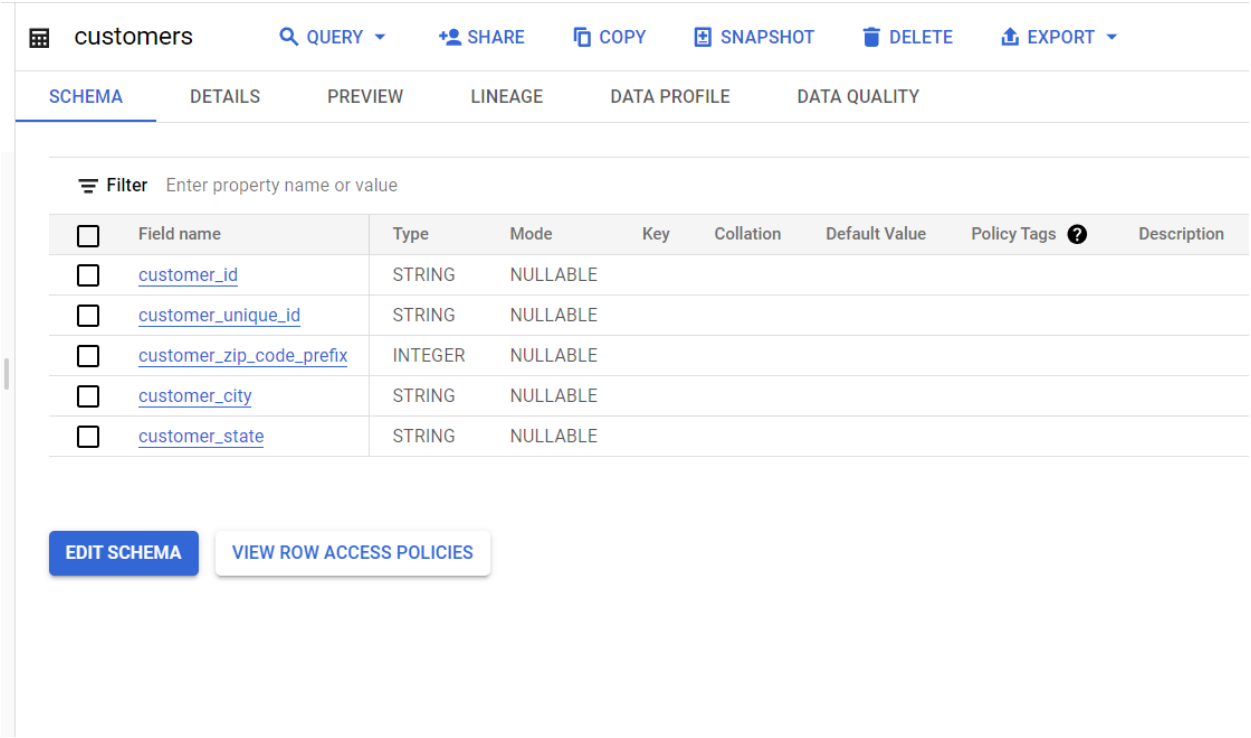
1.

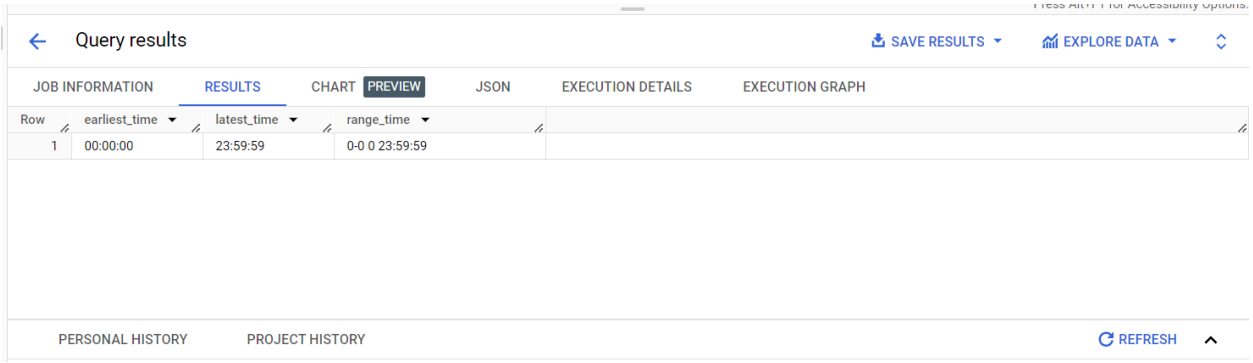
Import the dataset and do usual exploratory analysis steps like checking the structure & characteristics of the dataset:

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

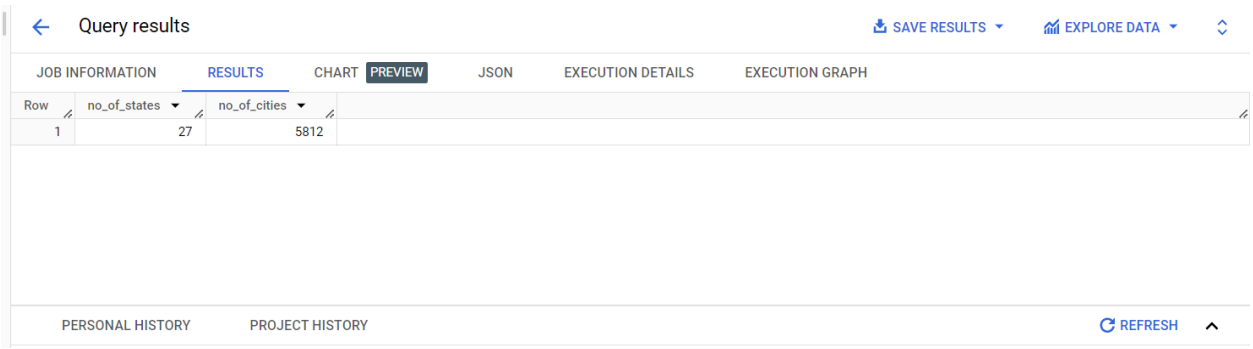


Get the time range between which the orders were placed.

```sql
SELECT *,
  latest_time - earliest_time AS range_time
FROM
  (
    SELECT MIN(EXTRACT(TIME FROM order_purchase_timestamp)) AS earliest_time,
      MAX(EXTRACT(TIME FROM order_purchase_timestamp)) AS latest_time,
    FROM `heroic-calculus-396815.Target_case_study.orders`
) t;
```



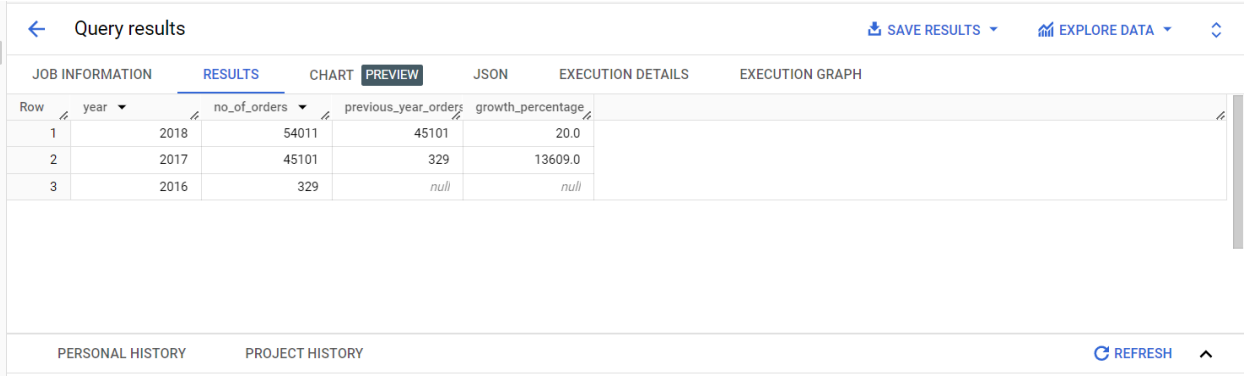

```
## Count the Cities & States of customers who ordered during the given period.
SELECT COUNT(DISTINCT geolocation_state) AS no_of_states,
  COUNT(DISTINCT geolocation_city) AS no_of_cities
FROM `heroic-calculus-396815.Target_case_study.geolocation`
WHERE geolocation_zip_code_prefix IN
  (
    SELECT customer_zip_code_prefix
    FROM `heroic-calculus-396815.Target_case_study.customers`
    WHERE customer_id IN
    (
      SELECT customer_id
      FROM `heroic-calculus-396815.Target_case_study.orders`
    )
  );
```



2.

