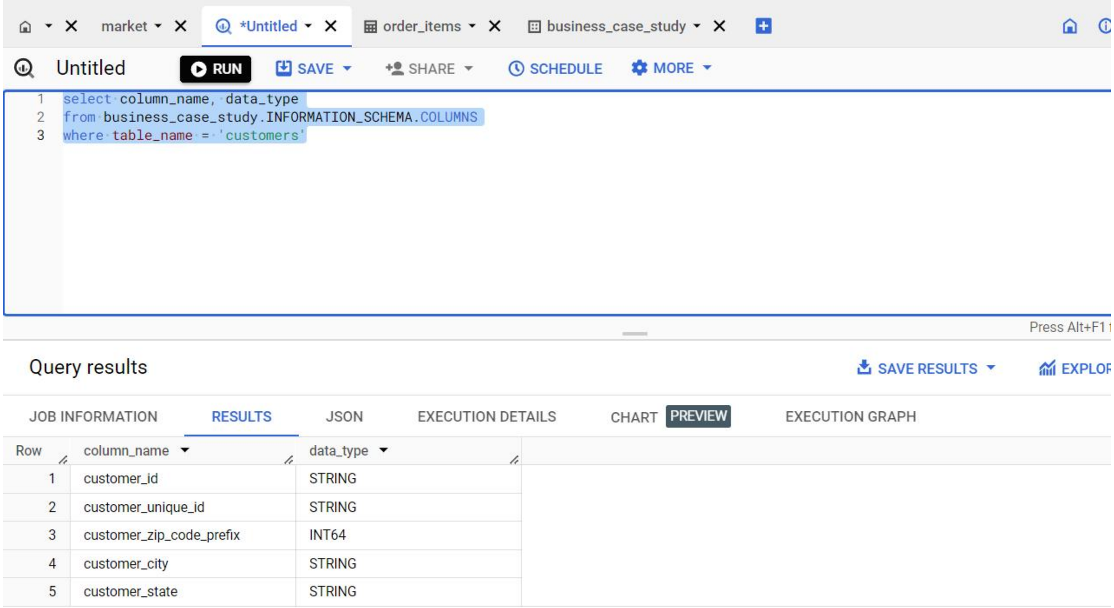
BUSINESS CASE STUDY:

I. 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.

```
select column_name, data_type
from business_case_study.INFORMATION_SCHEMA.COLUMNS
where table_name = 'customers'
```

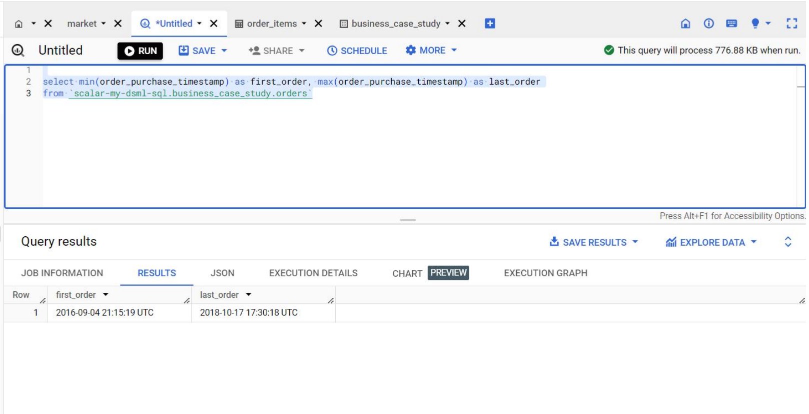


```
select column_name, data_type
from business_case_study.INFORMATION_SCHEMA.COLUMNS
where table_name = 'customers'
```

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

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

```
select min(order_purchase_timestamp) as first_order, max(order_purchase_timestamp)
as last_order
from `scalar-my-dsml-sql.business_case_study.orders`
```



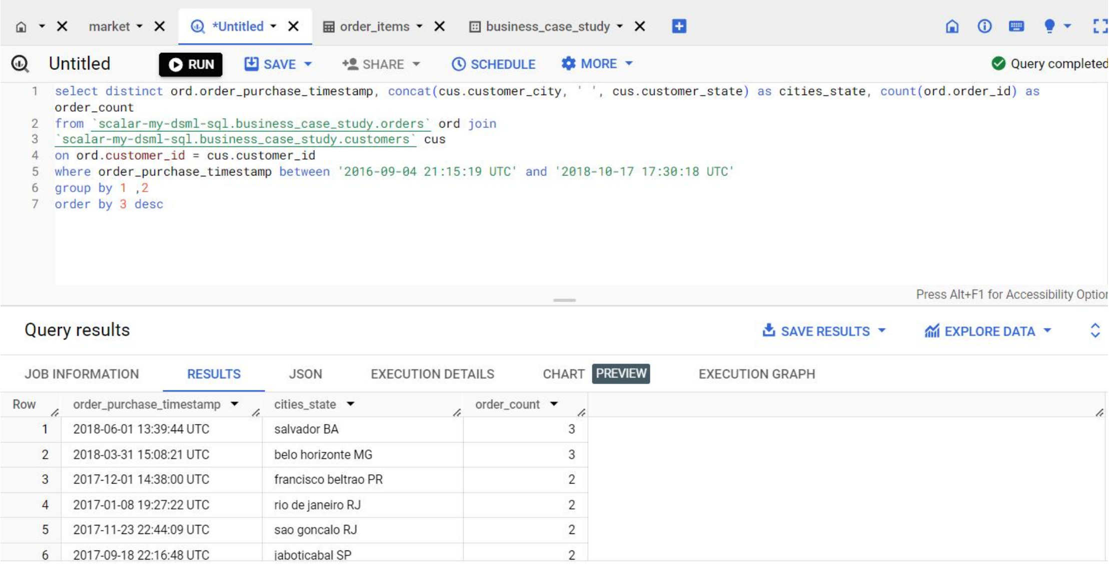
This query will process 776.88 KB when run.

```
select min(order_purchase_timestamp) as first_order, max(order_purchase_timestamp) as last_order
from `scalar-my-dsml-sql.business_case_study.orders`
```

Row	first_order	last_order
1	2016-09-04 21:15:19 UTC	2018-10-17 17:30:18 UTC

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

```
select distinct ord.order_purchase_timestamp, concat(cus.customer_city, ' ', cus.customer_state) as
cities_state, count(ord.order_id)
from `scalar-my-dsml-sql.business_case_study.orders` ord join
`scalar-my-dsml-sql.business_case_study.customers` cus
on ord.customer_id = cus.customer_id
where order_purchase_timestamp between '2016-09-04 21:15:19 UTC' and '2018-10-17 17:30:18 UTC'
group by 1 ,2
order by 3 desc
```



