Business Case: Target SQL Project

#(Q1)Import the dataset and do usual exploratory analysis steps like checking the structure & characteristics of the dataset:

```
#(Q1.1)Data type of all columns in the "customers" table
select column_name, data_type
from `target.INFORMATION_SCHEMA.COLUMNS`
where table_name = 'customers'
```

JOB INFORMATION | RESULTS | CHART | JSON

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

Insights

The 'customers' table contains 5 data types out of which 4 are string data_type (customer_id, customer_unique_id, customer_city, customer_state) and 1 is integer data_type(customer_zip_code_prefix)

```
#(Q1.2)Get the time range between which the orders were placed.

select min(order_purchase_timestamp) as min_order_placed,
max(order_purchase_timestamp) as max_order_placed
from `target.orders`
```

Query results

JOB INFORMATION | RESULTS | CHART | JSON

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

Insights

From the above output time range between the orders placed is

Minimum order placed on the date of '2016-09-04' and maximum order placed on the date of '2018-10-17'

#(Q1.3) Count the Cities & States of customers who ordered during the given period.

```
select count(distinct c.customer_city) as city_count,
count(distinct c.customer_state) as state_count
from `target.customers` c
join `target.orders` o
on c.customer_id = o.customer_id
where order_purchase_timestamp between '2016-09-04' and '2018-10-17'
```

Query results

JOB INFORMATION | RESULTS | CHART

Row	city_count	state_count
1	4119	27

Insights

According to the data given period is between '2016-09-04' and '2018-10-17'. And the customers orders from the above date period in 'state_count is 27' and city_count' is 4119

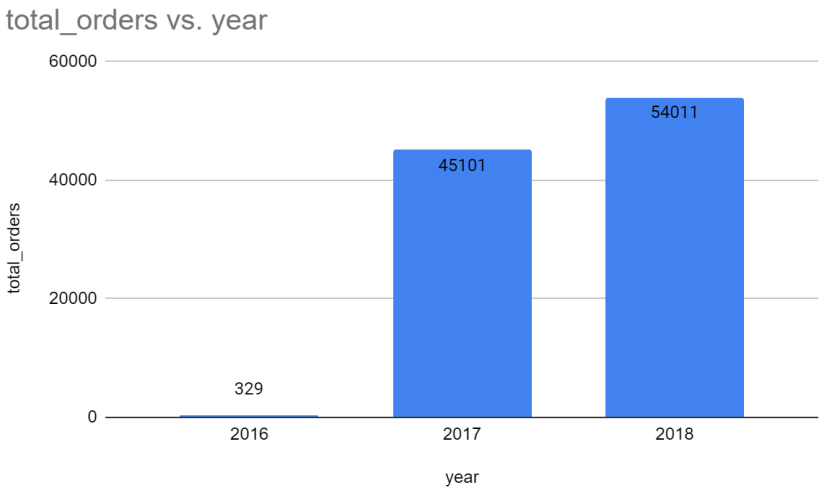
#(Q2) In-depth Exploration:

#(Q2.1) Is there a growing trend in the no. of orders placed over the past years?

```
with cte as (
select customer_id, order_id, date(order_purchase_timestamp) as date_detail
from `target.orders`)
select extract(year from date_detail) as year, count(order_id) as total_orders
from cte
group by year
order by year
```

JOB INFORMATION | RESULTS | CHA

Row	year	total_orders
1	2016	329
2	2017	45101
3	2018	54011



Insights

1. **Overall Growth**:
    - There is a significant increase in the number of orders placed each year, indicating robust growth in Target's operations in Brazil over the three years.
2. **Yearly Analysis**:
    - **2016**: The total number of orders in 2016 was very low (329 orders).
    - **2017**: There is a dramatic increase in orders to 45,101, which is a substantial rise compared to 2016.
    - **2018**: The number of orders continues to grow, reaching 54,011. This represents a 20% increase from 2017 (an increase of 8,910 orders)
3. **Business Insights**:
    - **Market Penetration**: The substantial growth from 2016 to 2018 suggests that Target has been successful in penetrating the Brazilian market.
    - **Scalability**: The consistent year-over-year growth implies that Target's operations are scalable and that the company has been able to handle increased demand effectively.

