



## Target Business Case study using SQL (Big query)

Target is a globally renowned brand and a prominent retailer in the United States. Target makes itself a preferred shopping destination by offering outstanding value, inspiration, innovation and an exceptional guest experience that no other retailer can deliver.

This particular business case focuses on the operations of Target in Brazil and provides insightful information about 100,000 orders placed between 2016 and 2018. The dataset offers a comprehensive view of various dimensions including the order status, price, payment and freight performance, customer location, product attributes, and customer reviews.

By analyzing this extensive dataset, it becomes possible to gain valuable insights into Target's operations in Brazil. The information can shed light on various aspects of the business, such as order processing, pricing strategies, payment and shipping efficiency, customer demographics, product characteristics, and customer satisfaction levels.

#1 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 `intense-digit-416417.Target_Business_case_study.INFORMATION_SCHEMA.COLUMNS`
WHERE
    table_name = 'customers';
```

Query results

JOB INFORMATION		RESULTS	CHART	JSON	EXECUTION DETAILS	EXECUTION GRAPH
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				

Insight: -

Out of 5 columns in the customer table 4 columns are string (VARCHAR) and 1 column is integer, this shows that most of the data related to date and texts is saved as string in this table except zip code.

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

```
WITH dates AS (  
  select date(MIN(order_purchase_timestamp)) AS start_date,  
         date(MAX(order_purchase_timestamp)) AS end_date  
from `Target_Business_case_study.orders`  
  
)  
  
SELECT  
  CONCAT(  
    CAST(DATE_DIFF(end_date, start_date, YEAR) AS STRING), ' years ',  
    CAST(DATE_DIFF(end_date, start_date, MONTH) AS STRING), ' months ',  
    CAST(DATE_DIFF(end_date, start_date, DAY) AS STRING), ' days'  
  ) AS Range_of_period, start_date, end_date  
FROM dates
```

Query results					
JOB INFORMATION		RESULTS	CHART	JSON	EXECUTION D
Row	Range_of_period	start_date	end_date		
1	2 years 25 months 773 days	2016-09-04	2018-10-17		

Insight:

The dataset encompasses orders spanning from April 9th, 2016, to October 17th, 2018, totaling a period of 2 years, equivalent to 25 months or 773 days. This comprehensive time frame serves as a crucial resource for analyzing order patterns, identifying trends, and understanding seasonality within the data.

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

```
with cte as (  
    select MIN(order_purchase_timestamp) AS start_time, MAX(order_purchase_timestamp)  
    AS end_time  
    from `Target_Business_case_study.customers` as c  
    inner join `Target_Business_case_study.orders` as o on o.customer_id = c.customer_id)  
  
select count(distinct customer_city) as unique_city_count, count(distinct  
customer_state) as unique_state_count  
from `Target_Business_case_study.customers` as c  
inner join `Target_Business_case_study.orders` as o on o.customer_id = c.customer_id  
where order_purchase_timestamp between (select cte.start_time from cte) and (select  
cte.end_time from cte)
```

Query results				
JOB INFORMATION		RESULTS	CHART	JSON
Row	unique_city_count	unique_state_count		
1	4119	27		

Insight:-

Within this dataset, customers are placing orders from a broad spectrum of 27 distinct states and a total of 4,119 unique cities. Delving into the expansive geographic reach of the company can unveil valuable insights, such as identifying thriving cities or states based on order volumes and conducting comprehensive regional analyses. Additionally, if a specific city or state experiences a decline in orders, we can investigate shipping durations and customer reviews to pinpoint any operational challenges that may be affecting performance.

## #2. In-depth Exploration

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

