



SQL Project Report

OnlineFoodDelivery

Advance Level



Md.Tanvir Ahmed
md.ahmedtanvirdev@gmail.com



Project Info :

This project aims to analyze an online food delivery system using SQL to generate actionable business insights.

By integrating datasets related to customers, orders, restaurants, and menu items, the analysis utilizes advanced SQL techniques—including subqueries, common table expressions (CTEs), window functions, views, temporary tables, and stored procedures—to uncover key trends and opportunities.

The purpose of this analysis extends beyond answering standard performance metrics. It is designed to reveal trends in customer behavior, restaurant performance, and order dynamics.

These insights empower decision-makers to:

- Streamline delivery and restaurant operations
- Personalize customer experiences
- Strengthen customer engagement and retention
- Drive overall growth and profitability
-

By transforming raw transactional data into actionable intelligence across twelve key insights, this project demonstrates the value of SQL in shaping smarter strategies for the rapidly evolving food delivery industry.





Problem Statements

- Identify our most valuable customers based on order frequency and spending.
- Identify percentage of orders are repeat vs. first-time purchases.
- Which restaurants receive the highest number of orders and generate the most revenue?
- Which menu items are most frequently ordered, and which items rarely sell?
- Which restaurants and menu items generate the highest profit margins?



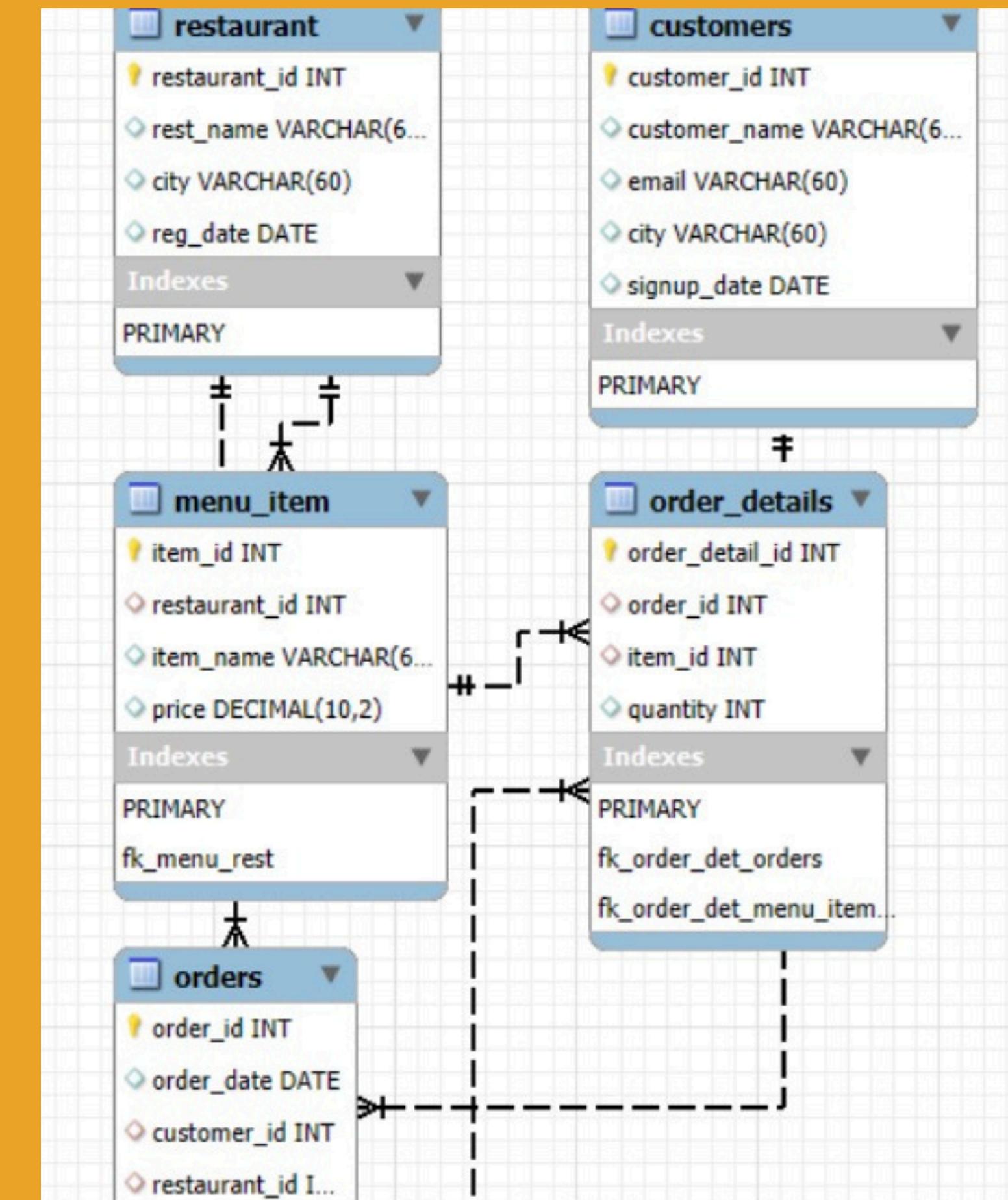
Dataset Description

Online Food Delivery Dataset

| Table Name | Description |
|---------------|--|
| customers | customer_id, customer_name, city, email, signup_date |
| orders | order_id, customer_id, restaurant_id, order_date |
| order_details | order_id, item_id, order_detail_id, quantity |
| restaurant | restaurant_id, rest_name, city, reg_date |
| menu_items | item_id, restaurant_id, item_name, price |



ER Diagram





Queries

Restaurant with the highest total revenue in each city

```
select r.city,r.rest_name from restaurant r
where (r.restaurant_id,r.city)in (select
r2.restaurant_id,r2.city from restaurant r2 join
orders o on o.restaurant_id=r2.restaurant_id
join order_details od on
od.order_id=o.order_id join menu_item m on
m.item_id=od.item_id group by
r2.city,r2.restaurant_id having
sum(m.price*od.quantity)= (select
max(Total_revenue) from(select r3.city as
city_name,r3.restaurant_id,sum(m.price*od.quantity)as Total_revenue from restaurant r3
join orders o on
r3.restaurant_id=o.restaurant_id join
order_details od on o.order_id=od.order_id
join menu_item m on m.item_id=od.item_id
group by r3.city,r3.restaurant_id)as
city_revenues where
city_revenues.city_name=r2.city));
```

