



Individual Coursework Submission Form

Specialist Masters Programme

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Module Code: SMM635	
Module Title: Data Visualisation	
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Declaration: By submitting this work, I declare that this work is entirely my own except those parts duly identified and referenced in my submission. It complies with any specified word limits and the requirements and regulations detailed in the coursework instructions and any other relevant programme and module documentation. In submitting this work, I acknowledge that I have read and understood the regulations and code regarding academic misconduct, including that relating to plagiarism, as specified in the Programme Handbook. I also acknowledge that this work will be subject to a variety of checks for academic misconduct. We acknowledge that work submitted late without a granted extension will be subject to penalties, as outlined in the Programme Handbook. Penalties will be applied for a maximum of five days lateness, after which a mark of zero will be awarded.	
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Deduction for Late Submission:

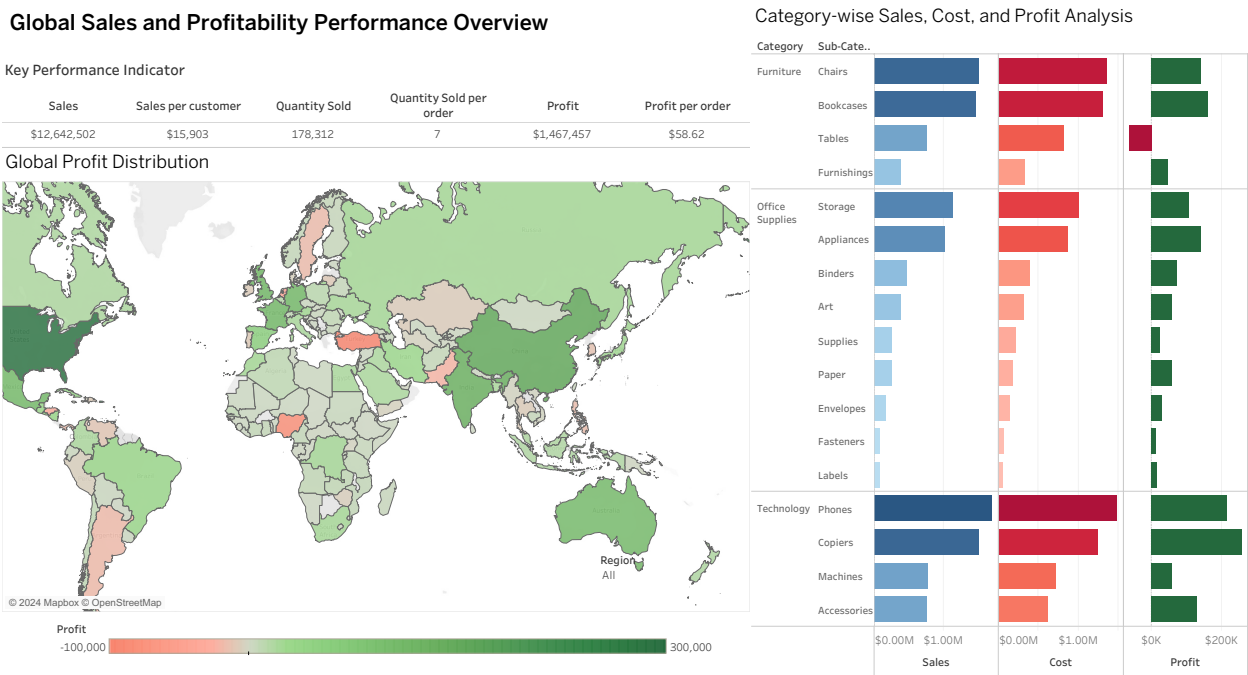
Final Mark:

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Dataset: <https://www.kaggle.com/datasets/shekpaul/global-superstore/data>

Visualization #1

Q1. As the senior business analyst of the Global Superstore Company, analyse which countries are the most profitable markets globally, and how do sales, costs, and profits vary across different product categories in key markets?