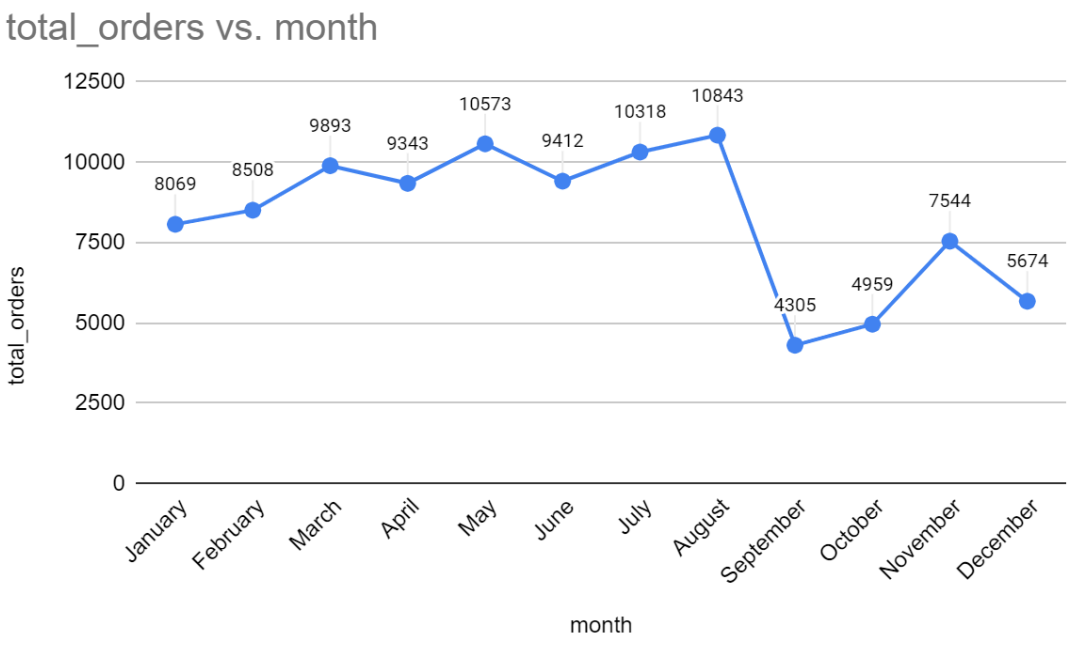
- **Strategic Planning**: The data from 2018 shows a positive trend that can inform strategic planning for future years, including potential expansions, marketing campaigns, and resource allocation.

```
#(Q2.2) Can we see some kind of monthly seasonality in terms of the no. of orders being placed?

with cte as (
  select customer_id, order_id, date(order_purchase_timestamp) as date_detail
  from `target.orders`),

cte1 as(
  select extract(month from date_detail) as month_number,
  format_date('%B', date_detail) as month, count(order_id) as total_orders
  from cte
  group by month_number,month
  )

select month, total_orders
from cte1
order by month_number
```

Query results

JOB INFORMATION | RESULTS | CHART | JSON

Row	month	total_orders
1	January	8069
2	February	8508
3	March	9893
4	April	9343
5	May	10573
6	June	9412
7	July	10318
8	August	10843
9	September	4305
10	October	4959
11	November	7544
12	December	5674



Insights

1. **Overall Trend:** The total number of orders fluctuates throughout the year, with noticeable peaks and troughs, highlighting the need to understand and plan for seasonal demand changes.
2. **Monthly Seasonal Trends**:
    - Orders gradually increase from January (8069 orders) to March(9893 orders), indicating a steady post-holiday recovery.
    - From April(9343 orders) to August(10843 orders), orders remain high, peaking in May(10573 orders) and August, likely due to mid-year promotions or holidays.
    - **Significant Drop in September**: There is a sharp decline in orders in September(4305 orders), possibly due to seasonal factors or fewer promotions.
    - **Recovery in the Last Quarter**: Orders recover in October (4959 orders), peak in November(7544 orders), likely due to holiday shopping, and then decline in December.
3. **Business Insights**:
    - **Promotional Timing**: Effective promotions in May and August; similar strategies could boost sales in September.
    - **Inventory and Staffing**: Optimize based on trends, ensuring higher stock and more staff during peak months.
    - **Marketing Strategies**: Design better campaigns and customer engagement strategies to even out demand.

(Q2.3) During what time of the day, do the Brazilian customers mostly place their orders? (Dawn,Morning,Afternoon orNight)

0-6 hrs : Dawn
7-12 hrs : Mornings
13-18 hrs : Afternoon
19-23 hrs : Night

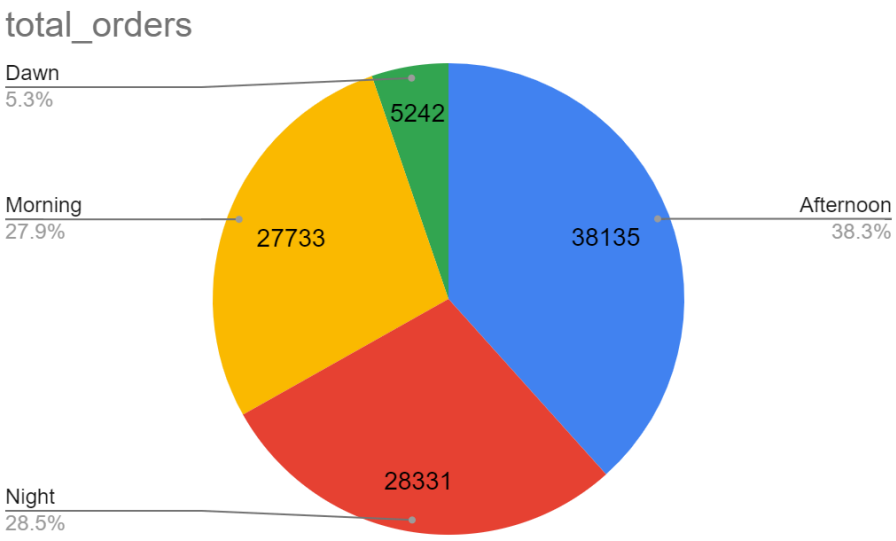
```
with cte as(
  select customer_id, order_id,
  extract(hour from order_purchase_timestamp) as order_hour
  from `target.orders`
  )

select
  case
    when order_hour between 0 and 6 then 'Dawn'
    when order_hour between 7 and 12 then 'Morning'
```

```
    when order_hour between 13 and 18 then 'Afternoon'
    when order_hour between 19 and 23 then 'Night'
  end as time_of_day,
  count(order_id) as total_orders
from cte
group by time_of_day
order by total_orders desc
```

