Sales Forecasting for Jain's Kirana Store

A Mid-Term report for the BDM capstone Project

Submitted by

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1. Executive Summary:

Jain's Kirana Store is a prominent grocery store situated in Village Daulari, Dist. Moradabad, specializing in B2C retail. Our mission is to offer high-quality products to our community while maintaining a robust and profitable business model.

Currently, the store faces a critical issue: a constrained profit margin largely due to excessive inventory levels. This inventory excess results in substantial financial blockage, adversely affecting our overall profitability.

To tackle this challenge, we propose a data-driven approach utilizing advanced Excel-based analytical techniques to optimize inventory management. Our strategy includes:

1. Data Visualization: Employing charts and graphs to detect and understand trends and patterns in sales and inventory data. This will help in recognizing which products are underperforming and which are performing well.
2. Pivot Tables: Utilizing pivot tables to efficiently summarize and analyze large datasets. This will allow us to break down data into actionable insights, making it easier to identify areas of improvement.
3. Formula-Based Calculations: Implementing formulas to optimize inventory levels, thereby reducing occurrences of stockouts and overstocking. This will ensure a balanced inventory, minimizing financial blockage and freeing up capital.

By leveraging these analytical approaches, our goal is to streamline inventory management, thereby reducing the financial strain caused by excessive stock. This will enhance overall profitability and ensure the sustainable growth of Jain's Kirana Store.

2. Proof of originality of the Data

- **Business Name :** Jain's Kirana Store
- **Location**: Village Daulari, Dist. Moradabad
- **Owners name**: Mr. Subham Jain

Video of interacting with business owner Video
Letter From Organization Image

Photos of Business


ROCKET


Valley Apples

3. Metadata

1. Data Overview:

- Business: Jain’s Kirana Store
- Location: Village Daulari, Dist. Moradabad
- Data Type: Sales and Inventory Records for Grocery Items
- Period Covered: [May 2024 - July 2024]

2. Dataset Description:

- Total Records: 28 items
- I went to the shop for 12 weeks and collected their data
- There is one summary sheet and 12 weekly sheets
- Key Variables for summary:
    - Item: Name of the product (e.g., Biscuits, Sugar, Tobacco)
    - Quantity Purchased: Total quantity of the item bought
    - Total Stock: Total available stock at the end of the period
    - Quantity Sold: Total quantity sold during the period
    - Cost per Unit: Purchase cost of one unit of the item
    - Total Cost: Total expenditure on purchasing the item
    - Selling Price per Unit: Price at which each unit is sold
    - Total Revenue: Total income from selling the item
    - Total Sold Units: Total units sold
    - Profit per Unit: Profit made on each unit sold
    - Total Profit: Overall profit from the item
    - P/L: Profit or Loss amount
    - % of Total Profit: Contribution of the item to the total profit
    - % of Total Revenue: Contribution of the item to the total revenue
    - Profit Margin %: Profit margin for each item

- Key Variables for Weeks:
    - Item: Name of the product (e.g., Biscuits, Sugar, Tobacco)
    - Already in stocks: Stocks remaining
    - Quantity Purchased: Total quantity of the item bought
    - Total Stock: Total available stock at the end of the period
    - Quantity Sold: Total quantity sold during the period
    - Cost per Unit: Purchase cost of one unit of the item
    - Total Cost: Total expenditure on purchasing the item

- Selling Price per Unit: Price at which each unit is sold
- Total Revenue: Total income from selling the item
- Stockout: Stockout(Yes/No)

3. Dataset Creation:

I [Harsh Pratap Singh] , went to the shop and reach out Mr. Subham jain [Shopkeeper]. And asked for their data. He happily shared their data with me. I went there for 12 weeks and noted down everything on my own and then uploaded it to sheets.

4. Descriptive Statistics:

There is descriptive data we can show. So first we are going to work on a summary table in which I have calculated all 12 weeks.