Q. What is the main insight of the chart? Why do you think this is insightful? (Max 200 words)

Click on : [Global Sales and Profitability Performance Overview- Visualisation 1](#)

Analysing the profitability of global markets for the Superstore reveals that not all sales are equal when it comes to profitability. A clear trend emerges that highlights the US as the most profitable market, with its solid sales and favourable profit-per-order ratio suggesting effective strategies and market reach. In comparison, China shows a significant sales volume but lower profit margins, suggesting competitive pricing strategies or possibly higher costs.

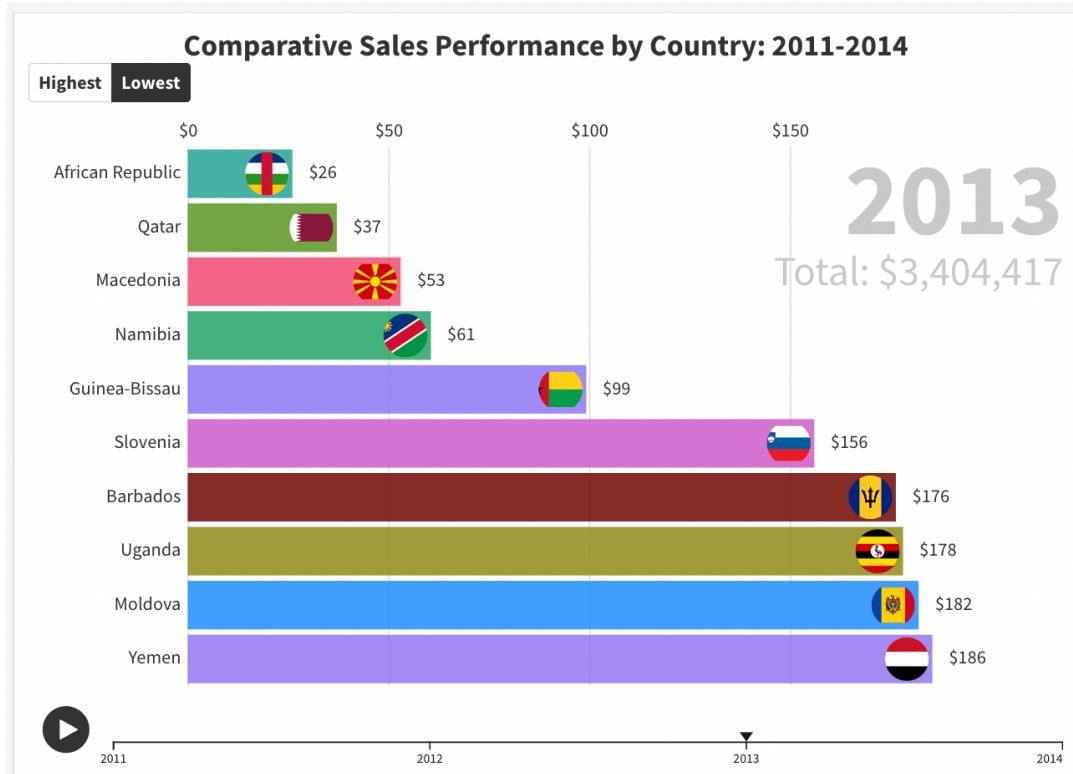
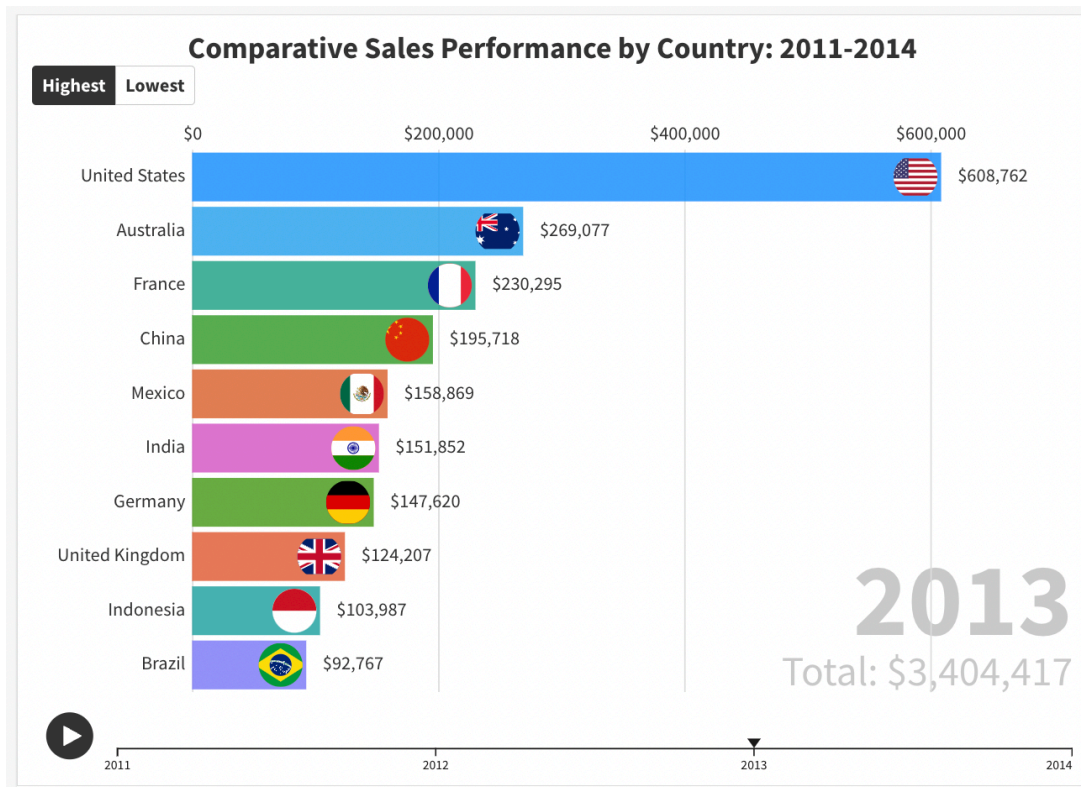
A deeper look into product categories reveals that technology items contribute substantial profits, likely due to higher margins. On the other hand, categories like office supplies, while essential for volume, yield lower profit margins, which could benefit from cost optimization.