Query results

JOB INFORMATION | RESULTS | CHART | JSON

Row	time_of_day	total_orders
1	Afternoon	38135
2	Night	28331
3	Morning	27733
4	Dawn	5242



Insights

1. The pie chart shows the distribution of total orders by time of day:
    - **Afternoon:** 38.3% (38,135 orders) - highest order volume.
    - **Night:** 28.5% (28,331 orders) - second highest.
    - **Morning:** 27.9% (27,733 orders).
    - **Dawn:** 5.3% (5,242 orders) - lowest order volume.

2. **Business Insights**:
    - Focus resources on Afternoon and Night due to high order volumes.
    - Schedule marketing and promotions during peak times (Afternoon and Night).
    - Enhance customer service during these peak periods for better support.
    - Optimize order processing and shipping around these times for efficiency.

```
#(Q3) Evolution of E-commerce orders in the Brazil region:

#(Q3.1) Get the month on month no.of orders placed in each state.

with cte as (
select c.customer_id, c.customer_state, o.order_id, date(o.order_purchase_timestamp)
as date_detail
from `target.orders` o
join `target.customers` c
on o.customer_id = c.customer_id
)
select extract(year from date_detail) as year, extract(month from date_detail) as
month, customer_state, count(order_id) as total_orders
from cte
group by year,month,customer_state
order by year,month
```

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

Row	year	month	customer_state	total_orders
1	2016	9	RR	1
2	2016	9	RS	1
3	2016	9	SP	2
4	2016	10	SP	113
5	2016	10	RS	24

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

Row	year	month	customer_state	total_orders
25	2016	12	PR	1
26	2017	1	PR	65
27	2017	1	MG	108
28	2017	1	SP	299
29	2017	1	RJ	97
30	2017	1	PA	12

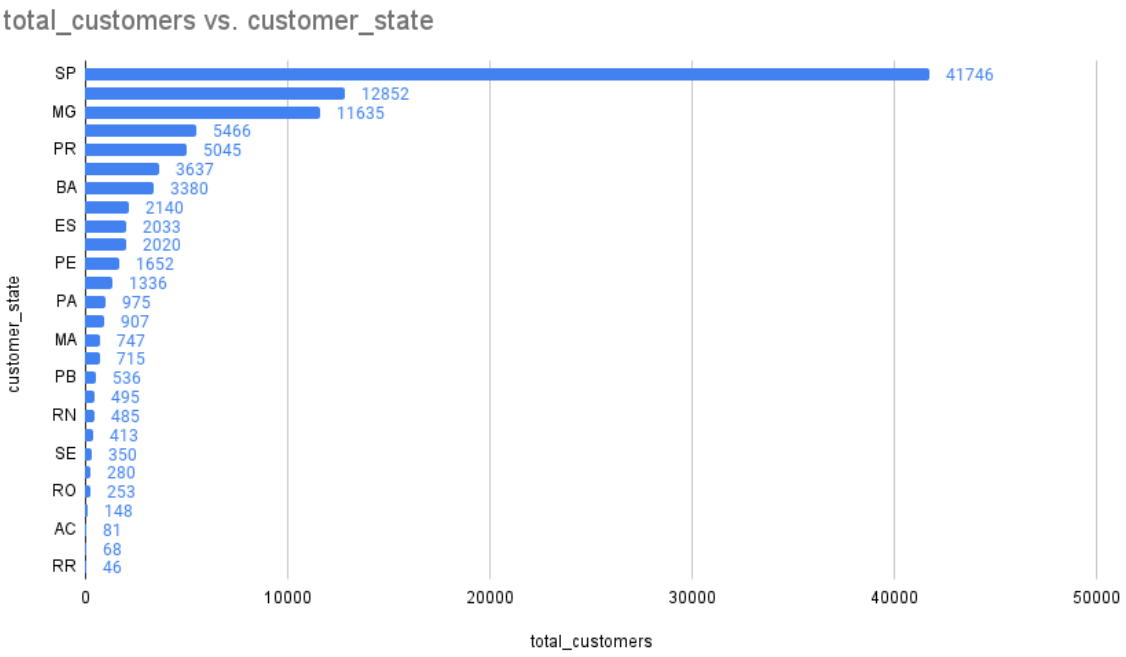
Insights

1. **Overall Trends:**
    - **Growth in Orders:** There is a clear upward trend in the total number of orders over the period from 2016 to 2018, indicating increasing customer engagement and business growth.
2. **Monthly Trends:**
    - Orders peak in specific months, particularly November (potentially due to Black Friday sales) and May, indicating seasonal spikes likely due to promotional events.
    - February typically sees lower orders, possibly due to post-holiday slowdowns.

```
#(Q3.2) How are the customers distributed across all the states?

select customer_state, count(customer_id) as total_customers
from `target.customers`
group by customer_state
order by total_customers desc
```