Statistical tool:

1. **Mean Calculation:** `=AVERAGE(range)`
2. **Standard Deviation Calculation:** `=STDEV.P(range)` for population or `=STDEV.S(range)` for sample
3. **Variance Calculation:** `=VAR.P(range)` for population or `=VAR.S(range)` for sample
4. **Range Calculation:** `=MAX(range) - MIN(range)`

Metric	Quantity Pu	Total Stock	Quantity Sc	Cost per Ur	Total Cost	Selling Pric	Total Rever	# Profit p	# Total P	# Profit Margin %
Count	28	28	28	28	28	28	28	28.00	28.00	28.00
Mean	316.33	346.15	310.44	64.50	15912.85	70.22	17136.67	5.73	1,515.59	0.10
Standard Deviat	273.81	286.82	272.7	82.25	14910.1	86.65	16088.47	4.96	1,383.70	0.05
Range	1233	1303	1261	442.00	61034	465.00	66060	24.40	5,090.00	0.15
Variance	74974.59	82264.5	74366.84	6765.35	222310998.4	7508.99	258838764.8	24.56	1,914,619.28	0.00
Minimum	87	97	74	8.00	1216	10.00	1540	0.60	250.00	0.05
Maximum	1320	1400	1335	450.00	62250	475.00	67600	25.00	5,340.00	0.20

Sales Data Statistics:

1. The item with the highest sales is Sugar. which is sold 1335 kgs and made the second highest revenue of 58740.
2. The item with the lowest sales is Honey. which sold 74 kgs and made a revenue of 35150.
3. The minimum profit on a unit is 0.6 on biscuits and it is also a loss item for the shop.
4. We can see the descriptive statistics.This summary is providing a comprehensive overview of the dataset's characteristics, helping in the analysis and decision-making process.

5. Detailed Explanation of Analysis Process/Method:

To address the inventory and profitability issues faced by Jain's Kirana Store, we will use various data analysis techniques in Excel. Here's a detailed explanation of the analysis process and justification for its usage:

1. Descriptive Analytics

Method:

- Excel Functions Used: AVERAGE, MEDIAN, STDEV, and other statistical functions.
- Purpose: To compute central tendency measures (mean and median) and dispersion measures (standard deviation) for various metrics such as quantity purchased, quantity sold, cost per unit, total cost, and total revenue.

Justification:

- Understanding Trends: Descriptive analytics provides a foundational understanding of historical sales data and inventory levels. By calculating the mean, median, and standard deviation, we can identify central tendencies and variances in the data.
- Identifying Patterns: This approach helps in spotting patterns, such as consistently high or low sales periods, and understanding variations in inventory levels and costs.

- Comparison: Comparing metrics like average quantity purchased against quantity sold allows us to evaluate the effectiveness of current inventory practices and identify discrepancies between purchase and sales.

Why It's Appropriate:

- Simplicity and Effectiveness: Descriptive statistics are simple to compute and interpret. They provide immediate insights into data distributions and variances, which are essential for understanding overall performance.
- Baseline for Further Analysis: These statistics serve as a baseline for more advanced analysis. They help in identifying key areas that require deeper investigation.

2. Data Visualization

Method:

- Excel Tools Used: Column charts, line charts, scatter plots, and other visualization tools.
- Purpose: To create visual representations of data, such as trends in sales, inventory levels, and cost variations over time.

Justification:

- Enhanced Understanding: Visualizing data helps in quickly grasping trends, patterns, and anomalies that might not be apparent from raw data alone. For instance, line charts can show how sales and inventory levels fluctuate over time.
- Effective Communication: Charts and graphs make it easier to communicate findings to stakeholders. They provide a clear and concise way to present complex data, making it accessible even to those without a statistical background.
- Identifying Trends: Data visualization can highlight seasonal trends, sales peaks and troughs, and other important patterns that are crucial for inventory management and strategic planning.

