Consumer Behavior Analysis SQL

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Project Objectives

EXPLORE ECOMMERCE CONSUMER BEHAVIOR USING SQL QUERIES ONLY

IDENTIFY KEY TRENDS, BEHAVIORS, AND SEGMENTS

PROVIDE ACTIONABLE BUSINESS RECCOMENDATIONS

Dataset Overview

Structured table with 28 columns and 1000 rows including demographics, purchase patterns, and engagement

Fields include age, income, purchase amount, product category, etc.

Focus is on individual level transactional data

Dataset sourced from Kaggle: Ecommerce Consumer Behavior Analysis Data
https://www.kaggle.com/datasets/salahuddinahmedshuvo/ecommerce-consumer-behavior-analysis-data

Quick Stats
KPI

Total Customers	1000
Gender Split	Female - 45% / Male – 44% / Other 11%
Age Range	18 - 54
Average Purchase	$275.06
Top Device	Desktop

Top 3 Purchase Categories

Question: Which purchase categories generate the highest average spend?

- **Insight**:
  The top 3 purchase categories by average purchase amount were:

SOFTWARE & APPS: $316.31

JEWELRY & ACCESSORIES $302.79

BOOKS $300.61

- **Recommendation**:
  Increase promotion of these high-value categories through targeted campaigns, especially via digital ads and loyalty incentives.

```
41
42  SELECT purchase_category, AVG(purchase_amt) AS average_purchase_amt
43  FROM consumer
44  GROUP BY purchase_category
45  ORDER BY average_purchase_amt DESC
46  LIMIT 3
```

	purchase_category character varying (100)	average_purchase_amt numeric
1	Software & Apps	316.31
2	Jewelry & Accessories	302.79
3	Books	300.61

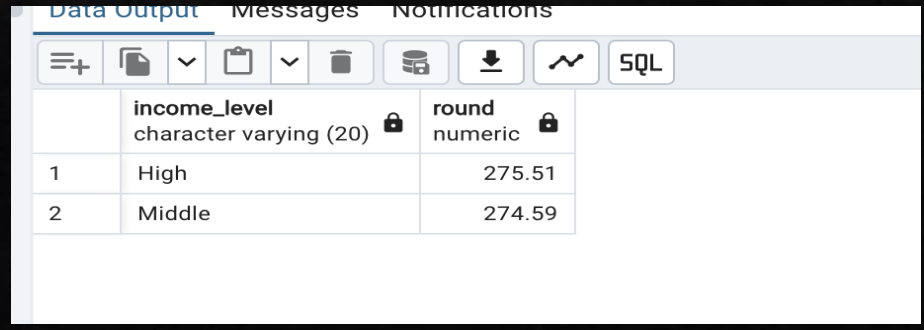
Do Higher Incomes Drive Bigger Purchases

Question: Does income level impact average spending?

- **Insight**:
  Consumers in the **"High Income"** bracket spent just a little over a $1.00 more on average compared to those in the ”Middle Income" segment.
- **Recommendation**:
  Develop personalized marketing for both High- and Middle-income customers with exclusive bundles or early access to premium products.

- High Income Level: $275.51
- Medium Income Level: $274.59

```
75  ---Income vs purchase amount
76  SELECT income_level, ROUND(AVG(purchase_amt),2)
77  FROM consumer
78  GROUP BY income_level
79  ORDER BY ROUND(AVG(purchase_amt),2) DESC;
80
```



Data Output | Messages | Notifications

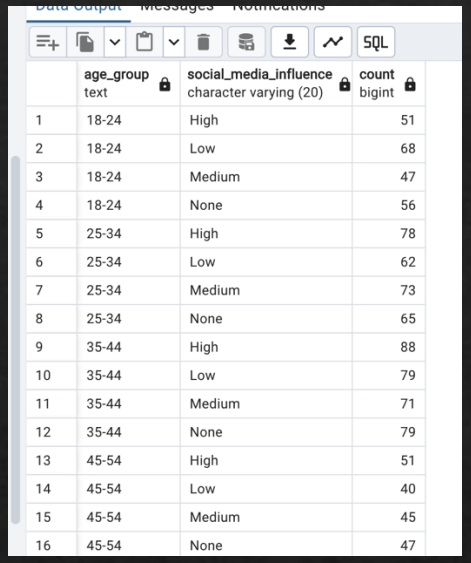
SQL

	income_level character varying (20)	round numeric
1	High	275.51
2	Middle	274.59

Age Group & Social Media Influence

Question: How does social media influence vary by age group?

