Name : Anupriya Lokras

Email ID: anupriyalokras@gmail.com

Contact no. : 8305762258

A1. Calculate the average delivery time for all orders in each city

Assumption: Orders under totalorders have the same delivery time and when status = completed then an order is delivered

with mycte as (select t1.orderid, t1.customerid,t1.status, t1.deliverytime,t2.city, t2.totalorders

from Orders t1 join Customers t2 on t1.customerid = t2.customerid

where t1.status = 'Completed')

select orderid,round(avg_time, 2)as avg_time

from(select orderid,

avg(deliverytime) over(partition by city order by orderid) as avg_time

from mycte) as t

```
9  with mycte as (select t1.orderid, t1.customerid,t1.status, t1.deliverytime,t2.city, t2.totalorders
10 from Orders t1 join Customers t2 on t1.customerid = t2.customerid
11 where t1.status = 'Completed')
12 select orderid,round(avg_time, 2)as avg_time
13 from( select orderid,
14 avg(deliverytime) over(partition by city order by orderid ) as avg_time
15 from mycte ) as t
16
17
18
```

Data Output | Messages | Notifications

	orderid [PK] integer	avg_time numeric
1	102	45.00
2	105	35.00
3	101	30.00
4	104	25.00

A2. Find the top 3 customers based on the total order value they have placed.

with mycte as(select customerid, order_value,

dense_rank() over(order by order_value desc) as rank from

(SELECT customerid, sum(totalamount) as order_value

from Orders

group by 1) as sub_query

)

select customerid from mycte

where rank <= 3

```
9  with mycte as(select customerid, order_value,
10 dense_rank() over(order by order_value desc) as rank from
11 (SELECT customerid, sum(totalamount) as order_value
12 from Orders
13 group by 1) as sub_query
14 )
15 select customerid from mycte
16 where rank <= 3
17
18
```

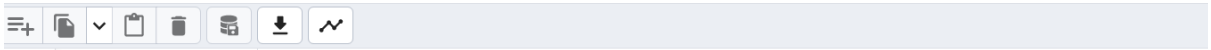
Data Output | Messages | Notifications

	customerid integer
1	1003
2	1001
3	1002

A 3. Retrieve the top 3 most frequently ordered products in Mumbai.

```
with frequency as (select t1.orderid, t1.customerid, t3.productid,
t4.productname, t2.city, t3.quantity
from Orders t1 join Customers t2 on t1.customerid = t2.customerid
join OrderDetails t3 on t1.orderid = t3.orderid
join Products t4 on t3.productid = t4.productid
where t2.city = 'Mumbai'
order by t3.quantity desc)

select productname from
(select productname, row_number() over(order by quantity) as rank
from frequency
) as t
where rank <= 3
```



	productname character varying (50)
1	Bread
2	Rice
3	Milk

A 4. Identify the number of customers who have not placed an order in the last 30 days

Assumption : From current date if a customer has not placed any order in the last 30 days

select count(customerid) as number_of_customers

from Customers

where lastorderdate >= CURRENT_DATE - 30

```
9  select count(customerid) as number_of_customers
10 from Customers
11 where lastorderdate >= CURRENT_DATE - 30
12
```

Data Output | Messages | Notifications

	number_of_customers bigint
1	0

A 5. Calculate the total revenue generated by each store.

select storeid, sum(totalamount)

from Orders group by 1

```
22
23  select storeid, sum(totalamount)
24  from Orders group by 1
25
26
```

Data Output | Messages | Notifications

	storeid integer	sum bigint
1	202	230
2	201	750
3	203	200

TO CALCULATE PROFIT:

with mycte as (select t1.storeid, t1.orderid, t1.totalamount, t2.productid, t2.quantity, t3.price

from Orders t1 join OrderDetails t2 on t1.orderid = t2.orderid

join Products t3 on t2.productid = t3.productid),

mycte2 as(select storeid as sid,sum(totalamount) AS totalamount from Orders where status='Completed'

