Retail Giant SQL Business Case

Question 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,
 is_nullable
FROM
`target`.INFORMATION_SCHEMA.COLUMNS
WHERE
 table_name = 'customers'
```

Row	column_name	data_type	is_nullable
1	customer_id	STRING	YES
2	customer_unique_id	STRING	YES
3	customer_zip_code_prefix	INT64	YES
4	customer_city	STRING	YES
5	customer_state	STRING	YES

Insight: There are 5 columns in "customers" table, of which 4 columns, 'customer_id', 'customer_unique_id', 'customer_city' and 'customer_state' are of string type and the column 'customer_zip_code_prefix' is of integer type.

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

```
SELECT
 MIN(order_purchase_timestamp) AS min_timestamp,
 MAX(order_purchase_timestamp) AS max_timestamp
FROM
 `target.orders`
```

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

Insight: The first order was placed on 2016-09-04 21:15:19 UTC and the last order was placed on 2018-10-17 17:30:18 UTC.

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

```
SELECT
 COUNT(DISTINCT(c.customer_city)) AS
number_of_cities,
 COUNT(DISTINCT(c.customer_state)) AS
number_of_states
FROM
`target.customers` AS c
INNER JOIN
`target.orders` AS o
ON c.customer_id=o.customer_id
```

Row	number_of_cities	number_of_states
1	4119	27

Insight: The orders have been placed by customers in 27 states and 4119 cities.

Question 2: In-depth Exploration

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

```sql
WITH cte AS (
  SELECT
   EXTRACT(YEAR FROM order_purchase_timestamp )
AS year,
   EXTRACT(MONTH FROM order_purchase_timestamp )
AS month,
   COUNT(DISTINCT order_id) AS no_of_orders
  FROM
   `target.orders`
  GROUP BY
   year,
   month
)
SELECT
 cte.year,
 cte.month,
 cte.no_of_orders,
 cte.no_of_orders-LAG(cte.no_of_orders) OVER
(ORDER BY year,month) AS orders_growth,
 ROUND(100*
(cte.no_of_orders-LAG(cte.no_of_orders) OVER
(ORDER BY year,month))/(LAG(cte.no_of_orders)
OVER (ORDER BY year,month)),2)
  AS orders_percentage_growth,
FROM
 cte
ORDER BY
 cte.year,
 cte.month
```

Row	year	month	no_of_orders	orders_growth	orders_percentage_growth
1	2016	9	4	*null*	*null*
2	2016	10	324	320	8000.0
3	2016	12	1	-323	-99.69
4	2017	1	800	799	79900.0
5	2017	2	1780	980	122.5
6	2017	3	2682	902	50.67
7	2017	4	2404	-278	-10.37
8	2017	5	3700	1296	53.91
9	2017	6	3245	-455	-12.3
10	2017	7	4026	781	24.07

Insight: This table shows the number of orders in each month, the growth and the percentage of orders growth compared to the previous month over the past years. Generally, there is a growing trend in the number of orders when compared to the previous month. However,as an exception to this, there is a decline towards the end of 2018 in the months 9 and 10.

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

```
WITH cte AS (
  SELECT
   EXTRACT(MONTH FROM order_purchase_timestamp)
AS month,
   COUNT(DISTINCT order_id) AS no_of_orders
  FROM
   `target.orders`
  GROUP BY
   month
)
```

```sql
SELECT
 cte.month,
 cte.no_of_orders,
 LAG(cte.no_of_orders,1) OVER (ORDER BY
cte.month) AS prev_month_orders,
 ROUND(100*(cte.no_of_orders-LAG(cte.no_of_orders
,1) OVER (ORDER BY
cte.month))/LAG(cte.no_of_orders,1) OVER (ORDER
BY cte.month),2) AS growth_percentage
FROM
 cte
ORDER BY
 cte.month
```

Row	month	no_of_orders	prev_month_orders	growth_percentage
1	1	8069	*null*	*null*
2	2	8508	8069	5.44
3	3	9893	8508	16.28
4	4	9343	9893	-5.56
5	5	10573	9343	13.16
6	6	9412	10573	-10.98
7	7	10318	9412	9.63
8	8	10843	10318	5.09
9	9	4305	10843	-60.3
10	10	4959	4305	15.19
11	11	7544	4959	52.13
12	12	5674	7544	-24.79

Insights: There is a peak in the month of August as far as the number of orders is concerned.

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"
  ELSE "Night"
 END AS order_time,
 COUNT(DISTINCT order_id) AS no_of_orders
FROM
 `target.orders`
GROUP BY
 order_time
ORDER BY
 no_of_orders DESC
```

