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Q.A1

```
SELECT  
  
C.City,  
  
AVG(O.DeliveryTime) AS Average_Delivery_Time  
  
From  
  
Orders O  
  
Join  
  
Customers C ON O. CustomerID = C.CustomerID  
  
Group by  
  
C.City;
```

Note: This Query will reflect how efficiently orders are delivered to customers in different cities.

Note: If you want to analyze how the location of the stores affects delivery times, use the store's city.

Q.A2

```
SELECT
C.CustomerID,
C.Name,
SUM(O.TotalAmount) AS Total_Order_Value
From
Orders O
Join
Customers C  ON O.CustomerID = C.CustomerID
WHERE O.Status = 'completed'-(filter to include only completed orders)
Group by
C.CustomerID, C.Name
Order by
Total_Order_Value DESC
Limit 3;
```

Note: This query ensures that only the completed order contribute to the total order value.

Q.A3

```
SELECT P.ProductID, P.ProductName,  
SUM(OD.Quantity) AS Total_Orders  
From  
OrderDetails OD  
Join  
Products P ON OD.ProductID = P.ProductID  
Join  
Order O ON OD.OrderID = O.OrderID  
Join  
Stores S ON O.StoreID = S.StoreID  
Where  
S.City = 'Mumbai'  
GROUP BY P.ProductID, P.ProductName  
ORDER BY Total_Orders DESC  
Limit 3;
```

Note: This query assumes that all tables (OrderDetails, Products, Orders, and Stores) have the necessary foreign key relationships and data to support the joins.

Q.A4

SELECT

Count(Distinct CustomerID) as
Customers_not_ordered_in_last_30_days

From

Customers C

Left Join

Orders O on C.CustomerID = O.CustomerId and O.Status = 'Completed'

And O.OrderDate >= Date_sub(curdate(), Interval 30 day)

Where O.OrderID is null;

Note: This query counts customers with no completed orders in the last 30 days.

Q.A5

Select

S.StoreID,

S.City,

S.Area,

Coalesce(Sum(O.TotalAmount), 0) as Total_Revenue

From

Stores S

Left Join

Orders O On S.StoreID = O.StoreID

Group by

S.StoreID, S.City, S.Area;

Note: Used left join and coalesce to ensure that all stores are included in the result set and total revenue is set to 0 for stores with no orders.

Q.B1

```
SELECT
C.CustomerID,
C.Name
from
Customers C
Where
C.TotalOrders = 1
AND C.CustomerID IN (
SELECT O.CustomerID
FROM Orders O
WHERE O.OrderDate >= DATE_SUB(CURDATE(), INTERVAL 3 MONTH)
and O.Status = 'completed');      (Only consider completed orders)
```

Note: TotalOrders only count valid orders(completed one) to avoid misleading results.

Q.B2

SELECT

C.City,

COUNT(C.CustomerID) AS Total_Customers,

SUM(CASE when C.TotalOrders = 1 Then 1 Else 0 End) AS
Single_Order_Customers,

(SUM(CASE when C.TotalOrders = 1 Then 1 Else 0 End) /
COUNT(C.CustomerID)) * 100 AS Percentage_Single_Order_Customers

From

Customers C

Group by

C.City

Having

Total_Customers > 0 (To avoid division by zero)

Order by

Percentage_Single_Order_Customers DESC;

Summary: In given dataset Mumbai, Bangalore, and Pune have no single order customers whereas Delhi has a 100% single order customer percentage due to Charlie Brown being the only customer with a single order.

Q.B3

Key features to build a customer churn prediction model:

- **Total Orders:** We should be very careful with customers having fewer total orders as they might be at a higher risk of churn, by tracking number of orders we can provide insight into a engagement level of customer with the service.
- **Last Order Date:** It is very useful to know the last order date as if the customer has not made any order in a while he might be more likely to churn. This feature can help us determine how long it has been since the last interaction.
- **Order Status:** It is one of the most important feature to analyze the status of order (e.g completed or cancelled). A higher number of cancelled status might indicate dissatisfaction and which can lead to churn. So, tracking percentage of order status either completed or cancelled can be a key predictor in churn prediction.
- **Order Frequency:** Frequency of orders could also play a important role in churn analysis.