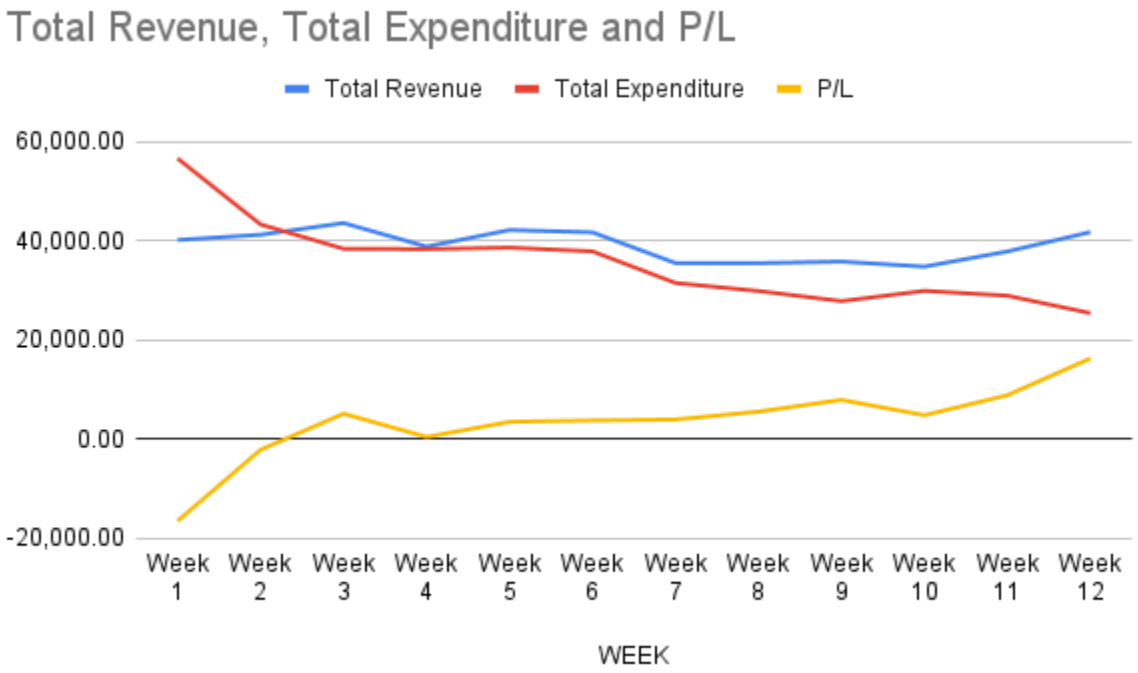
Why It's Appropriate:

- Immediate Insights: Visualization allows for the immediate identification of trends and outliers, which is crucial for timely decision-making.
- Decision Support: It supports better decision-making by making data insights visually apparent, facilitating easier interpretation and discussion.

6. Results and Findings:

Some insights gain from the data

- A total of 8,408 items were sold in 12 weeks where the total expenditure was 4,27,112 and the revenue was 4,69,414.
- Total profit for 12 week was 42,302



We Can see with this line chart that over the weeks revenue is similar but the expenditure comes down and the profit goes high.

Analysis:

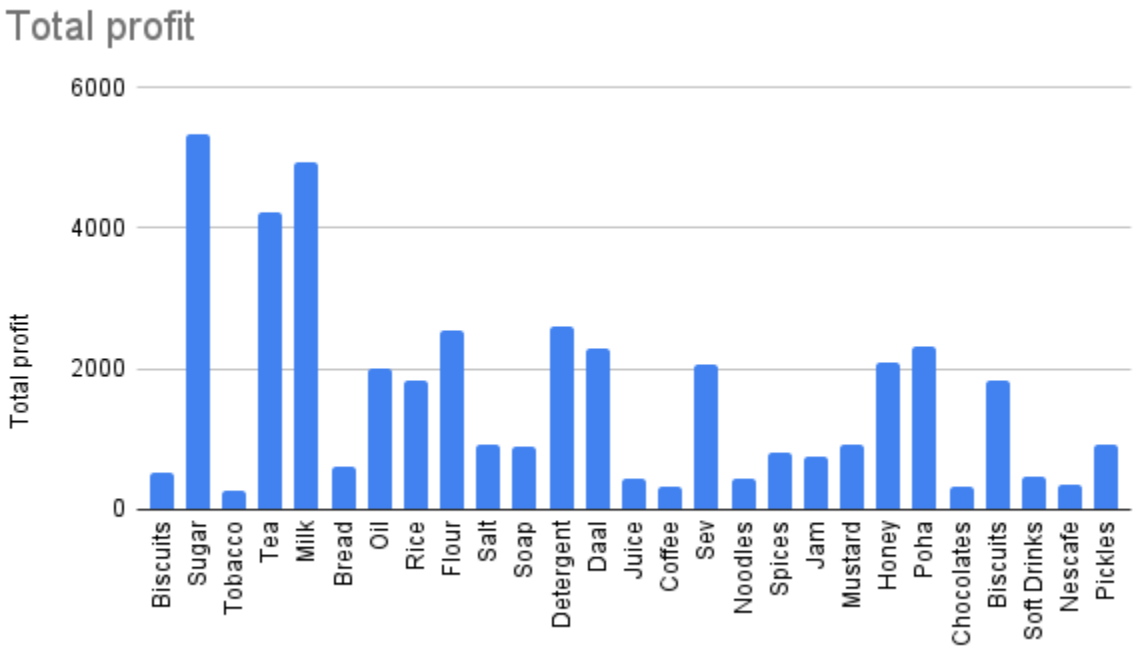
- **Trends in Expenditure:** We can see that the expenditure comes down till week 12.
- **Trends in Total Revenue:** It is almost flat in all the weeks.
- **Trends in P/L (Profit/Loss):** in week 1 shop has loss but after that it recovers and at the end of 12 week it is in profit of almost 45,000

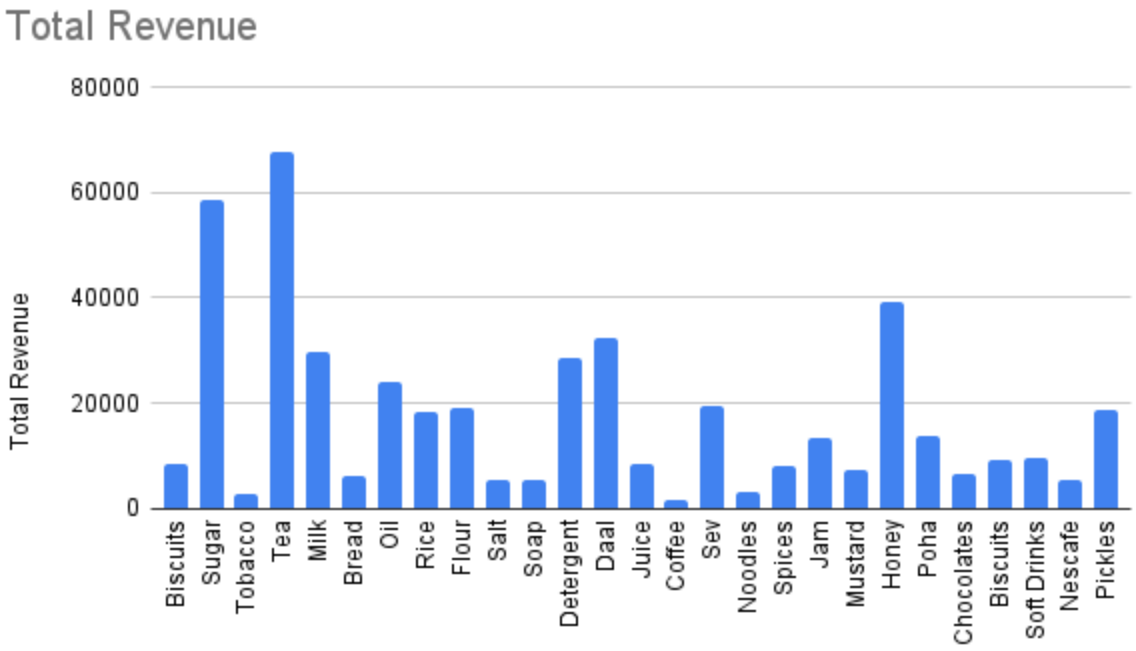
Bar Chart:

The bar chart is given in the below page.