Row	order_time	no_of_orders
1	Afternoon	38135
2	Night	28331
3	Morning	27733
4	Dawn	5242

Insight: Brazilian customers mostly order during afternoon and night time and are less likely to order during dawn. During late afternoon and in the night time, people are generally taking breaks from their work or finishing their work.

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

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

```
SELECT
  EXTRACT(MONTH FROM o.order_purchase_timestamp)
AS month,
  c.customer_state,
  COUNT(DISTINCT o.order_id) AS no_of_orders
FROM
 `target.customers` AS c
INNER JOIN
 `target.orders` AS o
ON c.customer_id=o.customer_id
GROUP BY
 month,
 c.customer_state
ORDER  BY
 month,
 no_of_orders DESC
```

Row	month	customer_state	no_of_orders
1	1	SP	3351
2	1	RJ	990
3	1	MG	971
4	1	PR	443
5	1	RS	427
6	1	SC	345
7	1	BA	264
8	1	GO	164
9	1	ES	159
10	1	DF	151

Insights: During each month, highest number of orders have been placed in the states São Paulo (SP), Rio de Janeiro (RJ) and Minas Gerais (MG) as these are the richest states in Brazil and the lowest number of orders have been placed in the states Acre (AC), Amapá (AP) and Roraima (RR) as these are the poorest states in Brazil.

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

```
SELECT
 customer_state,
 COUNT(DISTINCT customer_unique_id) AS
no_of_customers
FROM
 `target.customers`
GROUP BY
 customer_state
ORDER BY
 no_of_customers DESC
```

Row	customer_state	no_of_customers
1	SP	40302
2	RJ	12384
3	MG	11259
4	RS	5277
5	PR	4882
6	SC	3534
7	BA	3277
8	DF	2075
9	ES	1964
10	GO	1952

Insights: The states São Paulo (SP), Rio de Janeiro (RJ) and Minas Gerais (MG) have the highest number of customers as these are the richest states in Brazil and the states Acre (AC), Amapá (AP) and Roraima (RR) have the lowest number of customers as these are the poorest states in Brazil.

Question 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).
You can use the "payment_value" column in the payments table to get the cost of orders.

```
WITH cost_2017 AS (
    SELECT
     EXTRACT(MONTH FROM o.order_purchase_timestamp)
AS month,
     ROUND(SUM(p.payment_value),2) AS cost
    FROM
    `target.payments` AS p
    INNER JOIN
```

```
    `target.orders` AS o
    ON p.order_id=o.order_id
    WHERE
    o.order_purchase_timestamp BETWEEN '2017-01-01
00:00:00' AND '2017-08-31 23:59:59'
    GROUP BY
     month
    ORDER BY
     month
), cost_2018 AS (
    SELECT
     EXTRACT(MONTH FROM o.order_purchase_timestamp)
AS month,
     ROUND(SUM(p.payment_value),2) AS cost
    FROM
     `target.payments` AS p
    INNER JOIN
     `target.orders` AS o
    ON p.order_id=o.order_id
    WHERE
     o.order_purchase_timestamp BETWEEN '2018-01-01
00:00:00' AND '2018-08-31 23:59:59'
    GROUP BY
     month
    ORDER BY
     month
)


SELECT
 cost_2017.month,
 cost_2017.cost AS cost_in_2017,
  ROUND(100*(cost_2017.cost-LAG(cost_2017.cost) OVER
(ORDER BY cost_2017.month))/(LAG(cost_2017.cost) OVER
(ORDER BY cost_2017.month)),2) AS
```

```
 pct_cost_increase_2017,
 cost_2018.cost AS cost_in_2018,
 ROUND(100*(cost_2018.cost-LAG(cost_2018.cost) OVER
(ORDER BY cost_2018.month))/(LAG(cost_2018.cost) OVER
(ORDER BY cost_2018.month)),2) AS
 pct_cost_increase_2018
FROM
 cost_2017
INNER JOIN
 cost_2018
ON cost_2017.month=cost_2018.month
ORDER BY
 cost_2017.month
```