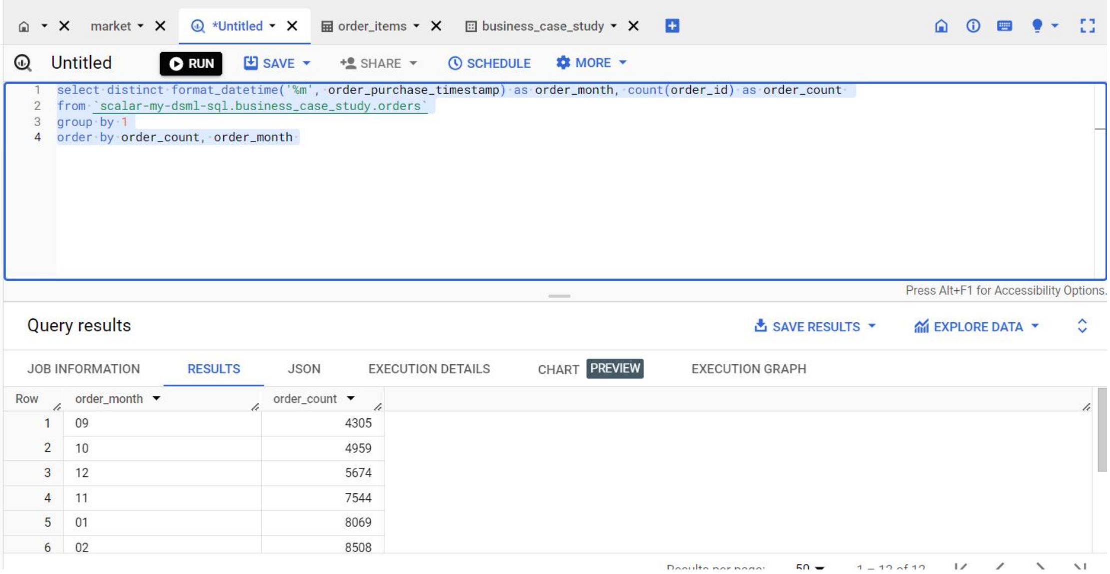
```
select distinct ord.order_purchase_timestamp, concat(cus.customer_city, ' ', cus.customer_state) as cities_state, count(ord.order_id) as
order_count
from `scalar-my-dsml-sql.business_case_study.orders` ord join
`scalar-my-dsml-sql.business_case_study.customers` cus
on ord.customer_id = cus.customer_id
where order_purchase_timestamp between '2016-09-04 21:15:19 UTC' and '2018-10-17 17:30:18 UTC'
group by 1 ,2
order by 3 desc
```

Row	order_purchase_timestamp	cities_state	order_count
1	2018-06-01 13:39:44 UTC	salvador BA	3
2	2018-03-31 15:08:21 UTC	belo horizonte MG	3
3	2017-12-01 14:38:00 UTC	francisco beltrao PR	2
4	2017-01-08 19:27:22 UTC	rio de janeiro RJ	2
5	2017-11-23 22:44:09 UTC	sao goncalo RJ	2
6	2017-09-18 22:16:48 UTC	jaboticabal SP	2

II. In-depth Exploration:

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

```
select distinct format_datetime('%m', order_purchase_timestamp) as order_month,
count(order_id) as order_count
from `scalar-my-dsml-sql.business_case_study.orders`
group by 1
order by order_count, order_month
```



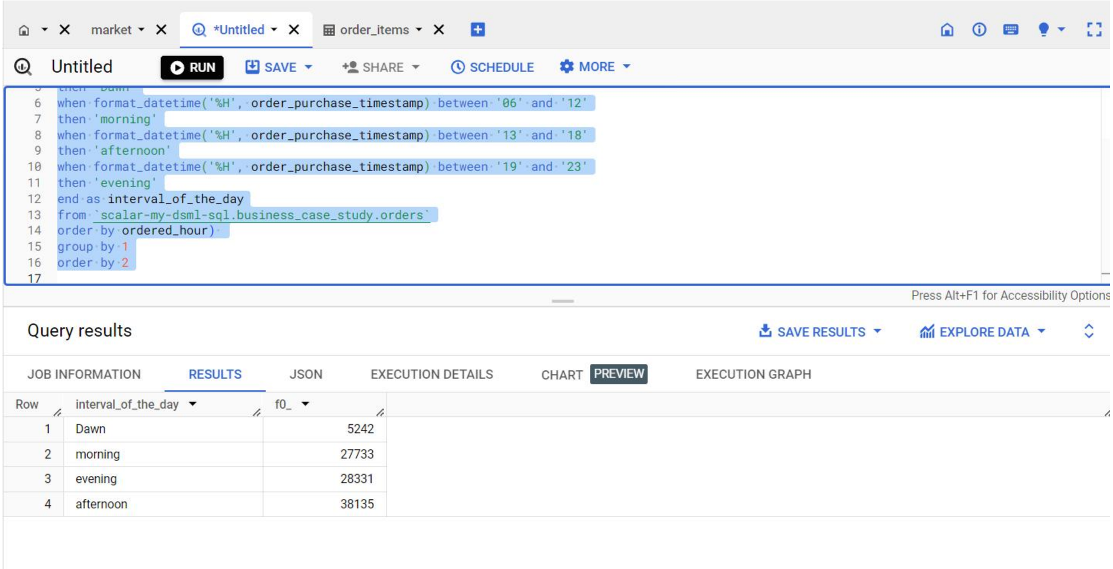
```
select distinct format_datetime('%m', order_purchase_timestamp) as order_month, count(order_id) as order_count
from `scalar-my-dsml-sql.business_case_study.orders`
group by 1
order by order_count, order_month
```

Row	order_month	order_count
1	09	4305
2	10	4959
3	12	5674
4	11	7544
5	01	8069
6	02	8508

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

```
select interval_of_the_day, count(interval_of_the_day)
from (select order_purchase_timestamp, format_datetime('%H',
order_purchase_timestamp) ordered_hour,
case
when format_datetime('%H', order_purchase_timestamp) between '00' and '06'
then 'Dawn'
when format_datetime('%H', order_purchase_timestamp) between '06' and '12'
then 'morning'
when format_datetime('%H', order_purchase_timestamp) between '13' and '18'
then 'afternoon'
when format_datetime('%H', order_purchase_timestamp) between '19' and '23'
then 'evening'
end as interval_of_the_day
from `scalar-my-dsml-sql.business_case_study.orders`
order by ordered_hour)
group by 1
order by 2
```