GROUP BY STOREID),

mycte3 as (select storeid, sum(quantity*price) as amount

from mycte group by 1)

select sid, (mycte2.totalamount - mycte3.amount) as Profit from

mycte2 join

mycte3 on sid=storeid

group by mycte2.sid,Profit

	sid integer	profit bigint
1	201	0
2	202	-95
3	203	-200

Part B: Problem Solving (Customer Retention & Churn Analysis)

B 1. Write a SQL query to identify customers who placed only one order in the last 3 months

Assumption: If orderid is considered as orders placed by customers

select count(t1.orderid), t1.customerid from Orders t1 join Customers t2

on t1.customerid = t2.customerid

where t2.lastorderdate >= NOW() - INTERVAL '3 months'

group by 2

having count(t1.orderid) = 1

```
16  select count(t1.orderid), t1.customerid from Orders t1 join Customers t2
17  on t1.customerid = t2.customerid
18  where t2.lastorderdate  >= NOW() - INTERVAL '3 months'
19  group by 2
20  having count(t1.orderid) = 1
21
22
23
```

Data Output Messages Notifications

count bigint	customerid integer

Assumption : If total orders are considered as orders placed by the customers

select customerid from Customers

where lastorderdate >= NOW() - INTERVAL '3 months' and totalorders = 1

```
18  select customerid from Customers
19  where lastorderdate  >= NOW() - INTERVAL '3 months' and totalorders = 1
20
21
22
23
```

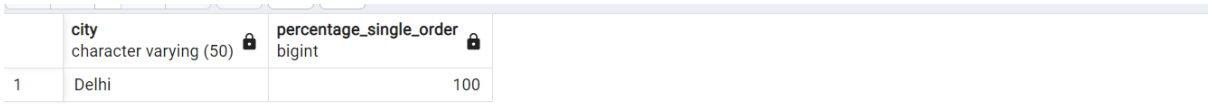
Data Output Messages Notifications

customerid [PK] integer

B 2. Create a list of cities with high percentages of single-order customers

```
WITH SingleOrderCustomers AS (
  SELECT city, COUNT(*) AS single_order_count
  FROM Customers
  WHERE totalorders = 1
  GROUP BY city
),
TotalCustomers AS (
  SELECT city, COUNT(*) AS total_customers
  FROM Customers
  GROUP BY city
)

SELECT s.city, (s.single_order_count / t.total_customers) * 100 AS percentage_single_order
FROM SingleOrderCustomers s
JOIN TotalCustomers t ON s.city = t.city
WHERE (s.single_order_count / t.total_customers) * 100 > 50;
```



	city character varying (50)	percentage_single_order bigint
1	Delhi	100

B3 . Suggest 3 features you would consider to build a customer churn prediction model.

The purpose of churn prediction models is to identify the consumers who are most likely to discontinue their use of the product or service based on a variety of attributes or factors that reflect their behavior, demographics, and interactions with it. The model's efficacy and accuracy are largely dependent on the features that are employed as input. Common feature kinds that can be utilized as inputs are listed below:

1. Demographics of the Customer
   Age: Certain age groupings of customers may have higher attrition rates.
   Gender: Different genders may have different churn patterns.
   Location: Churn rates may differ depending on the area.
   Income Level: Loyalty may be impacted by a higher or lower income.
2. Purchase History and Customer Behavior: The amount, frequency, and recentness of previous transactions.
   Length of Subscription: The amount of time a client has been utilizing the service.
   Usage Patterns: Time spent on the platform, frequency of use of the product or service, etc.
   Login Activity: The frequency with which the user interacts with the platform or logs in.
3. Metrics for Customer Engagement
   Email Open Rates: Indicates if a consumer is responding to promotional or newsletter emails.
   Customer feedback scores are based on reviews and ratings from actual customers.
   Net Promoter Score (NPS): An indicator of client loyalty and satisfaction.
   Referral Activity: There may be a lower chance of customer turnover when they recommend others.

B 4. Based on the above, outline 2-3 strategies Blinkit could implement to improve customer retention.

