E – Commerce Sales Analysis Full Project

1. **You need to calculate the monthly sales of the store and identify which month had the highest sales and which month had the lowest sales.**

   Output:

   What the chart represents?

   X-axis (Order month): Months 1 through 12, representing January to December.

   Y-axis (Sales): Sales values ranging from about 50k to 350k.

   Line trend: The line connects monthly sales totals, showing how sales fluctuate across the year.

   Key observations:

   - **Peaks:**
     - Around Month 3 (March), Month 9 (September), and Month 11 (November), sales are noticeably higher.
     - These could correspond to seasonal demand, promotions, or festive periods.
   - **Dips:**
     - Around Month 2 (February) and Month 10 (October), sales are lower compared to other months.
     - This might indicate off-season periods or weaker campaigns.
   - **Overall range:** Sales vary between 50k at the lowest and 350k at the highest, showing significant volatility.

   Business interpretation:

   - **High sales months (March, September, November)** → likely strong campaigns, festive seasons, or product launches.
   - **Low sales months (February, October)** → potential opportunities to investigate marketing gaps, customer behavior, or inventory issues.
   - **Actionable insight**: Understanding why peaks and dips occur helps optimize promotions, stock planning, and customer engagement strategies.

2. **You need to analyze sales based on product categories and determine which category has the lowest sales and which category has the highest sales.**

   Output:

   What the chart represents

   - The chart divides total sales into three product categories: Technology, Furniture, and Office Supplies.
   - Each slice shows the percentage share of total sales contributed by that category.

   Key observations:

- **Technology: 36.4%** → This is the largest contributor to overall sales, meaning tech products drive the biggest revenue share.
- **Furniture: 32.3%** → A strong second, showing nearly one-third of sales come from furniture.
- **Office Supplies: 31.3%** → Slightly behind furniture, but still a significant portion of total sales.

Business interpretation:

- **Technology dominance**: With the highest share, Technology is the most important category for revenue. It may be worth exploring which sub-categories (like phones, laptops, accessories) are driving this.
- **Balanced distribution:** The three categories are relatively close in contribution (all around one-third). This indicates a diversified sales mix, reducing dependency on any single category.
- **Strategic focus:** Since Office Supplies is slightly lower, there may be opportunities to boost sales through promotions, bundling, or targeting specific customer segments.

3. **The sales analysis needs to be done based on sub-categories**.

Output:

What the chart represents

X-axis (Sub-Category): Different product sub-categories such as Accessories, Appliances, Art, Binders, Chairs, Phones, etc.
Y-axis (Sales): Total sales values, ranging from 0 up to about 350k.
Bars: Each vertical bar shows the sales volume for that sub-category.

Key observations:

- **Highest sales:** Chairs and Phones stand out as the top performers, each exceeding 300k in sales.
- **Lowest sales:** Fasteners and Labels are at the bottom, both below 50k.
- **Mid-range performers**: Categories like Binders, Tables, and Copiers show moderate sales levels, neither leading nor lagging significantly.

Business interpretation:

- **Revenue drivers:** Chairs and Phones are critical to overall revenue. These sub-categories likely represent high-demand items or premium products.
- **Weak contributors:** Fasteners and Labels contribute very little to sales. They may be niche products or areas where marketing and pricing strategies could be revisited.

- **Balanced mix:** The chart highlights a wide spread of performance across sub-categories, suggesting that while some items dominate, others provide only marginal contributions.

4. **You need to analyze the monthly profit from sales and determine which month had the highest profit.**

Output:

What the chart represents

X-axis (Order month): Months 1 through 12, representing January to December.
Y-axis (Profit): Profit values ranging from about 10k to 45k.
Line trend: The line connects monthly profit totals, showing how profitability fluctuates across the year.

Key observations:

- **Peaks:**
  - Around **Month 3 (March)**, **Month 5 (May)**, **Month 9 (September)**, and **Month 12 (December)**, profit is noticeably higher.
- Dips:
  - Around **Month 4 (April)** and **Month 7 (July)**, profit drops significantly compared to surrounding months.
- **Overall range:** Profit varies between 10k at the lowest and 45k at the highest, showing moderate volatility compared to sales.

Business interpretation:

- **High-profit months (March, May, September, December)** → These could align with seasonal demand, festive periods, or successful campaigns.
- **Low-profit months (April, July)** → Potential issues such as higher discounts, increased costs, or weaker demand.
- **Actionable insight**: Comparing this chart with the Monthly Sales Analysis helps identify whether high sales months also translate into high profits, or if margins are being eroded by costs/discounts.