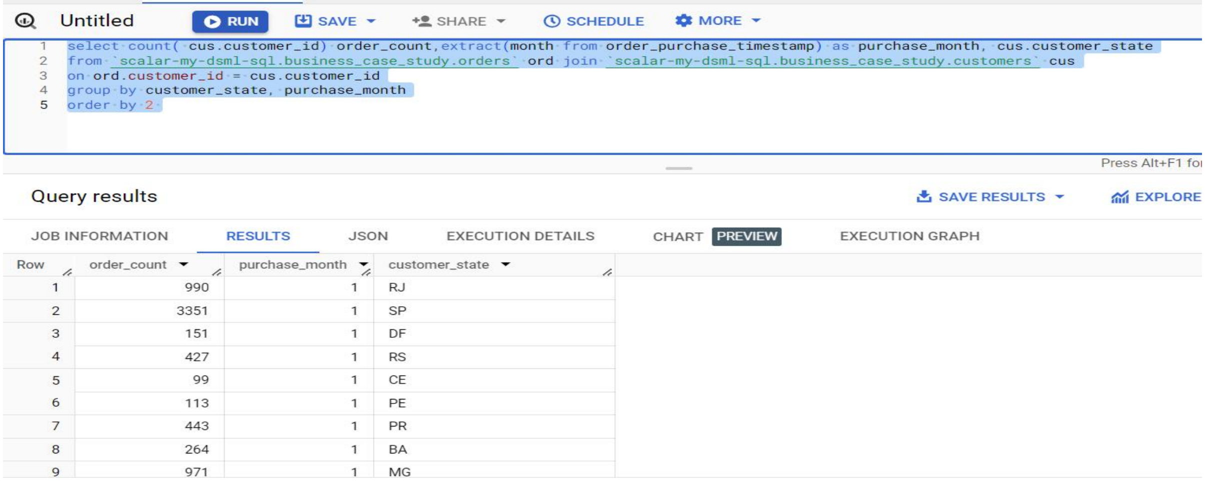
```
then 'Dawn'
when format_datetime('%H', order_purchase_timestamp) between '06' and '12'
then 'morning'
when format_datetime('%H', order_purchase_timestamp) between '13' and '18'
then 'afternoon'
when format_datetime('%H', order_purchase_timestamp) between '19' and '23'
then 'evening'
end as interval_of_the_day
from `scalar-my-dsml-sql.business_case_study.orders`
order by ordered_hour)
group by 1
order by 2
```

Row	interval_of_the_day	f0_
1	Dawn	5242
2	morning	27733
3	evening	28331
4	afternoon	38135

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

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

```
select count( cus.customer_id) order_count,extract(month from
order_purchase_timestamp) as purchase_month, cus.customer_state
from `scalar-my-dsml-sql.business_case_study.orders` ord join `scalar-my-dsml-
sql.business_case_study.customers` cus
on ord.customer_id = cus.customer_id
group by customer_state, purchase_month
order by 2
```



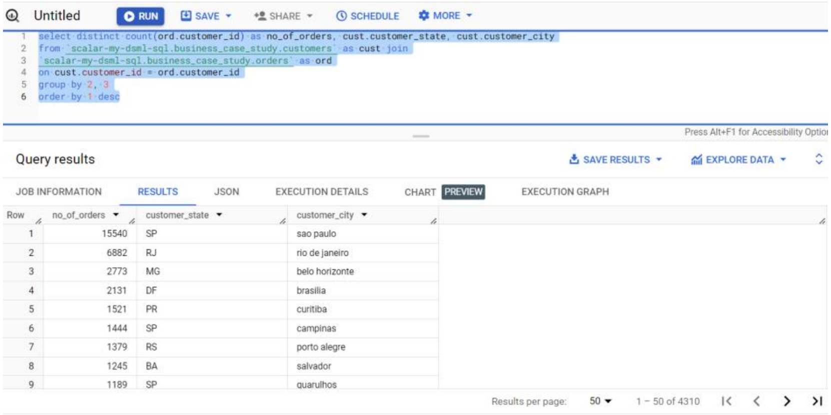
```
select count( cus.customer_id) order_count, extract(month from order_purchase_timestamp) as purchase_month, cus.customer_state
from `scalar-my-dsml-sql.business_case_study.orders` ord join `scalar-my-dsml-sql.business_case_study.customers` cus
on ord.customer_id = cus.customer_id
group by customer_state, purchase_month
order by 2
```

Query results

Row	order_count	purchase_month	customer_state
1	990	1	RJ
2	3351	1	SP
3	151	1	DF
4	427	1	RS
5	99	1	CE
6	113	1	PE
7	443	1	PR
8	264	1	BA
9	971	1	MG

--B.) How are the customers distributed across all the states?

```
select distinct count(ord.customer_id) as no_of_orders, cust.customer_state,
cust.customer_city
from `scalar-my-dsml-sql.business_case_study.customers` as cust join
`scalar-my-dsml-sql.business_case_study.orders` as ord
on cust.customer_id = ord.customer_id
group by 2, 3
order by 1 desc
```



```
select distinct count(ord.customer_id) as no_of_orders, cust.customer_state, cust.customer_city
from `scalar-my-dsml-sql.business_case_study.customers` as cust join
`scalar-my-dsml-sql.business_case_study.orders` as ord
on cust.customer_id = ord.customer_id
group by 2, 3
order by 1 desc
```

Query results

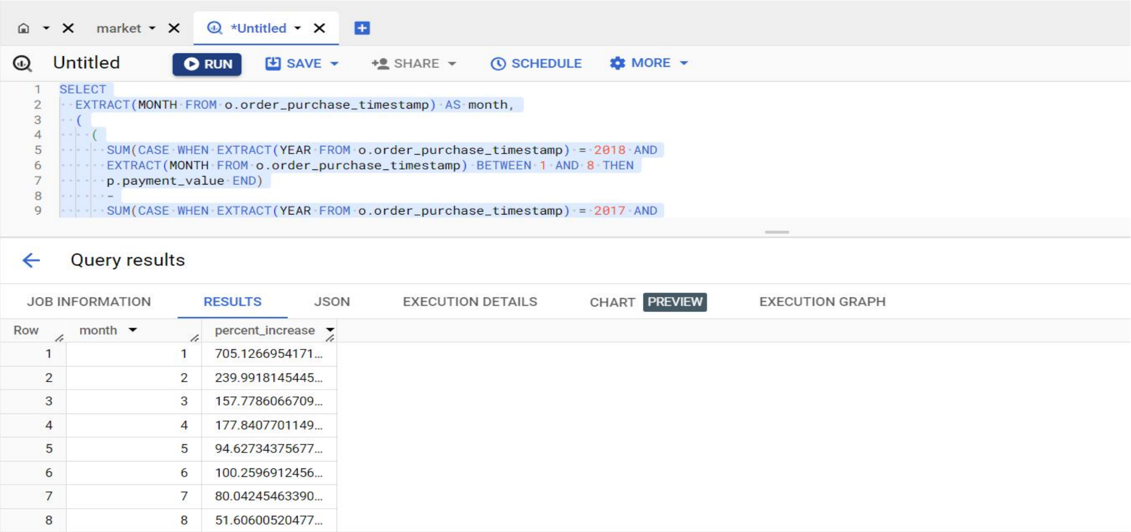
Row	no_of_orders	customer_state	customer_city
1	15540	SP	sao paulo
2	6882	RJ	rio de janeiro
3	2773	MG	belo horizonte
4	2131	DF	brasilia
5	1521	PR	curitiba
6	1444	SP	campinas
7	1379	RS	porto alegre
8	1245	BA	salvador
9	1189	SP	guarulhos