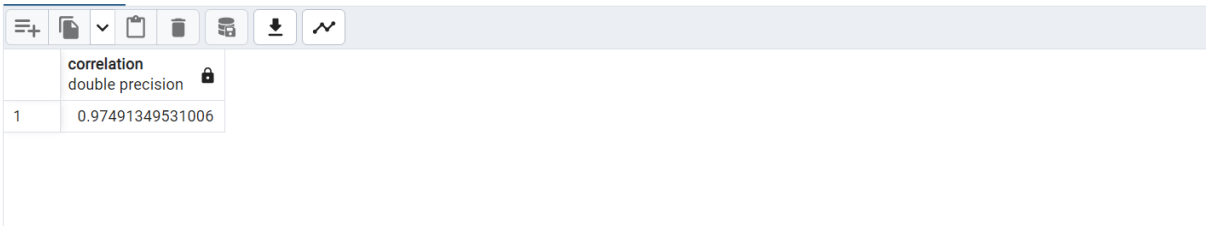
1. **Having a strong feedback system :** Having a strong feedback system from customers can help understand what they like and dislike about the service. When customers share their thoughts, we can find out which areas need improvement, such as faster delivery times or better product quality. This makes customers feel valued and more connected to the brand, which can lead to them coming back for more orders. Additionally, analyzing this feedback helps make smart decisions about what products to offer and how to enhance the overall shopping experience. Overall, a good feedback system can boost customer satisfaction and loyalty, making Blinkit more successful.
2. **Serve! Don’t sell:** "Serve, don't sell" means focusing on helping customers rather than just trying to make a sale. When businesses take this approach, they listen to what customers really need and provide solutions or support. This builds trust and makes customers feel valued, which encourages them to come back instead of feeling pressured to buy something. By analyzing customer data and preferences, Blinkit can offer personalized product suggestions that genuinely meet customers' needs rather than pushing popular items. For example, if a customer frequently orders snacks, Blinkit could recommend similar products or new arrivals in that category.
3. **Acknowledge your customers** : Acknowledging your customers is super important for any business, including Blinkit. They can show appreciation by sending personalized messages, like thank-you notes after purchases, which makes customers feel valued. Implementing loyalty programs that reward customers for repeat business is another great way to acknowledge them, as it encourages them to keep coming back. Blinkit can also engage with customers on social media by responding to their comments and sharing their stories, creating a community vibe. All of these actions help build strong relationships and make customers feel like they are part of something special, which can lead to more loyalty and positive word-of-mouth.

Part C: Business Case Study (Efficiency & Growth Strategy)

C 1. Analyze the relationship between the distance covered by delivery agents and the average delivery time. Use SQL to derive correlation metrics.

```
WITH mycte AS (
   SELECT
      orderid,
      deliverypersonid,
      deliveryendtime - deliverystarttime AS duration,
      distancecovered
   FROM delivery
)

SELECT
   CORR(EXTRACT(EPOCH FROM duration), distancecovered) AS correlation
FROM mycte
```



	correlation double precision
1	0.97491349531006

C 2. Recommend 3 strategies to optimize store-level operations and improve delivery efficiency.

Challenge : Maintaining fresh stocks in the dark stores is challenging because of Issues like limited storage space, fluctuating demand, and potential for spoilage can impact the efficiency and profitability of the operation. This can vary from city to city according to the weather conditions.

1. **Using Pathfinding algorithm**

Blinkit likely uses pathfinding algorithms like Dijkstra's and A* search to help delivery riders find the quickest routes. These algorithms work together with mapping systems to show locations and choose the best routes, taking into account real-time traffic and road conditions.

Dijkstra's Algorithm is a method used to find the shortest path between two points in a graph, which can represent things like road networks or connections between computers. It works by starting at the initial point, marking it as "visited," and then exploring all its neighbors to find the shortest path. It keeps updating the shortest path to each node until it reaches the destination. This algorithm can help delivery systems like Blinkit find the fastest route from the store to the customer, avoiding delays and minimizing travel time.

2. **Using predictive algorithms such as linear regression**
   It can be helpful look at past order trends, the availability of riders, and current stock levels. This helps to figure out which nearby store has the items needed and which rider is closest to deliver the order quickly.
   Linear regression: This algorithm is used to predict a continuous outcome based on one or more input variables. It finds the relationship between the input (independent) variables and the output (dependent) variable by fitting a straight line through the data points.