```
with cte as(select distinct FORMAT_DATE('%Y-%m', DATE(EXTRACT(YEAR FROM
order_purchase_timestamp), EXTRACT(MONTH FROM order_purchase_timestamp), 1)) as
year_month ,count(order_id) orderscount
from `Target_Business_case_study.orders`
group by FORMAT_DATE('%Y-%m', DATE(EXTRACT(YEAR FROM order_purchase_timestamp),
EXTRACT(MONTH FROM order_purchase_timestamp), 1) )
order by year_month)
select year_month , orderscount,lead(orderscount,1) over (order by year_month) as
next_month_ordercount, (lead(orderscount,1) over (order by year_month)-orderscount)as
ordercount_difference,
case when (lead(orderscount,1) over (order by year_month)-orderscount) >0 then 'yes'
else 'no' end as increased_Yes_No
from cte
order by year_month
```

Query results						
JOB INFORMATION		RESULTS	CHART	JSON	EXECUTION DETAILS	EXECUTION GRAPH
Row	year_month	orderscount	next_month_ordercount	ordercount_difference	increased_Yes_No	
1	2016-09	4	324	320	yes	
2	2016-10	324	1	-323	no	
3	2016-12	1	800	799	yes	
4	2017-01	800	1780	980	yes	
5	2017-02	1780	2682	902	yes	
6	2017-03	2682	2404	-278	no	
7	2017-04	2404	3700	1296	yes	
8	2017-05	3700	3245	-455	no	
9	2017-06	3245	4026	781	yes	

```
SELECT EXTRACT(YEAR FROM order_purchase_timestamp) AS year,
COUNT(*) AS number_of_orders
FROM `Target_Business_case_study.orders`
GROUP BY year
ORDER BY year;
```

Query results			
JOB INFORMATION		RESULTS	CHART
Row	year	number_of_orders	
1	2016	329	
2	2017	45101	
3	2018	54011	

Insight: - The data reveals a consistent upward trajectory in the volume of orders throughout the year. This increase in order frequency serves as a clear indicator of the company's expansion and ongoing growth.

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

```
select distinct month_of_order, Month_name, avg_orders_monthly
from (
with cte as (
select date_trunc(order_purchase_timestamp, month) as ordermonth, count(order_id) as
No_of_counts
FROM `Target_Business_case_study.orders`
group by 1
order by 1)
select extract(year from ordermonth) as year_of_order,
extract(month from ordermonth) as month_of_order,
format_date('%B', ordermonth ) as Month_name, ordermonth, No_of_counts,
avg(No_of_counts) over (partition by format_date('%B', ordermonth ) ) as
avg_orders_monthly
from cte
order by 1,2)
order by 3 desc
```

Query results					
JOB INFORMATION		RESULTS	CHART	JSON	EXECUTION DETAILS
Row	month_of_order	Month_name	avg_orders_monthly		
1	11	November	7544.0		
2	8	August	5421.5		
3	5	May	5286.5		
4	7	July	5159.0		
5	3	March	4946.5		
6	6	June	4706.0		
7	4	April	4671.5		
8	2	February	4254.0		
9	1	January	4034.5		
10	12	December	2837.0		

Insight :-

Drawing connections between spikes in orders and local events is invaluable here. We notice a significant surge in orders during November, attributed to the country's Republic Day celebrations, as well as pre-orders for Christmas and New Year festivities. Furthermore, São Paulo hosts the largest film festival in South America annually in August, coinciding with numerous local carnivals across various cities in Brazil during the same month. These correlations highlight the impact of cultural and seasonal events on consumer behavior, offering valuable insights for strategic planning and marketing initiatives.

We can introduce some discounts on December to attract more customers as it is the lowest number of orders amongst entire 12 months.

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
case when extract(hour from order_purchase_timestamp) between 0 and 6 then 'Dawn'
when extract(hour from order_purchase_timestamp) between 7 and 12 then 'Morning'
when extract(hour from order_purchase_timestamp) between 13 and 18 then 'Afternoon'
when extract(hour from order_purchase_timestamp) between 19 and 23 then 'Night'
end as time_of_day,
count(order_id) as order_count
from `Target_Business_case_study.orders`
group by (case when extract(hour from order_purchase_timestamp) between 0 and 6 then
'Dawn'
when extract(hour from order_purchase_timestamp) between 7 and 12 then 'Morning'
when extract(hour from order_purchase_timestamp) between 13 and 18 then 'Afternoon'
when extract(hour from order_purchase_timestamp) between 19 and 23 then 'Night'
end)
order by 2 desc
```

Query results				
JOB INFORMATION		RESULTS	CHART	JSON
Row	time_of_day	order_count		
1	Afternoon	38135		
2	Night	28331		
3	Morning	27733		
4	Dawn	5242		

Insight:- The query categorizes order timestamps based on the hour component into different time intervals (Dawn, Morning, Afternoon, Night). Subsequently, the results are arranged in descending order based on the count of orders within each time interval.