Results per page: 50 1 – 50 of 4310

IV. Impact on Economy: Analyze the money movement by e-commerce by 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).

```
SELECT
 EXTRACT(MONTH FROM o.order_purchase_timestamp) AS month,
 (
  (
    SUM(CASE WHEN EXTRACT(YEAR FROM o.order_purchase_timestamp) = 2018
AND
    EXTRACT(MONTH FROM o.order_purchase_timestamp) BETWEEN 1 AND 8 THEN
    p.payment_value END)
    -
    SUM(CASE WHEN EXTRACT(YEAR FROM o.order_purchase_timestamp) = 2017
AND
    EXTRACT(MONTH FROM o.order_purchase_timestamp) BETWEEN 1 AND 8 THEN
    p.payment_value END)
  )
  /
  SUM(CASE WHEN EXTRACT(YEAR FROM o.order_purchase_timestamp) = 2017
AND
  EXTRACT(MONTH FROM o.order_purchase_timestamp) BETWEEN 1 AND 8 THEN
  p.payment_value END)
 )*100 AS percent_increase
FROM
 `scalar-my-dsml-sql.business_case_study.orders` o
JOIN
 `scalar-my-dsml-sql.business_case_study.payments` p ON o.order_id = p.order_id
WHERE
 EXTRACT(YEAR FROM o.order_purchase_timestamp) IN (2017, 2018) AND
 EXTRACT(MONTH FROM o.order_purchase_timestamp) BETWEEN 1 AND 8
GROUP BY 1
ORDER BY 1;
```

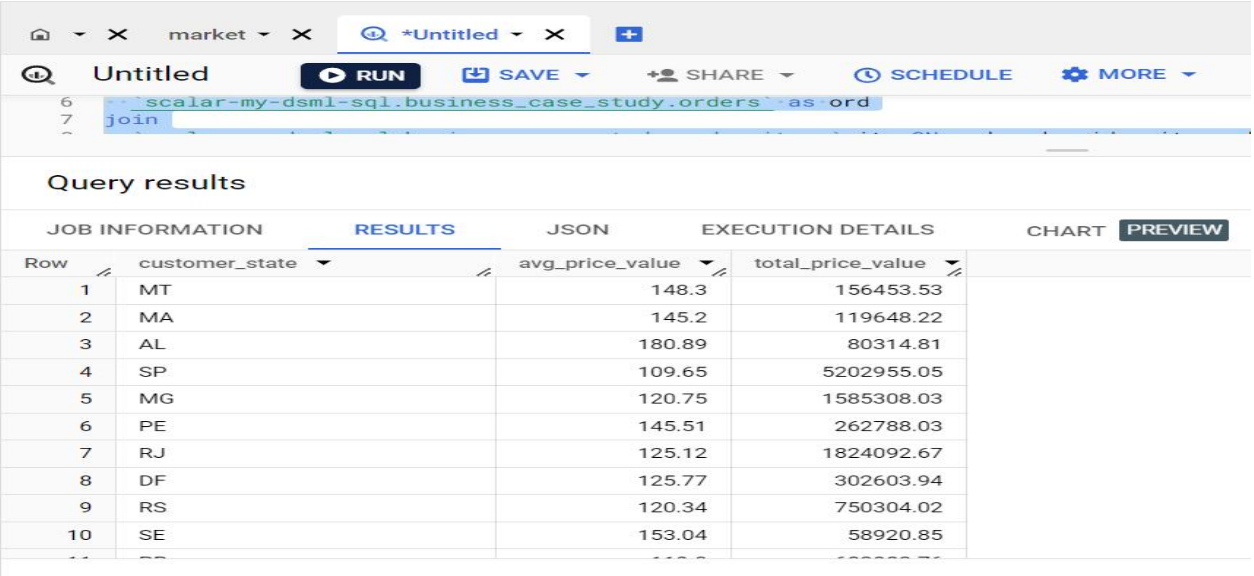


```
SELECT
  EXTRACT(MONTH FROM o.order_purchase_timestamp) AS month,
  (
    (
      SUM(CASE WHEN EXTRACT(YEAR FROM o.order_purchase_timestamp) = 2018 AND
      EXTRACT(MONTH FROM o.order_purchase_timestamp) BETWEEN 1 AND 8 THEN
      p.payment_value END)
      -
      SUM(CASE WHEN EXTRACT(YEAR FROM o.order_purchase_timestamp) = 2017 AND
```

Row	month	percent_increase
1	1	705.1266954171...
2	2	239.9918145445...
3	3	157.7786066709...
4	4	177.8407701149...
5	5	94.62734375677...
6	6	100.2596912456...
7	7	80.04245463390...
8	8	51.60600520477...

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

```
select
  cus.customer_state,
  round(avg(ite.price), 2) AS avg_price_value,
  round(sum(ite.price), 2) AS total_price_value
from
  `scalar-my-dsml-sql.business_case_study.orders` as ord
join
  `scalar-my-dsml-sql.business_case_study.order_items` ite ON ord.order_id =
ite.order_id
join
  `scalar-my-dsml-sql.business_case_study.customers` cus ON ord.customer_id =
cus.customer_id
group by
  cus.customer_state;
```



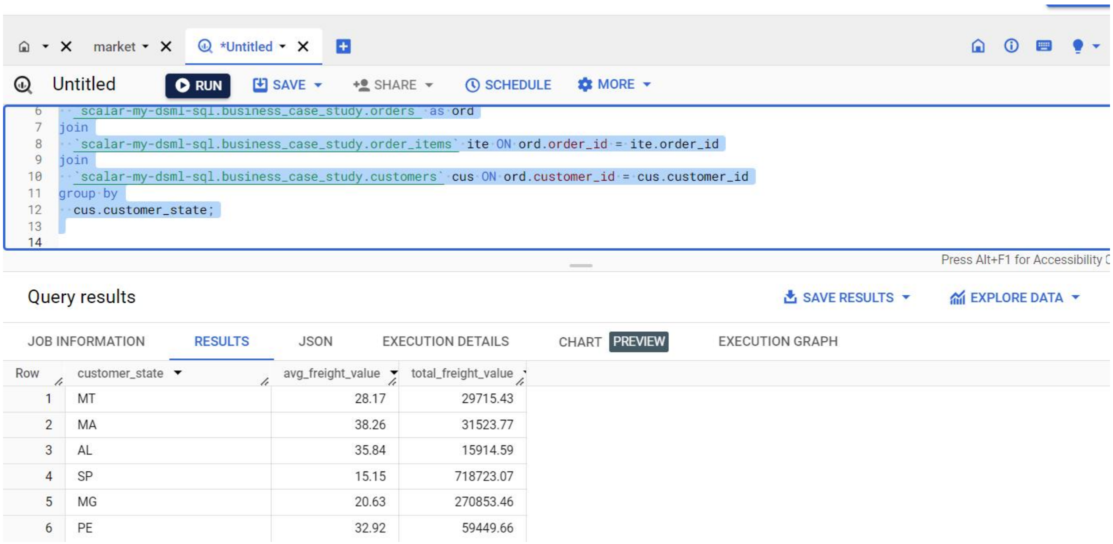
```
  `scalar-my-dsml-sql.business_case_study.orders` as ord
join
```