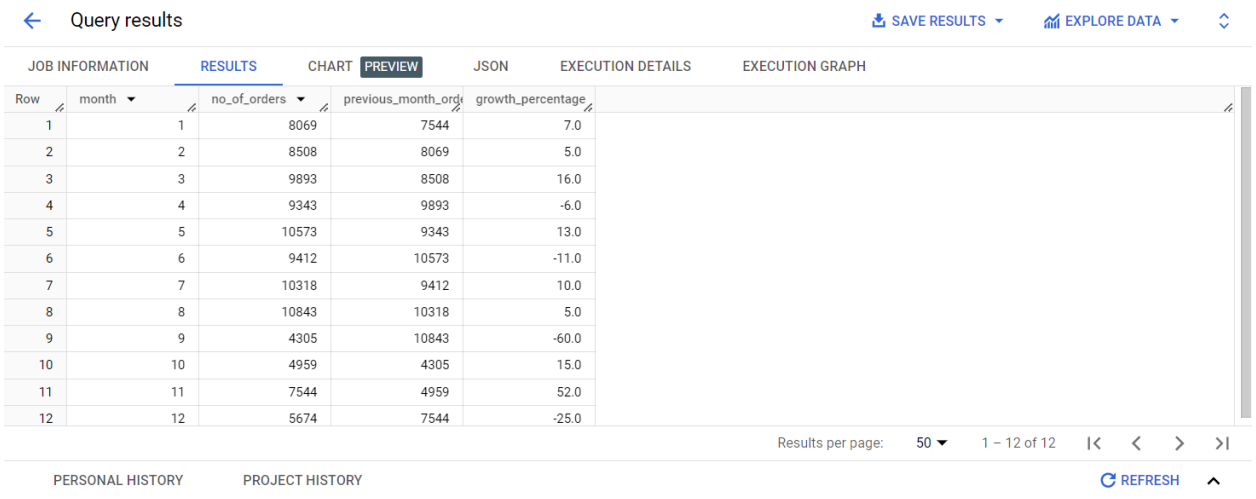
```
#In-depth Exploration:

##Is there a growing trend in the no. of orders placed over the past years?
SELECT *,
  ROUND(((ttt.no_of_orders - previous_year_orders) / ttt.previous_year_orders) * 100,
0) AS growth_percentage
```

```
FROM
  (
    SELECT year,
      tt.no_of_orders,
      LEAD(tt.no_of_orders, 1) OVER(ORDER BY year DESC) AS previous_year_orders
    FROM
      (
        SELECT COUNT(t.order_id) AS no_of_orders,
          t.year
        FROM
          (
            SELECT *,
              EXTRACT(YEAR FROM order_purchase_timestamp) AS year
            FROM `heroic-calculus-396815.Target_case_study.orders`
          ) t
        GROUP BY t.year
      ) tt
  ) ttt
ORDER BY year DESC;
```




```
##Can we see some kind of monthly seasonality in terms of the no. of orders being placed?
SELECT *
FROM
(
  (SELECT 1 AS month,
    8069 AS no_of_orders,
    7544 AS previous_month_order,
    ROUND(((8069 - 7544) / 7544) * 100, 0) AS growth_percentage)
  UNION ALL
  (SELECT *,
```

```
    ROUND(((ttt.no_of_orders - previous_month_orders) / ttt.previous_month_orders) *
100, 0) AS growth_percentage
  FROM
    (
      SELECT month,
        tt.no_of_orders,
        LEAD(tt.no_of_orders, 1) OVER(ORDER BY month DESC) AS previous_month_orders
      FROM
        (
          SELECT COUNT(t.order_id) AS no_of_orders,
            t.month
          FROM
            (
              SELECT *,
                EXTRACT(MONTH FROM order_purchase_timestamp) AS Month
              FROM `heroic-calculus-396815.Target_case_study.orders`
            ) t
          GROUP BY t.month
        ) tt
    ) ttt
  ORDER BY month ASC)
)
WHERE growth_percentage IS NOT NULL
ORDER BY month;
```

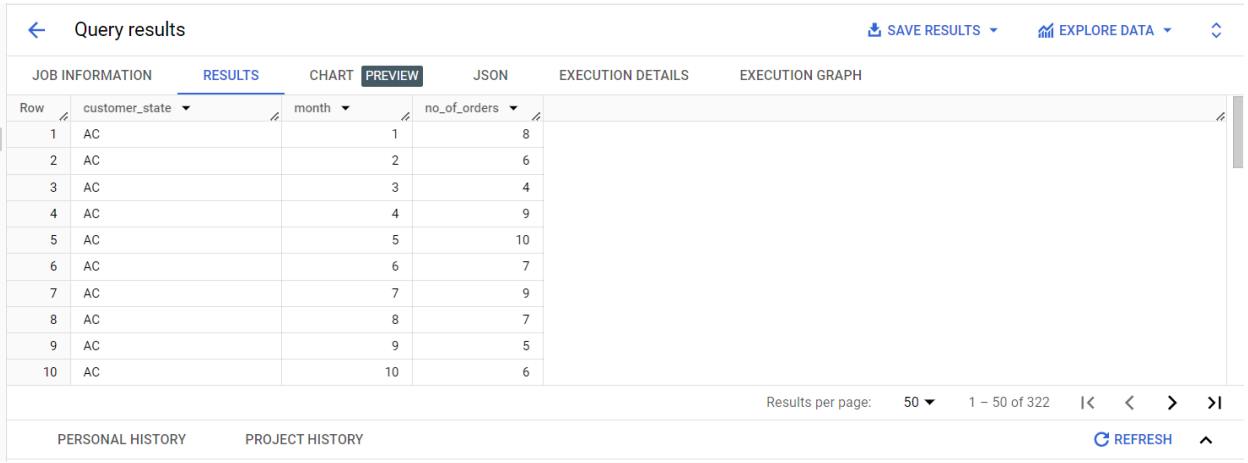


3.

