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

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

output :

Filter Enter property name or value

Field name	Type	Mode	Key	Collation	Default Value
customer_id	STRING	NULLABLE	-	-	-
customer_unique_id	STRING	NULLABLE	-	-	-
customer_zip_code_prefix	INTEGER	NULLABLE	-	-	-
customer_city	STRING	NULLABLE	-	-	-
customer_state	STRING	NULLABLE	-	-	-

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

```
select min(order_purchase_timestamp) as first_order,
max(order_purchase_timestamp)as last_order
from `Target.orders`;
```

output –

Query results

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

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

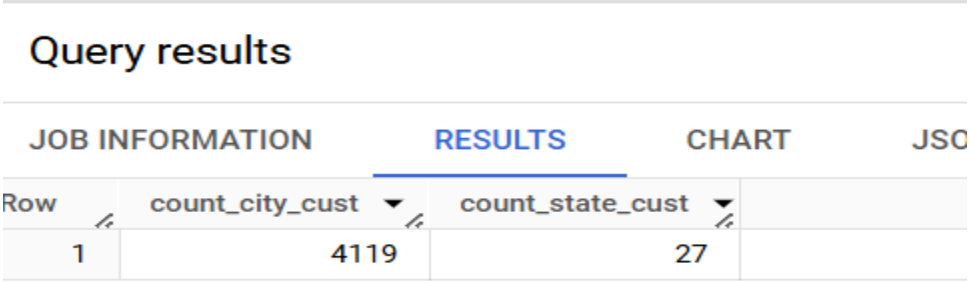
Insights

1. The very first_order was done on 2016-09-04 21:15:19.
2. The last order was done on 2018-10-17 17:30:18.

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

```
select count(distinct customer_city) count_city_cust,
count(distinct customer_state) count_state_cust
 from `Target.customers`;
```

output -



Insights

1. The very first_order was done on 2016-09-04 21:15:19.
2. The last order was done on 2018-10-17 17:30:18.

2) In-depth Exploration:

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

```
select extract(year from order_purchase_timestamp) YEAR,
extract(month from order_purchase_timestamp) MONTH,
COUNT(order_id) TOTAL
from `Target.orders`
group by year, month
order by year, month ;
```

output –

Query results

SAVE R

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

Row	YEAR	MONTH	TOTAL
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
11	2017	8	4331
12	2017	9	4285
13	2017	10	4631

Insights

1. The very first_order was done on 2016-09-04 21:15:19.

2. The last order was done on 2018-10-17 17:30:18.

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

```
SELECT EXTRACT(MONTH FROM
order_purchase_timestamp)MONTH_WISE_SALES,COUNT(ORDER_ID)Total
FROM `Target.orders`
GROUP BY MONTH_WISE_SALES
ORDER BY MONTH_WISE_SALES;
```

Output-

Query results

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAILS

Row	MONTH_WISE_SALE	Total
1	1	8069
2	2	8508
3	3	9893
4	4	9343
5	5	10573
6	6	9412
7	7	10318
8	8	10843
9	9	4305
10	10	4959
11	11	7544
12	12	5674

Insights

1. In January and February we have decent number of orders . But in the next 6 months that is from march to august the orders are gone up. Similarly the orders are reduced from sept to dec
2. So it is advisable to have good amount of storage in mar-aug season.

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 order_time,count(order_id) total