Row	customer_state	avg_price_value	total_price_value
1	MT	148.3	156453.53
2	MA	145.2	119648.22
3	AL	180.89	80314.81
4	SP	109.65	5202955.05
5	MG	120.75	1585308.03
6	PE	145.51	262788.03
7	RJ	125.12	1824092.67
8	DF	125.77	302603.94
9	RS	120.34	750304.02
10	SE	153.04	58920.85

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

```
select
  cus.customer_state,
  round(avg(ite.freight_value), 2) AS avg_freight_value,
  round(sum(ite.freight_value), 2) AS total_freight_value
from
  `scalar-my-dsml-sql.business_case_study.orders` as ord
join
  `scalar-my-dsml-sql.business_case_study.order_items` ite ON ord.order_id =
ite.order_id
join
  `scalar-my-dsml-sql.business_case_study.customers` cus ON ord.customer_id =
cus.customer_id
```

```
group by
  cus.customer_state;
```



```
  `scalar-my-dsml-sql.business_case_study.orders` as ord
join
  `scalar-my-dsml-sql.business_case_study.order_items` ite ON ord.order_id = ite.order_id
join
  `scalar-my-dsml-sql.business_case_study.customers` cus ON ord.customer_id = cus.customer_id
group by
  cus.customer_state;
```

Query results

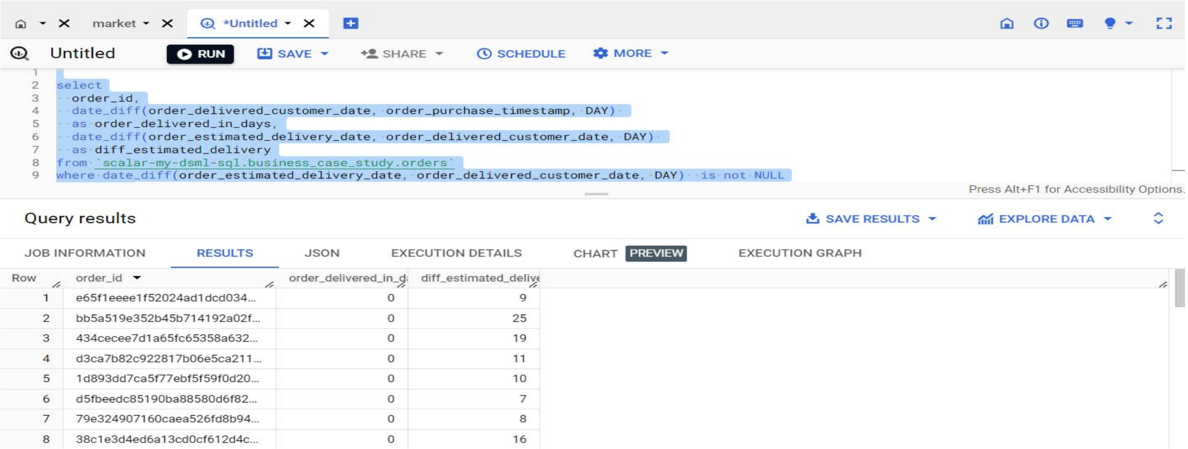
Row	customer_state	avg_freight_value	total_freight_value
1	MT	28.17	29715.43
2	MA	38.26	31523.77
3	AL	35.84	15914.59
4	SP	15.15	718723.07
5	MG	20.63	270853.46
6	PE	32.92	59449.66

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

A. 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.

```
select
  order_id,
  date_diff(order_delivered_customer_date, order_purchase_timestamp, DAY)
  as order_delivered_in_days,
  date_diff(order_estimated_delivery_date, order_delivered_customer_date, DAY)
  as diff_estimated_delivery
from `scalar-my-dsml-sql.business_case_study.orders`
where date_diff(order_estimated_delivery_date, order_delivered_customer_date,
DAY)  is not NULL
order by 2
```



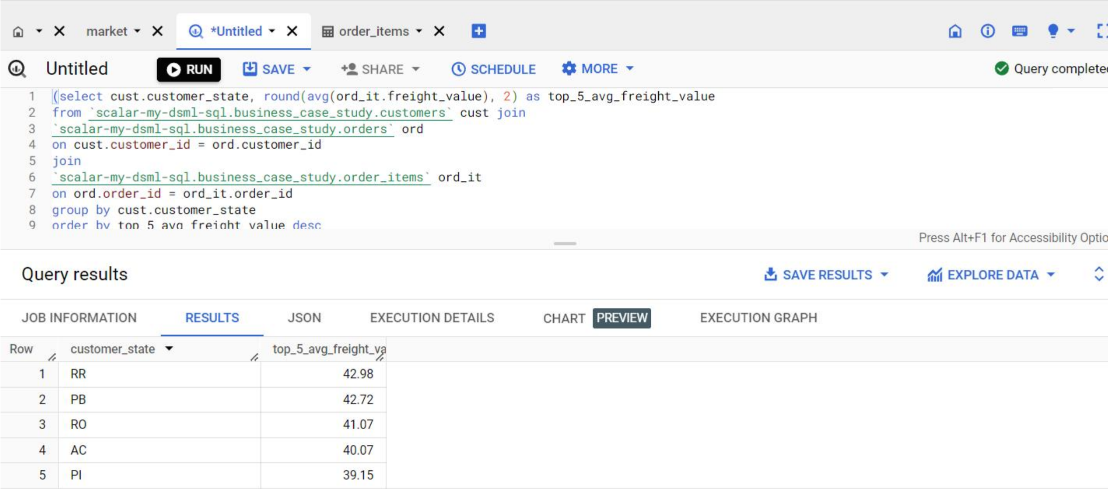
```
select
  order_id,
  date_diff(order_delivered_customer_date, order_purchase_timestamp, DAY)
  as order_delivered_in_days,
  date_diff(order_estimated_delivery_date, order_delivered_customer_date, DAY)
  as diff_estimated_delivery
from `scalar-my-dsml-sql.business_case_study.orders`
where date_diff(order_estimated_delivery_date, order_delivered_customer_date, DAY)  is not NULL
```

