STORE SALES ANALYSIS PROJECT

"UNCOVERING INSIGHTS TO BOOST RETAIL SALES PERFORMANCE WITH SQL ANALYSIS"

PostgreSQL

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This project involves cleaning, transforming, and analyzing an online retail store's transactional sales data using SQL. The goal is to uncover business insights and solve key operational challenges to help improve profitability, customer experience, and operational efficiency.

PROJECT OVERVIEW

This project analyzes sales data from an online retail store using SQL. The goal is to clean and transform the data to uncover key insights that can improve profits, customer experience, and business operations.

BUSINESS CONTEXT

An online retail store captures daily transactions, including product orders, customer demographics, payment methods, order status, and purchase timestamps.
However, the business lacks a clear view of its performance in key areas.
This limited visibility prevents data-driven decision-making and impacts profitability.

Business Problem

The store currently struggles with:

- Not knowing which products sell the most
- Unclear customer preferences and spending habits
- High cancellation and return rates
- No idea about peak purchase times
- Lack of insights into top-paying customers and popular categories
- No visibility into monthly trends or payment preferences

As a result, the store is:

- Missing sales opportunities
- Wasting resources on poor planning
- Losing customers
- Making weak business decisions

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USING SQL-BASED DATA ANALYSIS, THIS PROJECT DELIVERS CLEAR, ACTIONABLE INSIGHTS THROUGH REPORTING ON:

1. TOP 5 MOST SELLING PRODUCTS?
2. WHICH PRODUCTS ARE MOST OFTEN CANCELLED?
3. PEAK PURCHASE TIMES?
4. TOP 5 HIGHEST SPENDING CUSTOMERS?
5. HIGHEST REVENUE PRODUCT CATEGORIES?
6. CANCELLATION/RETURN RATE BY CATEGORY?
7. MOST PREFERRED PAYMENT MODES?
8. AGE GROUP PURCHASE BEHAVIOR?
9. MONTHLY SALES TREND?
10. GENDER-BASED PRODUCT PREFERENCE?

1. TOP 5 MOST SELLING PRODUCTS BY QUANTITY?

```sql
SELECT product_name,SUM(quantity)AS total_quantity_sold
FROM sales
where status = 'delivered'
GROUP BY product_name
ORDER BY total_quantity_sold desc
LIMIT 5
```

Insights:

- Wardrobe and Vegetables lead, making up ~41.5% of sales volume.
- All products are close in performance, showing balanced demand.

Recommendation:

Prioritize stock for Wardrobe and Vegetables; consider promotions for Vegetables and Fruits to leverage potential seasonal demand. Ensure steady supply for Sofas and Dining Tables.

2. MOST FREQUENTLY CANCELLED PRODUCTS ?

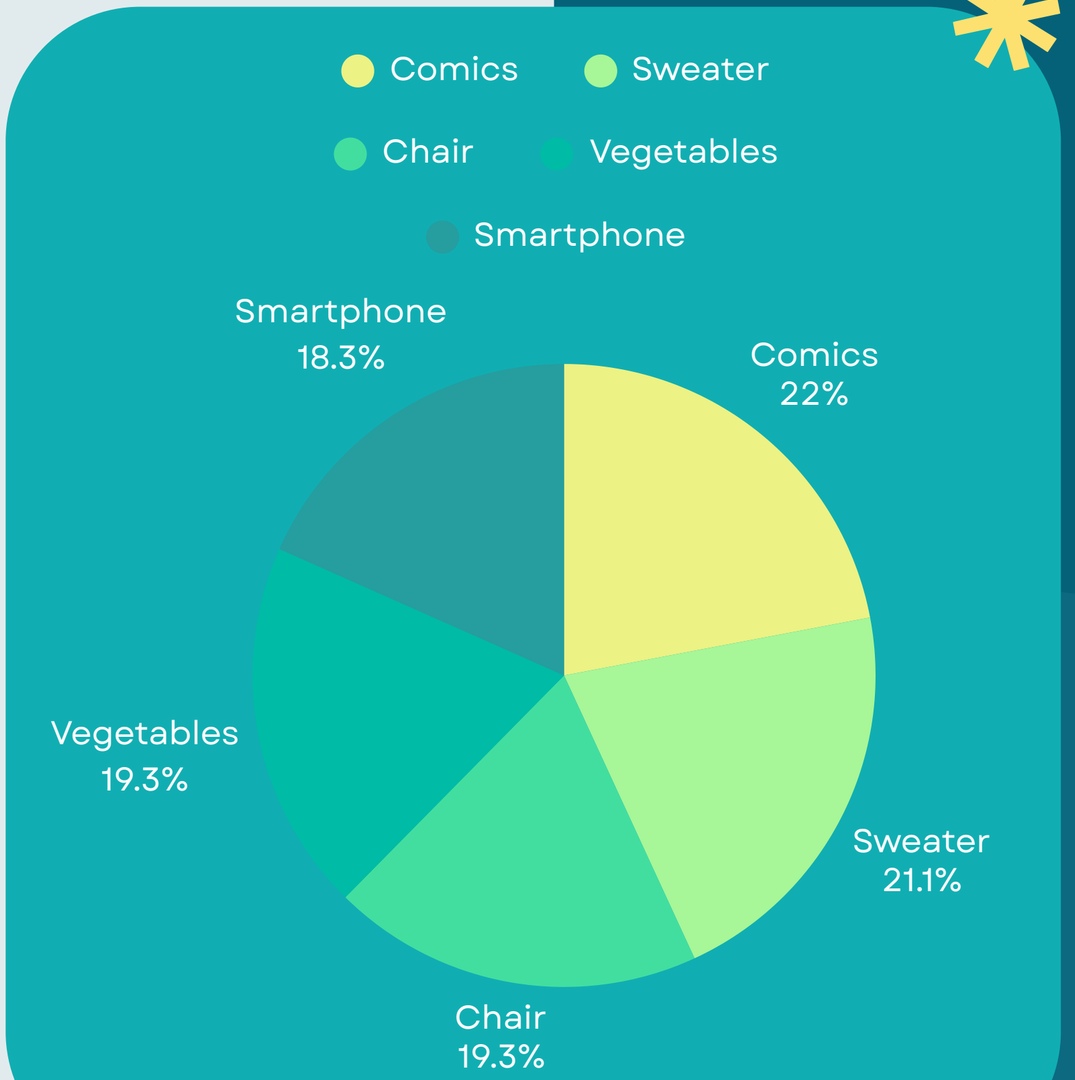
```sql
SELECT product_name,COUNT(*)AS cancel_count
FROM sales
where status = 'cancelled'
GROUP BY product_name
ORDER BY cancel_count desc
LIMIT 5
```