Result Grid | Filter Rows:

| | city | rest_name |
|-----|-----------|---------------|
| ▶ | Pune | Tasty Bistro |
| ▶ | Bangalore | Big Table |
| ▶ | Delhi | Tasty Bistro |
| ▶ | Ahmedabad | Tasty Palace |
| ▶ | Mumbai | Big Table |
| ▶ | Jaipur | Royal Grill |
| ▶ | Surat | Happy Grill |
| ▶ | Chennai | Spice Kitchen |
| ... | | |



Queries

Most Frequently Ordered Item



```
select
m.item_id,m.item_name,count(od.item_id) as
times_ordered
from menu_item m join order_details od on
m.item_id=od.item_id
group by m.item_id,m.item_name
order by times_ordered
desc
limit 1;
```

| Result Grid | | |
|-------------|-------------|---------------|
| Item ID | Item Name | Times Ordered |
| 71 | Masala Dosa | 2223 |



Queries

Percentile Bucket for Customers (Top/Bottom Tiers)

```
select
c.customer_id,
c.customer_name,
COUNT(o.order_id) as total_orders,
ntile(5) over (order by count(o.order_id) desc) as
percentile_bucket
from customers c
join orders o
on c.customer_id = o.customer_id
group by c.customer_id, c.customer_name
order by total_orders desc;
```

| | customer_id | customer_name | total_orders | percentile_bucket |
|---|-------------|---------------|--------------|-------------------|
| ▶ | 336 | Ishaan Sharma | 10 | 1 |
| | 28 | Vihaan Das | 9 | 1 |
| | 154 | Aditya Reddy | 8 | 1 |
| | 176 | Vihaan Patel | 8 | 1 |
| | 7 | Vihaan Nair | 7 | 1 |
| | 72 | Arjun Nair | 7 | 1 |
| | 120 | Ishaan Singh | 7 | 1 |
| | 135 | Aditya Verma | 7 | 1 |



Queries

Customers who spent more than 1000

```
create view Customer_Total_Spent as
select
c.customer_id,c.customer_name,sum(m.price*od.quantity)
as Total_Spent
from customers c
join orders o on c.customer_id=o.customer_id
join order_details od on o.order_id=od.order_id
join menu_item m on m.item_id=od.item_id
group by c.customer_id,c.customer_name;
--
select * from Customer_Total_Spent
where Total_spent >1000;
```

| | customer_id | customer_name | Total_Spent |
|---|-------------|----------------|-------------|
| ▶ | 151 | Vihaan Gupta | 5177.11 |
| | 104 | Muhammad Patel | 7000.67 |
| | 418 | Arjun Bhat | 5744.40 |
| | 497 | Aditya Das | 3186.83 |
| | 187 | Reyansh Sharma | 4166.15 |
| | 322 | Aarav Bhat | 6820.95 |
| | 37 | Reyansh Verma | 13635.56 |
| | 189 | Sai Patel | 9516.64 |



Queries

Find top 3 customers(based on total spending) using a temporary table

```
create temporary table temp_total_spending as
select
c.customer_id,c.customer_name,sum(od.quantity*m.price)as total_spent
from customers c
join orders o on c.customer_id=o.customer_id
join order_details od on od.order_id=o.order_id
join menu_item m on m.item_id=od.item_id
group by c.customer_id,c.customer_name;
select * from temp_total_spending
order by total_spent desc
limit 3;
```

--

| | customer_id | customer_name | total_spent |
|--|-------------|---------------|-------------|
| | 7 | Vishaan Nair | 17447.78 |
| | 408 | Aditya Verma | 15821.53 |
| | 235 | Vishaan Singh | 15604.50 |



Queries

Identifying Restaurant Performance

```
create view restaurant_performance as
select r.restaurant_id,r.rest_name,count(distinct o.order_id)as
total_orders,sum(od.quantity*m.price) as total_revenue
from restaurant r
join menu_item m on r.restaurant_id=m.restaurant_id
join order_details od on od.item_id=m.item_id
join orders o on o.order_id=od.order_id
group by r.restaurant_id,r.rest_name;
select * from restaurant_performance;
```

| restaurant_id | rest_name | total_orders | total_revenue |
|---------------|----------------|--------------|---------------|
| 1 | Fresh Hub | 56 | 77224.46 |
| 2 | Big Diner | 20 | 15824.42 |
| 3 | Big Corner | 34 | 40492.44 |
| 4 | Royal Hub | 20 | 23236.36 |
| 5 | Happy Garden | 46 | 57492.38 |
| 6 | Tasty Bistro | 49 | 51153.08 |
| 7 | Big Table | 34 | 31237.88 |
| 8 | Royal Garden | 45 | 50672.10 |
| 9 | Fresh Palace | 23 | 28228.96 |
| 10 | Flavors Corner | 54 | 46699.38 |
| 11 | Golden Bistro | 27 | 43016.54 |
| 12 | Royal Garden | 29 | 49224.39 |
| 13 | Flavors Palace | 27 | 19822.08 |



Queries

Customers ordered from more than five restaurants

```
create temporary table cust_ord_5rest as
select o.customer_id,count(distinct restaurant_id)as distinct_rest
from orders o
group by o.customer_id;
select c.customer_id,c.customer_name,t.distinct_rest
from cust_ord_5rest t
join customers c on c.customer_id=t.customer_id
where t.distinct_rest>5
order by t.distinct_rest desc;
```

| | customer_id | customer_name | distinct_rest |
|-----|----------------|---------------|---------------|
| 28 | Vihaan Das | 9 | |
| 176 | Vihaan Patel | 8 | |
| 336 | Ishaan Sharma | 8 | |
| 7 | Vihaan Nair | 7 | |
| 72 | Arjun Nair | 7 | |
| 154 | Aditya Reddy | 7 | |
| 180 | Vivaan Bhat | 7 | |
| 496 | Muhammad Verma | 7 | |
| 21 | Vihaan Patel | 6 | |
| 26 | Reyansh Reddy | 6 | |
| 49 | Krishna Bhat | 6 | |