JOB INFORMATION | RESULTS | CHART | JSON

Row	customer_state	total_customers
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



Insights

1. **Dominant State:**
    - **(SP)**[Total Customers: 41,746] overwhelmingly leads in the number of customers, indicating it is the primary market for Target in Brazil. This state alone accounts for a significant portion of the customer base.
2. **High Customer States**:

- **(MG)**: 12,852 Customers
- **(PR)**: 5,466 Customers
- **Insight**: These states are also key markets, suggesting it is also a critical market for Target.

3. **Moderate Customer States**:
   - **(PA)**: 975 Customers
   - **(MA)**: 747 Customers
   - **Insight**: Potential for growth in these areas, has a moderate customer base.
4. **Low Customer States**:
   - **(RO)**: 280 Customers
   - **(AC)**: 148 Customers
   - **(RR)**: 46 Customers
   - **Insight**: Significant room for market expansion.
5. **Business Insights**:
   - **Focus on dominant markets** (SP, MG, PR) with enhanced marketing.
   - **Invest in moderate markets** (PA, MA) for growth.
   - **Expand in low-penetration states** (RO, AC, RR) with targeted strategies.

```
#(Q4) Impact on Economy: Analyze the money movement by e-commerce by looking at order prices, freight and others.

#(Q4.1) Get the % increase in the cost of orders from year 2017 to 2018 (include months between Jan to Aug only).
--You can use the "payment_value" column in the payments table to get the cost of orders.
with cte as (
  select extract(year from o.order_purchase_timestamp) as year,
  extract(month from   o.order_purchase_timestamp) as month,
  sum(p.payment_value) as cost_orders
  from `target.orders` o
  join `target.payments` p
  on o.order_id = p.order_id
  group by year,month
),
cte2 as(
select distinct year, round(sum(cost_orders) over(partition by year),2) as total_cost
from cte
where month <= 8
)
```

```sql
select year, total_cost, round(((A - total_cost)/total_cost)*100,2) as percentage
from (
  select year, total_cost, lead(total_cost) over(order by year) as A
  from cte2
) tbl
order by year
```

Query results

JOB INFORMATION | RESULTS | CHART | JSON

Row	year	total_cost	percentage
1	2017	3669022.12	136.98
2	2018	8694733.84	*null*

Insights

- The percentage increase in the cost of orders from year 2017 to 2018 is 136.98.

1. **Significant Increase in Total Cost:**
    - The total cost increased significantly from 2017 to 2018. Specifically, the total cost in 2018 (8,694,733.84) is more than double the total cost in 2017 (3,669,022.12).

```sql
#(Q4.2) Calculate the Total & Average value of order price for each state.

select c.customer_state as state, round(sum(oi.price),2) as total_orders_value,
round(avg(oi.price),2) as avg_orders_value
from `target.order_items` oi
join `target.orders` o
on oi.order_id = o.order_id
join `target.customers` c
on o.customer_id = c.customer_id
group by state
order by total_orders_value desc
```

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DET

Row	state	total_orders_value	avg_orders_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
9	GO	294591.95	126.27
10	ES	275037.31	121.91

Insights

1. **Total Orders Value:**
    - **Highest Total Orders Value:**
        - (SP) leads with 5,202,955.05, significantly higher than other states.
        - (RJ) and (MG) follow with 1,824,092.67 and 1,585,308.03, respectively.
    - **Lowest Total Orders Value:**
        - (RR) has the lowest at 7,829.43, followed by (AC) at 15,982.95 and (AP) at 13,474.3.
2. **Average Orders Value:**
    - **Highest Average Orders Value:**
        - (PB) has the highest at 191.48, indicating higher spending per order.
        - (AL) and (RO) also show high averages at 180.89 and 165.97.
    - **Lowest Average Orders Value:**
        - (SP), despite high total order value, has the lowest average at 109.65.
        - Other states with low averages include (PR) at 119.0 and (MG) at 120.75.
3. **Business Insights**:
    - **Targeted Marketing:** Develop specific strategies for states with lower total and average order values to increase sales and customer engagement.
    - States like (PB) and (AL) have higher average spending despite lower total order values, suggesting higher per-order spending.

```sql
#(Q4.3) Calculate the Total & Average value of order freight for each state.

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

Row	state	total_freight_value	avg_freight_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

Insights

1. **Total Freight Value:**
    - **Highest Total Freight Value:**
        - (SP) has the highest total freight value at 718,723.07.
        - (RJ) and (MG) follow with 305,589.31 and 270,853.46, respectively.
    - **Lowest Total Freight Value:**
        - (RR) has the lowest at 2,235.19, followed by (AP) at 2,788.5 and (AC) at 3,686.75.

2. **Average Freight Value:**
    - **Highest Average Freight Value:**
        - (RR) has the highest average freight value at 42.98, indicating high freight costs per order.
        - (PB) and (AC) also show high averages at 42.72 and 40.07, respectively.
    - **Lowest Average Freight Value:**
        - (SP), despite having the highest total freight value, has the lowest average at 15.15.
        - (SC) and (MG) also have low averages at 21.47 and 20.63, respectively.
3. **Business Insights**:
    - **Cost Management:** Focus on optimizing freight costs in high-volume states like (SP) and (RJ) to improve margins.
    - **Logistical Planning:** Develop targeted strategies for states with high average freight costs to ensure competitive pricing and customer satisfaction.