Query results

Row	order_id	order_delivered_in_d	diff_estimated_delive
1	e65f1eeee1f52024ad1dcd034...	0	9
2	bb5a519e352b45b714192a02f...	0	25
3	434cecee7d1a65fc65358a632...	0	19
4	d3ca7b82c922817b06e5ca211...	0	11
5	1d893dd7ca5f77ebf5f59f0d20...	0	10
6	d5fbeedc85190ba88580d6f82...	0	7
7	79e324907160caea526fd8b94...	0	8
8	38c1e3d4ed6a13cd0cf612d4c...	0	16

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

```
select cust.customer_state, round(avg(ord_it.freight_value), 2) as
top_5_avg_freight_value
from `scalar-my-dsml-sql.business_case_study.customers` cust join
`scalar-my-dsml-sql.business_case_study.orders` ord
on cust.customer_id = ord.customer_id
join
`scalar-my-dsml-sql.business_case_study.order_items` ord_it
on ord.order_id = ord_it.order_id
group by cust.customer_state
order by top_5_avg_freight_value desc
limit 5
```



```
(select cust.customer_state, round(avg(ord_it.freight_value), 2) as top_5_avg_freight_value
from `scalar-my-dsml-sql.business_case_study.customers` cust join
`scalar-my-dsml-sql.business_case_study.orders` ord
on cust.customer_id = ord.customer_id
join
`scalar-my-dsml-sql.business_case_study.order_items` ord_it
on ord.order_id = ord_it.order_id
group by cust.customer_state
order by top_5_avg_freight_value desc
```

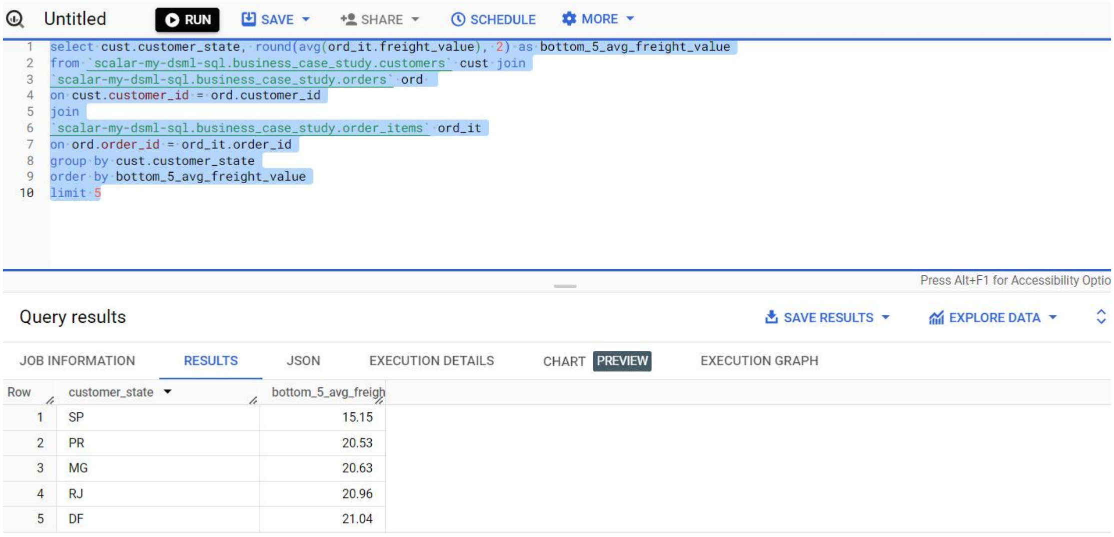
Query complete

Query results

Row	customer_state	top_5_avg_freight_va
1	RR	42.98
2	PB	42.72
3	RO	41.07
4	AC	40.07
5	PI	39.15

```
select cust.customer_state, round(avg(ord_it.freight_value), 2) as
bottom_5_avg_freight_value
from `scalar-my-dsml-sql.business_case_study.customers` cust join
`scalar-my-dsml-sql.business_case_study.orders` ord
on cust.customer_id = ord.customer_id
join
`scalar-my-dsml-sql.business_case_study.order_items` ord_it
```

```
on ord.order_id = ord_it.order_id
group by cust.customer_state
order by bottom_5_avg_freight_value
limit 5
```

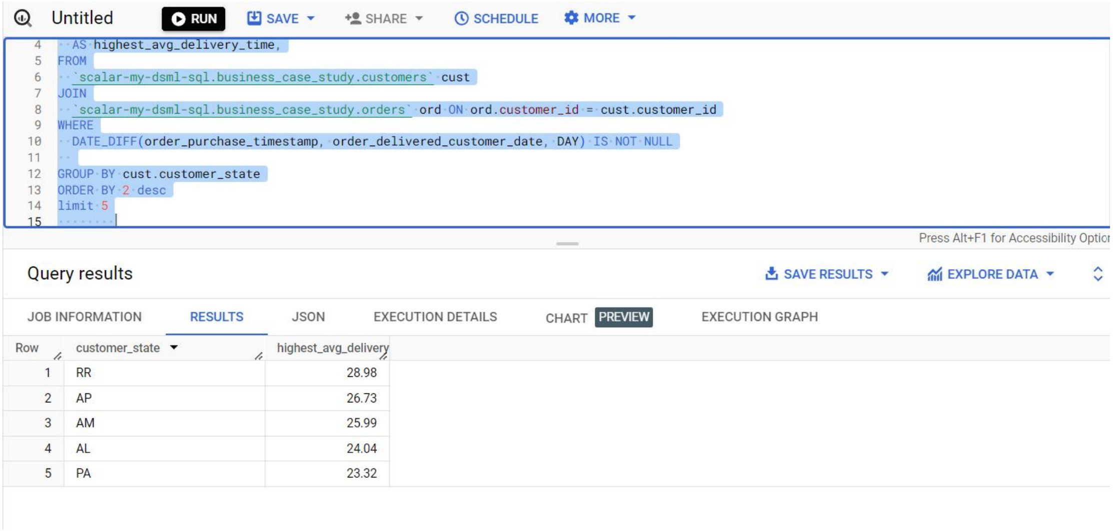


```
select cust.customer_state, round(avg(ord_it.freight_value), 2) as bottom_5_avg_freight_value
from `scalar-my-dsml-sql.business_case_study.customers` cust join
`scalar-my-dsml-sql.business_case_study.orders` ord
on cust.customer_id = ord.customer_id
join
`scalar-my-dsml-sql.business_case_study.order_items` ord_it
on ord.order_id = ord_it.order_id
group by cust.customer_state
order by bottom_5_avg_freight_value
limit 5
```

Row	customer_state	bottom_5_avg_freigh
1	SP	15.15
2	PR	20.53
3	MG	20.63
4	RJ	20.96
5	DF	21.04