Queries

Number of menu items per restaurant

```
with num_menu_item_rest as
(select m.restaurant_id,count(*) as number_items from menu_item m
group by m.restaurant_id)
select r.rest_name,nmr.number_items
from num_menu_item_rest nmr
join restaurant r on r.restaurant_id=nmr.restaurant_id
order by nmr.number_items desc;
```



Result Grid | Filter Rows: _____ | Export:

| rest_name | number_items |
|---------------|--------------|
| Spice Kitchen | 12 |
| Tasty Diner | 10 |
| Happy Grill | 9 |
| Flavors Diner | 9 |
| Fresh CafÃ© | 8 |
| Tasty Bistro | 7 |
| Happy Kitchen | 7 |
| Happy Corner | 7 |
| Big Diner | 7 |
| Golden Garden | 7 |
| Golden Garden | 7 |
| Flavors Table | 7 |
| Fresh Hub | 6 |
| Fresh Garden | 6 |
| Tomato Blends | 5 |

Result 5

Output





Queries

Cheapest Item in Each Restaurant

```
with cheap_item as
(select item_id,item_name,restaurant_id,min(price)as cheapest_item
from menu_item group by item_id,item_name)
select r.rest_name,ci.item_name,ci.cheapest_item
from cheap_item ci
join restaurant r on r.restaurant_id=ci.restaurant_id
order by ci.cheapest_item;
```



| Result Grid | Filter Rows: | Export: |
|---------------|----------------------|---------------|
| rest_name | item_name | cheapest_item |
| Little Corner | Masala Dosa | \$2.69 |
| Tasty Bistro | Paneer Butter Masala | \$6.42 |
| Big Diner | Idli Sambhar | \$7.32 |
| Happy Grill | Fish Curry | \$8.18 |
| Golden Garden | Masala Dosa | \$8.43 |
| Tasty Diner | Momos | \$8.91 |
| Fresh CafÃ© | Gulab Jamun | \$9.41 |
| Spice Garden | Fried Rice | \$9.42 |
| Happy Garden | Fish Curry | \$9.50 |
| Spice Kitchen | Chicken Biryani | \$9.75 |





Queries

Orders for a Specific Customer

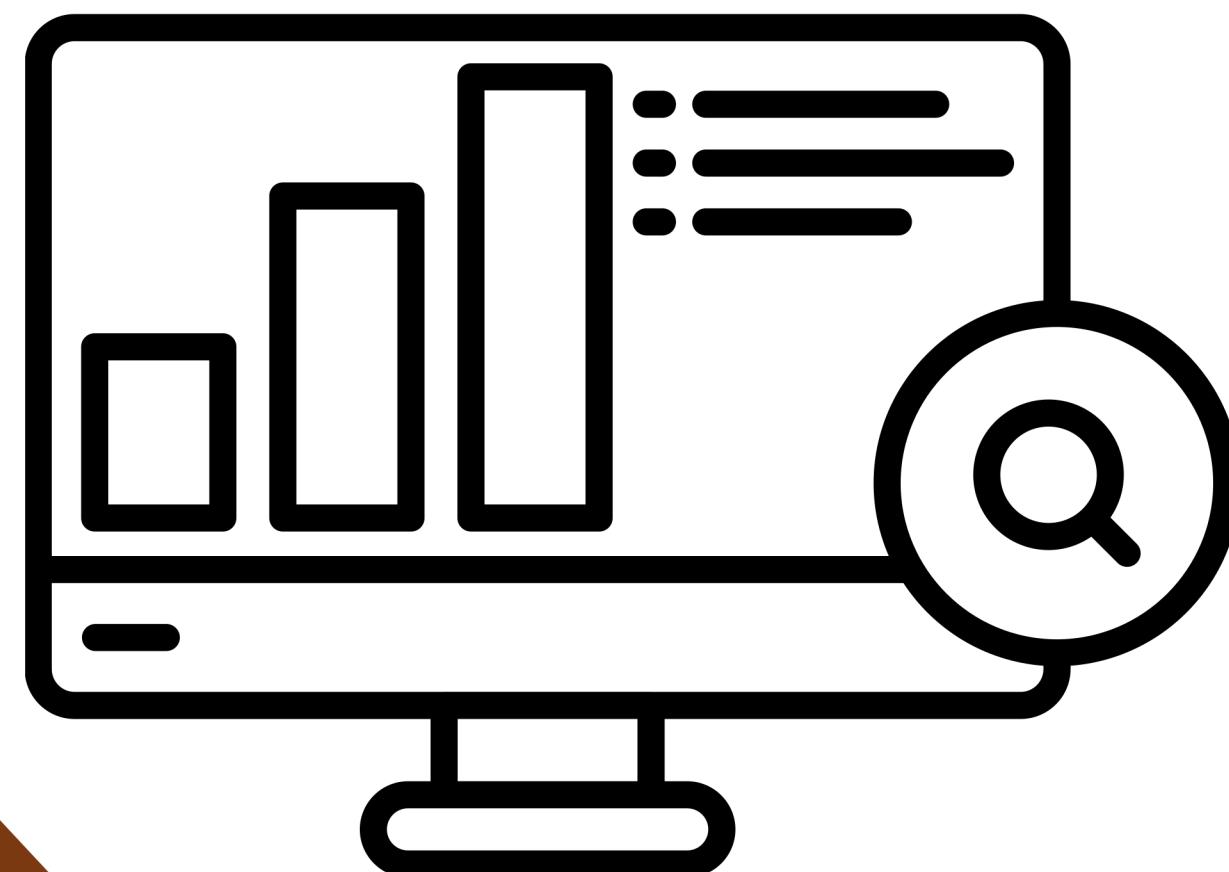
```
delimiter //
create procedure orderbycust(in cust_id int)
begin
select * from orders where customer_id=cust_id;
end//
delimiter;
```

Result Grid | Filter Rows: | Export: [CSV](#) [XLS](#) [PDF](#)

| | order_id | order_date | customer_id | restaurant_id |
|---|----------|------------|-------------|---------------|
| 1 | 192 | 2023-12-18 | 5 | 45 |
| 2 | 301 | 2023-01-02 | 5 | 22 |
| 3 | 561 | 2023-05-16 | 5 | 31 |
| 4 | 691 | 2024-11-10 | 5 | 9 |
| 5 | 854 | 2024-11-15 | 5 | 8 |
| 6 | 1233 | 2024-05-18 | 5 | 45 |



Insights and Storytelling





Visualization

Insights

1. Top Performing Cities

- Chennai (₹286,737), Pune (₹262,335), and Kolkata (₹259,586) lead in customer expenditure, indicating strong revenue contribution from these regions.