#Evolution of E-commerce orders in the Brazil region:

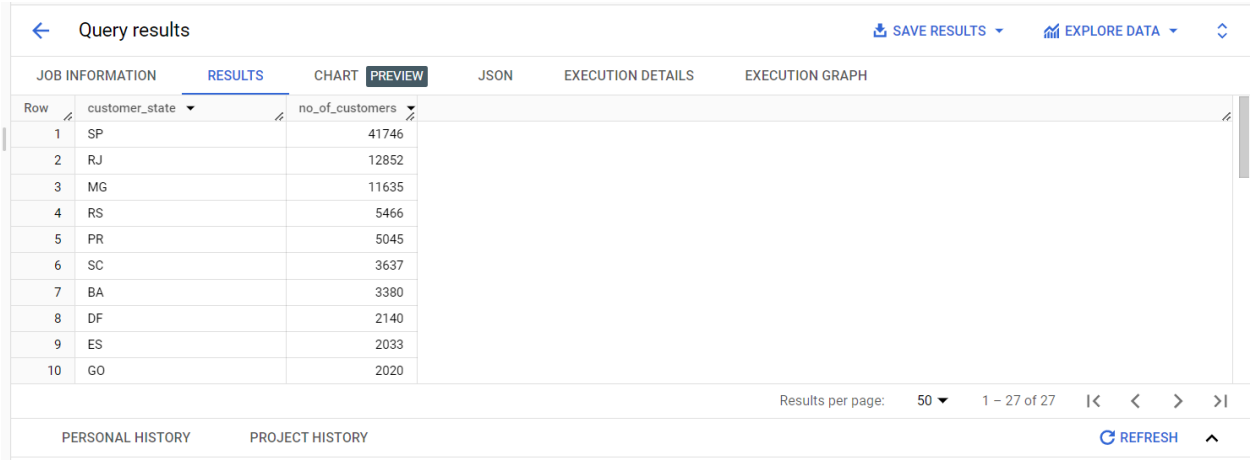
##Get the month on month no. of orders placed in each state.

```sql
SELECT customer_state,
  month,
  COUNT(order_id) AS no_of_orders
FROM
(
  SELECT *, EXTRACT(MONTH FROM orders.order_purchase_timestamp) AS month
  FROM
    `heroic-calculus-396815.Target_case_study.orders` orders
    INNER JOIN `heroic-calculus-396815.Target_case_study.customers` customers
    ON orders.customer_id = customers.customer_id
) t
GROUP BY customer_state, t.MONTH
ORDER BY 1, 2;
```



##How are the customers distributed across all the states?

```sql
SELECT customer_state,
  COUNT(customer_id) AS no_of_customers
FROM `heroic-calculus-396815.Target_case_study.customers`
GROUP BY customer_state
ORDER BY no_of_customers DESC;
```



4.

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

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

```
SELECT ROUND(((total_cost - previous_year_cost) / previous_year_cost) * 100, 2) AS
growth_2017_to_2018
FROM
(
  SELECT *, LEAD(t.total_cost) OVER(ORDER BY year DESC) AS previous_year_cost
  FROM
  (
    SELECT o.year, SUM(p.payment_value) AS total_cost
    FROM
      (
        SELECT order_id,
          EXTRACT(YEAR FROM order_purchase_timestamp) AS year,
          EXTRACT(MONTH FROM order_purchase_timestamp) AS month
        FROM `heroic-calculus-396815.Target_case_study.orders`
      ) o
      LEFT JOIN
      `heroic-calculus-396815.Target_case_study.payments` p
      ON o.order_id = p.order_id
```

```
    WHERE o.month BETWEEN 1 AND 8
    GROUP BY o.year
  ) t
) tt
WHERE previous_year_cost IS NOT NULL;
```

Query results

SAVE RESULTS EXPLORE DATA

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

Row	growth_2017_to_2018
1	136.98

```
##Calculate the Total & Average value of order price for each state.
SELECT c.customer_state,
  ROUND(SUM(p.payment_value), 2) AS Total_value,
  ROUND(AVG(p.payment_value), 2) AS Avg_value
FROM `heroic-calculus-396815.Target_case_study.orders` o
  INNER JOIN `heroic-calculus-396815.Target_case_study.customers` c
  ON o.customer_id = c.customer_id
  INNER JOIN `heroic-calculus-396815.Target_case_study.payments` p
  ON o.order_id = p.order_id
GROUP BY c.customer_state
ORDER BY 2 DESC, 3 DESC;
```