Analysis:

- Comparison of Revenue and Profit: We can see that Sugar and tea are making good revenue and profit as well.
- Tobacco is making least profit and revenue.
- Coffee is also making less revenue but a bit good profit.

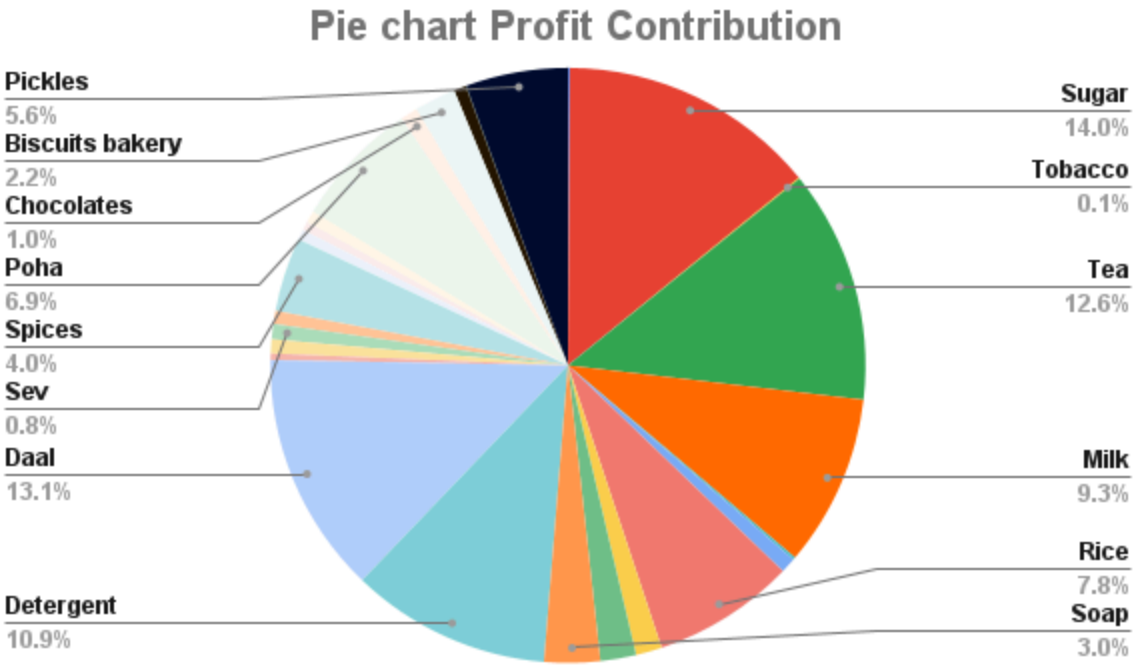




Pie Chart:

Analysis:

- Sugar is the most profit contributor in total profit
- Dal , tea , detergent are at 2nd , 3rd , 4th are the profit contributor
- Tobacco and different other items are contributing less than 0.1%. We have to mainly focus on them.



Summary:

Over 12 weeks, a total of 8,408 items were sold, with expenditures of ₹4,27,112 and revenue of ₹4,69,414, resulting in a profit of ₹42,302. Expenditure decreased consistently, while revenue remained stable. The shop transitioned from an initial loss to a profit by week 12, with **Sugar** and **Tea** being the top profit contributors, while items like **Tobacco** and **Coffee** generated lower revenue and profit.