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

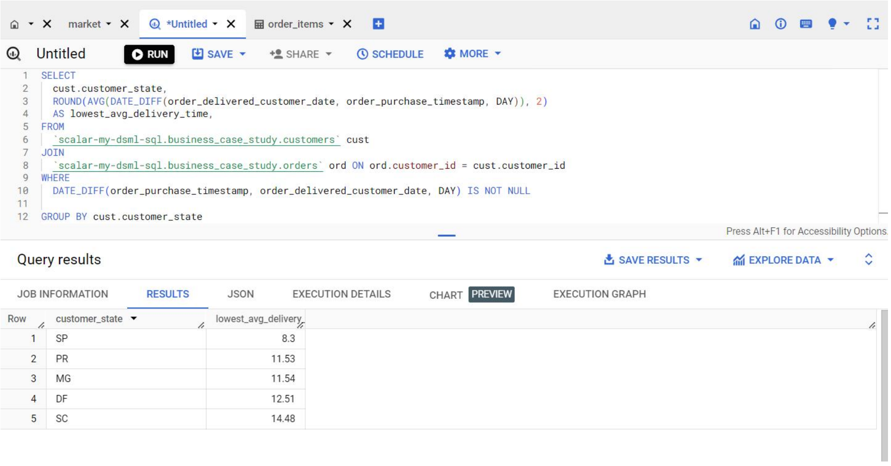
```
SELECT
  cust.customer_state,
  ROUND(AVG(DATE_DIFF(order_delivered_customer_date,
order_purchase_timestamp, DAY)), 2)
  AS highest_avg_delivery_time,
FROM
  `scalar-my-dsml-sql.business_case_study.customers` cust
JOIN
  `scalar-my-dsml-sql.business_case_study.orders` ord ON ord.customer_id =
cust.customer_id
WHERE
  DATE_DIFF(order_purchase_timestamp, order_delivered_customer_date, DAY) IS
NOT NULL

GROUP BY cust.customer_state
ORDER BY 2 desc
limit 5
```



```
  AS highest_avg_delivery_time,
FROM
  `scalar-my-dsml-sql.business_case_study.customers` cust
JOIN
  `scalar-my-dsml-sql.business_case_study.orders` ord ON ord.customer_id = cust.customer_id
WHERE
  DATE_DIFF(order_purchase_timestamp, order_delivered_customer_date, DAY) IS NOT NULL

GROUP BY cust.customer_state
ORDER BY 2 desc
limit 5
```

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

```
SELECT
  cust.customer_state,
  ROUND(AVG(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, DAY)), 2)
  AS lowest_avg_delivery_time,
FROM
  `scalar-my-dsml-sql.business_case_study.customers` cust
JOIN
  `scalar-my-dsml-sql.business_case_study.orders` ord ON ord.customer_id = cust.customer_id
WHERE
  DATE_DIFF(order_purchase_timestamp, order_delivered_customer_date, DAY) IS NOT NULL

GROUP BY cust.customer_state
ORDER BY 2
limit 5
```



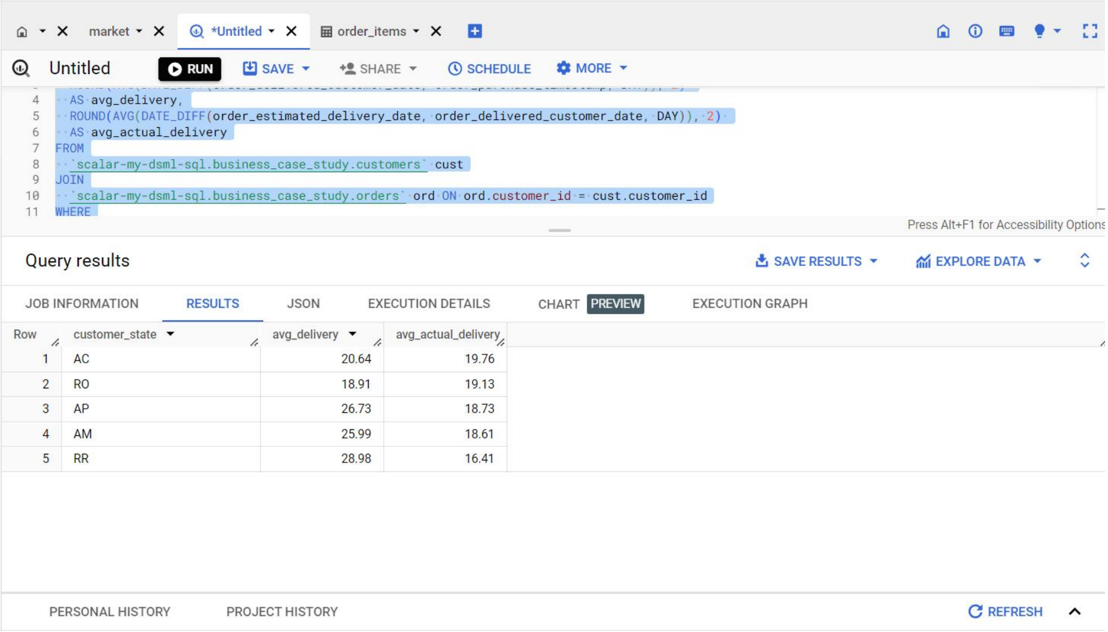
```
SELECT
  cust.customer_state,
  ROUND(AVG(DATE_DIFF(order_delivered_customer_date, order_purchase_timestamp, DAY)), 2)
  AS lowest_avg_delivery_time,
FROM
  `scalar-my-dsml-sql.business_case_study.customers` cust
JOIN
  `scalar-my-dsml-sql.business_case_study.orders` ord ON ord.customer_id = cust.customer_id
WHERE
  DATE_DIFF(order_purchase_timestamp, order_delivered_customer_date, DAY) IS NOT NULL

GROUP BY cust.customer_state
```

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

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

```
SELECT
  cust.customer_state,
  ROUND(AVG(DATE_DIFF(order_delivered_customer_date,
order_purchase_timestamp, DAY)), 2)
  AS avg_delivery,
  ROUND(AVG(DATE_DIFF(order_estimated_delivery_date,
order_delivered_customer_date, DAY)), 2)
  AS avg_actual_delivery
```

```
FROM
  `scalar-my-dsml-sql.business_case_study.customers` cust
JOIN
  `scalar-my-dsml-sql.business_case_study.orders` ord ON ord.customer_id =
cust.customer_id
WHERE
  DATE_DIFF(order_purchase_timestamp, order_delivered_customer_date, DAY) IS
NOT NULL
  AND
  DATE_DIFF(order_estimated_delivery_date, order_delivered_customer_date, DAY)
IS NOT NULL
GROUP BY
  cust.customer_state
ORDER BY 3 desc
limit 5
```



```
  AS avg_delivery,
  ROUND(AVG(DATE_DIFF(order_estimated_delivery_date, order_delivered_customer_date, DAY)), 2)
  AS avg_actual_delivery
FROM
  `scalar-my-dsml-sql.business_case_study.customers` cust
JOIN
  `scalar-my-dsml-sql.business_case_study.orders` ord ON ord.customer_id = cust.customer_id
WHERE
```