Insights:

- Comics and Sweaters are cancelled the most—maybe they're not what customers expect.
- Vegetables and Chairs also get cancelled a lot, so there might be a bigger problem.
- Smartphones have fewer cancellations but could still disappoint some buyers.

Recommendation:

- Check why Comics and Sweaters are being cancelled—fix quality or descriptions.
- Make Vegetables and Chairs better described; double-check Smartphone details.
- Listen to customer feedback to stop cancellations.



3. PEAK PURCHASE TIMES ?

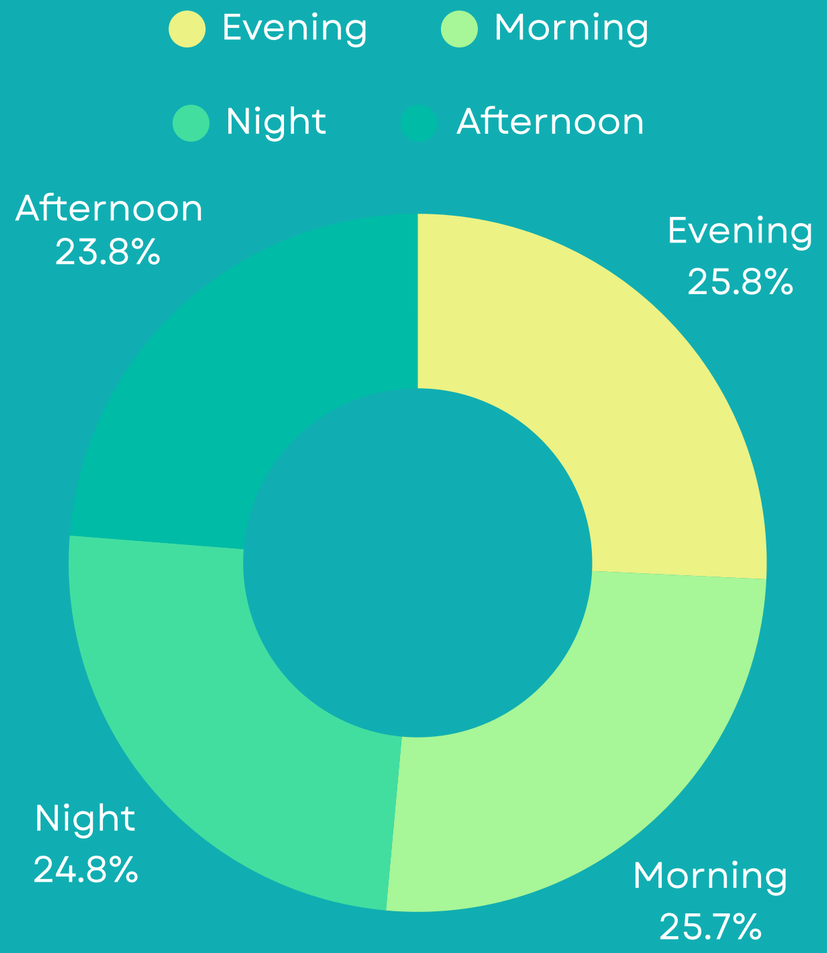
```sql
SELECT
  CASE
    WHEN EXTRACT(HOUR FROM time_of_purchase) BETWEEN 0 AND 5 THEN 'Night'
    WHEN EXTRACT(HOUR FROM time_of_purchase) BETWEEN 6 AND 11 THEN 'Morning'
    WHEN EXTRACT(HOUR FROM time_of_purchase) BETWEEN 12 AND 17 THEN 'Afternoon'
    WHEN EXTRACT(HOUR FROM time_of_purchase) BETWEEN 18 AND 23 THEN 'Evening'
  END AS time_of_day,
  COUNT(*) AS total_orders
FROM sales
GROUP BY time_of_day
ORDER BY total orders DESC:
```

