

Introduction

This project focuses on analysing an **Online Sales Dataset**, which provides detailed information about online sales transactions across various product categories and regions. Each transaction includes key data points such as order ID, date, product category, product name, quantity, pricing, region, and payment method. The dataset aims to represent the diverse and complex nature of online sales, offering a valuable resource for uncovering actionable business insights.

Dataset Overview

The dataset comprises the following columns:

1. **Order ID**: A unique identifier for each sales transaction.
 2. **Date**: The transaction date.
 3. **Category**: The product's broad category (e.g., Electronics, Home Appliances, Clothing, Books, Beauty Products, Sports).
 4. **Product Name**: The specific name or model of the product sold.
 5. **Quantity**: The number of units sold in the transaction.
 6. **Unit Price**: The price of a single unit of the product.
 7. **Total Price**: The total revenue generated from the transaction (calculated as Quantity × Unit Price).
 8. **Region**: The geographic region of the transaction (e.g., North America, Europe, Asia).
 9. **Payment Method**: The payment method used (e.g., Credit Card, PayPal, Debit Card).
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Objective of the Analysis

The goal of this analysis is to derive actionable insights from the dataset to guide **business strategies** and decision-making. The analysis addresses key business questions to help optimize **inventory management**, **marketing efforts**, and **sales strategies**.

Key Business Questions

1. **Sales Trends Over Time**: What are the patterns in sales across different time periods? Are there seasonal trends or growth opportunities?
 2. **Category Popularity by Region**: Which product categories perform best in different regions? How does category popularity vary regionally?
 3. **Performance by Region**: How do specific products or categories perform across regions? How can regional preferences shape targeted marketing?
 4. **Impact of Payment Methods**: How do various payment methods affect sales volume and revenue? Which payment methods are preferred in specific regions?
 5. **Top-Selling Products**: What are the best-selling products in each category? How can this information be used for inventory planning and marketing optimization?
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Approach

To address these questions, the following steps were undertaken:

- Data Cleaning and Preparation:**
 - Ensured the dataset was free of missing values, duplicates, and formatting issues.
 - Made minor formatting adjustments during analysis as required to maintain data integrity.
- Trend Analysis:**
 - Analysed total sales by month to identify seasonal trends and growth opportunities.
- Category and Region Analysis:**
 - Visualized the popularity of product categories in various regions, focusing on regional performance differences.
- Regional Performance Evaluation:**
 - Evaluated how specific products and categories performed in different regions, using **revenue** as the performance metric.
- Payment Method Impact:**
 - Assessed the distribution of payment methods to understand their influence on sales volume and revenue.
- Top-Selling Products Identification:**
 - Identified the best-selling products within each category to inform inventory and marketing strategies.

This structured approach ensures comprehensive insights are derived to support business growth and decision-making.

Analysis

Category	Sum of Total Revenue	Category	Sum of Units Sold
Electronics	\$68,812.56	Clothing	194
Sports	\$33,746.03	Books	173
Home Appliances	\$32,964.94	Sports	173
Clothing	\$10,758.55	Electronics	170
Beauty Products	\$5,087.43	Home Appliances	125
Books	\$2,772.34	Beauty Products	108
Grand Total	\$154,141.85	Grand Total	943