Row	month	cost_in_2017	pct_cost_increase_2017	cost_in_2018	pct_cost_increase_2018
1	1	138488.04	*null*	1115004.18	*null*
2	2	291908.01	110.78	992463.34	-10.99
3	3	449863.6	54.11	1159652.12	16.85
4	4	417788.03	-7.13	1160785.48	0.1
5	5	592918.82	41.92	1153982.15	-0.59
6	6	511276.38	-13.77	1023880.5	-11.27
7	7	592382.92	15.86	1066540.75	4.17
8	8	674396.32	13.84	1022425.32	-4.14

Insight: This table represents month wise percentage increase in the cost of orders from January to August in the years 2017 and 2018.

```
SELECT
 ROUND(100*(SUM(cost_2018.cost)-SUM(cost_2017.cost))/
(SUM(cost_2017.cost)),2) AS percentage_cost_increase
FROM
 cost_2017
INNER JOIN
 cost_2018
ON cost_2017.month=cost_2018.month
```

Row	percentage_cost_increase
1	136.98

Insight: There is an increase of 136.98% approximately in the cost of orders from 2017 to 2018.

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

```
SELECT
 c.customer_state,
 ROUND(SUM(oi.price),2) AS total_order_price,
 ROUND(AVG(oi.price),2) AS avg_order_price
FROM
 `target.customers` AS c
INNER JOIN
 `target.orders` AS o
ON c.customer_id=o.customer_id
INNER JOIN
`target.order_items` AS oi
ON  o.order_id=oi.order_id
GROUP BY
 c.customer_state
ORDER BY
 avg_order_price DESC
```

Row	customer_state	total_order_price	avg_order_price
1	PB	115268.08	191.48
2	AL	80314.81	180.89
3	AC	15982.95	173.73
4	RO	46140.64	165.97
5	PA	178947.81	165.69
6	AP	13474.3	164.32
7	PI	86914.08	160.36
8	TO	49621.74	157.53
9	RN	83034.98	156.97
10	CE	227254.71	153.76

Insight: This table represents the total order price and average order price of each state. The states Paraíba (PB), Alagoas (AL) and Acre (AC) have the highest average order price.

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

```
SELECT
 c.customer_state,
 ROUND(SUM(oi.freight_value),2) AS
total_order_freight_value,
 ROUND(AVG(oi.freight_value),2) AS
avg_order_freight_value
FROM
 `target.customers` AS c
INNER JOIN
 `target.orders` AS o
ON c.customer_id=o.customer_id
INNER JOIN
`target.order_items` AS oi
ON  o.order_id=oi.order_id
GROUP BY
```

```
 c.customer_state
ORDER BY
 total_order_freight_value DESC
```

Row	customer_state	total_order_freight_value	avg_order_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

Insight: This table represents the total order freight value and the average order freight value of each state. The states São Paulo (SP), Rio de Janeiro (RJ) and Minas Gerais (MG) have the highest total order freight value.

Question 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.