We can determine the preferred ordering times of Brazilian clients through data analysis, providing insights into their habits and preferences. Our findings reveal that Brazilian customers tend to place more orders during the afternoon, suggesting a peak in online shopping activity during this time. Utilizing this knowledge, we can optimize operations by scheduling customer assistance personnel or implementing targeted marketing strategies during peak ordering periods. Additionally, we observe that orders are least frequent during dawn.

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

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

```
select distinct customer_state, extract(month from order_purchase_timestamp) as
Month_of_order,
count(order_id) as No_of_orders
from `Target_Business_case_study.orders` as o
inner join `Target_Business_case_study.customers` as c on o.customer_id = c.customer_id
group by 1,2
order by 3 desc
```

Query results

JOB INFORMATION		RESULTS	CHART	JSON	EXECUTION DETAILS	EXECUTION GRAPH
Row	customer_state	Month_of_order	No_of_orders			
1	SP	8	4982			
2	SP	5	4632			
3	SP	7	4381			
4	SP	6	4104			
5	SP	3	4047			
6	SP	4	3967			
7	SP	2	3357			
8	SP	1	3351			

Insight:-

By analyzing the query results, we gain valuable insights into the monthly order counts for each state. Over time, this allows us to identify trends, patterns, and seasonality in order volumes across different states. We can leverage this information to identify states with consistently high order volumes and to pinpoint any notable fluctuations in order counts by month or state. Notably, our data reveals that the state of São Paulo consistently records the highest number of orders every month.

Leveraging these insights, we can tailor our marketing strategies to target states experiencing a surge in order volumes. Simultaneously, we can proactively address any operational challenges in states witnessing a decline in order volumes in this case state of Roraima and optimize inventory management based on order trends observed across various states.



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

```
select distinct count(customer_id) as count_of_customers, customer_state
from `Target_Business_case_study.customers`
group by 2
order by 1 desc
```

Query results				
JOB INFORMATION		RESULTS	CHART	JSON
Row	count_of_customers	customer_state		
1	41746	SP		
2	12852	RJ		
3	11635	MG		
4	5466	RS		
5	5045	PR		
6	3637	SC		
7	3380	BA		
8	2140	DF		
9	2033	ES		

Insights:

By analysing the query results, we gain insights into the distribution of clients across states. This analysis reveals which states boast the highest number of customers and which ones have relatively fewer consumers. Notably, São Paulo (SP) stands out with the largest client base, while Roraima (RR) has the fewest clients. This information serves various purposes such as informing market targeting strategies, identifying expansion opportunities, and enhancing customer service initiatives.

Delving into the geographic distribution of our client base allows us to identify potential growth areas and make informed decisions to optimize our company strategy. By examining customer distribution patterns across states, we can discern valuable insights to guide our strategic planning process effectively.

#### #4 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).

```
with cte as (  
select p.order_id, p.payment_value, extract(month from order_purchase_timestamp) as  
month_of_order, extract(year from order_purchase_timestamp) as year_of_order  
from `Target_Business_case_study.payments` as p left join  
`Target_Business_case_study.orders` as o on p.order_id=o.order_id  
where extract(month from order_purchase_timestamp) between 1 and 8  
order by year_of_order, month_of_order)  
select  
round((((sum (case when year_of_order = 2018 then payment_value else 0 end))-  
(sum (case when year_of_order = 2017 then payment_value else 0 end)))/(sum (case when  
year_of_order = 2017 then payment_value else 0 end)))*100,2) as increase_in_percentage  
from cte
```

JOB INFORMATION		RESULTS
Row		increase_in_percentage
1		136.98

#### Insights:

Our analysis focuses on orders placed between January and August for both 2017 and 2018.

To calculate the percentage increase, the query examines monthly prices across the two years.

The results reveal a remarkable growth rate of approximately 137% from 2017 to 2018 between January and August.

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

```
select round(sum(p.payment_value),2) as Total_order_value,  
round(avg(p.payment_value),2) as avg_order_value, customer_state  
from `Target_Business_case_study.payments` as p left join  
`Target_Business_case_study.orders` as o on p.order_id=o.order_id join  
`Target_Business_case_study.customers` as c on o.customer_id=c.customer_id  
group by customer_state  
order by total_order_value desc
```

Query results				
JOB INFORMATION		RESULTS	CHART	JSON
Row	Total_order_value	avg_order_value	customer_state	EXECUTION
1	5998226.96	137.5	SP	
2	2144379.69	158.53	RJ	
3	1872257.26	154.71	MG	
4	890898.54	157.18	RS	
5	811156.38	154.15	PR	
6	623086.43	165.98	SC	
7	616645.82	170.82	BA	

Insights:

The "total\_order\_price" column displays the cumulative order prices for each state, representing the total value of orders placed. On the other hand, In the "average\_order\_price" column, we find the typical order value for each state along with the average order price.