2. Mid-Tier Cities

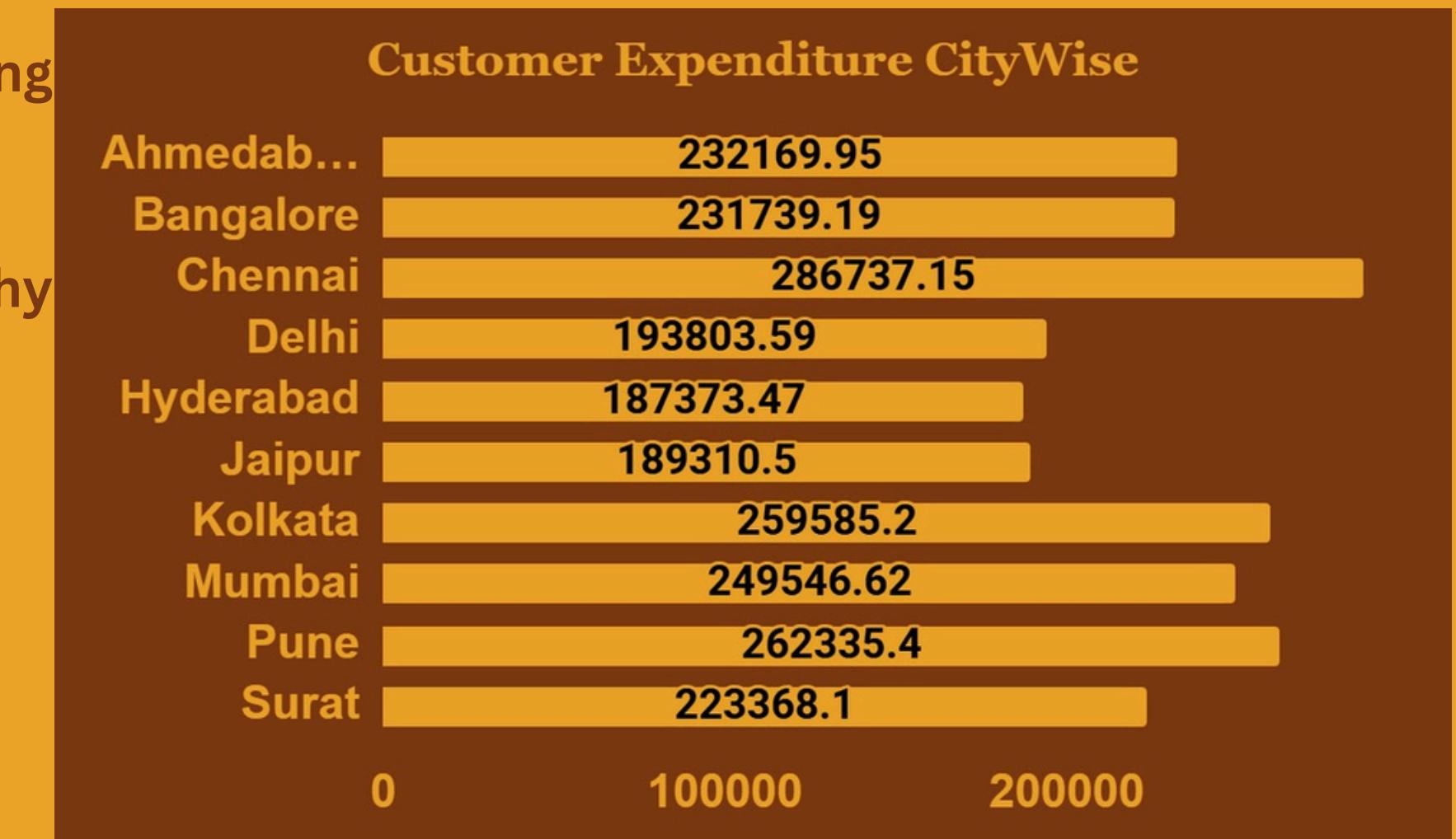
- Mumbai (₹249,547) and Bangalore (₹232,170) show healthy expenditure, close to the leaders but slightly behind.

3. Lower Performing Cities

- Delhi (₹193,804), Hyderabad (₹189,373), and Jaipur (₹89,311) record the lowest expenditure.

4. Strategic Implication

- Focus on sustaining growth in Chennai, Pune, and Kolkata through loyalty programs and premium offerings.
- Unlock potential in mid-tier cities like Mumbai and Bangalore with additional campaigns.
- Address gaps in Delhi, Hyderabad, and Jaipur by understanding customer behavior.





Visualization

Insights

Even Distribution Across Percentiles

- Each percentile bucket (1 through 5) has a similar customer count (94–95).
- This indicates balanced distribution across percentile groups.