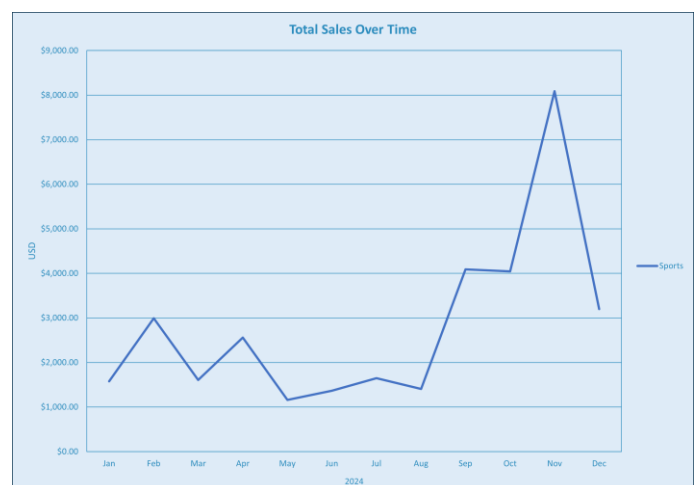
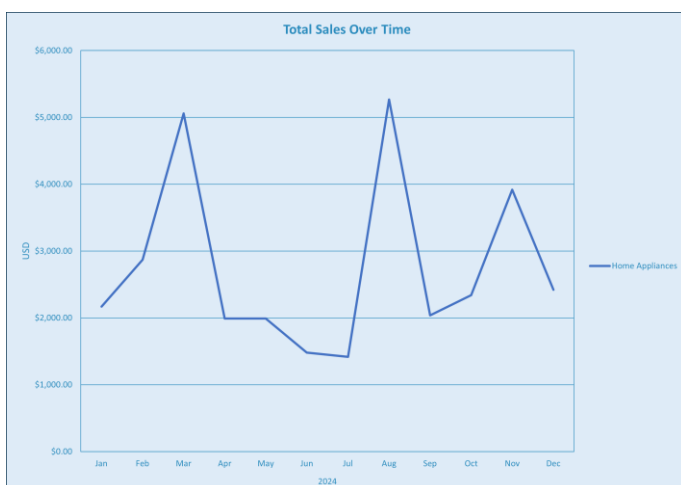
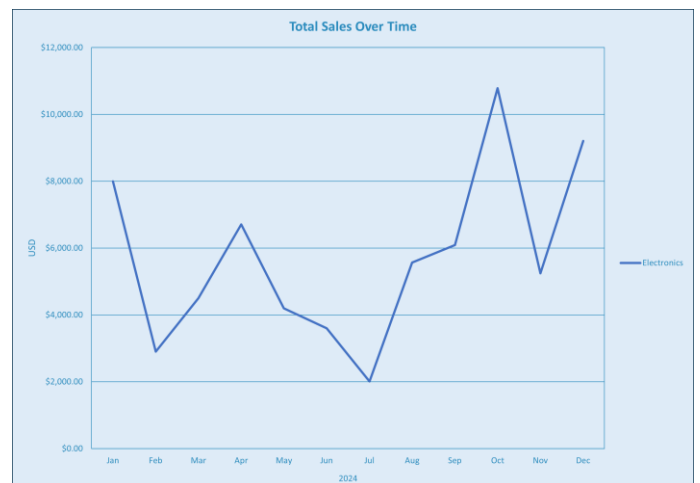
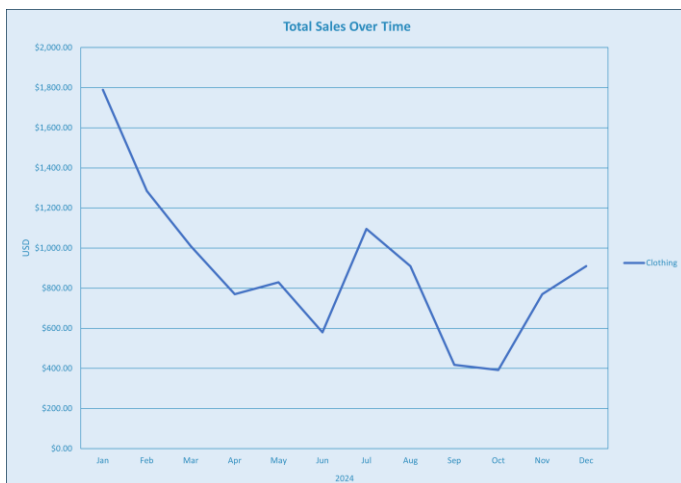
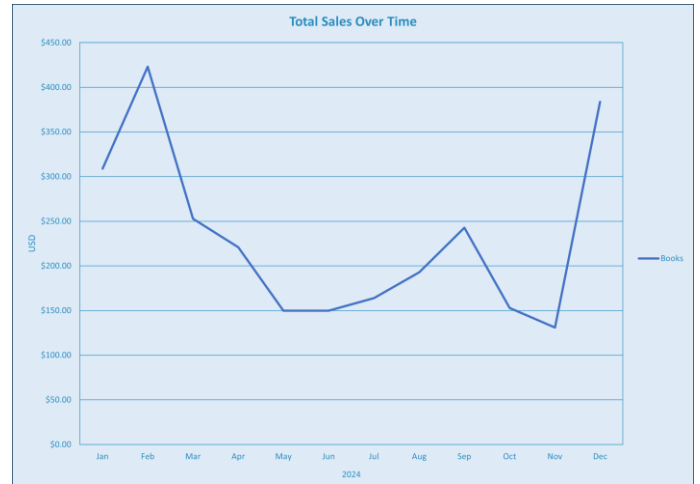
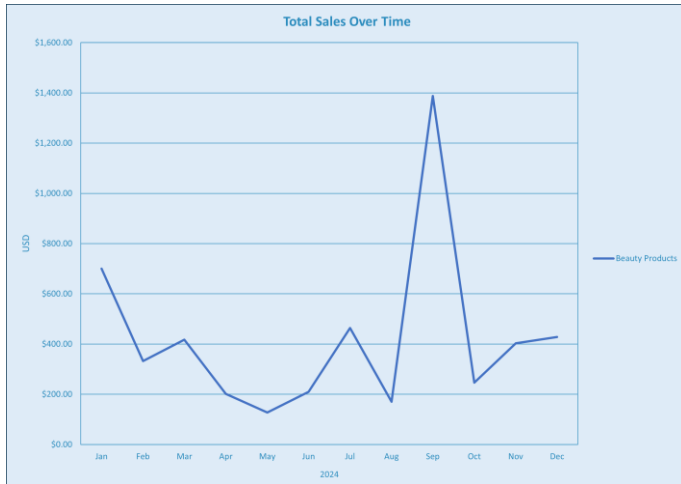
Interpretation