By analyzing the results, we can identify states with substantial total order values, indicating potentially lucrative marketplaces.

Comparing average order prices across states enables us to tailor focused marketing or pricing strategies, pinpointing areas with higher or lower average spending.

For a comprehensive understanding and informed decision-making, it's crucial to contextualize the data by considering factors such as population, economic indicators, and customer behavior unique to each state.

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

```
select round(sum(oi.freight_value),2)
Total_freight_value,round(avg(oi.freight_value),2) as avg_freight_value,
customer_state
from `Target_Business_case_study.order_items` as oi left join
`Target_Business_case_study.orders` as o on oi.order_id=o.order_id join
`Target_Business_case_study.customers` as c on o.customer_id=c.customer_id
group by customer_state
order by total_freight_value desc
```

Query results				
JOB INFORMATION		RESULTS	CHART	JSON
Row	Total_freight_value	avg_freight_value	customer_state	
1	718723.07	15.15	SP	
2	305589.31	20.96	RJ	
3	270853.46	20.63	MG	
4	135522.74	21.74	RS	
5	117851.68	20.53	PR	
6	100156.68	26.36	BA	
7	89660.26	21.47	SC	
8	59449.66	32.92	PE	
9	53114.98	22.77	GO	

Insights:

Understanding the disparities in order freight rates between states offers valuable information about local shipping behaviors, supplier distribution, and customer preferences. Leveraging this knowledge can help streamline processes and reduce costs effectively.

By analyzing the results, we can identify states with notably high total freight costs, such as São Paulo (SP). This observation may indicate regions with elevated shipping expenses or logistical challenges.

When optimizing logistics operations or refining pricing strategies, it's beneficial to uncover regions with varying average shipping prices. Comparing the average order freight costs across states can provide valuable insights.

## #5 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 date_diff(order_delivered_customer_date,order_purchase_timestamp, DAY) as  
Delivered_in_days,  
DATE_DIFF(order_estimated_delivery_date,order_delivered_customer_date, DAY) as  
Estimate_vs_actual_delivery_difference  
from `Target_Business_case_study.orders`
```

Query results			
JOB INFORMATION		RESULTS	CHART
Row	Delivered_in_days	Estimate_vs_actual_delivery_difference	
1	30	-12	
2	30	28	
3	35	16	
4	30	1	
5	32	0	
6	29	1	
7	43	-4	

### Insights:

Analyzing the " Delivered\_in\_days, " and "diff\_estimated\_delivery" columns provides valuable insights into the efficiency of our delivery process. This analysis allows us to identify any delays or instances of early deliveries compared to the projected timeframe.

Delving deeper into these columns enables us to uncover trends, identify places with faster delivery, and understand factors influencing delivery times or discrepancies between estimated and actual delivery dates.

These insights are instrumental in managing customer expectations when we analyse the delivery time with order reviews, elevating customer satisfaction levels, streamlining the delivery process, and enhancing overall logistics operations. By leveraging these findings, we can implement targeted strategies to optimize our delivery operations and ensure seamless customer experiences.

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