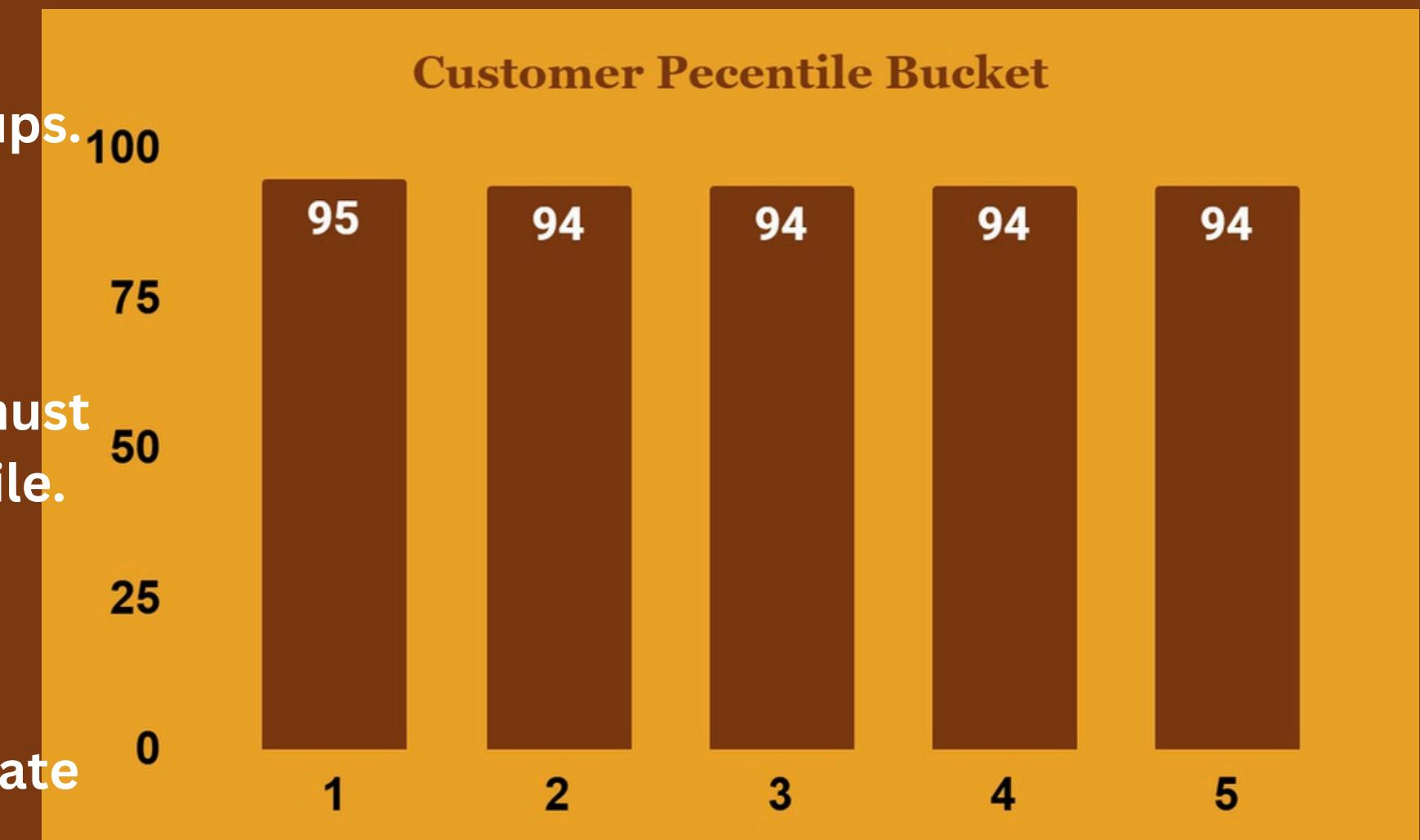
Implication on Targeting

- Since no percentile bucket dominates, growth strategies must be broad-based rather than focusing on a specific percentile.

Strategic Opportunity

While the distribution is uniform, businesses should differentiate strategies within each percentile to maximize spend.

For example, premium offers for higher percentiles and value-driven promotions for lower ones.





Visualization

Insights

Strong and Competitive Leaders

- Revenue contribution among the top 3 restaurants is very close, ranging between ₹74K–77K.
- Royal Grill leads slightly (₹76.6K), followed closely by Fresh Garden (₹75.8K).

Stable Revenue Sources

- This balanced performance reduces reliance on a single restaurant.

Strategic Implication

- Since the top 3 contribute almost equally, efforts should focus on strengthening partnerships with all three.