Query results

SAVE RESULTS EXPLORE DATA

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

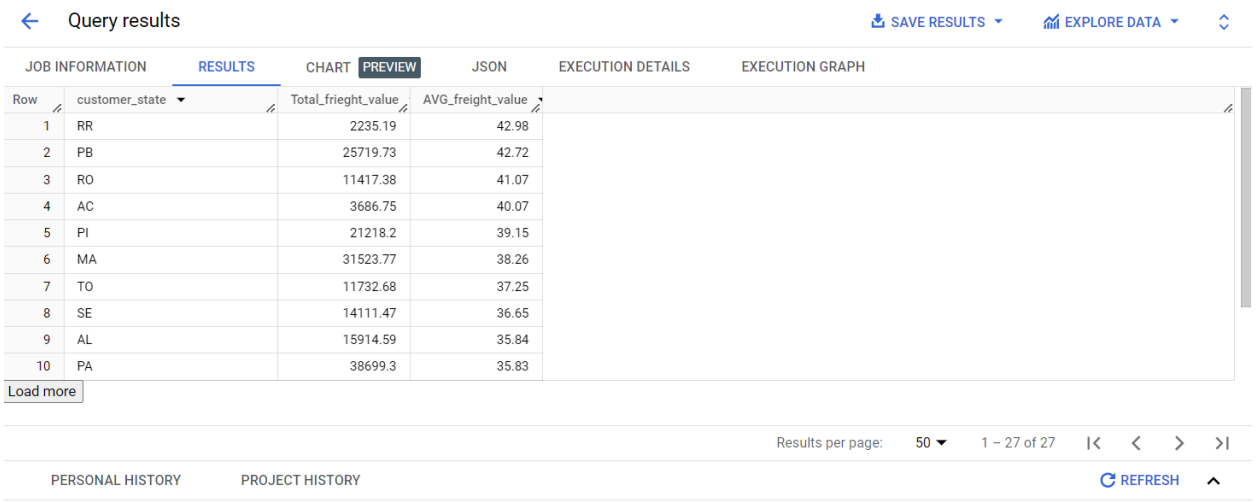
Row	customer_state	Total_value	Avg_value
1	SP	5998226.96	137.5
2	RJ	2144379.69	158.53
3	MG	1872257.26	154.71
4	RS	890898.54	157.18
5	PR	811156.38	154.15
6	SC	623086.43	165.98
7	BA	616645.82	170.82
8	DF	355141.08	161.13
9	GO	350092.31	165.76
10	ES	325967.55	154.71

Results per page: 50 1 – 27 of 27

PERSONAL HISTORY PROJECT HISTORY REFRESH

```
##Calculate the Total & Average value of order freight for each state.
SELECT c.customer_state,
  ROUND(SUM(oi.freight_value), 2) AS Total_frieght_value,
  ROUND(AVG(oi.freight_value), 2) AS AVG_freight_value
FROM `heroic-calculus-396815.Target_case_study.order_items` oi
  INNER JOIN `heroic-calculus-396815.Target_case_study.orders` o
  ON oi.order_id = o.order_id
```

```
  INNER JOIN `heroic-calculus-396815.Target_case_study.customers` c
  ON o.customer_id = c.customer_id
GROUP BY c.customer_state
ORDER BY 3 DESC, 2 DESC;
```



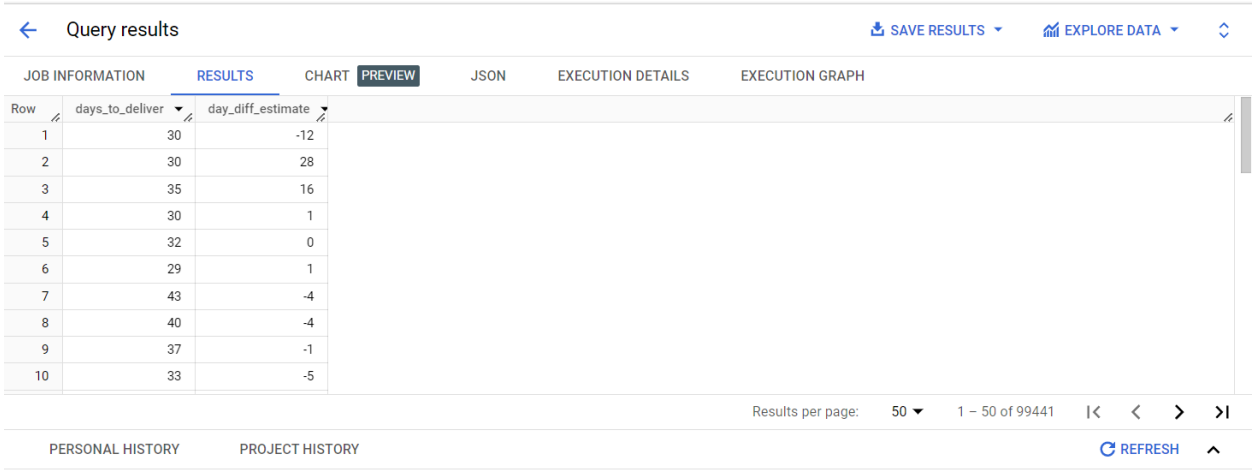
Row	customer_state	Total_frieght_value	AVG_freight_value
1	RR	2235.19	42.98
2	PB	25719.73	42.72
3	RO	11417.38	41.07
4	AC	3686.75	40.07
5	PI	21218.2	39.15
6	MA	31523.77	38.26
7	TO	11732.68	37.25
8	SE	14111.47	36.65
9	AL	15914.59	35.84
10	PA	38699.3	35.83

5.