```
#(Q5) Analysis based on sales, freight and delivery time.

#(Q5.1) 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.

You can calculate the delivery time and the difference between the estimated & actual
delivery date using the given formula:
 - time_to_deliver = order_delivered_customer_date - order_purchase_timestamp
 - diff_estimated_delivery = order_delivered_customer_date -
order_estimated_delivery_date

select order_id,
date_diff(order_delivered_customer_date, order_purchase_timestamp, day) as
time_to_deliver,
date_diff(order_delivered_customer_date, order_estimated_delivery_date, day) as
diff_estimated_delivery
from `target.orders`
order by time_to_deliver desc
```

JOB INFORMATION | RESULTS | CHART | JSON | EXECUTION DETA

Row	order_id	time_to_deliver	diff_estimated_delivery
1	ca07593549f1816d26a572e06...	209	181
2	1b3190b2dfa9d789e1f14c05b...	208	188
3	440d0d17af552815d15a9e41a...	195	165
4	0f4519c5f1c541ddec9f21b3bd...	194	161
5	285ab9426d6982034523a855f...	194	166
6	2fb597c2f772eca01b1f5c561b...	194	155
7	47b40429ed8cce3aee9199792...	191	175
8	2fe324febf907e3ea3f2aa9650...	189	167
9	2d7561026d542c8dbd8f0daea...	188	159
10	437222e3fd1b07396f1d9ba8c...	187	144

Insights

The following insights are for the first 10 rows

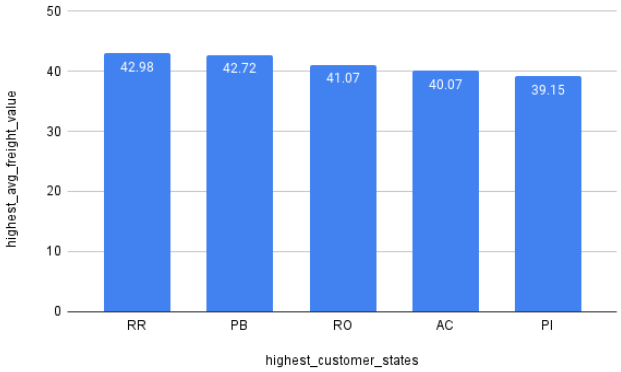
- Delivery times are stable, mostly ranging between 190-210 units.
- Significant variation in how actual delivery times differ from estimated times
- Some orders show large deviations, indicating less accurate delivery estimates.
- Consistent delivery times but varied accuracy suggest the need for better estimation methods.
- Reducing estimation errors can enhance customer satisfaction.
- Accurate delivery estimates are crucial for customer satisfaction.
- Large deviations from estimated times can lead to dissatisfaction.
- Investigate orders with high deviations to identify causes.
- Proactively inform customers of potential delays to manage expectations.
- Regularly track delivery performance to identify improvement areas.

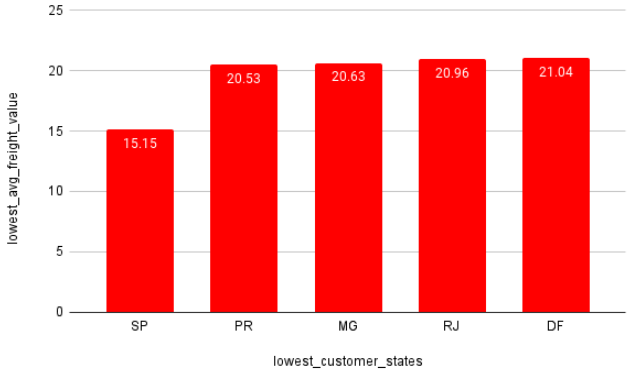
```
#(Q5.2) Find out the top 5 states with the highest & lowest average freight value.

with avg_freight as (
  select c.customer_state as state,
  round(avg(oi.freight_value), 2) as avg_freight_value
  from `target.order_items` oi
  join `target.orders` o
  on oi.order_id = o.order_id
  join `target.customers` c
```