- Bestselling based on unit sold: Clothing, Books, Sports
 - Bestselling based on revenue: Electronics, Home Appliances, Sports
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Sales Over Time

Question:

What are the sales trends over different time periods? Are there any identifiable seasonal patterns or growth opportunities?



Interpretation

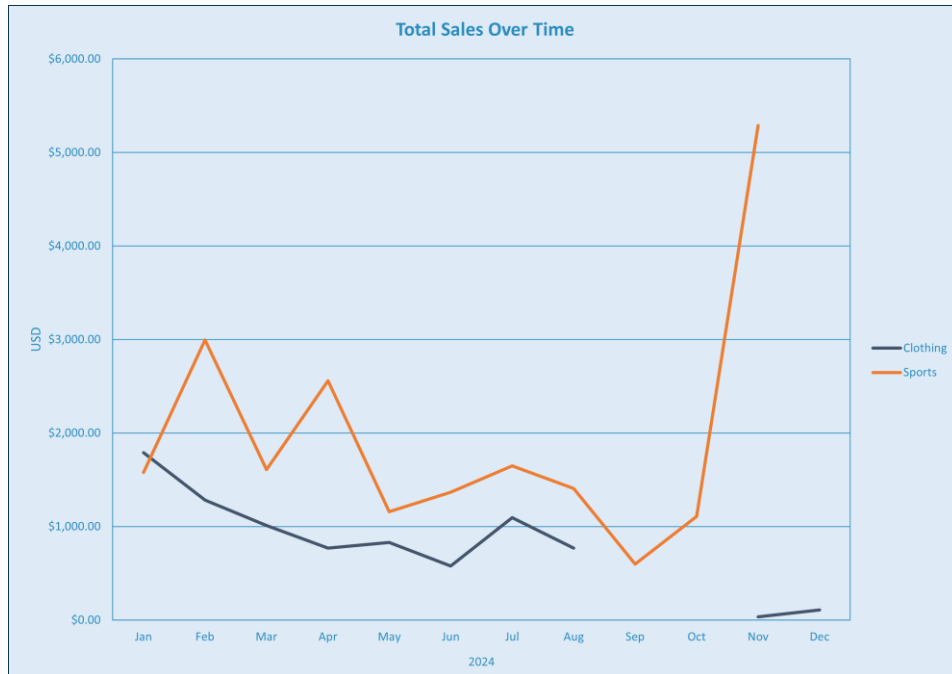
- Seasonal patterns can be seen in **Clothing and Sports** categories. Sales seem to be higher starting from **January till March** for clothing and sales are higher starting **September till December** for Sports.

- Spike in Beauty Products sales can be seen during **August till October**.

