Sales Data Analysis Report

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 SALES ANALYSIS SUMMARY
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--- Overall Metrics ---
  Total Orders: 50
  Total Revenue: $12,787.15
  Total Quantity Sold: 98
  Average Order Value: $255.74
  Total Discounts Given: $1,000.87
  Unique Customers: 30
  Unique Products: 30

--- Descriptive Statistics ---

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 GROUPBY AGGREGATION OPERATIONS
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--- Revenue by Category (groupby + sum) ---
  Electronics              $8,600.65 ( 67.3%)
  Furniture                $3,426.36 ( 26.8%)
  Office Supplies            $760.14 (  5.9%)

--- Revenue by Region ---
  South                    $4,618.34 ( 36.1%)
  North                    $3,424.22 ( 26.8%)
  West                     $2,565.36 ( 20.1%)
  East                     $2,179.23 ( 17.0%)

--- Revenue by Payment Method ---
  Credit Card              $8,686.69
  PayPal                   $2,360.39
  Debit Card               $1,194.86
  Cash                       $545.21

--- Monthly Revenue Trend ---
  2024-01                  $7,568.40
  2024-02                  $5,218.75

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 TOP N ANALYSIS
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--- Top 10 Products by Quantity Sold ---
                    quantity_sold  total_revenue  order_count
product_name
Paper Ream                     15         134.85            2
Notebook Set                   13         158.48            2
Sticky Notes Pack               6          41.94            1
Wireless Mouse                  6         170.94            3
Calculator Scientific           4          79.96            1
Laptop Pro 15                   4        4692.96            3
Monitor 27inch                  4        1312.46            3
Office Chair                    4         962.46            3
Desk Lamp                       3         137.97            2
External SSD 1TB                3         383.47            2

--- Top 10 Products by Revenue ---
                    total_revenue
product_name
Laptop Pro 15             4692.96
Standing Desk             1601.97
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Monitor 27inch              1312.46
Office Chair                 962.46
Filing Cabinet               503.97
Headphones Noise Cancel      489.98
External SSD 1TB             383.47
Printer Wireless             369.98
Keyboard Mechanical          299.98
Webcam HD                    260.97
```

--- Top 10 Customers by Spending ---

	customer_id	customer_name	total_spent	order_count	avg_order_value
0	C021	Uma Patel	2287.98	1	2287.98
1	C012	Leo Anderson	1294.98	2	647.49
2	C001	Alice Johnson	1289.97	3	429.99
3	C006	Frank Lee	1104.96	2	552.48
4	C004	David Brown	1102.46	3	367.49
5	C017	Quinn Martin	589.97	2	294.99
6	C028	Brian Green	551.99	1	551.99
7	C008	Henry Davis	539.98	2	269.99
8	C015	Olivia White	427.98	2	213.99
9	C003	Carol Williams	377.38	3	125.79

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 PIVOT TABLE ANALYSIS
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--- Revenue by Category × Region (pivot_table) ---

region	East	North	South	West
category				
Electronics	1594.94	2556.41	3055.90	1393.40
Furniture	329.47	520.97	1403.96	1171.95
Office Supplies	254.82	346.84	158.48	0.00

--- Category Statistics (multi-aggregation) ---

	order_count	total_revenue	avg_order_value	total_quantity	av
category					
Electronics	27	8600.65	318.54	36	
Furniture	12	3426.36	285.53	15	
Office Supplies	11	760.14	69.10	47	

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 FILTERING OPERATIONS (Lambda Expressions)
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--- Electronics Category Filter ---

--- North Region Filter ---

--- High-Value Orders (>=$500) ---

--- Custom Lambda Filter (quantity > 2) ---

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 METHOD CHAINING (Stream-like Operations)
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--- Chained Filters: Electronics + North Region ---

--- High-Value Order Analysis (pipe + groupby + agg) ---

	net_amount		quantity	
	sum	mean	count	sum
category				
Electronics	7909.81	494.36	16	20
Furniture	3218.40	357.60	9	11

Sales Data Analysis Report

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--- Category Performance (map with lambda) ---

--- Average Discount by Category ---
  Furniture: 4.8%
  Electronics: 3.8%
  Office Supplies: 0.9%


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 End of Report
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