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Internship Domain : Data Analytics

Internship Duration : 12-06-2023 to 24-07-2023

Student ID : STU62da42a179c811658471073
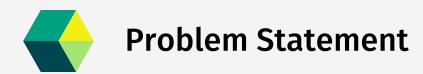
Internship : IBM SkillsBuild on Data Analytics (DA)

Internship ID: INTERNSHIP_168198413964410a8b547b1

Data Analysis

on Super Store Data based in USA

Category : Data Science and Business Analytics

Dataset : US based Sample Superstore

Dataset Volume : 9994 rows × 12 columns

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Problem Statement

The business is growing down and the stakeholders are seeking for an analysis to support the business managers to work upon the delicate areas to make necessary improvements for making more profits.

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Agenda

1. Defining the problem

2. Importing all necessary Libraries

3. Loading and exploring data

4. Cleaning and Pre-Processing of the Data

5. Exploratory Data analysis (EDA) to understand patterns, trends & insights

6. Visualization of findings

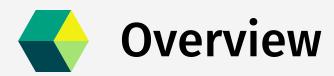7. Statistical Analysis

8. Conclusion

Overview

Project Overview:

The data analysis project aims to analyze a dataset with various columns, including Ship Mode, Segment, Country, City, State, Region, Category, Sub-Category, Sales, Quantity, Discount, and Profit. The purpose of the project is to gain insights into the business's sales and profitability by exploring the dataset, conducting statistical analysis, and visualizing the data.
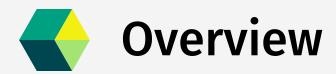
Project Purpose:

The purpose of the data analysis project is to understand the business's performance and identify key factors influencing sales and profit. By exploring the dataset and applying various analytical techniques, the project seeks to uncover patterns, trends, and correlations within the data. The analysis aims to provide actionable recommendations to improve sales, optimize discount strategies, and enhance overall profitability.

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Overview

Project Scope:

1. **Data Exploration:** Analyzing the dataset to understand its structure, identifying data types, and checking for any data quality issues.
2. **Descriptive Statistics:** Calculating summary statistics, such as mean, median, and standard deviation, for numerical variables (Sales, Quantity, Discount, Profit) to understand their central tendencies and variabilities.
3. **Customer Segments:** Identifying different customer segments based on the provided variables (Segment) and exploring their impact on sales and profit.
4. **Regional Analysis:** Analyzing sales and profit variations across different regions (Country, State) to identify regional trends and differences.
5. **Discount and Profit Relationship:** Investigating the relationship between discount and profit for different categories (Category, Sub-Category) to optimize discount strategies.

Overview

Project Objectives:

The main objectives of the data analysis project are as follows:

1. **Uncover Business Insights:** Through data exploration and analysis, identify key trends and insights that can provide a deeper understanding of the business's performance.
2. **Optimize Sales Strategies:** Identify customer segments that contribute significantly to sales and focus on improving sales performance in those areas.
3. **Enhance Profitability:** Analyze factors affecting profit margins, such as discount rates and product categories, to optimize pricing and maximize profitability.
4. **Provide Actionable Recommendations:** Based on the findings, suggest data-driven actionable recommendations to improve sales, profit, and overall business performance.

End Users

Business Managers and Executives:

Business managers and executives can use the insights from the analysis to make data-driven decisions and formulate strategies to improve sales, profitability, and overall business performance. They can identify areas of growth, focus on profitable customer segments, and optimize discount strategies.

Sales and Marketing Team

Sales and marketing teams can benefit from the analysis to understand customer preferences, identify high-performing products, and target specific customer segments more effectively. They can use the insights to design targeted marketing campaigns and promotional offers.

Operations and Supply Chain Managers:

Operations and supply chain managers can use the analysis to optimize inventory management and distribution strategies based on sales and demand patterns. They can identify regions with higher sales and allocate resources accordingly.

Business Analysts and Data Scientists:

Business analysts and data scientists within the organization can use the analysis as a foundation for further advanced analytics and predictive modeling to forecast sales and profitability, segment customers, or optimize pricing strategies.

Proposed Solutions

1. Customer Segmentation: The First Class segment customers tend to contribute to higher profits when compared to Standard class Segment contributing to very less profits. this means we have to consider customers of other segments for targeted marketing, personalized promotions, and understanding their preferences.
2. Optimal Discount Strategy: Analyze the relationship between discount and profit for different product categories and customer segments. Determine the optimal discount levels that maximize both sales and profit.
3. Regional Performance Analysis: Identify regions with the highest sales and profit to focus on expansion or marketing efforts. Understand the factors contributing to success in these regions.
4. Categorical Performance: Analyze the performance of different product categories to identify top-selling and low-performing categories. Focus on strategies to improve the sales and profitability of underperforming categories.
5. Supply Chain Optimization: Investigate the impact of different shipping modes on sales and profit. Optimize the supply chain and logistics to reduce costs and improve delivery efficiency.

Value Propositions

1. Data-Driven Decision Making: The insights and analysis will empower the business to make informed decisions backed by data, leading to improved performance and profitability.
2. Improved Sales and Profitability: By understanding customer behavior and market trends, the business can implement strategies that drive higher sales and increase overall profitability.
3. Targeted Marketing: Customer segmentation will enable personalized marketing campaigns and promotions, resulting in higher engagement and conversion rates.
4. Optimized Discount Strategies: Finding the right balance between discounts and profitability will lead to increased customer loyalty and sustainable revenue growth.
5. Competitive Advantage: Leveraging data-driven insights will help the business gain a competitive edge by understanding unique selling points and areas for improvement.
6. Customer Satisfaction: Understanding customer preferences and needs will lead to enhanced customer satisfaction and retention, fostering long-term relationships.
7. Geographic Expansion Opportunities: Identifying high-performing regions provides valuable information for targeted expansion efforts and market penetration.

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Customization

1. **Research Methodology:** Focuses on understanding customer behavior, pricing strategies, and identifying trends in the market.
2. **Visual Style:** Customized visual elements in charts and plots to match preferred palette, fonts, and themes.
3. **Interactivity:** Customized interactive visualizations using Plotly and other interactive libraries. Allows users to interact with the charts by adding hover effects, tooltips, or filters for better exploration.
4. **Advanced Analysis**: Advanced data analysis techniques to gain deeper insights into dataset.
5. **Dashboard:** Create an interactive dashboard using tools like Dash or Streamlit to present your findings and allow users to interact with the data.
6. **Contextual Insights:** Contextual insights and interpretations for the analysis results to make them more relevant and meaningful for your intended audience.
7. **Data Storytelling:** Craft a compelling data story by structuring your analysis in a way that takes your audience on a journey through the data, from the initial exploration to the final insights.
8. **Feedback Loop:** Seek feedback from stakeholders or users to iteratively improve and refine your analysis and visualizations.

Results and Findings

1. Profit in South and Central region is Less when compared to East and West Regions.

2. Highest overall Profit Contribution is from "Copiers"

3. Sub-Category "Tables" has negative profits and leading to Losses

4. "Supplies" has comparitively very less profits

5. "Technology" Segment has more Profitability

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Resources

Dataset	[Kaggle](#)
Style Guide	[How to Choose the Right Data Visualization](#)
Training Courses	[IBM Skills Build](#)