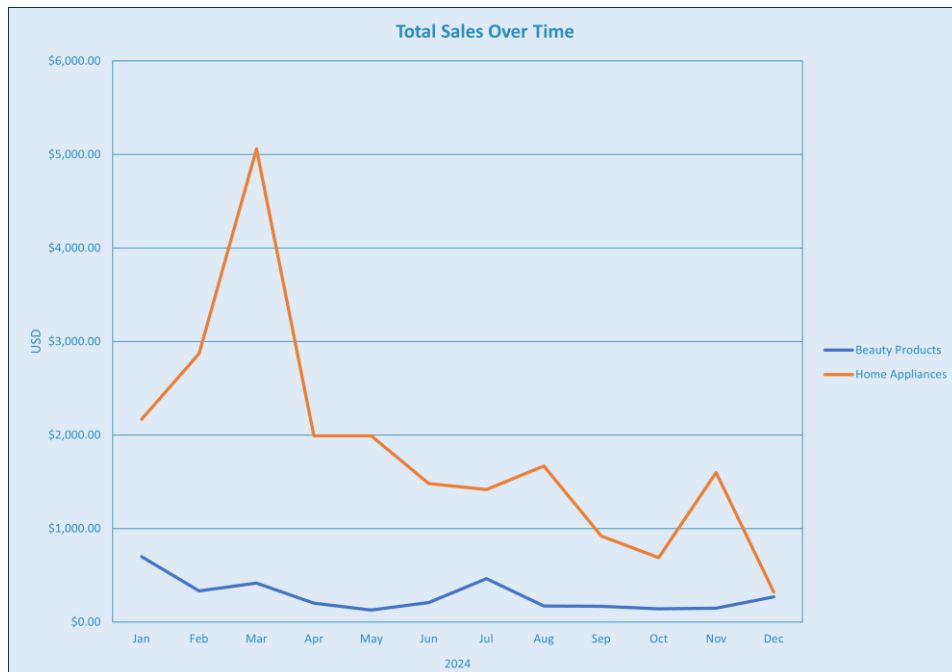
Category Popularity by Region

Question:

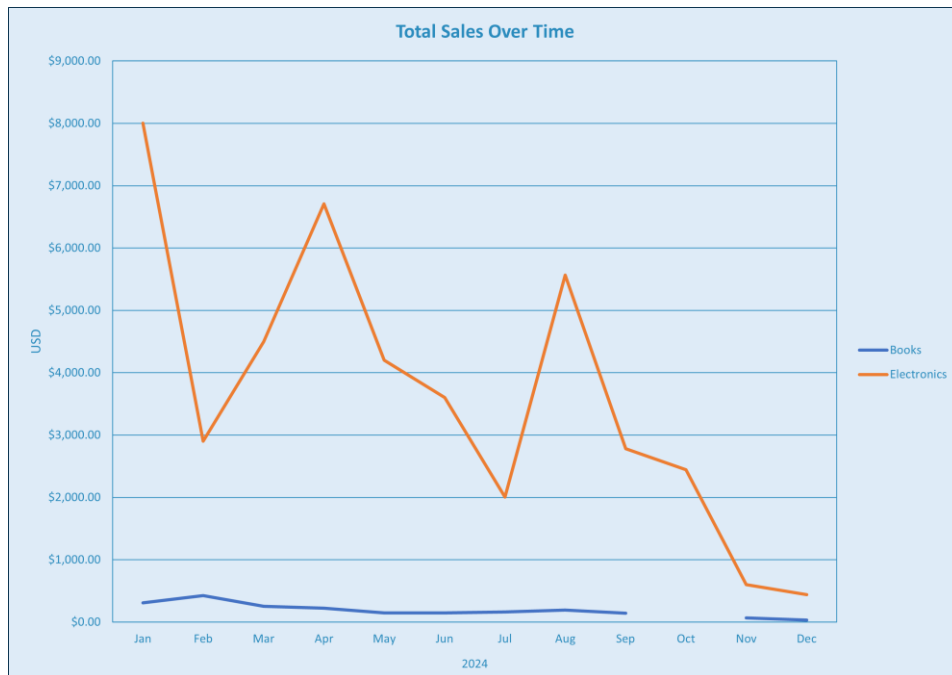
Which product categories are most popular in different regions? How does product category performance vary across regions?



Asia



Europe



North America

Interpretation

Strangely, certain product categories are only sold in specific regions.

Asia: Clothing, Sports

Europe: Beauty Products, Home Appliances

North America: Electronics, Books

Total Revenue based on product category should also be investigated

Performance by Region:

Question

How do specific products or categories perform in different regions? How can marketing campaigns be tailored to regional preferences?

1. North America brings in the most revenue through the sales of electronics and Books.
2. Asia comes in second place with slightly more revenue than Europe, driving its revenue from sports products and then clothing.
3. Europe comes in third place with most of its revenue generated from Home Appliances.