Underperforming countries like Argentina, despite its negative profitability, poses a strategic decision point—whether to invest in market growth or reconsider its presence, considering the sales and order quantities which reflect consumer behaviour and price sensitivity.

In summary, the focus for the Company should be on expanding in high-profit regions such as the US while seeking strategies to improve margins in high-volume, low-margin regions like China. The product category analysis emphasizes the importance of strategic pricing, cost management, and market-specific sales strategies to enhance overall profitability. The company should also consider customer-centric tactics, tailored to each region's purchasing patterns, to capitalize on the sales potential and improve profit margins across all categories.

Visualization #2

Q2. How have sales trends evolved globally from 2011 to 2014, and what contrasts can be seen between the highest and lowest performing countries?



Q. What is the main insight of the chart? Why do you think this is insightful?

Click on: [Comparative sales performance by country: 2011-14 - Visualisation 2](#)

Sales trends from 2011 to 2014 showcase a robust ascendancy, it's evident that the United States has consistently been the highest performer in terms of sales from 2011 to 2014, with a steady increase year over year, emphasizing the market's strong demand and the company's solid footprint. Notably, there is a remarkable growth trajectory, with sales peaking significantly higher than in other countries, marking it as a pivotal region for the company's revenue stream.

In contrast, the countries with the lowest sales figures, such as Tunisia and Paraguay, present a different story. While these numbers are modest, they show the potential for market development and expansion. However, strategic approaches tailored to these specific markets are necessary, considering the distinct market dynamics and consumer behaviour that might be affecting sales.