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_estimated_delivery_date - order_delivered_customer_date

```
SELECT
```

```
 DISTINCT
 order_id,
 order_purchase_timestamp,
 order_delivered_customer_date,
 ROUND(DATE_DIFF(order_delivered_customer_date,or
der_purchase_timestamp,HOUR)/24,2) AS
delivery_time,
 ROUND(DATE_DIFF(order_estimated_delivery_date,or
der_delivered_customer_date,HOUR)/24,2) AS
diff_estimated_delivery
FROM
 `target.orders`
WHERE
 order_delivered_customer_date IS NOT NULL AND
 LOWER(order_status)="delivered"
ORDER BY
 delivery_time
```

Row	order_id	order_purchase_timestamp	order_delivered_customer_date	delivery_time	diff_estimated_delivery
1	1d893dd7ca5f77ebf5f59f0d20...	2017-06-19 08:19:45 UTC	2017-06-19 21:07:52 UTC	0.5	10.08
2	434cecee7d1a65fc65358a632...	2017-05-29 13:21:46 UTC	2017-05-30 08:06:56 UTC	0.75	19.63
3	8339b608be0d84fca9d8da68b...	2018-06-26 20:48:33 UTC	2018-06-27 17:31:53 UTC	0.83	27.25
4	f3c6775ba3d2d9fe2826f93b71...	2017-07-04 11:37:47 UTC	2017-07-05 08:09:26 UTC	0.83	11.63
5	e65f1eeee1f52024ad1dcd034...	2018-05-18 15:03:19 UTC	2018-05-19 12:28:30 UTC	0.88	9.46
6	bb5a519e352b45b714192a02f...	2017-05-31 11:11:55 UTC	2017-06-01 08:34:36 UTC	0.88	25.63
7	d5fbeedc85190ba88580d6f82...	2017-05-15 11:50:53 UTC	2017-05-16 10:21:52 UTC	0.92	7.54
8	21a8ffca665bc7a1087d31751...	2017-05-31 12:00:35 UTC	2017-06-01 10:28:24 UTC	0.92	11.54
9	d3ca7b82c922817b06e5ca211...	2017-11-16 13:54:08 UTC	2017-11-17 13:49:40 UTC	0.96	11.42
10	79e324907160caea526fd8b94...	2018-06-18 12:59:42 UTC	2018-06-19 12:43:27 UTC	0.96	8.46

Insight: This table shows the delivery time in days and the time difference between the actual and estimated delivery in days for each order.

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

```
SELECT
 c.customer_state,
```

```
 ROUND(AVG(oi.freight_value),2) AS
avg_freight_value
FROM
 `target.customers` AS c
INNER JOIN
 `target.orders` AS o
ON c.customer_id=o.customer_id
INNER JOIN
 `target.order_items` AS oi
ON o.order_id=oi.order_id
GROUP BY
 c.customer_state
ORDER BY
 avg_freight_value DESC
 LIMIT 5
```

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

Insight: The top 5 states with the highest average freight value are Roraima (RR), Paraíba (PB), Rondônia (RO), Acre (AC) and Piauí (PI).

```
SELECT
 c.customer_state,
 ROUND(AVG(oi.freight_value),2) AS
avg_freight_value
FROM
 `target.customers` AS c
INNER JOIN
```

```
 `target.orders` AS o
ON c.customer_id=o.customer_id
INNER JOIN
 `target.order_items` AS oi
ON o.order_id=oi.order_id
GROUP BY
 c.customer_state
ORDER BY
 avg_freight_value ASC
LIMIT 5
```

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

Insight: The top 5 states with the lowest average freight value are São Paulo (SP), Paraná (PR), Minas Gerais (MG), Rio de Janeiro (RJ) and the Federal District (DF).

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

```
SELECT
 c.customer_state,
 ROUND(AVG(DATE_DIFF(o.order_delivered_customer_d
ate,o.order_purchase_timestamp,HOUR)/24),2) AS
avg_delivery_time,
FROM
 `target.orders`  AS o
INNER JOIN
```

```
 `target.customers` AS c
ON o.customer_id= c.customer_id
WHERE
 o.order_delivered_customer_date IS NOT NULL AND
 LOWER(o.order_status)="delivered"
GROUP BY
 c.customer_state
ORDER BY
 avg_delivery_time DESC
LIMIT 5
```

Row	customer_state	avg_delivery_time
1	RR	29.36
2	AP	27.17
3	AM	26.4
4	AL	24.52
5	PA	23.75