Insights:

- Evening and Morning are the busiest times for purchases, just slightly ahead of Night and Afternoon.
- All time slots are close, showing sales spread evenly throughout the day.

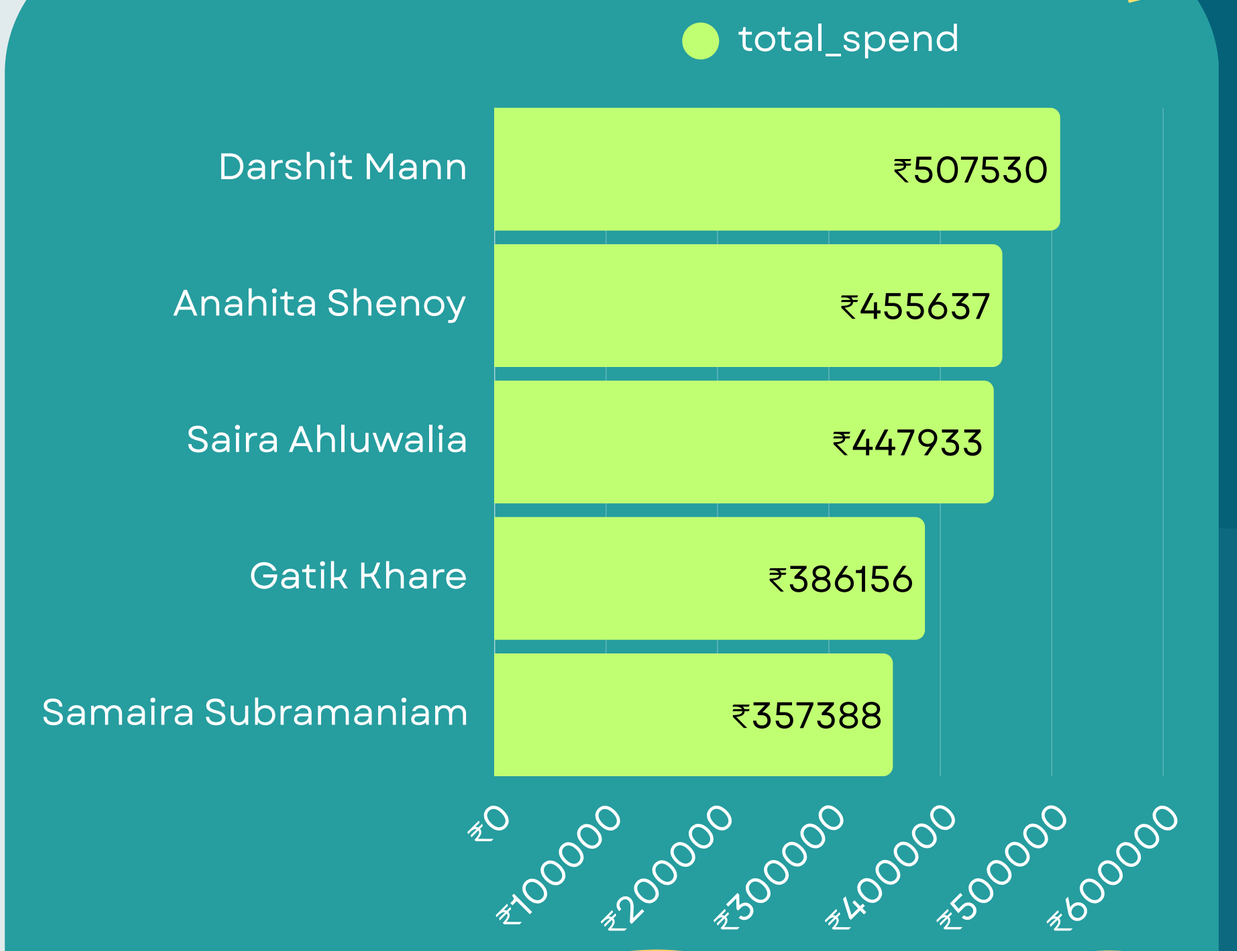
Recommendation:

- Focus staffing and promotions during Evening and Morning hours to catch the most customers.
- Keep steady support for Night and Afternoon to maintain sales across all times.



