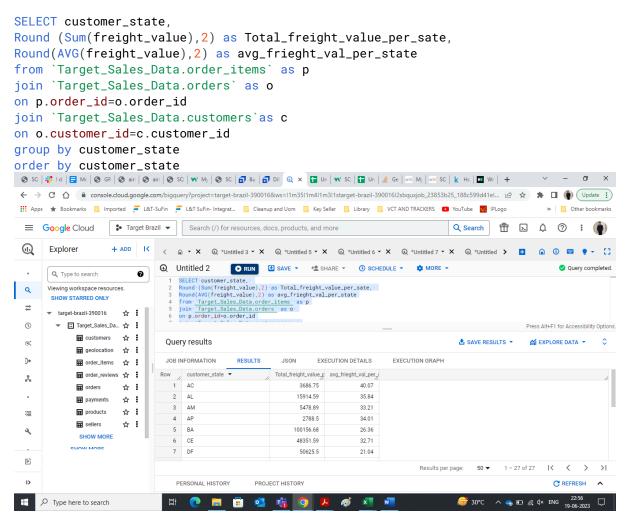
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4.2. Calculate the Total & Average value of order price for each state.

```
SELECT customer_state, Round (Sum(payment_value),2) as Total_order_value_per_sate,
Round(AVG(payment_value),2) as avg_order_val_per_state
from `Target_Sales_Data.payments` as p
join `Target_Sales_Data.orders` as o
on p.order_id=o.order_id
join `Target_Sales_Data.customers`as c
on o.customer_id=c.customer_id
group by customer_state
order by customer_state
```



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



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

5.1. 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.

Below is gives actual delivery time and difference in estimated & actual delivery date only where order were delayed with sate of customer and seller.

```
SELECT customer_state, seller_state,
TIMESTAMP_DIFF (order_delivered_carrier_date, order_purchase_timestamp, DAY) as
time_to_deliver,
TIMESTAMP_DIFF (order_estimated_delivery_date, order_delivered_carrier_date,
DAY) as diff_estimated_delivery
from `Target_Sales_Data.orders` as o
join `Target_Sales_Data.customers` as c
on o.customer_id=c.customer_id
join `Target_Sales_Data.order_items` as oi
on o.order_id=oi.order_id
join `Target_Sales_Data.sellers`as s
on oi.seller_id=s.seller_id
where LOWER(order_status) = "delivered" and
TIMESTAMP_DIFF (order_estimated_delivery_date, order_delivered_carrier_date,
DAY) < 0
Order by time_to_deliver desc
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TIMESTAMP_DIFF (order_estimated_delivery_date, order_delivered_carrier_date, DAY) as diff_estimated_delivery
from Target_Sales_Data_orders as o
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```

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

```
Select
customer_state, avg_frieght_val_per_state
from (SELECT
   customer_state,
   Round(AVG(freight_value),2) as avg_frieght_val_per_state
   from `Target_Sales_Data.order_items` as p
   join `Target_Sales_Data.orders` as o
   on p.order_id=o.order_id
```

```
join `Target_Sales_Data.customers`as c
     on o.customer_id=c.customer_id
     group by customer_state
    order by avg_frieght_val_per_state
    LIMIT 5) as lower_freight
    UNION ALL
    Select
customer_state, avg_frieght_val_per_state
from (SELECT
    customer_state,
     Round(AVG(freight_value),2) as avg_frieght_val_per_state
     from `Target_Sales_Data.order_items` as p
     join `Target_Sales_Data.orders` as o
    on p.order_id=o.order_id
     join `Target_Sales_Data.customers`as c
    on o.customer_id=c.customer_id
    group by customer_state
    order by avg_frieght_val_per_state DESC
    LIMIT 5) as higest_freight
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5.3. Find out the top 5 states with the highest & lowest average delivery time.