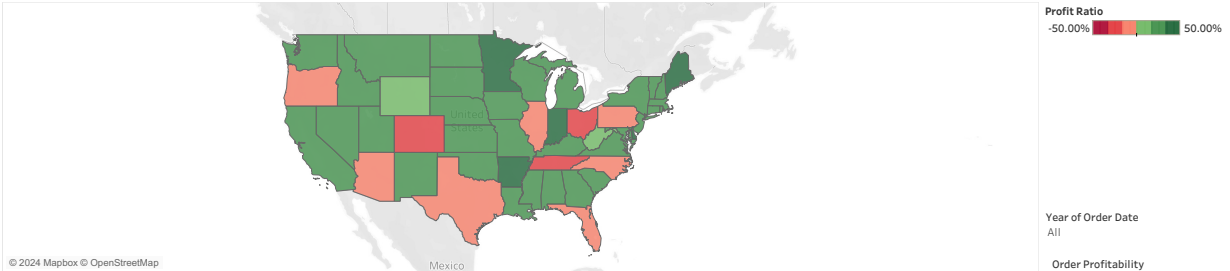
The main insight of the charts is the identification of strong versus weak markets, providing a clear indicator of where the company's strategies are succeeding and where they need refinement. The insight is particularly valuable as it pinpoints growth opportunities and areas that may require a realignment of market approach or additional resources to tap into latent potential. The sales trends and country performance offer a macro perspective on global sales dynamics, shaping decisions for resource allocation, market investment, and strategic planning for long-term growth.

Visualization #3

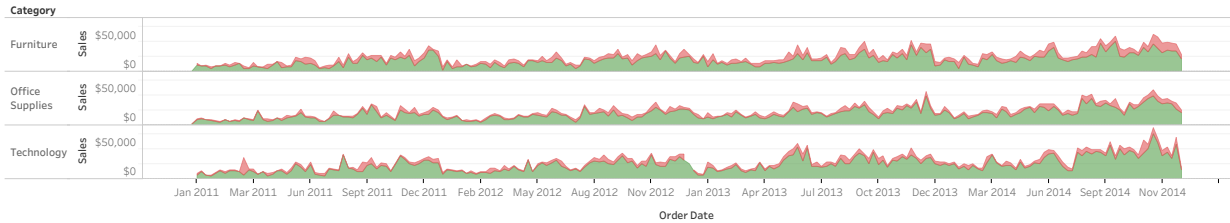
Q3. From the above, we found out United States is our most promising market, do a deeper analysis, check how does profitability vary by state, and what is the sales performance across different product categories?

Comprehensive Sales and Profitability Analysis

Profitability Heat Map Across the United States



Sales Performance by Category



Q. What is the main insight of the chart? Why do you think this is insightful?

Click on: [Comprehensive sales and profitability analysis- Visualisation 3](#)

Examining the U.S. market, it's evident that state-by-state profitability varies significantly, offering key insights into our operational strategies. Minnesota stands out with an impressive profit ratio of 36.24%, which is indicative of a market where our product offerings resonate well with customer demand. Ohio, however, faces a profit ratio of -21.69%, signalling potential operational challenges or a disconnect between our products and the market's needs.

Drilling down into product categories, technology emerges as a consistently profitable segment across various states, with strong demand and healthy margins. For instance, in June 2014, technology sales in the U.S. brought in profits of \$7,948 on sales of \$32,999, compared to a loss of \$1,713 on sales of \$5,353. This stark difference underscores the critical role of sales volume in sustaining profitability. Furniture sales display volatility, hinting at market conditions or seasonal influences that sway purchasing patterns. Office supplies, despite being essential, show lower profitability, which may suggest a saturated market or limited pricing power.