4. TOP 5 HIGHEST SPENDING CUSTOMERS?

```sql
SELECT
  customer_name,
  SUM(price * quantity) AS total_spend
FROM sales
GROUP BY customer_name
ORDER BY SUM(price * quantity) DESC
LIMIT 5;
```



Insights:
Customers like Darshit Mann and Anahita Shenoy are top spenders.

Recommendation:
Offer personalized rewards to retain high-value customers.

5. HIGHEST REVENUE PRODUCT CATEGORIES ?

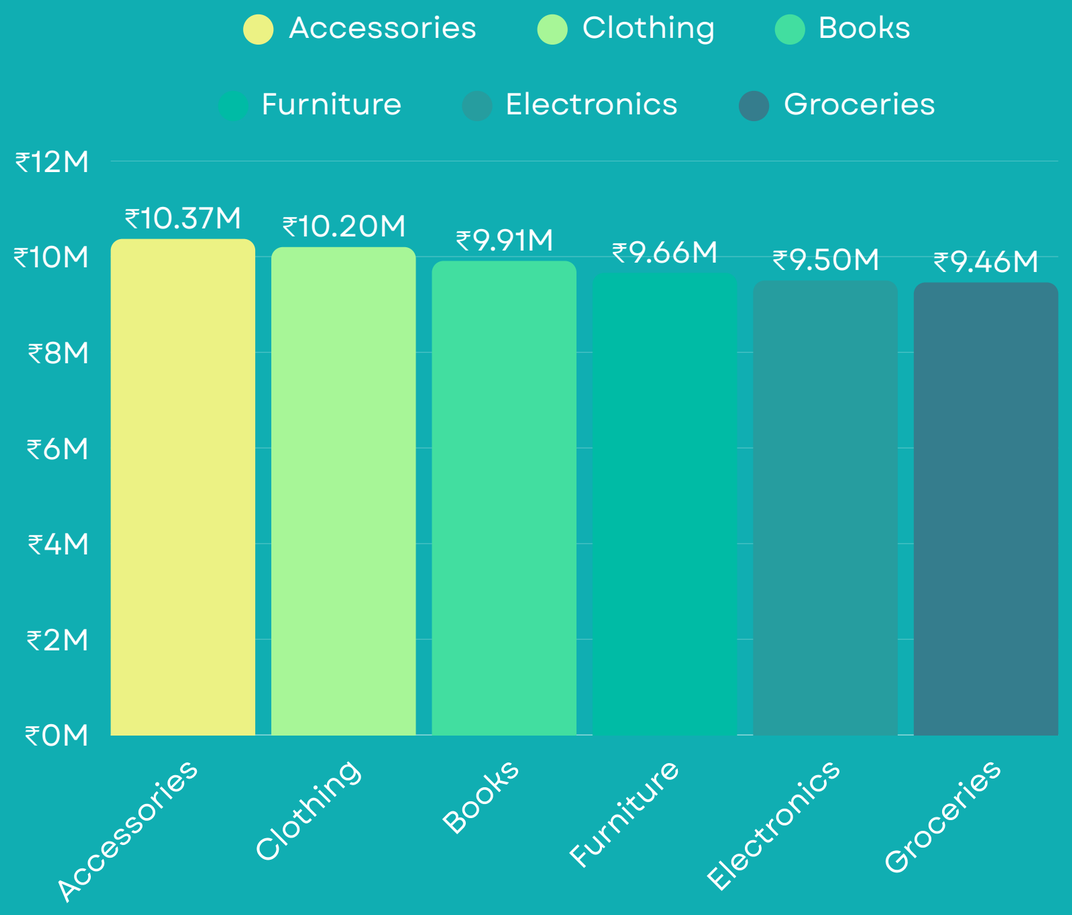
```sql
SELECT
  product_category,
  SUM(price * quantity) AS revenue
FROM sales
GROUP BY product_category
ORDER BY SUM(price * quantity) DESC;
```

Insights:

- Accessories and Clothing bring in the most money, making up nearly half of the revenue.
- All categories are close, with Groceries only ₹1.11M behind Accessories.

Recommendation:

- Focus on stocking more Accessories and Clothing to boost profits.
- Run marketing campaigns for these top categories to keep sales strong.