```
  on o.customer_id = c.customer_id
  group by state
),
top_5_highest as (
  select state as highest_customer_states, avg_freight_value as
highest_avg_freight_value,
  dense_rank() over(order by avg_freight_value desc) as rank_high
  from avg_freight
  order by avg_freight_value desc
  limit 5
),
top_5_lowest as (
  select state as lowest_customer_states, avg_freight_value as
lowest_avg_freight_value,
  dense_rank() over(order by avg_freight_value) as rank_low
  from avg_freight
  order by avg_freight_value asc
  limit 5
)
select h.highest_customer_states, h.highest_avg_freight_value,
l.lowest_customer_states, l.lowest_avg_freight_value
from top_5_highest h
full outer join top_5_lowest l
on h.rank_high = l.rank_low
order by COALESCE(h.rank_high, l.rank_low);
```

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

Row	highest_customer_states	highest_avg_freight_value	lowest_customer_states	lowest_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

Highest Average Freight Value

The first graph shows the states with the highest average freight values:

- **(RR)** has the highest average freight value at 42.98.
- **(PB)** follows closely with an average freight value of 42.72.
- **(RO)** has an average freight value of 41.07.
- **(AC)** shows an average freight value of 40.07.
- **(PI)** has an average freight value of 39.15.

Lowest Average Freight Value

The second graph shows the states with the lowest average freight values:

- **(SP)** has the lowest average freight value at 15.15.
- **(PR)** follows with an average freight value of 20.53.
- **(MG)** is next with an average freight value of 20.63.
- **(RJ)** has an average freight value of 20.96.
- **(DF)** has an average freight value of 21.04.

Business Insights:

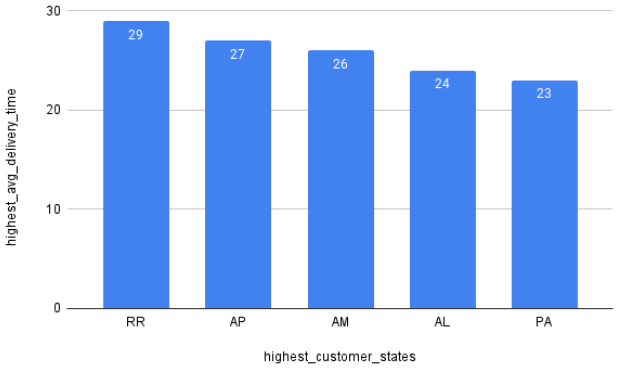
- There is a stark contrast between the states with the lowest and highest average freight values, highlighting regional disparities in shipping costs within Brazil.
- The data underscores the importance of considering geographical and infrastructural factors in logistics planning and pricing strategies.

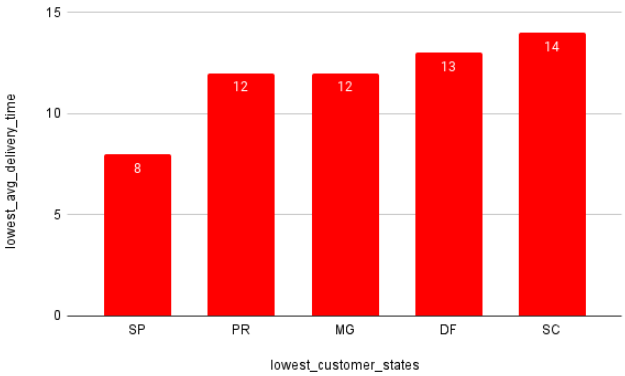
```
#(Q5.3) Find out the top 5 states with the highest & lowest average delivery time.

with avg_freight as (
  select c.customer_state as state,
  round(avg(datetime_diff(o.order_delivered_customer_date,
  o.order_purchase_timestamp,day))) as avg_delivery_time
  from `target.orders` o
  join `target.customers` c
  on o.customer_id = c.customer_id
```