Q.B4

Strategies to improve customer retention:

- After identifying the customers who have not placed an order in last 14 days create various activities to target them and bring them back, these activities can include personal emails or notifications with special offers, recommend a product based on their past orders. keep an close eye on their activities at blinkit's website, offer them the product of type they look the most.
- Perform various data analytical operations on various tables like customers table to segregate customers based on purchase frequencies and last order date so that we can have deep insights about customers activity and take necessary action for customers becoming inactive for a long. One idea is to find inefficiencies in delivery by performing various data analytical activities on delivery table to analyze delivery performing metrics such as average delivery time and distance covered etc. and after identifying these inefficiencies can enhance customer satisfaction plans as per the problem.
- By segmenting customers based on their total order value and frequency blinkit can introduce a loyalty program which will provide benefits such as cashbacks, heavy discounts or free delivery for customers with high order values and frequent orders which we can identify here by TotalOrders column.

Q.C1

```
SELECT CORR(O.DeliveryTime, D.DistanceCovered)
```

```
as Correlation_Time_Distance
```

```
from Orders O
```

```
Join
```

```
Delivery D on O.OrderID = D.OrderID;
```

Note: Using the corr function query will compute the correlation between delivery time and distance covered using the filtered data.

Data points for correlation will be (30,5) (45,8) (20,3) (35,7)

The output will be a single correlation coefficient value:

- **Positive Correlation**(value closer to +1): which means longer delivery times are associated with greater distance covered.
- **Negative Correlation**(value closer to -1) which means longer delivery time is associated with shorter distance covered.
- **No correlation**(value around 0) which means there is no linear relation between delivery time and distance covered.

Here in this case the correlation coefficient between the delivery time and distance covered is = **0.9748** i.e **positive correlation**

Q.C2

Strategies to optimize store level operations and improve delivery efficiency:

- Utilize advance analytics to predict which products are in high demand and adjust inventory accordingly so that product does not go out of stock. Employ automated systems to minimize manual errors in inventory.
- Use mapping tools to optimize delivery roots so that delivery can be fastest with respect to the traffic conditions. Always schedule deliveries based on peak demand times.
- There should be proper communication channel between stores and delivery personnel so that there is a streamline flow of operations and less delivery times.
- Proper feedback should be gathered from delivery personnel regarding obstacles faced during deliveries and then making adjustments accordingly.
- Train store staff efficiently in order packing processes to ensure they makes the order ready as soon as the delivery boy arrives.

Q.C3

Revenue Maximization Formula:

General formula for revenue can be as:

Total revenue(TR) = Average Order Value * Orders

$$(TR) = X * Y$$

Where X = Average Order Value (AOV) i.e the average value of each customer order.

Y = Orders i.e total number of orders placed.

To maximize total revenue:

- Encourage Customers to spend more per order (using upselling and cross selling techniques) to increase average order value(AOV)
- Acquire more customers by increasing repeat purchases from the existing customers to increase number of orders.

This is a simple formula which focuses on two main components of revenue i.e order value and order volume.

Q.C4

Per Order Profit Maximization Formula:

Per Order Profit = Average Order Value(AOV) – (Cost Of Item Sold + Delivery Cost + Operation Cost)

Where:

AOV = Total Sales / Total Orders

COIS (Cost of Item Sold): is the direct cost of the product e.g procurement cost.

Delivery Cost: expense incurred in delivering each order.

Operational Cost: this includes cost to run the business such as labour expenses, technology used, warehousing etc.

Key strategies to maximize per order profit:

- Increase AOV by promoting high margin products. Use upselling and cross selling.
- Negotiate with suppliers to reduce cost of item. Minimize wastage in inventory by hiring skilled labourers.
- Merge number of orders, optimize delivery routes to reduce delivery time through logistics.
- Automate various processes like picking and packing of items, ensure efficient use of staff to reduce operational costs.

Q.C5

Holistic comparison of Blinkit, Zepto, Instamart and BB:

1. Delivery Speed

- **Blinkit:** Known for 10–20-minute grocery deliveries, with a strong emphasis on rapid delivery in urban areas.
- **Zepto:** Similar to Blinkit, Zepto focuses on 10-minute deliveries, making quick commerce its primary selling point.
- **Instamart (Swiggy):** Offers 15–30-minute deliveries, balancing speed with a slightly broader product range.
- **BigBasket (BB):** Primarily focused on scheduled deliveries (same day or next day) rather than ultra-fast service. Recently, BigBasket has introduced BB Now for instant delivery but not as aggressively as Blinkit or Zepto.

Note: Blinkit and Zepto are ultrafast while instamart also very quick but not as rapid. Bigbasket focus on scheduled delivery.