from

(select order_id,

case
```

```
when extract (time from order_purchase_timestamp) between "00:00:00" and "05:59:59" then "DAWN"
when extract (time from order_purchase_timestamp) between "06:00:00" and "11:59:59" then "MORNING"
when extract (time from order_purchase_timestamp) between "12:00:00" and "17:59:59" then "AFTERNOON"
ELSE "NIGHT"
END as order_time
from `Target.orders`) tbl
group by order_time ;
```

output-

Query results

JOB INFORMATION | RESULTS | CHART | JSON

Row	order_time	total
1	MORNING	22240
2	DAWN	4740
3	AFTERNOON	38361
4	NIGHT	34100

Insights

1. The Brazilian customers placed more orders during afternoon .

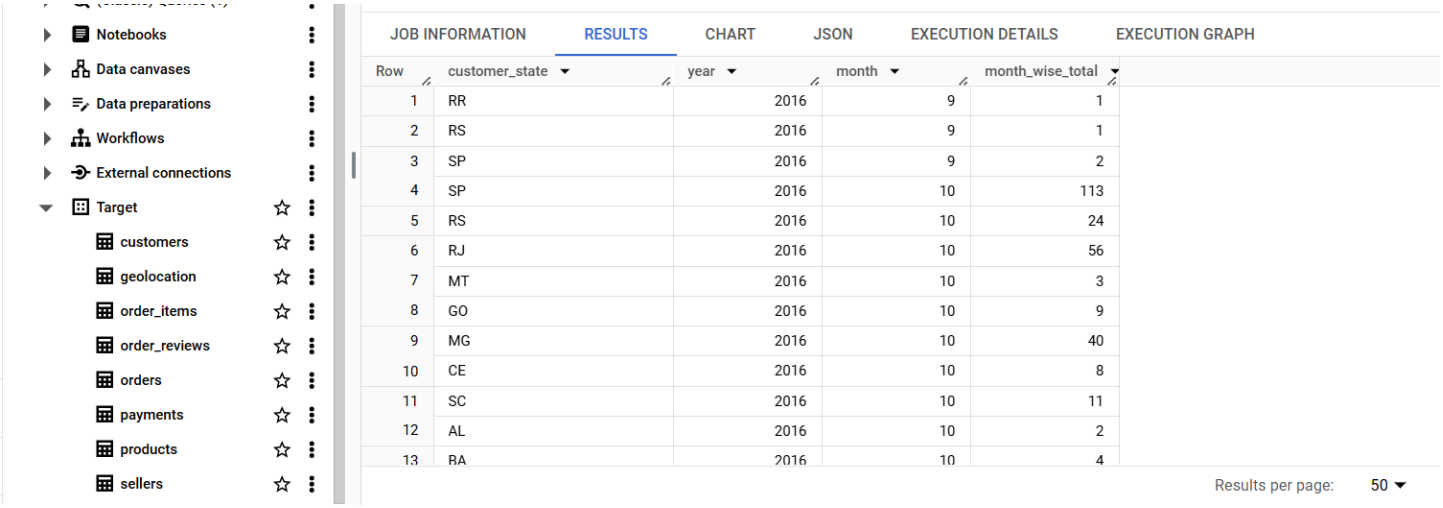
3.1. Get the month on month no. of orders placed in each state

```
select customer_state,extract(year from order_purchase_timestamp)year,
extract(month from order_purchase_timestamp)month,count(order_id)month_wise_total
from `Target.orders`
 inner join Target.customers c
 using (customer_id)
```

group by customer_state,year,month

order by year,month;

output -



Row	customer_state	year	month	month_wise_total
1	RR	2016	9	1
2	RS	2016	9	1
3	SP	2016	9	2
4	SP	2016	10	113
5	RS	2016	10	24
6	RJ	2016	10	56
7	MT	2016	10	3
8	GO	2016	10	9
9	MG	2016	10	40
10	CE	2016	10	8
11	SC	2016	10	11
12	AL	2016	10	2
13	BA	2016	10	4

Results per page: 50

Insights

1. A total of 654 orders have been received from the state SP alone in February 2017 which is the highest among all the states in a single month.

2. Increase the orders in the other state as well by giving discount, buy one get one free, combo Offers.

3.2. How are the customers distributed across all the states?

select customer_state,count(customer_id)Total_customers

from `target.customers`

group by customer_state

order by Total_customers desc;

output –

Query results

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTI

Row	customer_state	total_cust
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
11	PE	1652
12	CE	1336
13	PA	975

Insights

1.SP RJ and MG are the top three states in terms of number of orders

4.1. 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 order_purchase_timestamp)year,sum(payment_value)cost
from `Target.payments`
inner join`Target.orders`
using (order_id)
where extract(month from order_purchase_timestamp) between 01 and 08
group by year
order by year),
```