Visualization In s i g h t s



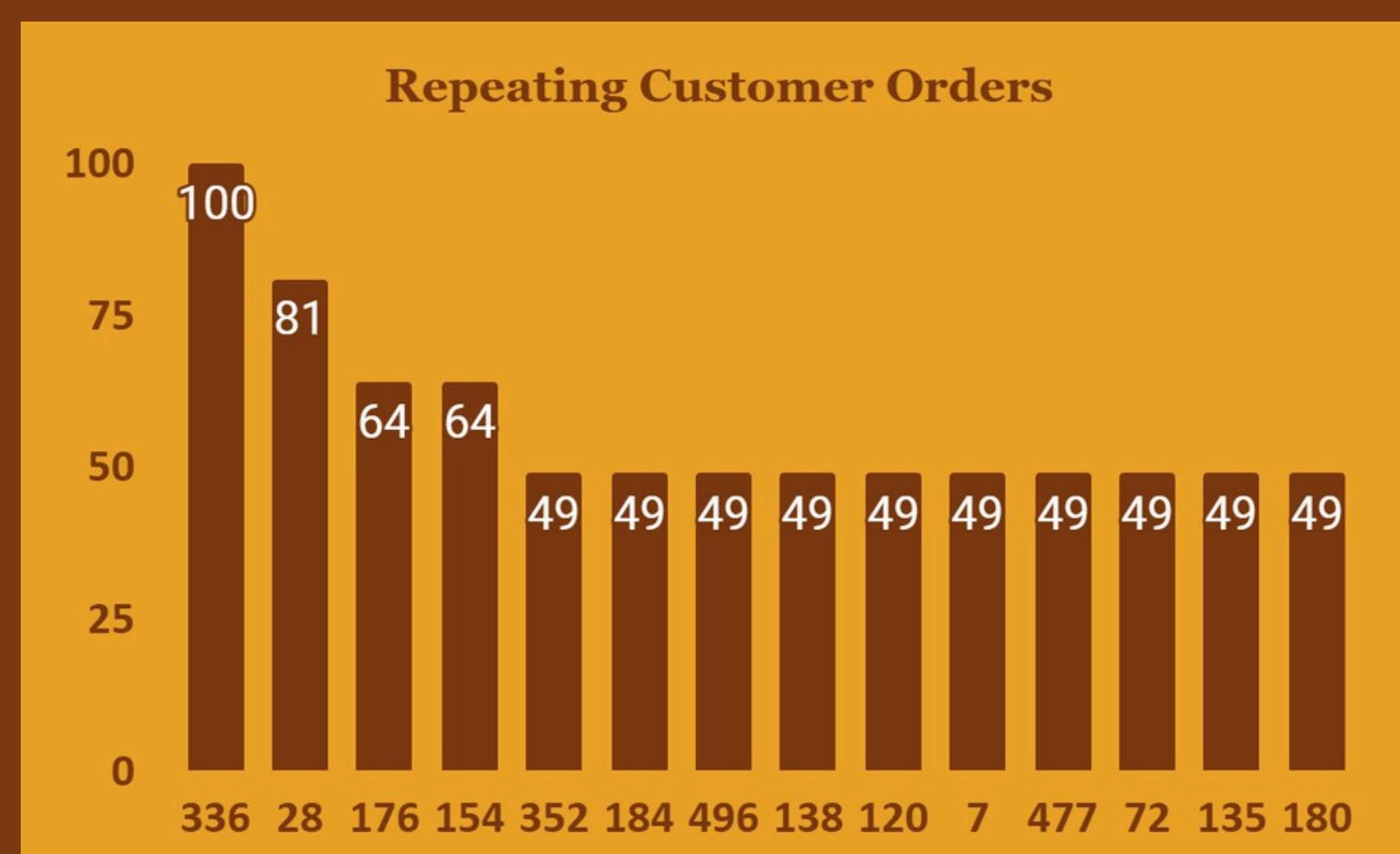
A few super-repeaters stand out

The top customer placed 100 orders, followed by 81, then two at 64.

These are clear outliers versus the rest and should be treated as VIPs(early-access).

Large plateau of heavy repeaters

Many customers cluster at 49 orders each, forming a flat “shoulder” in the distribution.





Visualization

Insights



Premium Segment Leaders

- Paneer Tikka (₹598.53) and Fish Curry (₹597.90) are positioned at the top, signaling strong candidates for premium promotion bundles.
- Aloo Paratha (₹596.94) also competes closely, showing that both vegetarian and non-vegetarian dishes contribute to the high-value segment.

Menu Strategy Implication

- Since the difference among items is marginal, customer perception (taste, popularity, cultural preference) will influence choice more than price.
- Restaurants can bundle premium items or market them as “signature dishes” to reinforce exclusivity and drive higher margins.

5 Most Expensive Items





Visualization

Insights

Clear Market Leaders

- **Momos (529 orders)** is the top-selling item, followed closely by **Fish Curry (513 orders)**.
- These two alone account for the largest share of demand, indicating strong customer preference.

Balanced Popularity Across Segments

- Vegetarian options like **Aloo Paratha (495 orders)** and **Paneer Tikka (454 orders)** also perform strongly.
- This balance between veg and non-veg items suggests a diverse customer base with mixed preferences.

Strategic Implication

- Momos and Fish Curry should be highlighted as hero products in campaigns, promotions, and menu placements.
- Hakka Noodles (400 orders) is the lowest among the top 5, but still popular – could be uplifted via combo deals (e.g., Momos + Hakka Noodles) or special offers to push volumes.





Visualization

Insights

Majority are Regular Signups

- 206 customers (largest group) fall under the Regular category, showing stable and consistent acquisition in the current cycle.

Early Birds Remain Strong

193 customers signed up early, indicating a strong early adoption trend — these are likely to be engaged, loyal users who joined before others.

Low Share of New Customers

- Only 101 new signups, significantly fewer than Regular and Early Bird groups.
- This points to a slowdown in fresh customer acquisition, which may impact future growth if not addressed.

Strategic Implications

- Retain and reward Early Birds with loyalty perks to strengthen long-term engagement.
- Sustain Regulars by continuing current acquisition campaigns.





visualiz ation

Insights

Gradual Decline Over Time

Orders started at 63 (July 2023) and steadily declined to 51 (May 2024).