2. Product Assortment

- **Blinkit:** Offers a range of everyday essentials, including groceries, fruits, vegetables, and household products. The assortment is more limited compared to traditional supermarkets, focusing on high-demand products.
- **Zepto:** Similar to Blinkit, Zepto's product offering focuses on daily essentials, including groceries, snacks, and beverages, with a slightly broader range in high-demand products.
- **Instamart (Swiggy):** Instamart offers a larger assortment compared to Blinkit and Zepto, including snacks, groceries, personal care, and household products, leveraging Swiggy's logistical power.
- **BigBasket (BB):** Offers the widest product range, including groceries, fresh produce, dairy, bakery, and personal care, with thousands of SKUs (stock-keeping units), making it ideal for larger, planned orders.

Note: BB leads in product variety, followed by Instamart, Blinkit and Zepto.

3. Geographical Reach

- **Blinkit:** Operates in major cities across India, focusing primarily on urban centers with high population density to maximize delivery efficiency.
- **Zepto:** Like Blinkit, Zepto operates in select urban areas, targeting metros where demand for quick delivery is highest.

- **Instamart (Swiggy):** Has a broad reach, leveraging Swiggy's established delivery network. Available in several major cities and growing fast.
- **BigBasket (BB):** The widest reach among the four, available in over 30 cities across India, catering to both metros and tier 2 cities with a focus on both scheduled and express deliveries.

Note: BB has the largest geographical presence followed by instamart, blinkit and zepto which focuses on densely populated areas.

4. Pricing & Discounts

- **Blinkit:** Competitive pricing on essentials with frequent offers and discounts, but generally aligned with local supermarkets. Charges small delivery fees for smaller orders.
- **Zepto:** Similar pricing to Blinkit, with competitive discounts on popular items, though occasionally slightly higher for ultra-fast convenience. Free delivery on orders above a threshold.
- **Instamart (Swiggy):** Offers competitive pricing and combines offers from Swiggy's ecosystem, often integrating Swiggy discounts and promotions, such as free delivery for Swiggy One subscribers.
- **BigBasket (BB):** Bulk and subscription-based pricing available for larger, planned orders. Offers competitive discounts and has BB Star memberships with perks like free delivery, cashback, and exclusive deals.

Note: BB and Instamart offer more structured discounts while blinkit and zepto focus on pricing convenience for smaller and everyday orders.

5. Order Size and Minimum Order Value

- **Blinkit:** Targets small, frequent orders. Typically requires a small minimum order value (around ₹50 to ₹100) for free or low-cost delivery.
- **Zepto:** Similar to Blinkit, Zepto targets small basket sizes, with low minimum order requirements and free delivery thresholds.
- **Instamart (Swiggy):** More flexible, offering low minimum order values for quick delivery but also supports larger orders.
- **BigBasket (BB):** Traditionally caters to larger, planned orders with higher minimum order values (₹300-500 for free delivery), though BB Now caters to small, quick orders.

Note: Blinkit and zepto is for small, frequent orders while Bigbasket is designed for larger purchases. Instamart is flexible for both.

6. Technology & App Experience

- **Blinkit:** Simple and intuitive app focused on speed and convenience. Real-time tracking of orders and delivery times is well-integrated.
- **Zepto:** Similar to Blinkit, the app is optimized for quick navigation and checkout, with real-time updates and minimal friction in the buying process.
- **Instamart (Swiggy):** Leverages Swiggy's established app ecosystem, offering seamless integration with Swiggy's food delivery, real-time tracking, and a familiar user experience.
- **BigBasket (BB):** Comprehensive app with features like subscription ordering, scheduled delivery slots, bulk buying, and BB Star membership benefits. BB Now is optimized for quicker orders.

Note: Instamart and BB for larger orders while Blinkit and Zepto focus on simplicity and speed.

7. Operational Costs and Sustainability

- **Blinkit:** Focuses on optimizing delivery efficiency and minimizing costs through high-density urban operations. Quick deliveries, however, can drive up logistics costs.
- **Zepto:** Similar to Blinkit, Zepto operates dark stores in close proximity to customers, which allows for quick deliveries but can incur high operational costs.

- **Instamart (Swiggy):** Uses Swiggy's well-established delivery fleet, spreading costs across food delivery and grocery services, making it more scalable.
- **BigBasket (BB):** Higher operational costs due to extensive warehousing, but with economies of scale in larger orders and planned deliveries. BB Now caters to quicker deliveries but at higher operational costs.

Note: BB and Instamart are better to balance operational costs while Blinkit and Zepto have higher operational cost due to ultra fast deliveries.