```
  group by state
),
top_5_highest as (
  select state as highest_customer_states,
  avg_delivery_time as highest_avg_delivery_time,
  row_number() over(order by avg_delivery_time desc) as rank_high
  from avg_freight
  order by avg_delivery_time desc
  limit 5
),
top_5_lowest as (
  select state as lowest_customer_states,
  avg_delivery_time as lowest_avg_delivery_time,
  row_number() over(order by avg_delivery_time) as rank_low
  from avg_freight
  order by avg_delivery_time asc
  limit 5
)
select h.highest_customer_states, h.highest_avg_delivery_time,
l.lowest_customer_states, l.lowest_avg_delivery_time
from top_5_highest h
full outer join top_5_lowest l
on h.rank_high = l.rank_low
order by COALESCE(h.rank_high, l.rank_low);
```

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

Row	highest_customer_states	highest_avg_delivery_time	lowest_customer_states	lowest_avg_delivery_time
1	RR	29.0	SP	8.0
2	AP	27.0	PR	12.0
3	AM	26.0	MG	12.0
4	AL	24.0	DF	13.0
5	PA	23.0	SC	14.0





Insights

States with the Highest Average Delivery Time

- **(RR):** 29.0 days
- **(AP):** 27.0 days
- **(AM):** 26.0 days
- **(AL):** 24.0 days
- **(PA):** 23.0 days

States with the Lowest Average Delivery Time

- **(SP):** 8.0 days
- **(PR):** 12.0 days
- **(MG):** 12.0 days
- **(DF):** 13.0 days
- **(SC):** 14.0 days

Business Insights:

- The disparity in delivery times across Brazil highlights the need for strategic investments in logistics and infrastructure to improve service levels and customer satisfaction, particularly in remote regions.

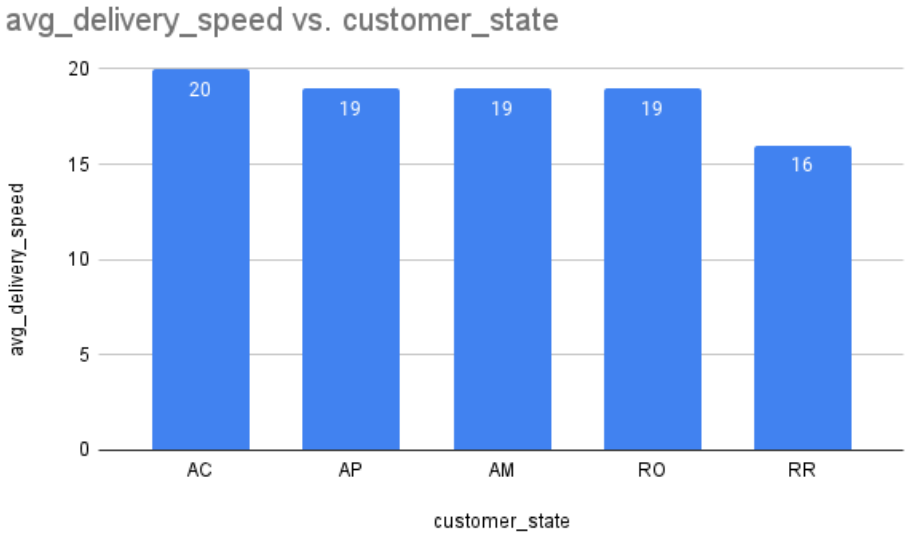
#(Q5.4) Find out the top 5 states where the order delivery is really fast as compared to the estimated date of delivery.
You can use the difference between the averages of actual & estimated delivery date to figure out how fast the delivery was for each state.

```
select c.customer_state,
round(avg(date_diff(order_estimated_delivery_date,
order_delivered_customer_date, day))) as avg_delivery_speed
from `target.orders` o
join `target.customers` c
on o.customer_id = c.customer_id
WHERE o.order_status = 'delivered'
```

```
group by c.customer_state
order by avg_delivery_speed desc
limit 5;
```

JOB INFORMATION | RESULTS | CHART | J

Row	customer_state	avg_delivery_speed
1	AC	20.0
2	AM	19.0
3	RO	19.0
4	AP	19.0
5	RR	16.0



Insights

Average Delivery Speed by State

- ➔ **(AC):** 20.0 days
- ➔ **(AP):** 19.0 days
- ➔ **(AM):** 19.0 days
- ➔ **(RO):** 19.0 days
- ➔ **(RR):** 16.0 days

- The average delivery speeds range from 16 days (RR) to 20 days (AC).
- All states have average delivery speeds above 16 days, indicating logistical challenges in these regions.
- **(RR)** has the fastest average delivery speed at 16 days.
- **(AC)** has the slowest average delivery speed at 20 days.
- States like **(RO)**, **(AP)**, and **(AM)** have similar delivery speeds around 18-19 days, indicating comparable logistical infrastructure.

Business Insights:

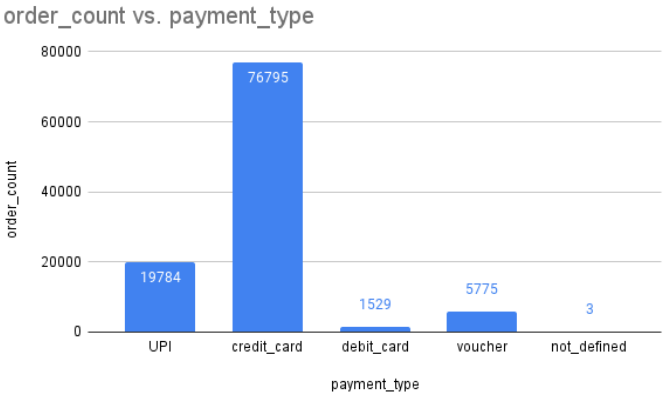
- Investing in transportation infrastructure in slower regions can help reduce delivery times.
- Setting up regional distribution centers in faster-performing states can improve efficiency.
- Clear communication with customers in slower regions about delivery times can improve satisfaction.

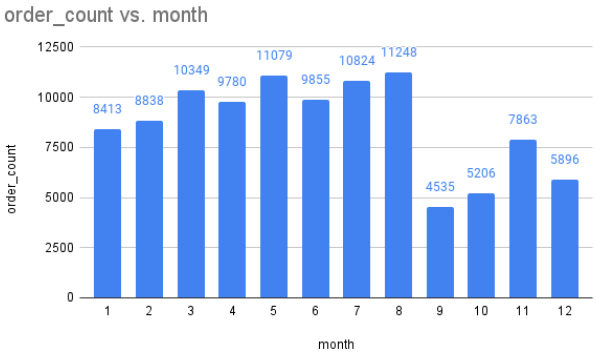
#(Q6) Analysis based on the payments:

#(Q6.1) Find the month on month no. of orders placed using different payment types.