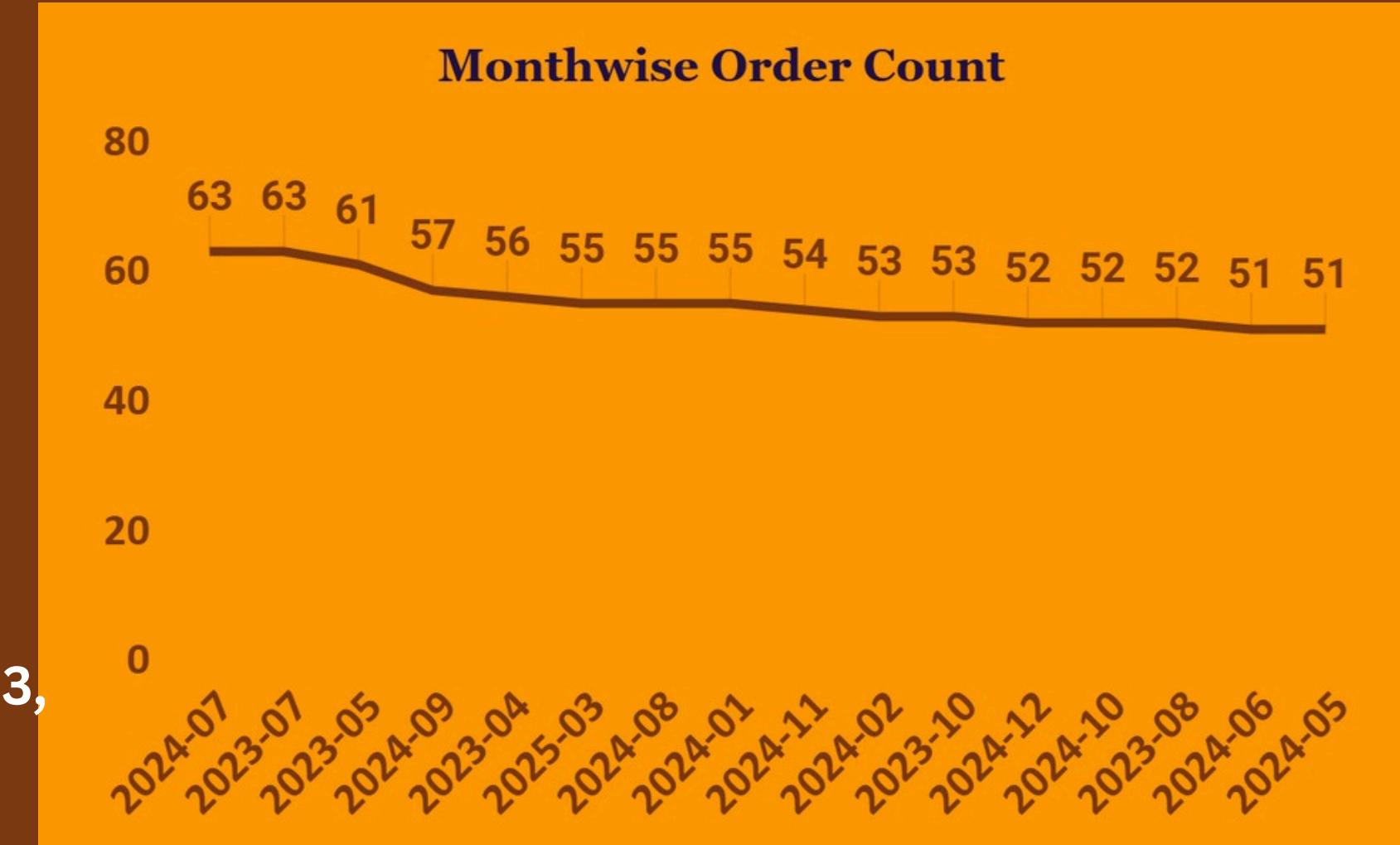
This represents a ~19% drop in monthly orders over the 11-month period.

Stabilization at Lower Levels

After November 2023, order counts largely stabilized around 52–53, suggesting the business has reached a plateau in demand.

Strategic Concern

The downward trend indicates customer engagement or acquisition is slowing, and without intervention, long-term growth may stagnate.





Visualization

Insights

Dominance of Medium-Sized Restaurants

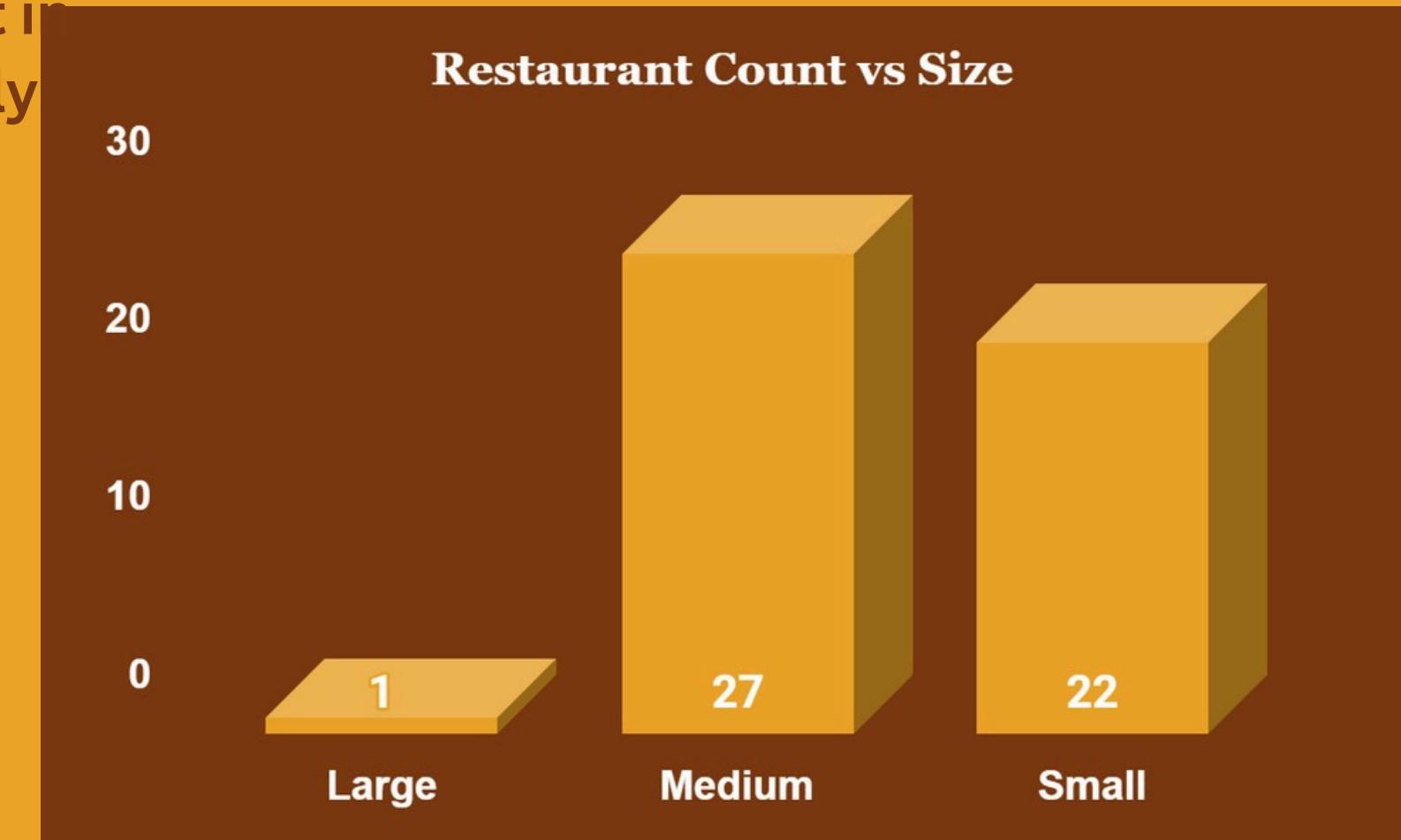
- 27 restaurants are medium-sized, making them the largest segment in the network. This suggests medium restaurants form the core supply base.