Insight: The top 5 states with the highest average delivery time are Roraima (RR), Amapá (AP), Amazonas (AM), Alagoas (AL) and Pará (PA).

```
SELECT
 c.customer_state,
 ROUND(AVG(DATE_DIFF(o.order_delivered_customer_d
ate,o.order_purchase_timestamp,HOUR)/24),2) AS
avg_delivery_time
FROM
 `target.orders`  AS o
INNER JOIN
 `target.customers` AS c
ON o.customer_id= c.customer_id
WHERE
 o.order_delivered_customer_date IS NOT NULL AND
```

```
 LOWER(o.order_status)="delivered"
GROUP BY
 c.customer_state
ORDER BY
 avg_delivery_time ASC
LIMIT 5
```

Row	customer_state	avg_delivery_time
1	SP	8.74
2	PR	11.97
3	MG	11.99
4	DF	12.95
5	SC	14.93

Insight: The top 5 states with the lowest average delivery time are São Paulo (SP), Paraná (PR), Minas Gerais (MG), the Federal District (DF) and Santa Catarina (SC).

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.

```
SELECT
 c.customer_state,
 ROUND(AVG(DATE_DIFF(o.order_delivered_customer_d
ate,o.order_purchase_timestamp,HOUR)/24)-AVG(DATE
_DIFF(o.order_estimated_delivery_date,o.order_pur
chase_timestamp,HOUR)/24),2) AS
delivery_speed_in_days
FROM
 `target.orders` AS o
INNER JOIN
 `target.customers` AS c
```

```
ON o.customer_id=c.customer_id
WHERE
 o.order_delivered_customer_date IS NOT NULL AND
 LOWER(o.order_status)="delivered"
GROUP BY
 c.customer_state
ORDER BY
 delivery_speed_in_days ASC
LIMIT 5
```

Row	customer_state	delivery_speed_in_days
1	AC	-20.08
2	RO	-19.39
3	AP	-19.06
4	AM	-18.85
5	RR	-16.6

Insight: The top 5 states where the order delivery is really fast when compared to the estimated delivery are Acre (AC), Rondônia (RO), Amapá (AP), Amazonas (AM) and Roraima (RR).

Question 6: Analysis based on the payments.

A. 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(DISTINCT p.order_id) AS number_of_orders
FROM
 `target.customers` AS c
INNER JOIN
 `target.orders` AS o
```

```
ON c.customer_id=o.customer_id
INNER JOIN
 `target.payments` AS p
ON o.order_id=p.order_id
GROUP BY
 month,
 p.payment_type
ORDER BY
 month,
 number_of_orders DESC
```

Row	month	payment_type	number_of_orders
1	1	credit_card	6093
2	1	UPI	1715
3	1	voucher	337
4	1	debit_card	118
5	2	credit_card	6582
6	2	UPI	1723
7	2	voucher	288
8	2	debit_card	82
9	3	credit_card	7682
10	3	UPI	1942

Insight: This table shows the month wise number of orders placed using different modes of payment. During each month, the highest number of orders are placed using credit card and UPI and very less orders are placed using debit card.

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