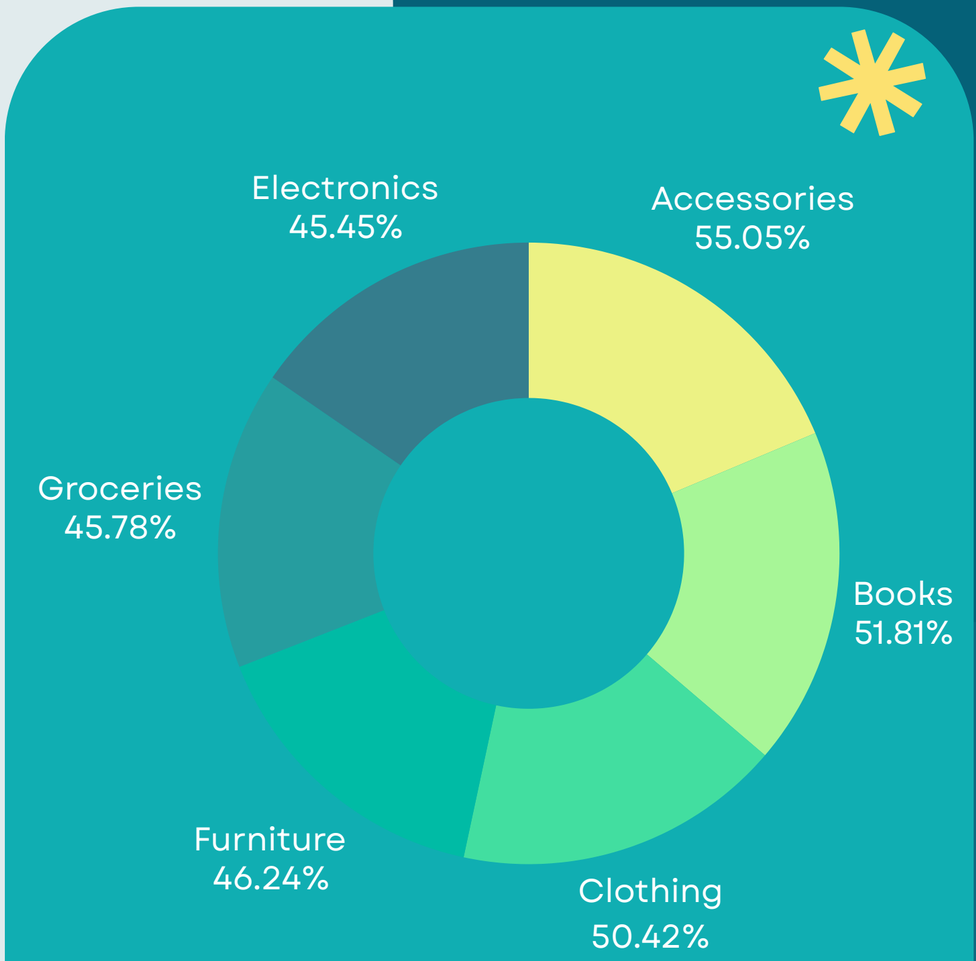


6. RETURN/CANCELLATION RATE PER PRODUCT CATEGORY ?

```sql
SELECT
    product_category,
    ROUND(COUNT(*) FILTER (WHERE status IN ('cancelled', 'returned')) * 100.0 / COUNT(*), 2) || ' %'
    AS return_cancel_rate
FROM sales
GROUP BY product_category
ORDER BY return_cancel_rate DESC;
```

Insights:
Accessories and Books have higher return/cancellation rates.

Recommendation:
Improve product descriptions and quality control.