```
select extract(month from o.order_purchase_timestamp) as month,
p.payment_type, count(*) as order_count
from `target.orders` o
join `target.payments` p
on o.order_id = p.order_id
group by month,payment_type
order by month,payment_type
```

Row	month	payment_type	order_count
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





Insights

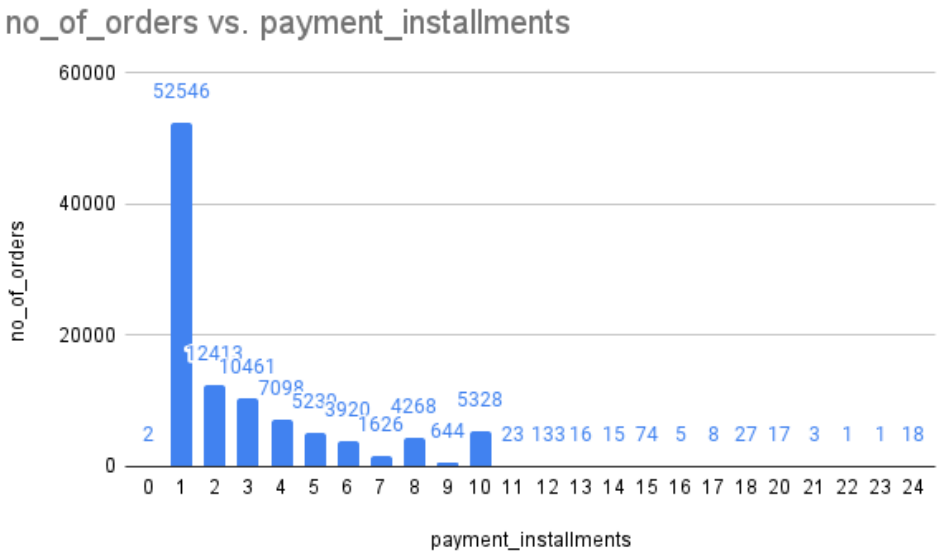
The graph shows the number of orders made using different payment types.

1. **Payment Preferences:**
    - Credit Card has the highest number of orders (76795), followed by UPI (19784), Voucher (5775), and Debit Card (1529).
    - Credit card payments consistently have the highest order counts each month, ranging from a low of 3286 in September to a high of 8350 in May.
    - Interestingly, the category labeled as “not_defined” has an extremely low count with only 3 orders. This suggests that almost all transactions were effectively categorized.
2. **Consumer Behavior:**
    - The predominance of credit card payments could indicate several possibilities:
        - This suggests a strong preference for credit cards among customers, possibly due to the convenience and benefits they offer, such as reward points and cashback.
    - The popularity of UPI payments also stands out, indicating its widespread adoption.
        - The order counts for UPI show a general increasing trend from 1715 in January to a peak of 2077 in August, followed by a significant drop to 903 in September.
    - Debit card and voucher payments have relatively low order counts compared to credit cards and UPI.
    - The highest order count for debit cards is 311 in August, while vouchers peak at 645 in July.

3. **Business Insights:**
    - There are noticeable fluctuations in order counts across all payment methods, with peaks typically observed in March, May, July, and August.
    - September shows a significant drop in orders across all payment types, indicating a potential seasonal effect or external factor impacting sales during this month.
    - By leveraging the insights from payment type trends and seasonal fluctuations, businesses can tailor their payment processing strategies to enhance customer satisfaction and drive sales growth.

```
#(Q6.2) Find the no. of orders placed on the basis of the payment installments that have been paid.

select payment_installments,count(*) as no_of_orders
from `target.orders` o
join `target.payments` p
on o.order_id = p.order_id
group by payment_installments
order by payment_installments
```

Row	payment_installments	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



Insights

The graph compares the number of orders based on the payment installments:

1. **Observations:**

- **Single Installment Payments:**
  - The vast majority of orders (52,546) are made with a single installment, indicating a strong preference for paying the full amount upfront.
  - This might suggest that customers prefer to avoid debt or are attracted by possible discounts for single-payment options.
- **Preference for Short-Term Installments:**
  - Installment options up to 10 installments are quite popular, with significant numbers for 2 (12,413), 3 (10,461), and 10 (5,328) installments.
  - This indicates a preference for short_term to medium-term installments among customers.
- **Longer Installments Less Popular:**
  - Installments beyond 10 months show a sharp decline in order numbers, indicating lower customer preference for extended payment plans.
  - Orders for installments of 12, 15, 18, 20, and 24 months are relatively low, showing some limited interest in longer payment plans but not a widespread trend.

2. **Business Insights:**
    - Promote single-payment discounts by offering additional incentives or discounts for customers who choose to pay the full amount upfront to encourage this behavior.
    - Highlight and promote flexible installment plans up to 10 months, as these are the most popular among customers. Ensure these options are visible and easy to select during the checkout process.
    - Evaluate long-term installment options, while there's limited appeal for installments beyond 10 months, they can be offered for high-value items.