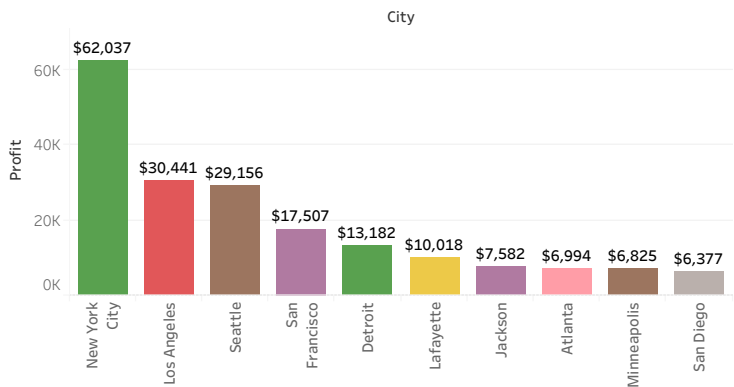
The key Insights from the sales performance area chart and heat map of profit ratio are telling. Geographical location and product category are pivotal to profitability. These analytical tools guide strategic decisions, indicating where to leverage strengths and remedy weaknesses. Thus, they are crucial for plotting future growth and refining profit strategies.

Visualization #4

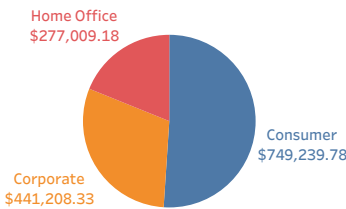
Q4: Which U.S. cities emerge as the top profit generators, and how do customer segments within these cities contribute to overall revenue, influenced by the performance across different business sub-categories?

Financial Performance and Customer Insights for Top U.S. Cities

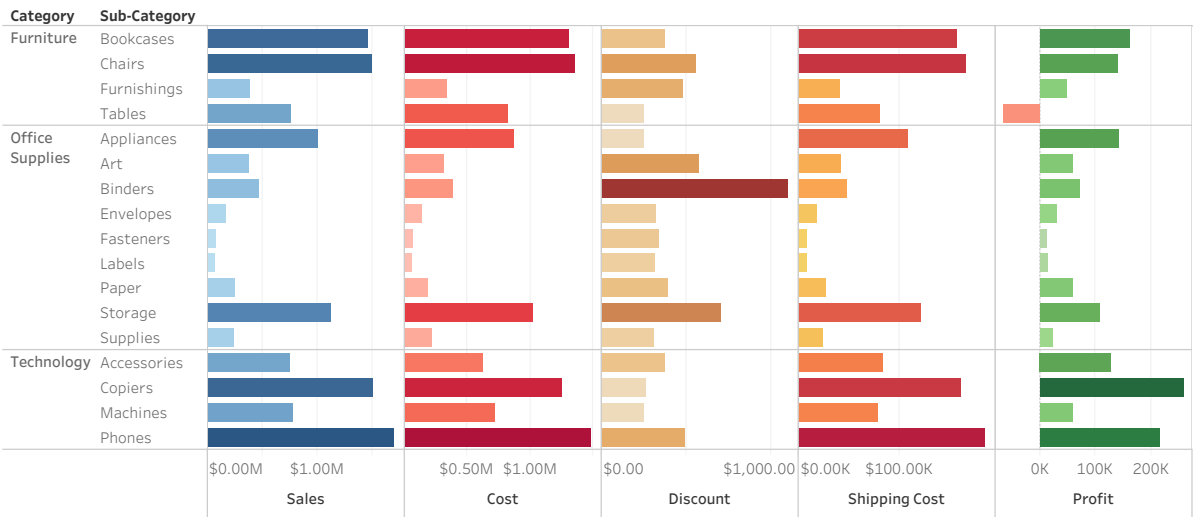
Profit Rankings of Top 10 United State Cities



Revenue Breakdown by Customer Segment



Business Analysis



Q. What is the main insight of the chart? Why do you think this is insightful?

Click on: [Financial Performance and Customer Insights for Top U.S. Cities- Visualisation 4](#)

In the U.S., New York City emerges as the top profit generator among U.S. cities, significantly outperforming others with a substantial lead. This reflects a strong market presence and indicates successful sales strategies and customer engagement.

Revenue analysis displays a heavy reliance on the consumer segment across cities, suggesting that individual consumer sales, likely driven by retail and e-commerce, form the bedrock of the city's sales strategy. Corporate sales follow closely, pointing to a solid B2B customer base, which include large-scale contracts and volume discounts. This trend is clearly illustrated the discounts offered on office supplies like binders across cities.