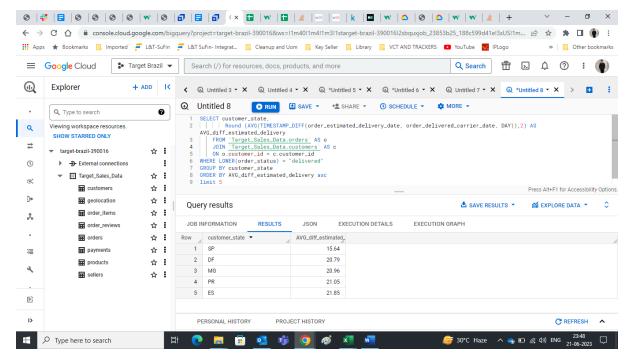
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WHERE LOWER(order_status) = "delivered" AND
TIMESTAMP_DIFF(order_delivered_carrier_date, order_purchase_timestamp, DAY) = 0
        ORDER BY time_to_deliver
        LIMIT 5) AS top_deliveries
UNION ALL
SELECT customer_state,
        time_to_deliver,
        diff_estimated_delivery
FROM
         (SELECT customer_state,
                 TIMESTAMP_DIFF(order_delivered_carrier_date, order_purchase_timestamp,
DAY) AS time_to_deliver,
                 TIMESTAMP_DIFF(order_estimated_delivery_date,
order_delivered_carrier_date, DAY) AS diff_estimated_delivery
        FROM `Target_Sales_Data.orders` AS o
        JOIN `Target_Sales_Data.customers` AS c
        ON o.customer_id = c.customer_id
        WHERE LOWER(order_status) = "delivered"
        ORDER BY time_to_deliver DESC
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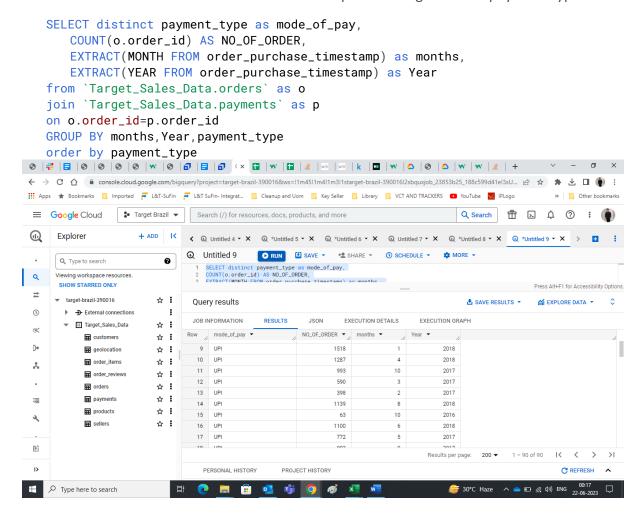
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   >+
                  geolocation
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                  order_items
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                  order reviews
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                  orders
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                  products
                                        ☆:
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                  sellers
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                                                      PERSONAL HISTORY
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5.4. Find out the top 5 states where the order delivery is really fast as compared to the
        estimated date of delivery.
SELECT customer_state,
                 Round (AVG(TIMESTAMP_DIFF(order_estimated_delivery_date,
order_delivered_carrier_date, DAY)),2) AS AVG_diff_estimated_delivery
        FROM `Target_Sales_Data.orders` AS o
        JOIN `Target_Sales_Data.customers` AS c
        ON o.customer_id = c.customer_id
WHERE LOWER(order_status) = "delivered"
GROUP BY customer_state
ORDER BY AVG_diff_estimated_delivery asc
limit 5
```



Observation: SP has fastest delivery

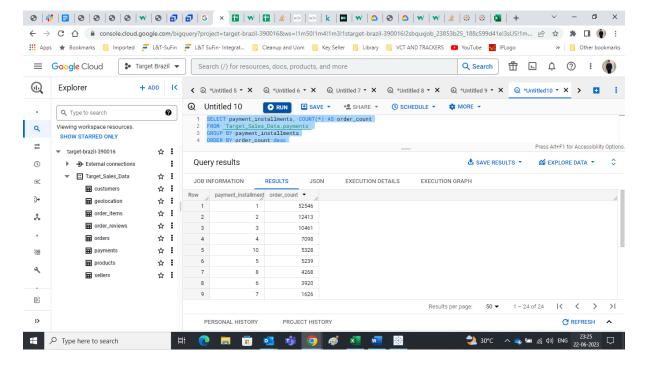
6. Analysis based on the payments:

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



6.2. Find the no. of orders placed on the basis of the payment instalments that have been paid

```
SELECT payment_installments, COUNT(*) AS order_count
FROM `Target_Sales_Data.payments`
GROUP BY payment_installments
ORDER BY order_count desc
```



Observation - More than 9 instalment is least preferred.