cte1 as

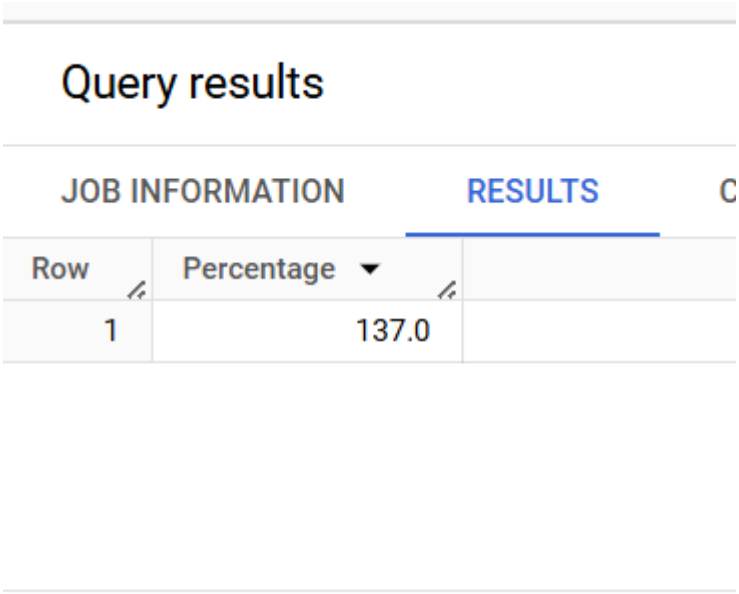
(select year,cost,lead(cost) over(order by year)next_cost,(((lead(cost) over(order by year)-cost)/cost)*100)change_in_percentage from cte)

select round(change_in_percentage) Percentage

from cte1

limit 1;

output-



Insights

1. There has been approximately 137% change in cost of orders in the year 2018 compared to 2017. For comparison only jan-aug months have been included from both the years

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

select customer_state,round(sum(price),2)total_value,round(avg(price),2)avg_value

from `Target.customers`

inner join `Target.orders` o

using(customer_id)