Impact of Payment Methods:

Question

How do different payment methods impact sales volume and revenue? Are certain payment methods more popular in specific regions?

ASIA

Payment Method	Credit Card	Debit Card	PayPal	Grand Total
Sports	\$18,285.98	\$59.98	\$2,979.52	\$21,325.48
Electronics	\$7,945.80	\$1,379.94	\$2,189.95	\$11,515.69
Home Appliances	\$5,229.81		\$1,779.91	\$7,009.72
Beauty Products	\$288.00	\$119.96	\$639.96	\$1,047.92
Books	\$205.87		\$100.93	\$306.80
Clothing	\$144.97	\$8,128.93		\$8,273.90
Grand Total	\$32,100.43	\$9,688.81	\$7,690.27	\$49,479.51

EUROPE

Payment Method	PayPal	Credit Card	Debit Card	Grand Total
Electronics	\$5,679.89	\$6,491.83	\$1,379.94	\$13,551.66
Sports	\$987.47	\$4,211.55	\$4,799.66	\$9,998.68
Home Appliances	\$20,535.83	\$919.96	\$719.88	\$22,175.67
Beauty Products	\$2,725.90	\$624.70		\$3,350.60
Clothing	\$829.90	\$324.95	\$349.90	\$1,504.75
Books		\$83.92	\$281.84	\$365.76
Grand Total	\$30,758.99	\$12,656.91	\$7,531.22	\$50,947.12

North America

Payment Method	Credit Card	Debit Card	PayPal	Grand Total
Electronics	\$43,045.25	\$599.97	\$99.99	\$43,745.21
Sports	\$2,421.87			\$2,421.87
Home Appliances	\$2,279.64	\$419.97	\$1,079.94	\$3,779.55
Books	\$2,016.85	\$64.95	\$17.98	\$2,099.78
Beauty Products	\$603.96		\$84.95	\$688.91
Clothing	\$207.96	\$571.98	\$199.96	\$979.90
Grand Total	\$50,575.53	\$1,656.87	\$1,482.82	\$53,715.22

Interpretation

The use of different methods of payment for each category is as follows:

Credit Card: Books, Sports, Electronics (North America and Asia)

Debit Cards: Clothing (Asia)

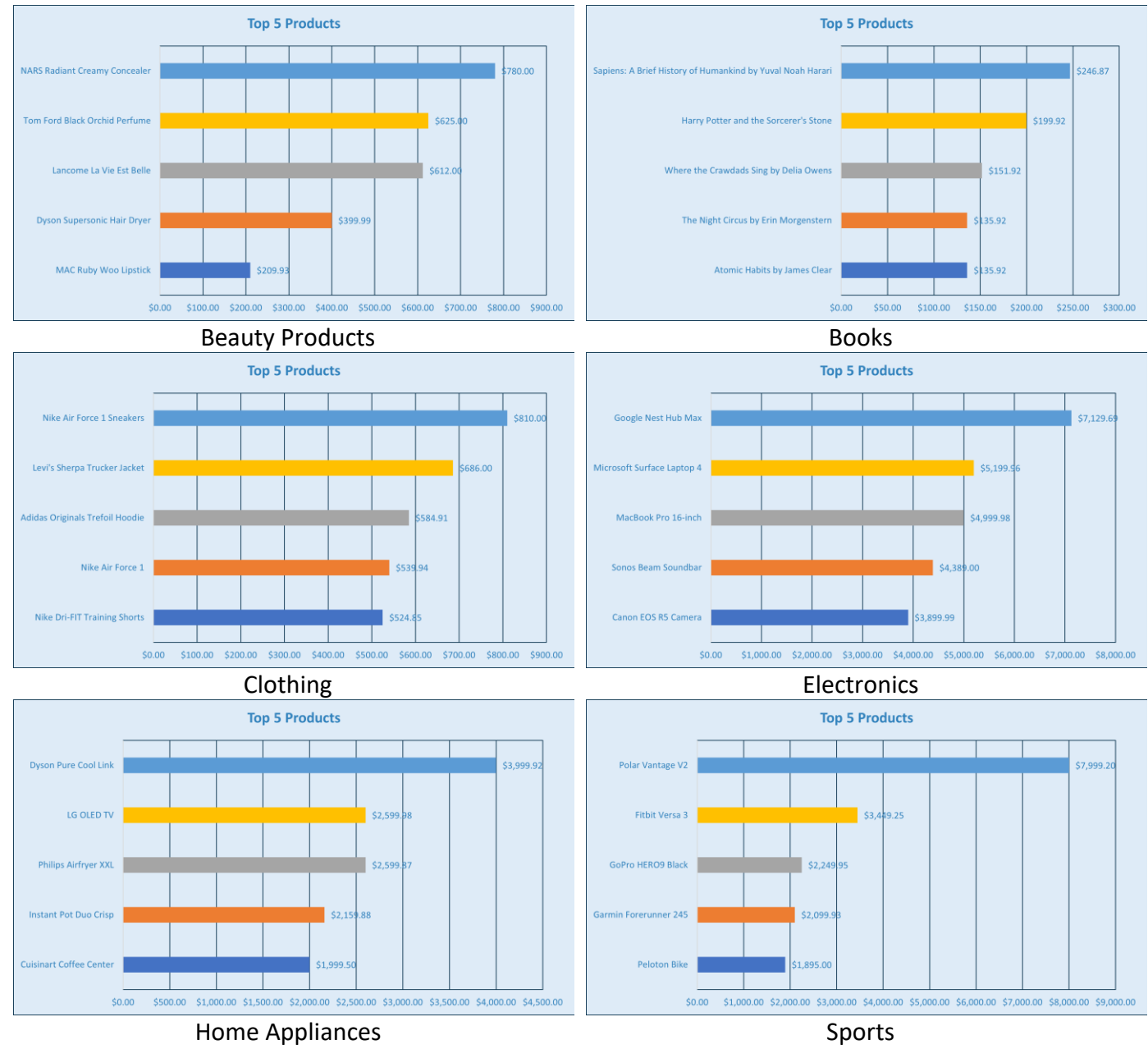
Paypal: Beauty Product, Home Appliances (Europe)