#Analysis based on sales, freight and delivery timeTABLE

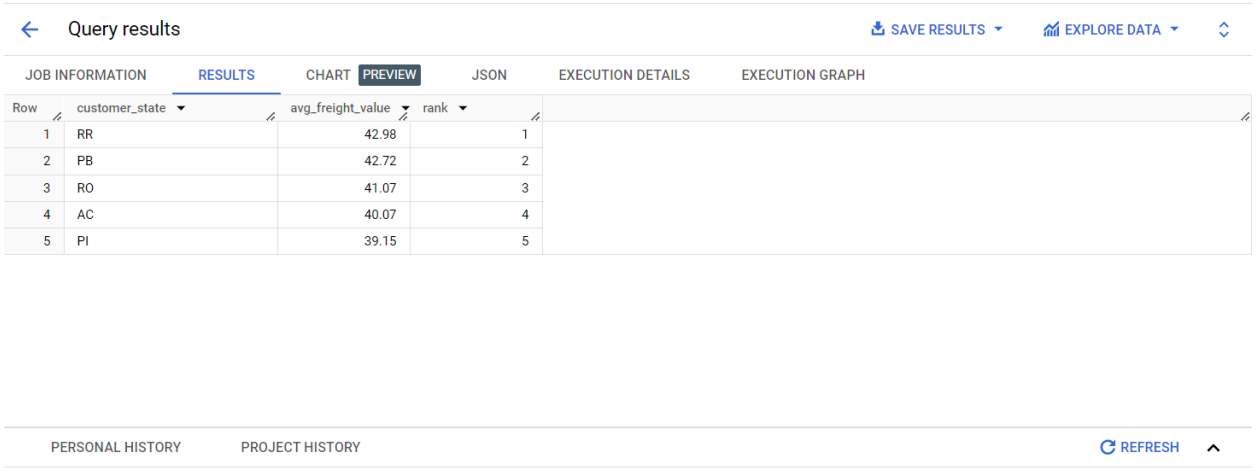
##Find the no. of days taken to deliver each order from the order's purchase date as delivery time.

```
SELECT DATETIME_DIFF(order_delivered_customer_date, order_purchase_timestamp, DAY) AS
days_to_deliver,
  DATETIME_DIFF(order_estimated_delivery_date, order_delivered_customer_date, DAY) AS
day_diff_estimate
FROM `heroic-calculus-396815.Target_case_study.orders`;
```



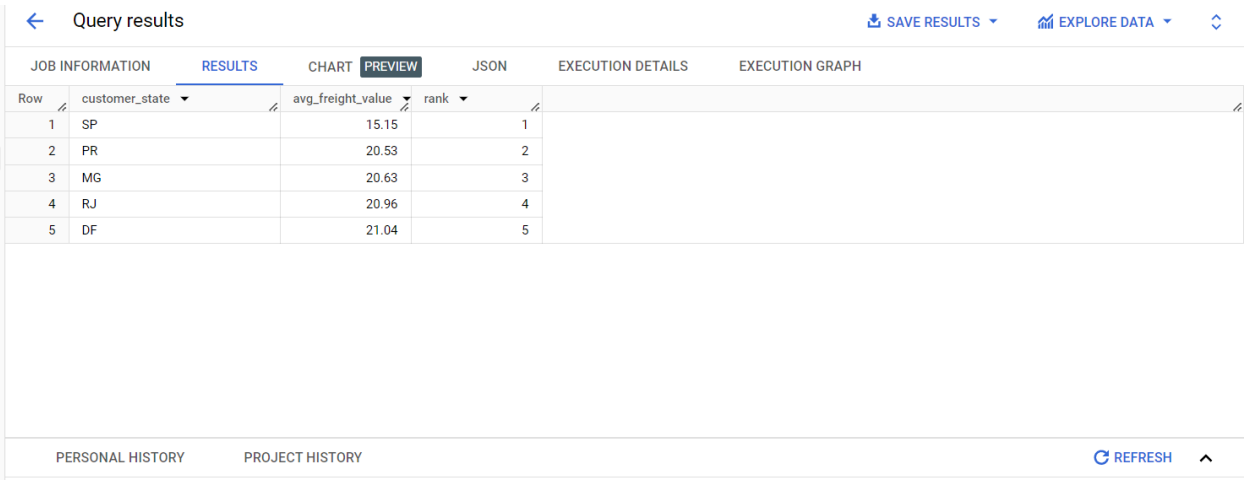
Row	days_to_deliver	day_diff_estimate
1	30	-12
2	30	28
3	35	16
4	30	1
5	32	0
6	29	1
7	43	-4
8	40	-4
9	37	-1
10	33	-5

```sql
##Find out the top 5 states with the highest & lowest average freight value.
--highest avg_frieght
WITH STATE_FREIGHT AS
(
  SELECT customers.customer_state, ROUND(AVG(order_items.freight_value), 2) AS
avg_freight_value
  FROM `heroic-calculus-396815.Target_case_study.order_items` order_items
    INNER JOIN `heroic-calculus-396815.Target_case_study.orders` orders
    ON order_items.order_id = orders.order_id
    INNER JOIN `heroic-calculus-396815.Target_case_study.customers` customers
    ON customers.customer_id = orders.customer_id
  GROUP BY customers.customer_state
)

SELECT *
FROM
  (
    SELECT *,
      RANK() OVER(ORDER BY avg_freight_value DESC) AS rank
    FROM state_freight
  )
WHERE rank <= 5
ORDER BY rank;
```




```sql
--lowest avg_freight

WITH STATE_FREIGHT AS
(
```