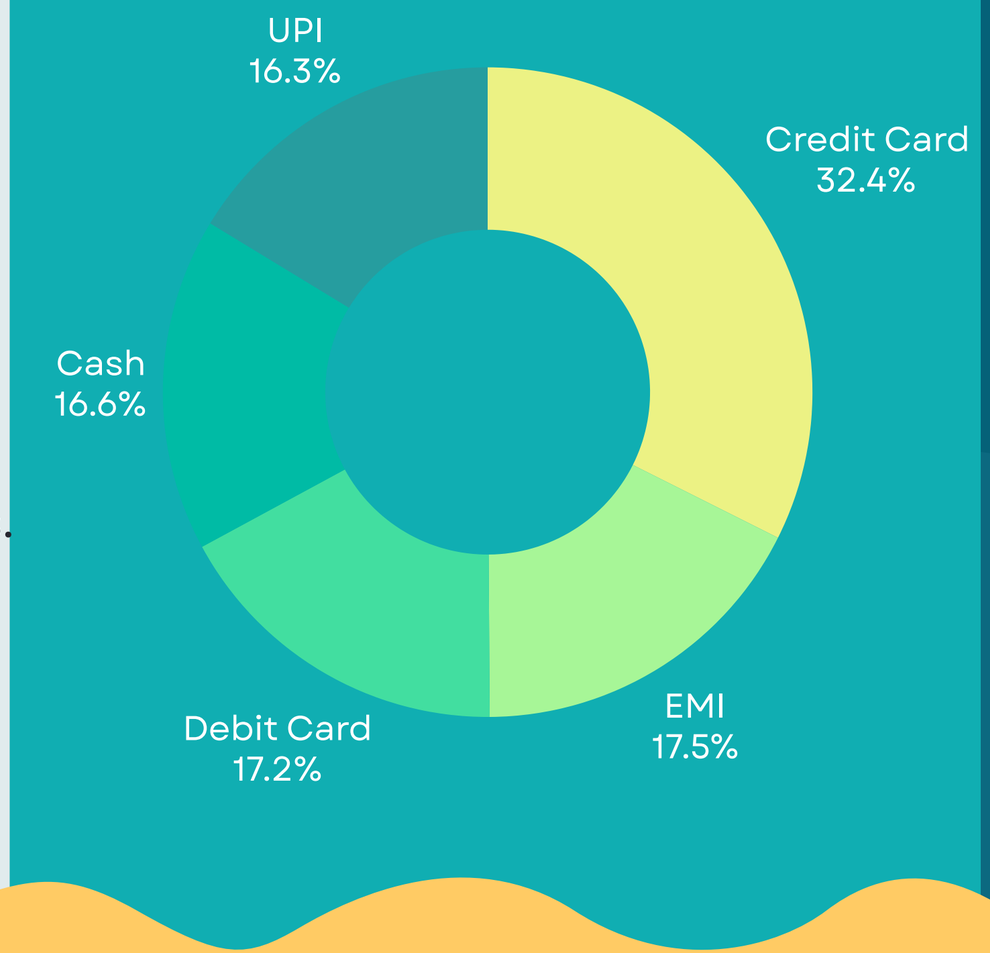


7. MOST PREFERRED PAYMENT MODES ?

```sql
SELECT payment_mode , COUNT(*) as payment_mode_count
from sales
group by payment_mode
order by payment_mode_count desc
```

Sample Findings:
Credit Card and EMI are the most used payment methods.

Business Impact:
Streamline payment processing for popular methods.
Prioritize popular modes.

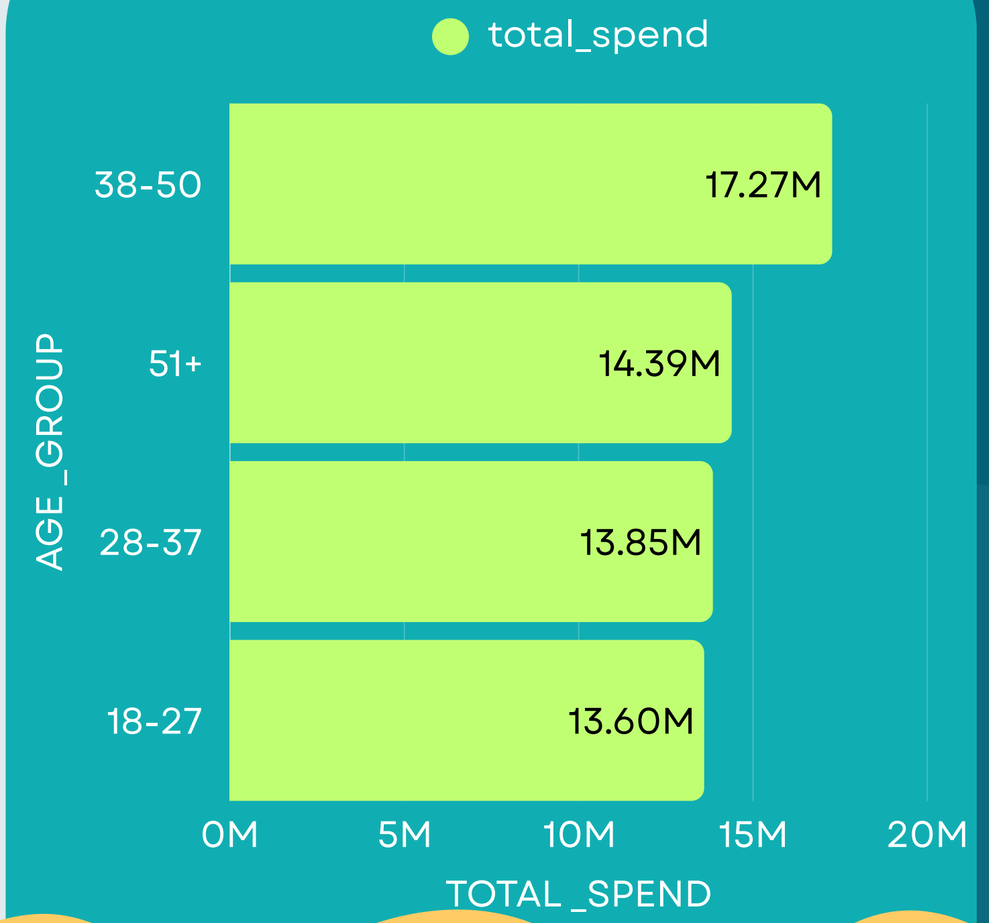


8. PURCHASING BEHAVIOR BY AGE GROUP ?

```sql
SELECT
    CASE
        WHEN customer_age BETWEEN 18 AND 27 THEN '18-27'
        WHEN customer_age BETWEEN 28 AND 37 THEN '28-37'
        WHEN customer_age BETWEEN 38 AND 50 THEN '38-50'
        ELSE '51+'
    END AS age_group,
    SUM(price * quantity) AS total_spend
FROM sales
GROUP BY age_group
ORDER BY total_spend DESC;
```

Sample Findings:
Age group 38-50 contributes significantly to sales.

Business Impact:
Target marketing campaigns to high-spending age groups.