3. **Automation in Warehouses**: Using robots or automated picking systems in dark stores can drastically reduce the time spent preparing orders for delivery. This minimizes the time between order placement and rider dispatch.

C 3. **Develop a Revenue Maximization Formula for Blinkit using the most relevant factors and explain those as well**

Total Revenue=(Average Order Value×Order Volume)−Operational Costs

i. Average order value : According to ET Blinkit's average order value stood at Rs. 635 in quatere 3rd against Rs. 607 in previous quarter. AOV can be increased by :
   - Increasing delivery charges and reducing the cost of goods at cart
   - Bringing more categories in the company i.e. by increasing stock keeping units or sku's
   - By advertising in the platform.

ii. Order Volume=Total Number of Orders per Day
   It can be done through marketing campaigns, promotions, and improving app engagement with push notifications and personalized offers. As the order volume increases variable cost also increase and as a result contribution margin will increase which means that as Blinkit scales up its orders the contribution margin would increase while the fixed cost would remain same resulting to lower the cost of rent, salaries, electricity.

iii. Operational Cost={(Delivery Costs + Inventory Costs + Warehousing Costs)}
   Expenses related to sum of deliveries which includes deliveries from mother dark store to child dark store as well as from child dark store to the customer. Cost of packaging , wastage, support services are also included , also the operation cost of dark store.
   This cost can be reduced by improving route optimization techniques.

C 4. **Generate a Per Order Profit Maximization Formula based on your understanding of Blinkit and Quick Commerce**

Per Order Profit=Revenue per Order−(Cost of Goods Sold+Delivery Cost+Operational Costs)

1. Revenue per order = Order Value (Price)+Add-ons/Service Fees
   Amount a customer pays for the order including the delivery charges or extra add ons.
2. COGS : This includes the cost to Blinkit for sourcing and buying the goods, along with any associated procurement or storage costs. Reducing procurement costs through efficient sourcing or discounts from suppliers can directly impact profit.
3. Delivery cost : This includes mid mile delivery as well as last mile delivery also the fule/vehicle costs. Optimizing route planning, using electric vehicles, or increasing delivery density (more orders in a single route) can reduce delivery costs.
4. Operational costs = Delivery Costs + Inventory Costs + Warehousing Costs
   Blinkit can lower operational costs by optimizing warehouse locations, automating processes, and improving inventory management.

C 5. **Make a holistic comparison of Blinkit, Zepto, Instamart and BB on most important factors. You can use the internet for gathering relevant data.**

Factors	Blinkit	Zepto	Instamart	BB now
Repeat rate	able to achieve by keeping more than 6000 sku's.	Relatively low	Less than blinkit	Smallest range of sku's
Prime Products	Groceries,Chicken,Meat, Fish,Baby care food,vegetables, fruits, dairy products, beverages, pet care foods, etc.	Groceries, snacks, beverages, vegetables, fruits, dry rations, cleaning items, dairy products, personal care items, etc	Groceries, snacks, beverages, vegetables, fruits, dry rations, cleaning items, dairy products, personal care items, etc	Groceries, snacks, beverages, vegetables, fruits, dry rations,
Product search strategy	"Request a product" suggestion onboards the item in the dark store upon higher requests. Ex: cow dung, dhanteras coins also available because of the search system.	No such feature available	No such feature available	No such feature available
Average order value	Electronics items are readily available. These things are needed much faster	Electronics SKU'S are less	Electronics SKU'S are less	Electronics SKU'S are very less
Blinkit billboard strategy 	Everywhere around the city by creative billboards and also heavy marketing	No such creative marketing done	No such creative marketing done	Not done
Monthly traffic(based on 2022-2023)	600k	100k	100k	< 100k
Performance marketing	Heavy advertising during festive season	Relatively low	Advertising during festive season	Very less
Estimated delivery time	10-30 minutes	10 minutes	15-30 mintues	10-25 min

Delivery charges	INR 9.00 to INR 30.00 (depending on the peak hours of the day)	INR 35.00 for orders uner 99	INR 15-35	INR 50 slightly on the higher side
Number of dark stores	400	220	605	Exact data not available(~350)