5. **Analyze the profit by category.**

Output:

What the chart represents

The chart divides total profit into three product categories: Technology, Office Supplies, and Furniture.
Each slice shows the percentage share of total profit contributed by that category.

Key observations:

- **Technology: 50.8% →** This is the largest contributor to profit, accounting for more than half of total profitability.
- **Office Supplies: 42.8% →** A strong second, showing nearly as much profit contribution as Technology.
- **Furniture: 6.44% →** Very low compared to the other categories, indicating weak profitability in this segment.

Business interpretation:

- **Technology dominance:** Technology drives the majority of profit, making it the most critical category for sustaining margins.
- **Office Supplies strength:** Despite being a lower sales contributor compared to Technology, Office Supplies deliver a significant share of profit, suggesting healthy margins.
- **Furniture weakness:** Furniture contributes very little to profit. This could be due to high costs, heavy discounts, or lower demand. It's a potential area for review either improve margins or reconsider product strategy.

6. **Analyze the profit by Sub-Category.**

Output:

What the chart represents

X-axis (Sub-Category): Different product sub-categories such as Accessories, Appliances, Chairs, Phones, Tables, etc.

Y-axis (Profit): Profit values ranging from negative (losses) around -20k up to positive profits over 40k.

Bars: Each vertical bar shows the profit contribution of that sub-category.

Key observations:

- **Highest profits:** Copiers, Accessories, and Phones stand out as the strongest profit generators, each contributing significantly above 30k–40k.
- **Negative profits:** Tables and Bookcases show losses (negative profit), meaning these sub-categories are eroding overall profitability.
- **Mixed performance:** Sub-categories like Chairs, Binders, and Machines show moderate profits, while others such as Fasteners and Labels contribute very little.

Business interpretation

- **Profit drivers:** Copiers, Accessories, and Phones are critical to sustaining margins. These should be prioritized for growth strategies.
- **Loss-making areas:** Tables and Bookcases are problematic — they may have high costs, heavy discounts, or weak demand. These require corrective action (pricing, sourcing, or product strategy).
- **Balanced portfolio:** While some sub-categories are strong profit contributors, others are marginal or negative. This highlights the importance of monitoring not just sales volume but also profitability at the sub-category level.

7. **Analyze the sales and profit by customer segment**.

Output:

What the chart represents

X-axis (Customer Segment): Three segments — Consumer, Corporate, and Home Office.
Y-axis (Amount): Ranges from 0 up to about 1.2M, showing both sales and profit values.
Bars: Each segment has two bars — one for Sales (teal) and one for Profit (yellow).

Key observations:

Consumer segment:

- Highest sales, close to 1.2M.
- Profit around 0.15M, the largest among all segments**.**

Corporate segment:

- Sales around 0.7M.
- Profit slightly above 0.1M, showing decent profitability relative to sales.

Home Office segment:

- Lowest sales, around 0.45M.
- Profit below 0.05M, indicating weaker profitability compared to other segments.

Business interpretation:

- Consumer dominance: The Consumer segment drives the majority of revenue and profit, making it the most critical customer group.
- Corporate stability: Corporate contributes solid sales and profit, suggesting a balanced and reliable segment.
- Home Office weakness: This segment lags in both sales and profit, which may point to limited demand or lower margins. It could be an area for targeted marketing or cost optimization.
- Profit margins: While Consumer has the highest absolute profit, corporate shows relatively stronger profit margins compared to its sales volume, meaning it's more efficient in converting sales into profit.

8. **Analyze the sales to profit ratio**.

Output:

What the table represents

Segments: Consumer, Corporate, and Home Office**.**
Sales to Profit Ratio: This metric shows how much sales revenue is generated for every unit of profit. A higher ratio means that more sales are needed to achieve each unit of profit, while a lower ratio indicates stronger profitability efficiency.

Key observations:

- **Consumer:** Ratio ≈ 8.66 → The Consumer segment requires about 8.7 units of sales to generate 1 unit of profit.

- **Corporate:** Ratio ≈ 7.68 → Slightly more efficient than Consumer, meaning corporate converts sales into profit at a better rate.
- **Home Office**: Ratio ≈ 7.13 → The most efficient segment, needing the least sales per unit of profit.

Business interpretation:

- **Consumer segment:** Although it has the highest absolute sales and profit, its ratio is the least efficient. This suggests margins are thinner possibly due to discounts, competitive pricing, or higher costs.
- **Corporate segment**: Balanced performance with solid sales and relatively better efficiency.
- **Home Office segment:** Despite lower total sales and profit, it shows the best efficiency. This indicates stronger margins, making it a potentially profitable niche if scaled up.