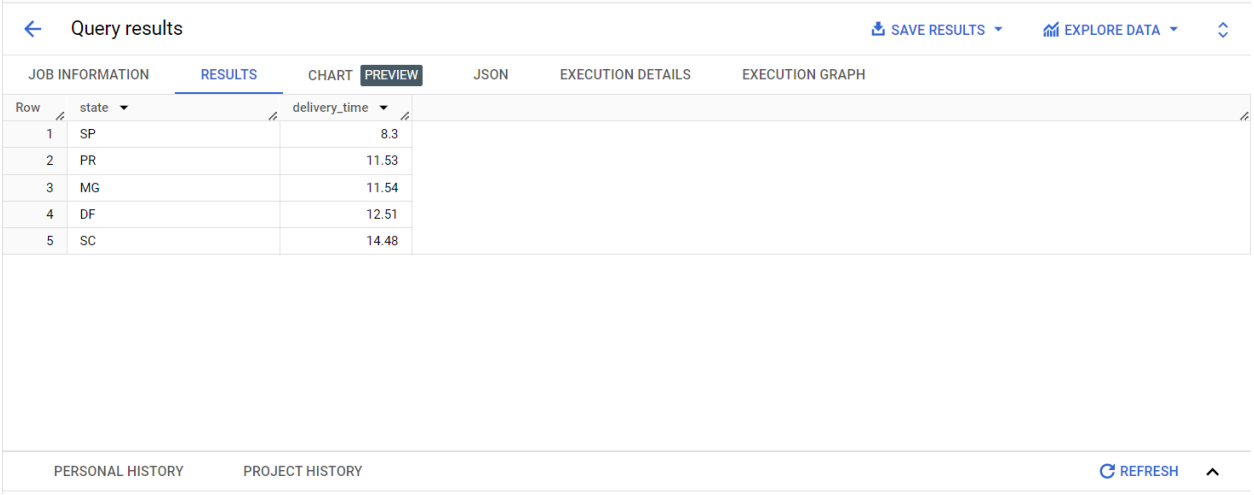
```
  SELECT customers.customer_state, ROUND(AVG(order_items.freight_value), 2) AS
avg_freight_value
  FROM `heroic-calculus-396815.Target_case_study.order_items` order_items
    INNER JOIN `heroic-calculus-396815.Target_case_study.orders` orders
    ON order_items.order_id = orders.order_id
    INNER JOIN `heroic-calculus-396815.Target_case_study.customers` customers
    ON customers.customer_id = orders.customer_id
  GROUP BY customers.customer_state
)

SELECT *
FROM
  (
    SELECT *,
      RANK() OVER(ORDER BY avg_freight_value ASC) AS rank
    FROM state_freight
  )
WHERE rank <= 5
ORDER BY rank;
```



Row	customer_state	avg_freight_value	rank
1	SP	15.15	1
2	PR	20.53	2
3	MG	20.63	3
4	RJ	20.96	4
5	DF	21.04	5

```
##Find out the top 5 states with the highest & lowest average delivery time.
--LOWEST
WITH new_table AS
(
  SELECT customers.customer_state,
    ROUND(AVG(DATETIME_DIFF(order_delivered_customer_date, order_purchase_timestamp,
DAY)), 2) AS delivery_time,
  FROM `heroic-calculus-396815.Target_case_study.orders` orders
    INNER JOIN `heroic-calculus-396815.Target_case_study.customers` customers
    ON orders.customer_id = customers.customer_id
```

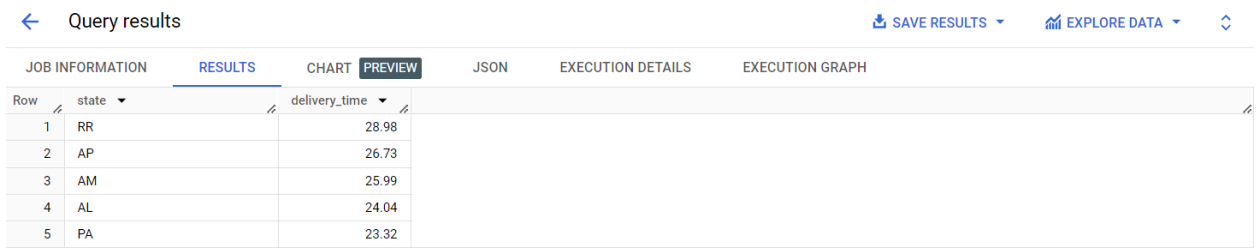
```
  GROUP BY customers.customer_state
)

SELECT customer_state AS state,
  delivery_time
FROM
  (
    SELECT *,
      RANK() OVER(ORDER BY new_table.delivery_time ASC) AS rank
    FROM new_table
  ) t
WHERE rank <= 5
ORDER BY rank;
```