```
select top.customer_state as top_5_customer_state, top.avg_freight_value as
top_5_avg_freight_value, bottom.customer_state as bottom_5_customer_state,
bottom.avg_freight_value as bottom_5_avg_freight_value
from
(select round(avg(oi.freight_value),2) as avg_freight_value, customer_state,
row_number() over (order by (round(avg(oi.freight_value),2))desc) as Rnumber_top
from `Target_Business_case_study.order_items` as oi left join
`Target_Business_case_study.orders` as o on oi.order_id=o.order_id join
`Target_Business_case_study.customers` as c on o.customer_id=c.customer_id
group by customer_state
order by avg_freight_value desc
limit 5 ) as top
join
(select round(avg(oi.freight_value),2) as avg_freight_value, customer_state,
row_number() over (order by (round(avg(oi.freight_value),2))) as Rnumber_bottom
from `Target_Business_case_study.order_items` as oi left join
`Target_Business_case_study.orders` as o on oi.order_id=o.order_id join
`Target_Business_case_study.customers` as c on o.customer_id=c.customer_id
group by customer_state
order by avg_freight_value
limit 5 ) as bottom
on top.Rnumber_top=bottom.Rnumber_bottom
```

Query results

JOB INFORMATION		RESULTS	CHART	JSON	EXECUTION DETAILS	EXECUTION GRAPH
Row	top_5_customer_state	top_5_avg_freight_value	bottom_5_customer_state	bottom_5_avg_freight_value		
1	RR	42.98	SP	15.15		
2	PB	42.72	PR	20.53		
3	RO	41.07	MG	20.63		
4	AC	40.07	RJ	20.96		
5	PI	39.15	DF	21.04		

Insights:

Analyzing freight values across states unveils valuable patterns and opportunities for optimization within our logistics operations. States like RR and PB, exhibiting the highest average freight values, may encounter challenges such as remote locations or elevated transportation costs. In contrast, states like SP and PR, with lower average freight values, present potential areas for cost-saving initiatives.

By leveraging this data, our company can strategically target freight cost reduction efforts and negotiate favorable terms with carriers. Additionally, identifying regions with comparatively lower shipping prices enables us to optimize our supply chain operations and enhance cost efficiency. It's essential to contextualize these insights within broader considerations such as distance, transportation infrastructure, carrier availability, and regional economic dynamics. This holistic approach ensures informed decision-making and effective implementation of cost-saving strategies across our supply chain network.

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

```
select Top.avg_Delivered_in_days as top_avg_Delivered_in_days, top.customer_state as
top_customer_state, Bottom.avg_Delivered_in_days as bottom_avg_Delivered_in_days,
bottom.customer_state as bottom_customer_state
from
(select round(avg(date_diff(order_delivered_customer_date,order_purchase_timestamp,
DAY)),0) as avg_Delivered_in_days, customer_State,
row_number() over (order by
(round(avg(date_diff(order_delivered_customer_date,order_purchase_timestamp,
DAY)),0))desc ) as Rnumber_top
from `Target_Business_case_study.orders` as o join
`Target_Business_case_study.customers` as c on o.customer_id=c.customer_id
group by customer_state
order by avg_Delivered_in_days desc
limit 5
) as Top
join
(select round(avg(date_diff(order_delivered_customer_date,order_purchase_timestamp,
DAY)),0) as avg_Delivered_in_days, customer_State,
row_number() over (order by
(round(avg(date_diff(order_delivered_customer_date,order_purchase_timestamp, DAY)),0))
) as Rnumber_bottom
from `Target_Business_case_study.orders` as o join
`Target_Business_case_study.customers` as c on o.customer_id=c.customer_id
group by customer_state
order by avg_Delivered_in_days
limit 5) as Bottom
on top.Rnumber_top=bottom.Rnumber_bottom
```

Query results <a href="#">SAVE RESULT</a>					
JOB INFORMATION	RESULTS	CHART	JSON	EXECUTION DETAILS	EXECUTION GRAPH
Row	top_avg_Delivered_in_days	top_customer_state	bottom_avg_Delivered_in_days	bottom_customer_state	
1	29.0	RR	8.0	SP	
2	27.0	AP	12.0	PR	
3	26.0	AM	12.0	MG	
4	24.0	AL	13.0	DF	
5	23.0	PA	14.0	SC	

Insights:-

In the realm of ecommerce, delivery time stands as a pivotal factor influencing customer behavior. A customer's transition from local to online purchases hinges on two primary drivers: pricing and convenience. Extended delivery times may render a product less appealing to customers, potentially leading to loss of business for the ecommerce company.

Moreover, the degree of cost savings in logistics operations correlates with the level of development in the logistics infrastructure. São Paulo, with its status as a hub for ecommerce activity and a well-developed infrastructure, presents significant opportunities for cost optimization. Conversely, regions like RR, characterized by lower order volumes, offer an avenue for the company to investigate whether prolonged delivery times contribute to reduced sales. This analysis enables the company to strategize effectively to address potential obstacles and enhance overall business performance.

D. Find out the top 5 states where the order delivery is really fast as compared to the estimated date of delivery. You can use the difference between the averages of actual & estimated delivery date to figure out how fast the delivery was for each state.