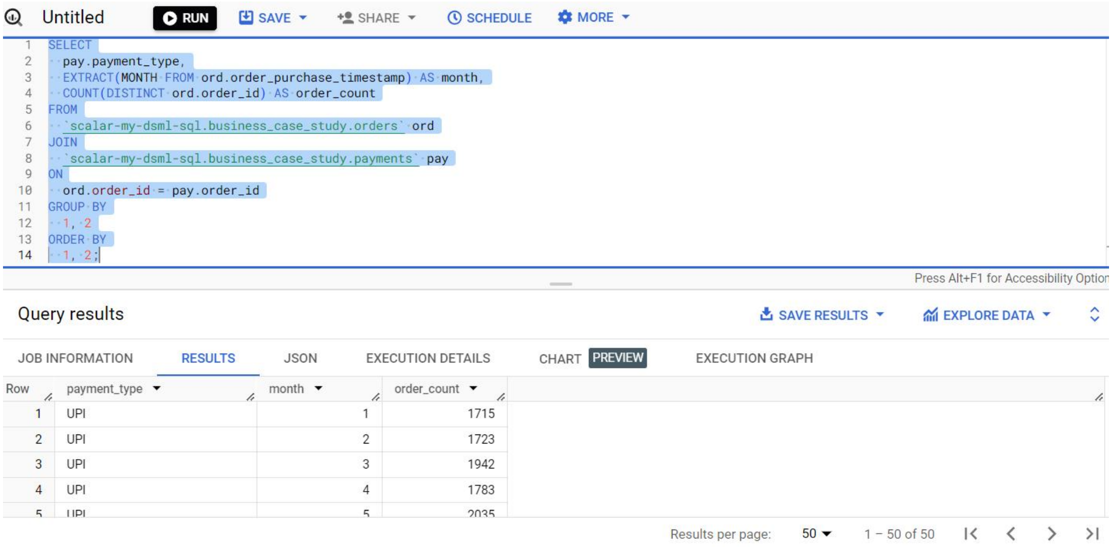
Query results

Row	customer_state	avg_delivery	avg_actual_delivery
1	AC	20.64	19.76
2	RO	18.91	19.13
3	AP	26.73	18.73
4	AM	25.99	18.61
5	RR	28.98	16.41

VI. Analysis based on the payments:
A. Find the month on month no. of orders placed using different payment types.

```
SELECT
  pay.payment_type,
  EXTRACT(MONTH FROM ord.order_purchase_timestamp) AS month,
  COUNT(DISTINCT ord.order_id) AS order_count
FROM
  `scalar-my-dsml-sql.business_case_study.orders` ord
JOIN
  `scalar-my-dsml-sql.business_case_study.payments` pay
ON
  ord.order_id = pay.order_id
```

```
GROUP BY
  1, 2
ORDER BY
  1, 2;
```



```
SELECT
  pay.payment_type,
  EXTRACT(MONTH FROM ord.order_purchase_timestamp) AS month,
  COUNT(DISTINCT ord.order_id) AS order_count
FROM
  `scalar-my-dsml-sql.business_case_study.orders` ord
JOIN
  `scalar-my-dsml-sql.business_case_study.payments` pay
ON
  ord.order_id = pay.order_id
GROUP BY
  1, 2
ORDER BY
  1, 2;
```

Row	payment_type	month	order_count
1	UPI	1	1715
2	UPI	2	1723
3	UPI	3	1942
4	UPI	4	1783
5	UPI	5	2035

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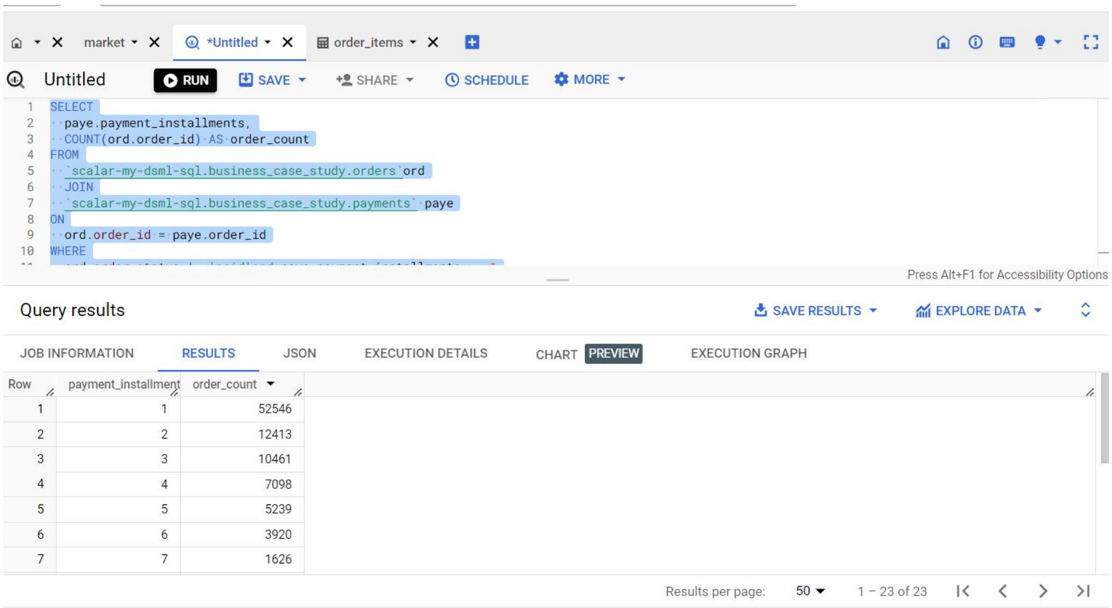
B. Find the no. of orders placed on the basis of the payment installments that have been paid.

```
SELECT
  paye.payment_installments,
  COUNT(ord.order_id) AS order_count
FROM
  `scalar-my-dsml-sql.business_case_study.orders`ord
  JOIN
  `scalar-my-dsml-sql.business_case_study.payments` paye
ON
  ord.order_id = paye.order_id
WHERE
  ord.order_status != 'paid'and paye.payment_installments >= 1
GROUP BY
  1
ORDER BY 1
```



```sql
SELECT
  paye.payment_installments,
  COUNT(ord.order_id) AS order_count
FROM
  `scalar-my-dsml-sql.business_case_study.orders`ord
  JOIN
  `scalar-my-dsml-sql.business_case_study.payments` paye
ON
  ord.order_id = paye.order_id
WHERE
```

Query results

Row	payment_installment	order_count
1	1	52546
2	2	12413
3	3	10461
4	4	7098
5	5	5239
6	6	3920
7	7	1626

Results per page: 50 1 – 23 of 23