The financial metrics of sales, cost, and profits within business sub-categories like furniture, office supplies, and technology reveal a nuanced picture. For instance, In New York city, although furniture (especially Tables) shows significant sales, it doesn't always translate into equivalent profits due to high costs or shipping costs. In contrast, technology, while having lower sales in some instances, often results in higher profits, hinting at better margins or efficient cost management.

Discounts and shipping costs also play into the equation. Strategically applied discounts may boost sales volumes but can simultaneously erode profit margins if not carefully managed. Similarly, shipping costs can be a double-edged sword; while necessary to facilitate transactions, they must be controlled to prevent undue profit loss.

These insights reveal the importance of understanding local market dynamics and customer buying behaviour, allowing for strategic alignment of product offerings, pricing, and discounting strategies to optimize financial performance.

Visualization #5

Q5: How can we identify and reward our top customers based on their profit contributions and purchase frequency to foster loyalty and encourage higher order volumes?

Top 20 Customers by Profit Contribution



Q. What is the main insight of the chart? Why do you think this is insightful?

Click on: [Top 20 Customers by Profit Contribution- Visualisation 5](#)

The bubble chart visualizes the top 20 customers by profit contribution along with their order frequency, offering valuable insights for customer relationship management. The identification of high-value customers who are not only frequent buyers but also contribute significantly to the company's profitability. This information is pivotal for developing targeted loyalty programs, personalized marketing, and strategic engagement plans.

Customers like Bill Elpett, contributing a profit of over \$7,400 with a high order frequency of 102, demonstrate both loyalty and high value. On the other hand, Sanjit Chaud, with a lower frequency but higher profitability, signifies the impact of large, less frequent orders. This differentiation is insightful as it informs the need for a nuanced approach to customer engagement—where high-frequency customers might benefit from volume-based rewards, and high-profit but lower-frequency customers may be encouraged through personalized discounts or exclusive offers.

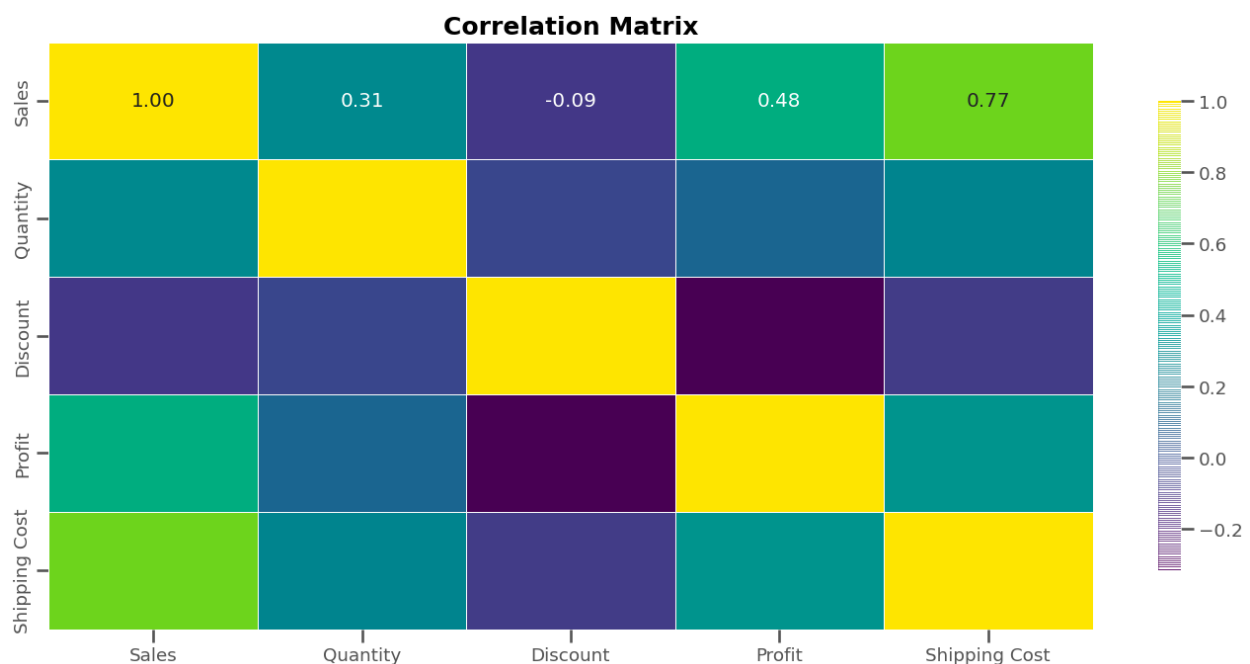
This chart is particularly insightful because it underscores the dual importance of profit and purchase frequency in vilifying customer value. By recognizing and rewarding these top customers, the company can not only foster loyalty but also motivate these customers to maintain or increase their order volumes. It highlights potential candidates for customer advocacy programs or further personalized engagement, ensuring that the company's most valuable customers feel valued and remain committed to the brand. This strategic focus on top customers can lead to increased customer lifetime value and sustainable revenue growth.