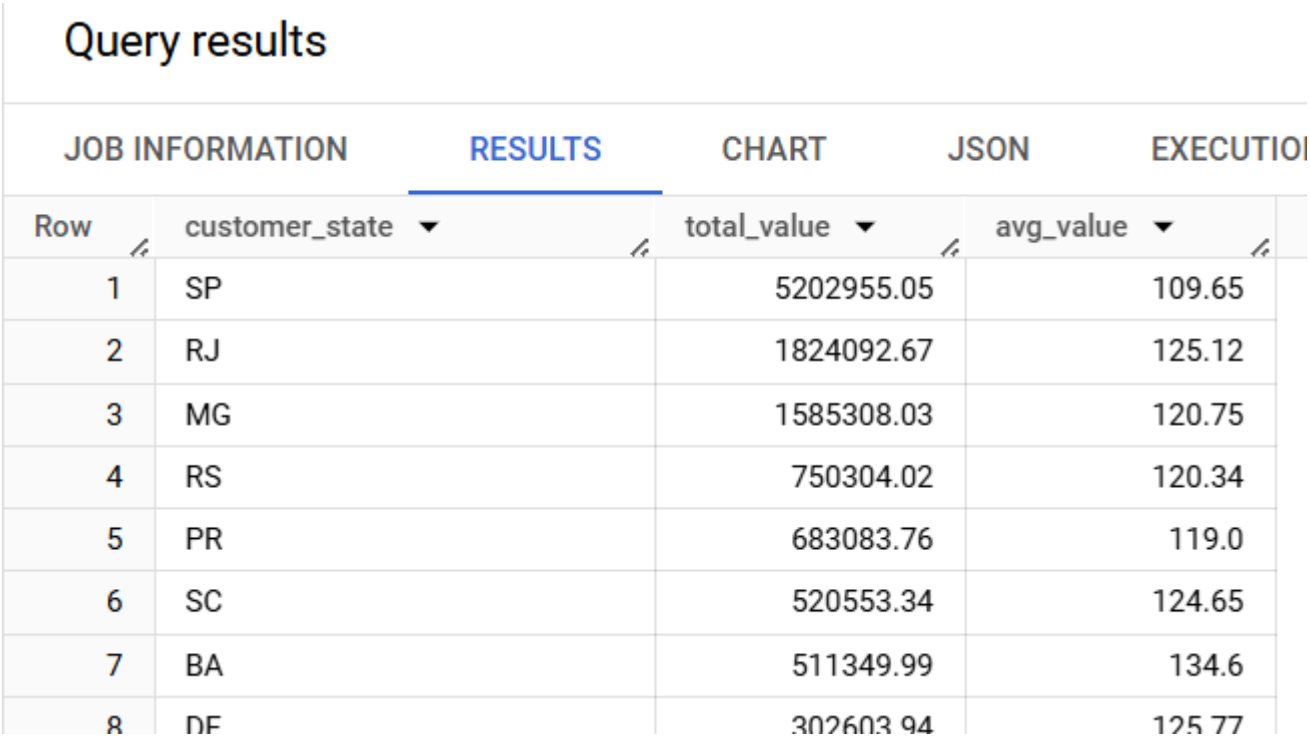
inner join `Target.order_items` oi

on o.order_id=oi.order_id

group by customer_state

order by total_value desc,avg_value desc;

output -



Row	customer_state	total_value	avg_value
1	SP	5202955.05	109.65
2	RJ	1824092.67	125.12
3	MG	1585308.03	120.75
4	RS	750304.02	120.34
5	PR	683083.76	119.0
6	SC	520553.34	124.65
7	BA	511349.99	134.6
8	DF	302603.94	125.77

Insights

1. SP, RJ and MG are top three states in terms of total value.

2. PB, AL and AC are top three states in terms of average value of an order.

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

```
select
customer_state,round(sum(freight_value),2)total_freight_value,round(avg(freight_value),2)avg_value
from `Target.customers`
inner join `Target.orders` o
using (customer_id)
inner join `Target.order_items` oi
on o.order_id=oi.order_id
group by customer_state
order by total_freight_value desc,avg_value;
```

output -

output -

Query results

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETAI

Row	customer_state	total_freight_value	avg_value
1	SP	718723.07	15.15
2	RJ	305589.31	20.96
3	MG	270853.46	20.63
4	RS	135522.74	21.74
5	PR	117851.68	20.53
6	BA	100156.68	26.36
7	SC	89660.26	21.47
8	PE	59449.66	32.92
9	GO	53114.98	22.77
10	DF	50625.5	21.04
11	ES	49764.6	22.06

Insights

1. SP, RJ, MG are having more freight value because the orders from these states are also more.

2. RR, PB, RO are having more average freight value than all other states.

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

```
select order_id,date_diff(order_delivered_customer_date,
order_purchase_timestamp,day)time_to_deliver,
date_diff(order_delivered_customer_date,
order_estimated_delivery_date,day)diff_estimated_delivery
from `Target.orders`;
```

output –

Query results

JOB INFORMATION | RESULTS | CHART | JSON | EXECU

Row	order_id	time_to_deliver	diff_estimated_delivery
1	1950d777989f6...	30	12
2	2c45c33d2f9cb...	30	-28
3	65d1e226dfaeb...	35	-16
4	635c894d068a...	30	-1
5	3b97562c3aee...	32	0
6	68f47f50f04c4...	29	-1
7	276e9ec344d3...	43	4
8	54e1a3c2b97fb...	40	4
9	fd04fa4105ee8...	37	1
10	302bb8109d09...	33	5
11	66057d37308e...	38	6

Insights

1. SP, RJ, MG are having more freight value because the orders from these states are also more. 2. RR, PB, RO are having more average freight value than all other states.

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

Top 5 Highest avg freight value states

```
select customer_state,avg_freight

from

(select customer_state,round(avg(freight_value),2)avg_freight,dense_rank()

over(order by round(avg(freight_value),2) desc)rnk

from `Target.customers`

inner join `Target.orders` o

using (customer_id)

inner join `Target.order_items` oi
```

on o.order_id=oi.order_id

group by customer_state

order by rnk)tbl

limit 5;

output –

Query results

JOB INFORMATION | RESULTS | CHART | JSON

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

Insights

1. SP, RJ, MG are having more freight value because the orders from these states are also more.

2. RR, PB, RO are having more average freight value than all other states.

Top 5 lowest avg freight value states

select customer_state,avg_freight

from

(select customer_state,round(avg(freight_value),2)avg_freight,dense_rank()

over(order by round(avg(freight_value),2))rnk

from `Target.customers`

inner join `Target.orders` o

using (customer_id)