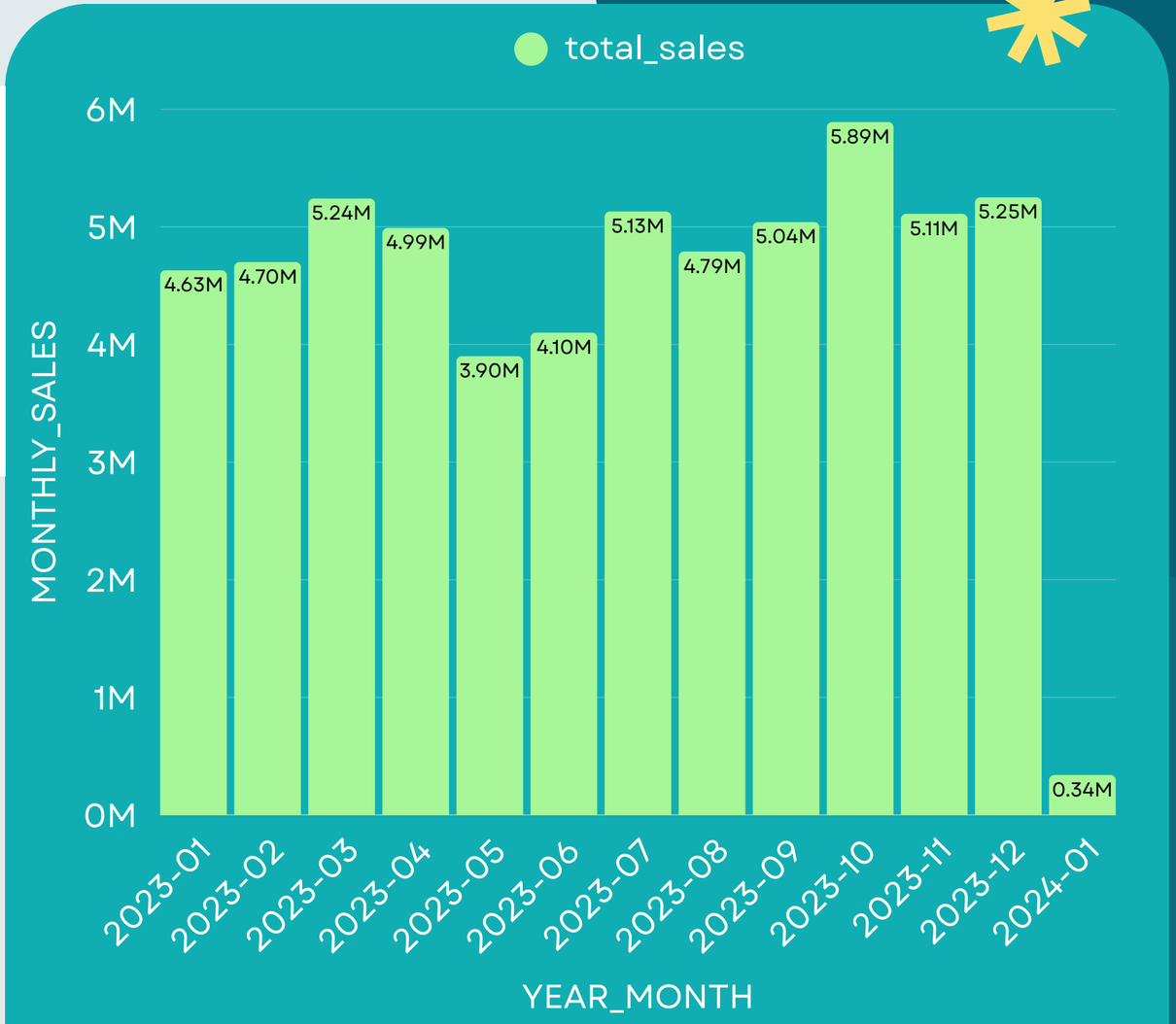


9. MONTHLY SALES TREND ?

```sql
SELECT
    TO_CHAR(purchase_date, 'YYYY-MM') AS month_year,
    SUM(price * quantity) AS total_sales,
    SUM(quantity) AS total_quantity
FROM sales
GROUP BY TO_CHAR(purchase_date, 'YYYY-MM')
ORDER BY month_year
```

Sample Findings:
Sales peak on October and December 2023.

Business Impact:
Plan inventory and promotions for seasonal trends.