```
SELECT
 payment_installments,
```

```
 COUNT(DISTINCT order_id) AS no_of_orders
FROM
`target.payments`
WHERE
 payment_value>0
GROUP BY
 payment_installments
ORDER BY
 no_of_orders DESC
```

Row	payment_installments	no_of_orders
1	1	49057
2	2	12389
3	3	10443
4	4	7088
5	10	5315
6	5	5234
7	8	4253
8	6	3916
9	7	1623
10	9	644

Insight: This table shows the number of orders placed on the basis of the number of payment installments where at least one installment has been paid successfully. Most orders are placed using 1,2 and 3 payment installments, only a couple of orders are done in 0 payment installments i.e., without EMI and very few orders are done using 22 and 23 payment installments.

Conclusions:

1. **The first order was placed on 2016-09-04 21:15:19 UTC and the last order was placed on 2018-10-17 17:30:18 UTC.**
2. **The orders have been placed by customers in 27 states and 4119 cities.**
3. **The number of orders has been highest in the month of August.**
4. **Brazilian customers mostly order during afternoon and night time.**

5. **During each month, the highest number of orders have been placed in the states São Paulo (SP), Rio de Janeiro (RJ) and Minas Gerais (MG).**
6. **During each month, the lowest number of orders have been placed in the states Acre (AC), Amapá (AP) and Roraima (RR).**
7. **The states São Paulo (SP), Rio de Janeiro (RJ) and Minas Gerais (MG) have the highest number of customers.**
8. **The states Acre (AC), Amapá (AP) and Roraima (RR) have the lowest number of customers.**
9. **The cost of orders has increased approximately 137% from 2017 to 2018.**
10. **The top 5 states with the highest average freight value are Roraima (RR), Paraíba (PB), Rondônia (RO), Acre (AC) and Piauí (PI).**
11. **The top 5 states with the lowest average freight value are São Paulo (SP), Paraná (PR), Minas Gerais (MG), Rio de Janeiro (RJ) and the Federal District (DF).**
12. **The top 5 states with the highest average delivery time are Roraima (RR), Amapá (AP), Amazonas (AM), Alagoas (AL) and Pará (PA).**
13. **The top 5 states with the fastest order delivery time when compared with the estimated delivery time are Amazonas (AM), Acre (AC), Amapá (AP), Pará (PA) and Rio Grande do Sul (RS).**
14. **During each month, the highest number of orders are placed using credit card and UPI while very few orders are placed using debit cards.**
15. **The highest number of orders are placed using 1,2 and 3 payment installments.**

<u>Recommendations</u>:

1. **Since, there is a highest peak in the number of orders in August, the planning about the inventories should be done in advance. More employees are required to work in order processing, payment processing, customer care, server management, marketing and logistics. Discounts should be provided for a specific time period everyday to avoid crowding. The website servers should be intact before the peak sale and adequate maintenance is required to make sure that the website is capable of handling huge traffic.**
2. **Since Brazilian customers mostly order during afternoon and night, the website should be prepared to handle high traffic in advance.**

3. **The states Acre (AC), Amapá (AP) and Roraima (RR) have the lowest number of customers. So, the efforts should be made in marketing, advertising, social media promotions to welcome new customers. More welcome offers and discounts should be provided.**
4. **The states São Paulo (SP), Rio de Janeiro (RJ) and Minas Gerais (MG) have the highest number of customers. So, the efforts should be made to provide best and personalized customer service. If the customer has not ordered for a certain time, exclusive reminder emails along with gifts, vouchers and coupons should be sent to the customer. In the case of customers using mobile, greeting messages should be sent via SMS, Whatsapp and App-Notifications.**
5. **Since, there is an increase in the cost of orders of about 137% from 2017 to 2018, efforts should be made to reduce the production cost to optimize the cost of orders for the upcoming year.**
6. **The top 5 states with the highest average freight value are Roraima (RR), Paraíba (PB), Rondônia (RO), Acre (AC) and Piauí (PI). Measures are to be taken to reduce the freight value to maximize sales in these states.**
7. **The states Roraima (RR), Amapá (AP), Amazonas (AM), Alagoas (AL) and Pará (PA) have the highest average delivery time. Efforts are required to reduce the delivery time in these states in order to provide better customer service.**
8. **Since very few orders are placed using debit cards during each month, more cashbacks and promotional offers are required to encourage payments by debit cards. Also, partnerships and collaborations with financial companies should be made in order to encourage the customers to purchase using debit cards so as to increase the number of orders by existing customers and also to attract new customers.**
9. **Majority of the orders are placed using 1,2 and 3 payment installments and very few orders are placed with more than 12 installments. Partnerships should be made with banks and financial companies to be able to provide long term and affordable EMI options to encourage the customers who are not willing to purchase expensive products, to spend on those products. This will ensure that the company does not lose revenue coming from the expensive products due to affordability issues of the customers**