inner join `Target.order_items` oi

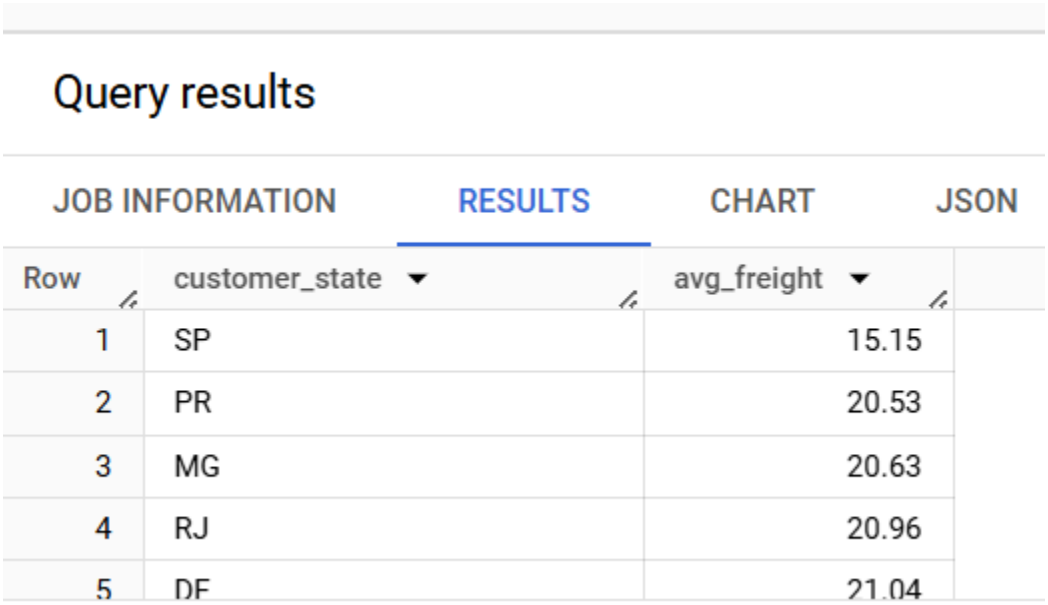
on o.order_id=oi.order_id

group by customer_state

order by rnk)tbl

limit 5

output –



Query results

JOB INFORMATION | RESULTS | CHART | JSON

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

Insights

1. SP, PR, MG, RJ, DF are having lowest avg freight charges compared to other states.

5.3 Find out the top 5 states with the highest & lowest average delivery time

Top_5_highest_avg_delivery_time

select customer_state,avg_delivery_time

from

(select

customer_state,round(avg(date_diff(order_delivered_customer_date,order_purchase_timestamp,day)),2)avg_delivery_time,

dense_rank() over(order by

round(avg(date_diff(order_delivered_customer_date,order_purchase_timestamp,day)),2)desc)rnk

from `Target.customers`

inner join `Target.orders` o

using (customer_id)

inner join `Target.order_items` oi

on o.order_id=oi.order_id

group by customer_state

order by rnk)tbl

limit 5;

output-

Query results

JOB INFORMATION | RESULTS | CHART | JSON | E

Row	customer_state	Highest_avg_delivery_time
1	RR	27.83
2	AP	27.75
3	AM	25.96
4	AL	23.99
5	PA	23.3

Insights

1. RR, AP, AM, AL and PA are top 5 states in terms of taking more avg delivery time.

Top_5_lowest_avg_delivery_time

select customer_state,avg_delivery_time

from

(select

customer_state,round(avg(date_diff(order_delivered_customer_date,order_purchase_timestamp,day)),2)avg_delivery_time,

dense_rank() over(order by

round(avg(date_diff(order_delivered_customer_date,order_purchase_timestamp,day)),2)asc)rnk

from `Target.customers`

inner join `Target.orders` o

using (customer_id)

inner join `Target.order_items` oi

on o.order_id=oi.order_id

group by customer_state

order by rnk)tbl

limit 5;

output –

Query results

JOB INFORMATION | RESULTS | CHART | JSON | EXE

Row	customer_state	Lowest_avg_delivery_time
1	SP	8.26
2	PR	11.48
3	MG	11.52
4	DF	12.5
5	SC	14.52