Appendix

Conclusion:

The journey begins with a global perspective, pinpointing profitable regions and successful product categories, and then narrows down to the country level, where we examine sales trends over time to understand growth trajectories. Diving deeper into the United States, we explore state-by-state profitability and identify which product categories are the sales drivers. This leads us to examine the most profitable cities and understand the demographic contributing to this profitability. Finally, focusing on individual contributors, we highlight the top customers who are pivotal to profit, thereby shaping a customer-centric strategy to bolster profitability.

Exploratory data analysis-



The correlation matrix provides a visual representation of the relationship between different variables. Here's a structured interpretation incorporating the information provided:

- **Positive Values (Yellow to Green range):** Indicate a positive correlation where, as one variable increases, the other variable tends to also increase. For example, 'Sales' and 'Profit' have a correlation of 0.77, suggesting a strong positive relationship — as sales increase, profit tends to increase as well.
- **Negative Values (Blue to Purple range):** Indicate a negative correlation where, as one variable increases, the other variable tends to decrease. The matrix shows that 'Discount' and 'Profit' have a correlation of -0.09, which is a very weak negative relationship — as discounts increase, there might be a very slight tendency for profits to decrease, but the relationship is not strong.

- Values Close to 0 (Dark Blue): Imply negligible linear relationships between the variables. For instance, 'Discount' and 'Quantity' have a correlation of -0.09, indicating no significant linear impact of discounting on the quantity of items sold.
- Value of 1.00 (Bright Yellow): This is found on the diagonal from the top left to bottom right and indicates a perfect positive correlation. It's always 1.00 for a variable with itself.

The matrix thus acts as a guide for strategic decision-making. Understanding these correlations helps to make more informed choices on sales strategies, discount policies, and overall business performance optimization.

Visualisation links:

Global Sales and Profitability Performance Overview- Visualisation 1

https://public.tableau.com/views/DataVisualisationAssignment-Viz1/Visualisation1?:language=en-GB&publish=yes&:sid=&:display_count=n&:origin=viz_share_link

Comparative sales performance by country: 2011-14 - Visualisation 2

<https://public.flourish.studio/visualisation/17358905/>

Comprehensive sales and profitability analysis- Visualisation 3

https://public.tableau.com/views/DataVisualisationAssignment-Viz3/Visualisation3?:language=en-GB&publish=yes&:sid=&:display_count=n&:origin=viz_share_link

Financial Performance and Customer Insights for Top U.S. Cities- Visualisation 4

https://public.tableau.com/views/DataVisualisationAssignment-Viz4/Visualisation4?:language=en-GB&publish=yes&:sid=&:display_count=n&:origin=viz_share_link

Top 20 Customers by Profit Contribution- Visualisation 5

https://public.tableau.com/views/DataVisualisationAssignment-Viz5/Visualisation5?:language=en-GB&publish=yes&:sid=&:display_count=n&:origin=viz_share_link