The use of payment methods is distinctly separated for each category of products, and it shows that credit & debit cards are more popular over Asia and North America, while PayPal is used widely in Europe.

Top-Selling Products:

Question

What are the top-selling products within each category? How can this information be used to optimize inventory and marketing strategies?



Conclusions

Sales Trends Over Time

- 1. **Clothing and Sports Categories:**
 - Clothing sales peak between January and March.
 - Sports sales show a significant increase from September to December.
- 2. **Beauty Products:**
 - Sales experience a surge between August and October.

Category Performance by Region

1. **North America:**
 - Leads in revenue, driven predominantly by electronics.
2. **Asia:**
 - Second in revenue, with sports products and clothing as top-performing categories.
3. **Europe:**
 - Third in revenue, with home appliances as the leading sales category.

Impact of Payment Methods

- **Credit Cards:** The most popular method, especially in North America and Asia.
 - **Debit Cards:** Primarily used in Asia, ranking second in popularity.
 - **PayPal:** Favoured in Europe.
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Top-Selling Products (All Time)

1. **Sonos Beam Soundbar**
 2. **MacBook Pro 16-inch**
 3. **Microsoft Surface Laptop 4**
 4. **Google Nest Hub Max**
 5. **Polar Vantage V2**
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Recommendations

1. Enhance Seasonal Marketing Campaigns

- **Clothing and Sports:**
Launch targeted marketing campaigns starting in August to leverage the upcoming peak sales period.
- **Promotions and Discounts:**
Offer deals during high-demand seasons to maximize revenue.

2. Optimize Regional Strategies

- **North America:**
Increase inventory and marketing for electronics, the top-performing category.
- **Asia:**
Focus on sports and clothing products, aligning with regional preferences.
- **Europe:**
Amplify promotions for home appliances to boost sales and market share.

3. Refine Product Inventory

- Stock top-performing products across categories to meet customer demand.
- Regularly analyse sales data to identify emerging trends and adjust inventory accordingly.

4. Targeted Advertising and Promotions

- Leverage sales insights to design region-specific advertising for top-selling products.

- Implement tailored promotions based on local payment preferences and product interests.

5. Diversify Payment Method Options

- Encourage **credit card usage** in North America and Asia through exclusive discounts or loyalty programs.
- Promote **PayPal** as a flexible payment option in North America and Asia.
- Partner with local payment providers in each region to cater to diverse customer needs.

6. Customer Feedback and Engagement

- Collect feedback on payment preferences and product interests to enhance the shopping experience.
- Offer personalized recommendations and deals based on purchase history and regional trends.