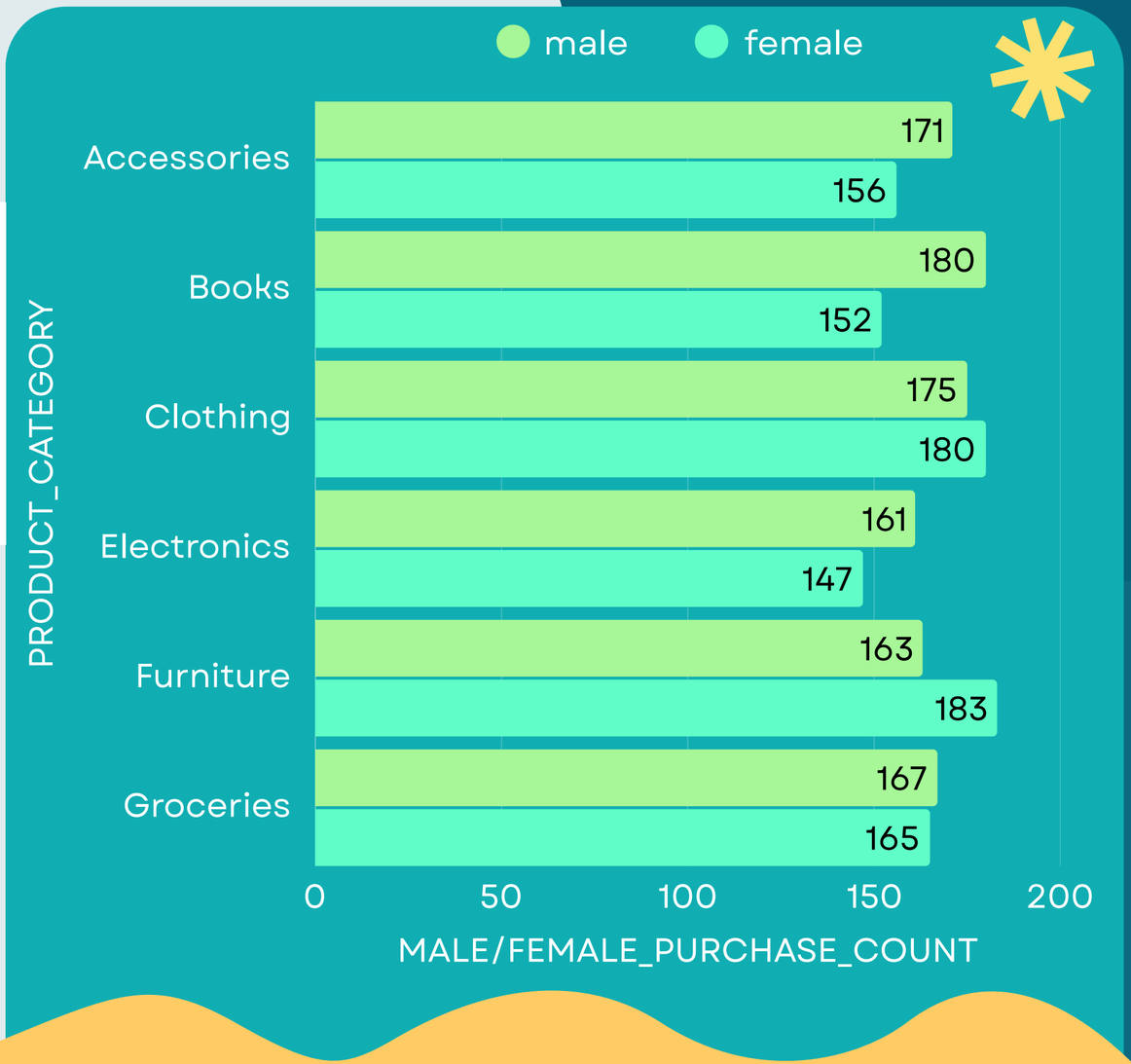


10. GENDER-BASED PRODUCT CATEGORIES PREFERENCE?

```sql
SELECT
    product_category,
    COUNT(CASE WHEN gender = 'Male' THEN 1 END) AS Male,
    COUNT(CASE WHEN gender = 'Female' THEN 1 END) AS Female
FROM sales
GROUP BY product_category
ORDER BY product_category;
```

Sample Findings:
Males prefer Books ; Females prefer Furniture.

Business Impact:
Tailor ads and recommendations by gender.



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KEY INSIGHTS & ACTIONS

1. Top Sellers: Wardrobe & Vegetables (41.5% of sales).
- → *Stock priority + seasonal promotions.*

2. High Cancellations: Comics, Sweaters, Vegetables.
- → *Improve descriptions & quality checks.*

3. Peak Hours: Evening (25.8%) & Morning (25.7%).
- → *Boost staffing/promotions during peaks.*

4. Big Spenders: Top 5 customers (e.g., Darshit Mann: ₹507K).
- → *Personalized rewards for retention.*

5. Revenue Leaders: Accessories (₹10.4M),Clothing (₹10.2M).
- → *Focus inventory/marketing here.*

6. Worst Returns: Accessories (55%), Books (52%).
- → *Enhance quality control.*

7. Payments: Credit Card (32%) most popular.
- → *Optimize checkout for top methods.*

8. Top Buyers: Age 38-50 (₹17.3M).
- → *Target ads to this group.*

9. Seasonal Peaks: Oct & Dec sales surge.
- → *Plan inventory/promotions ahead.*

10. Gender Trends: Men buy Books; Women prefer Furniture.
- → *Tailor recommendations.*

IMPACT: INCREASE SALES, CUT LOSSES, AND IMPROVE CUSTOMER EXPERIENCE.