Insights

1. SP, PR, MG, DF and SC are top 5 states in terms of taking less avg delivery time.

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

top_5_fastest delivery states

select customer_state,difference

from

(select

customer_state,round(avg(date_diff(order_delivered_customer_date,order_estimated_delivery_date,day)),2)difference,

dense_rank() over(order by

round(avg(date_diff(order_delivered_customer_date,order_estimated_delivery_date,day)),2) asc)rnk

```
from `Target.customers`
inner join `Target.orders` o
using(customer_id)
inner join `Target.order_items` oi
on o.order_id=oi.order_id
group by customer_state
order by difference ) tbl
limit 5 ;
```

output-

Query results

JOB INFORMATION | RESULTS | CHART | JSON

Row	customer_state	difference
1	AC	-20.01
2	RO	-19.08
3	AM	-18.98
4	AP	-17.44
5	RR	-17.43

Insights

1. Ac, RO, AM, AP, RR are the states where the order delivery is really fast as compared to the estimated date of delivery.

top_5_slowest delivery states

```
select customer_state,difference
from
(select
```

```
customer_state,round(avg(date_diff(order_delivered_customer_date,order_estimated_delivery_date,day)),2)difference,

dense_rank() over(order by
round(avg(date_diff(order_delivered_customer_date,order_estimated_delivery_date,day)),2) desc)rnk

from `Target.customers`)

inner join `Target.orders` o

using(customer_id)

inner join `Target.order_items` oi

on o.order_id=oi.order_id

group by customer_state
```

output –

Query results

JOB INFORMATION | RESULTS | CHART | JSON

Row	customer_state	difference
1	AL	-7.98
2	MA	-9.11
3	SE	-9.17
4	ES	-9.77
5	BA	-10.12

Insights

1. AL, MA, SE, ES, BA are the states where the order delivery is slow among all the states as compared to the estimated date of delivery.

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

```
select extract(year from order_purchase_timestamp)year,extract(month from

order_purchase_timestamp)month,

payment_type,count(order_id)Total

from `Target.orders`
```

inner join `Target.payments`

using(order_id)

group by year,month,payment_type

order by year,month;

output-

Query results

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

Row	year	month	payment_type	Total
1	2016	9	credit_card	3
2	2016	10	credit_card	254
3	2016	10	voucher	23
4	2016	10	debit_card	2
5	2016	10	UPI	63
6	2016	12	credit_card	1
7	2017	1	voucher	61
8	2017	1	UPI	197
9	2017	1	credit_card	583
10	2017	1	debit_card	9
11	2017	2	credit_card	1356

Insights

1. From the data provided we can see that we have only 3 months(9,10,12) data in the year 2016.

2. Multiple payment options voucher, credit card, UPI, Debit card were used for making the payments.

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

select payment_installments,count(order_id)total

from `Target.payments`

where payment_installments >0 and payment_value>0

group by payment_installments;

output -

Query results

JOB INFORMATION | RESULTS | CHART | JSO

Row	payment_installment	total
1	1	52537
2	2	12413
3	3	10461
4	4	7098
5	5	5239
6	6	3920
7	7	1626
8	8	4268
9	9	644
10	10	5328
11	11	23

Insights

1. The output includes data about the no of installments and amount that is paid

Here are key recommendations:

1. Seasonal Inventory Planning

• Increase storage capacity from March to August to handle higher order volumes

• Implement dynamic inventory management for seasonal fluctuations

• Plan for reduced storage needs from September to December

• Maintain adequate stock levels in January-February for decent order volumes

2. Regional Focus

• Prioritize SP, RJ, and MG states which show highest sales performance

• Introduce promotional campaigns in lower-performing states

• Consider establishing distribution centers in high-volume states

• Target marketing efforts in states with potential for growth

3. Delivery System Improvements

• Address delivery delays in AL, MA, SE, ES, and BA states

• Study and replicate efficient delivery systems from SP, PR, MG, DF, and SC

4. Growth Areas

• Target expansion in states showing potential but lower volumes

• Develop strategies for states with high average order values (PB, AL, AC)

• Consider local partnerships in underserved regions

• Implement customer retention programs in high-performing states

5. Data Analytics Enhancement
   - Continue monitoring ordering patterns and trends
   - Track delivery performance metrics
   - Analyze payment preferences and installment patterns
   - Monitor regional performance variations

6..Infrastructure Development

• Strengthen logistics in states with delivery challenges

• Improve warehousing capabilities in high-volume region

s • Develop better last-mile delivery solutions

• Enhance tracking and monitoring systems