```
with cte as (select
DATE_DIFF(order_estimated_delivery_date,order_delivered_customer_date, DAY) as
Estimate_vs_actual_delivery_difference, order_delivered_customer_date,
order_estimated_delivery_date, customer_state
from `Target_Business_case_study.orders` as o join
`Target_Business_case_study.customers` as c on o.customer_id=c.customer_id
where order_delivered_customer_date is not null
)

select round(avg(Estimate_vs_actual_delivery_difference),2)
avg_Estimate_vs_actual_delivery_difference, customer_state
from cte
group by customer_state
order by avg_Estimate_vs_actual_delivery_difference desc
limit 5
```

Query results		
JOB INFORMATION		EXECUTION
Row	avg_Estimate_vs_actual_delivery_difference	customer_state
1	19.76	AC
2	19.13	RO
3	18.73	AP
4	18.61	AM
5	16.41	RR

Insights:-

Operating in states such as AC, RO, AP, and AM, where the average delivery speed is highest, provides our company with an opportunity to leverage our quick and reliable service. Highlighting our rapid delivery times can attract more clients and enhance overall customer satisfaction. Additionally, these insights enable us to enhance our operations, improve the customer experience, optimize logistics, and explore expansion prospects in regions known for swift order delivery.



## #6 Analysis based on the payments:

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

```
with cte as (select o.order_id, payment_type, extract (month from
order_purchase_timestamp) as month_of_order, extract(year from
order_purchase_timestamp) as year_of_order
from `Target_Business_case_study.payments` as p join
`Target_Business_case_study.orders` as o on p.order_id=o.order_id
order by year_of_order, month_of_order
)

select year_of_order, month_of_order,count(distinct order_id) as order_counts,
payment_type
from cte
group by payment_type,1,2
order by 1,2
```

Query results					
JOB INFORMATION		RESULTS		CHART	JSON
EXECUTION DETAILS		EX			
Row	year_of_order	month_of_order	order_counts	payment_type	
1	2016	9	3	credit_card	
2	2016	10	253	credit_card	
3	2016	10	11	voucher	
4	2016	10	2	debit_card	
5	2016	10	63	UPI	
6	2016	12	1	credit_card	

### Insights :-

In November 2017, credit card emerged as the most frequently used payment method, highlighting its significance in consumer transactions. Analyzing month-to-month trends in order counts provides valuable insights into seasonality, peak months, and the impact of marketing efforts or external factors on consumer behavior. Leveraging insights from payment preferences across different months enables firms to refine payment procedures, tailor marketing campaigns, and elevate overall customer experiences effectively.

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

```
select count(distinct order_id) as orders_count, payment_installments
from `Target_Business_case_study.payments`
where payment_installments>0
group by payment_installments
order by payment_installments
```

Query results			
JOB INFORMATION		RESULTS	CHART
Row	orders_count	payment_installment	JSON
1	49060	1	
2	12389	2	
3	10443	3	
4	7088	4	
5	5234	5	
6	3916	6	
7	1623	7	

Insights: -

A total of 49,060 orders were placed with a single payment installment. This analysis sheds light on the popularity and client preference for payment installment options. By observing customers' tendencies towards specific installment numbers, insights into their budgeting or financing preferences can be gleaned. Additionally, monitoring the distribution of orders based on payment installments provides valuable information on clients' buying habits and their inclination towards flexible payment methods.

### Additional Insights & Recommendations:

Analyzing the distribution and statistical data reveals that the average delivery time is currently 12 days, which is relatively high in the competitive e-commerce market. To remain competitive, it's imperative to reduce this time by 6.

One key area for improvement is optimizing the time it takes for carriers to initiate delivery, currently at 2.5 days, and order approval, currently at 0.26 days. Streamlining these processes can significantly contribute to faster delivery times.

Notably, the northern regions of Brazil exhibit slower delivery compared to estimated dates. Expanding our network in this area and focusing on improving delivery speed can unlock new customer segments and revenue streams.

Considering the unique natural attractions of the northern region, such as the Amazon rainforest, introducing specialized products tailored to adventure and survival enthusiasts can tap into a lucrative market segment and drive revenue growth.

Products; 1) Bed table bath, Furniture decoration, Health Beauty, Sport leisure are 4 product category types that has more than 500 unique products each with review score as low as '1', we can investigate the quality of them and advise to improve going forward.