Row	state	delivery_time
1	SP	8.3
2	PR	11.53
3	MG	11.54
4	DF	12.51
5	SC	14.48

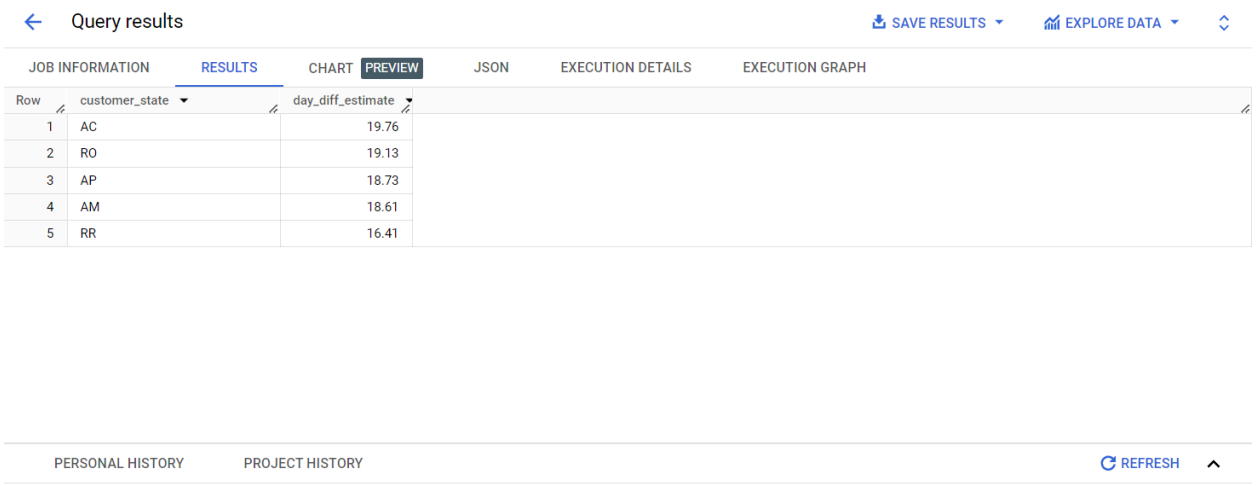
```
--HIGHEST
WITH new_table AS
(
  SELECT customers.customer_state,
    ROUND(AVG(DATETIME_DIFF(order_delivered_customer_date, order_purchase_timestamp,
DAY)), 2) AS delivery_time,
  FROM `heroic-calculus-396815.Target_case_study.orders` orders
    INNER JOIN `heroic-calculus-396815.Target_case_study.customers` customers
    ON orders.customer_id = customers.customer_id
  GROUP BY customers.customer_state
)

SELECT customer_state AS state,
  delivery_time
```

```
FROM
  (
    SELECT *,
      RANK() OVER(ORDER BY new_table.delivery_time DESC) AS rank
    FROM new_table
  ) t
WHERE rank <= 5
ORDER BY rank;
```



Row	state	delivery_time
1	RR	28.98
2	AP	26.73
3	AM	25.99
4	AL	24.04
5	PA	23.32


```
##Find out the top 5 states where the order delivery is really fast as compared to the estimated date of delivery.
SELECT customers.customer_state,
  ROUND(AVG(DATETIME_DIFF(order_estimated_delivery_date,
order_delivered_customer_date, DAY)), 2) AS day_diff_estimate
FROM `heroic-calculus-396815.Target_case_study.orders` orders
  INNER JOIN
  `heroic-calculus-396815.Target_case_study.customers` customers
  ON orders.customer_id = customers.customer_id
GROUP BY customers.customer_state
ORDER BY 2 DESC
LIMIT 5;
```



6.

```
#Analysis based on the payments

##Find the month on month no. of orders placed using different payment types.
SELECT orders.month,
  payments.payment_type,
  COUNT(orders.order_id) AS no_of_orders
FROM
(
  SELECT *, EXTRACT(MONTH FROM order_purchase_timestamp) AS month
  FROM `heroic-calculus-396815.Target_case_study.orders`
) orders
  INNER JOIN
  `heroic-calculus-396815.Target_case_study.payments` payments
  ON orders.order_id = payments.order_id
GROUP BY orders.month, payments.payment_type
ORDER BY orders.month, payments.payment_type;
```

Query results

SAVE RESULTS | EXPLORE DATA

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

Row	month	payment_type	no_of_orders
1	1	UPI	1715
2	1	credit_card	6103
3	1	debit_card	118
4	1	voucher	477
5	2	UPI	1723
6	2	credit_card	6609
7	2	debit_card	82
8	2	voucher	424
9	3	UPI	1942
10	3	credit_card	7707

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PERSONAL HISTORY | PROJECT HISTORY | REFRESH

```
##Find the no. of orders placed on the basis of the payment installments that have been paid.
SELECT payment_installments,
  COUNT(order_id) AS no_of_orders
FROM `heroic-calculus-396815.Target_case_study.payments`
GROUP BY payment_installments;
```

Query results

SAVE RESULTS | EXPLORE DATA

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

Row	payment_installment	no_of_orders
1	0	2
2	1	52546
3	2	12413
4	3	10461
5	4	7098
6	5	5239
7	6	3920
8	7	1626
9	8	4268
10	9	644

Results per page: 50 1 – 24 of 24

PERSONAL HISTORY | PROJECT HISTORY | REFRESH