- **Insight**: Contrary to expectations, **middle-aged consumers (35–44)** were the most influenced by social media when making purchase decisions, followed by the 18–24 group. Older segments showed lower social media impact.
- **Recommendation**:
  Focus influencer campaigns and social-driven promotions on middle aged consumers to increase engagement and conversions.



	age_group text	social_media_influence character varying (20)	count bigint
1	18-24	High	51
2	18-24	Low	68
3	18-24	Medium	47
4	18-24	None	56
5	25-34	High	78
6	25-34	Low	62
7	25-34	Medium	73
8	25-34	None	65
9	35-44	High	88
10	35-44	Low	79
11	35-44	Medium	71
12	35-44	None	79
13	45-54	High	51
14	45-54	Low	40
15	45-54	Medium	45
16	45-54	None	47

```sql
SELECT
    CASE
        WHEN age BETWEEN 18 AND 25 THEN '18-24'
        WHEN age BETWEEN 25 AND 34 THEN '25-34'
        WHEN age BETWEEN 35 AND 44 THEN '35-44'
        WHEN age BETWEEN 45 AND 54 THEN '45-54'
        ELSE 'Unknown'
    END AS age_group,
social_media_influence,
COUNT(*)
FROM consumer
GROUP BY age_group,social_media_influence
ORDER BY age_group,social_media_influence
```

Peak Shopping Periods

Question: When do most purchases occur?

- **Insight**:
  The highest purchase volume occurred in Spring and Summer
- **Recommendation**:
  Purchase volume peaked in **Q2 (April–August)**, indicating stronger seasonal activity during spring and early summer.

```
95
96  ---Peak season for shoppers
97  SELECT
98    TO_CHAR(time_of_purchase, 'YYYY-MM') AS purchase_month,
99    COUNT(*) AS total_purchases
100 FROM consumer
101 GROUP BY purchase_month
102 ORDER BY total_purchases DESC
103 LIMIT 3;
```

	purchase_month text	total_purchases bigint
1	2024-04	100
2	2024-08	98
3	2024-07	94

Purchase Channels & Device Preferences

Question: How do consumers prefer to shop?

- **Insight:**
  Across the full age range, the most used purchase channel was **Mixed** (a combination of online and in-store).
- **Recommendation:**
  Optimize both the **mobile shopping experience** and the **in-store experience** to meet customers where they are and enhance convenience across all touchpoints.

```
102
103  ---Which purchase channel is used the most
104  SELECT purchase_channel, COUNT(*)
105  FROM consumer
106  GROUP BY purchase_channel
107  ORDER BY COUNT(*) DESC
108
```

Data Output | Messages | Notifications

	purchase_channel character varying (10)	count bigint
1	Mixed	340
2	Online	334
3	In-Store	326

Time to Decision by Device

Question: Are mobile users faster or slower to make a purchase?

- **Insight:**
  Mobile users had the **longest average time to purchase**, users may be browsing more or experiencing friction before committing. In contrast, desktop and tablet users made quicker decisions.
- **Recommendation:**
  Conduct a user experience audit on the mobile shopping flow. Consider simplifying navigation, speeding up load times, and reducing the number of steps at checkout to minimize drop-off and improve decision speed.

```sql
---Avg time to decision by device used
SELECT
  device_used_for_shopping,
  ROUND(AVG(time_to_decision), 2) AS avg_time_to_decision,
  COUNT(*) AS total_users
FROM consumer
GROUP BY device_used_for_shopping
ORDER BY avg_time_to_decision ASC;
```

	device_used_for_shopping character varying (50)	avg_time_to_decision numeric	total_users bigint
1	Tablet	7.27	339
2	Desktop	7.38	350
3	Smartphone	8.03	311

Final Takeaways

- This project demonstrated my ability to explore and interpret data using SQL alone
- Gained insight into real-world consumer behavior trends
- Practiced data cleaning, segmentation, and aggregation techniques
- Converted raw data into business-friendly insights and recommendations