Strong Presence of Small Restaurants

- 22 small restaurants are also a significant part of the ecosystem.
- Together with medium restaurants, they account for 96% of all restaurants — showing a reliance on smaller establishments.

Very Limited Large Restaurants

- Only 1 large restaurant is present, highlighting a gap in scaling partnerships with bigger players.



Strategic Implications

- Strengthen partnerships with medium restaurants since they are the backbone of supply.
- Support small restaurants with growth initiatives (marketing, tech support) to help them scale.

Target onboarding more large restaurants to diversify and balance the portfolio with high-capacity contributors.



Visualization

Insights

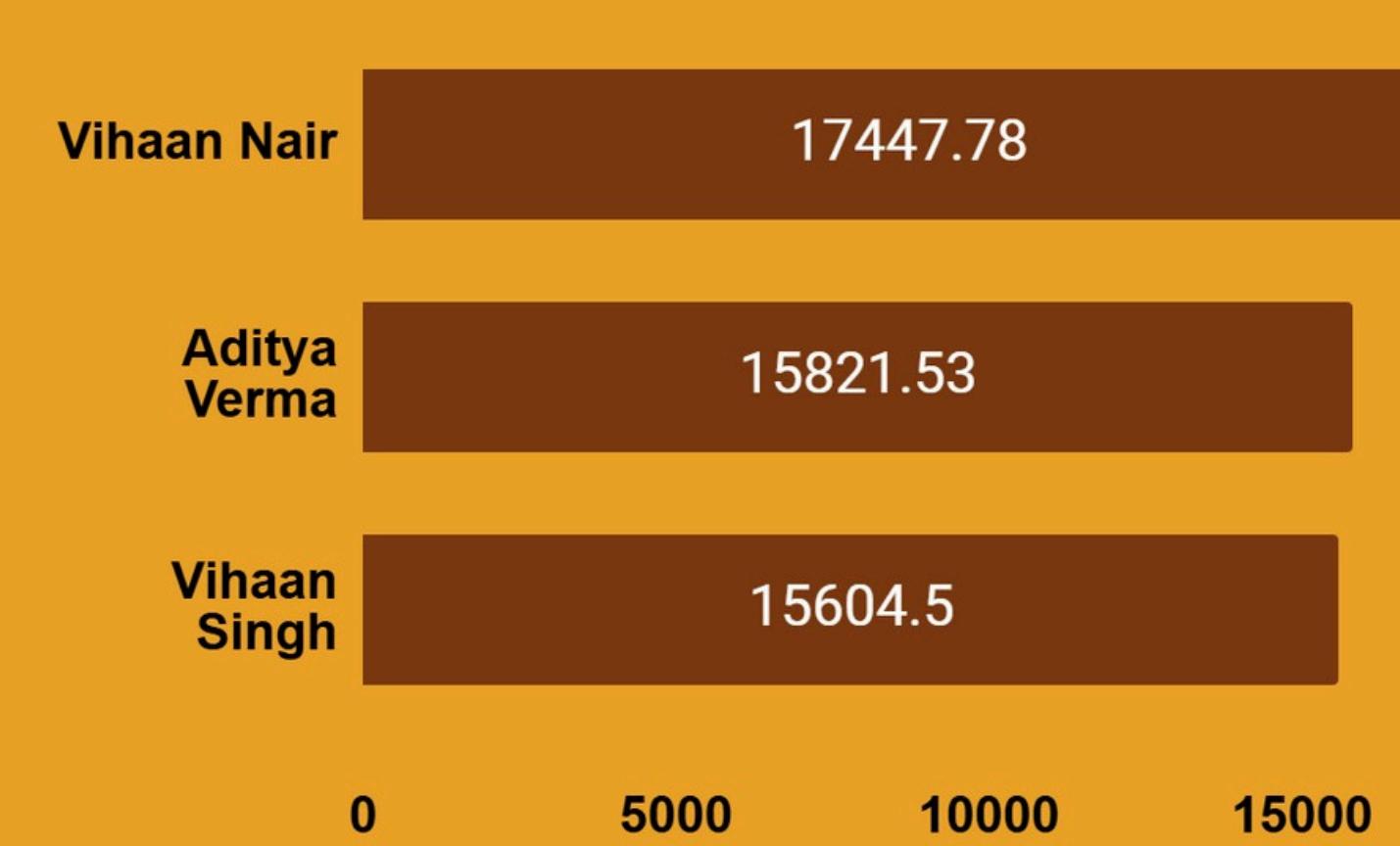
Customer Ranking and Spending

- Vihaan Nair is the highest spender, with a total spending of 17,447.78.
- Aditya Verma ranks second, spending 15,821.53.
- Vihaan Singh is third, with 15,604.5 in total spending.

Spending Gap Analysis

- The difference between the top spender (Vihaan Nair) and the third (Vihaan Singh) is 1,843.28.
- The spending amounts are relatively close, indicating strong engagement and potential loyalty among these top customers.

Top 3 Customers by Total Spending



Business Implications

Targeted reward or loyalty programs for these top customers could enhance retention and drive even higher spending.



Conclusion & Recommendation

- VIP outliers (100/81/64): retention calls, surprise & delight, referral asks.
- Introduce combo deals (e.g., Paneer Tikka + Masala Dosa) to increase average order value.
- Position these items in loyalty rewards or upsell campaigns, leveraging their premium pricing.
- Hakka Noodles (400 orders) is the lowest among the top 5, but still popular – could be uplifted via combo deals (e.g., Momos + Hakka Noodles) or special offers to push volumes.
- Boost acquisition efforts to add new customers .
- Seasonal promotions or product launches to re-ignite demand.
- Larger restaurants usually bring higher volume capacity and brand pull, so this is an opportunity area.
- Consider offering exclusive benefits or personalized communication to Vihaan Nair, Aditya Verma, and Vihaan Singh to maintain their loyalty



Thank You!

md.ahmedtanvirdev@gmail.com