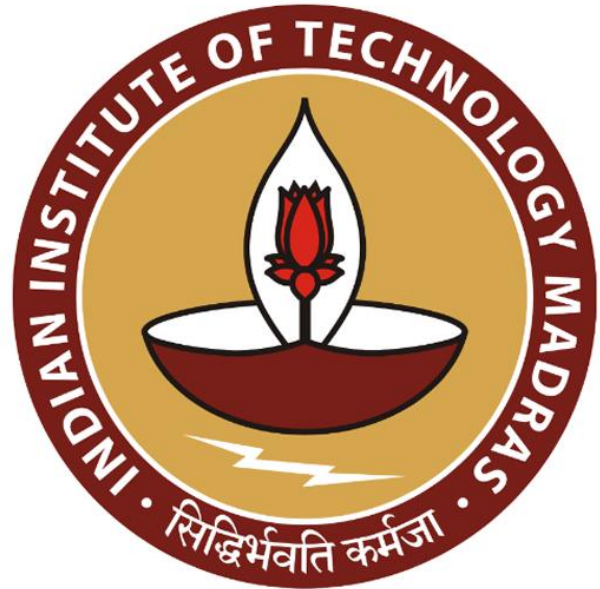# BUSINESS DATA MANAGEMENT

MID-TERM SUBMISSION

STRATEGIC OPTIMIZATION OF SALES AND INVENTORY AT JAI MAA KIRANA STORE

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1. **Executive Summary and Title :**

   Title: **"Strategic Optimization of Sales and Inventory at Jai Maa Kirana Store"** for a unorganized B2C Grocery Store.

   The project focuses on analyzing the operational and financial aspects of **Jai Maa Kirana Store**, a prominent grocery retailer based in Dalsingh Sarai, Bihar. This study aims to address key challenges such as low sales, profitability concerns, and inventory management by leveraging two months of transactional data collected through informal billing records and book keeping. A comprehensive dataset was meticulously compiled, covering daily sales, purchases, and inventory details from April 1st to May 31st, 2024.

   The analysis utilized descriptive statistics and data visualization techniques to identify revenue trends, profit margins, and purchasing patterns. Key findings revealed that items like Atta, Ghee, and Refined oil are major revenue generators, while products such as Rajma offer high-profit margins despite contributing less to total sales. Observations also highlighted the significance of competitive pricing for customer retention and the need for better inventory planning to minimize overstocking or shortages.

   By focusing on high-margin items, optimizing procurement strategies, and addressing low-performing products, the store can enhance its overall profitability. Additionally, visual insights such as Pareto charts and line graphs provided actionable recommendations for improving inventory control and marketing approaches. This study serves as a foundation for strategic decision-making, ensuring the store remains competitive and responsive to local market dynamics.

2. **Proof of originality of the Data:**

   • **Details:**

   Name: Jai Maa Kirana Store

   Owner: Mr. Sumit Kumar

   Address: IB Road ,Dalsingh Sarai,samastipur,Bihar,848114

   • **About :**

   Jai Maa Kirana Store is a prominent grocery retailer serving a diverse range of essential household items. Specializing in products such as Atta,Rice, Dal, Chole,Rajma,Ghee, Snacks, and Spices. Jai Maa Kirana Store, has become the preferred choice for local sellers and nearby customers . Seeking fresh and quality products at competitive prices. With a steadfast commitment to customer satisfaction and product excellence and store's friendly service and dedication to customer satisfaction have made it a trusted choice for families and individuals in the area.

• **Video:** Link-1: [click here to open](#)

• **Letter from Organisation :** Link-2: [click here to open](#)

• **Images:** To support my statements, I've included visual documentation. This includes pictures of the shop itself, a photo of myself with the owner of the shop, and sample bills and book-keeping records used by the shop to keep track of each sale carefully.

  ▪ **Pic of Shop**: Link-3: [click here to open](#)

  ▪ **Shop storage area:** Link-4: [click here to open](#)

  ▪ **Pic with the Owner**: Link-5: [click here to open](#)

Since Jai Maa Kirana Store primarily operates at a local level, it only uses informal data storage that makes it impossible to present or obtain all records. Consequently, in order to capture a glimpse of the shop's sales records, some snapshots of the informal bills have been presented. While the absence of official data storage may limit the availability of documentation, these captured snapshots provide valuable insights into the shop's transactional activities and contribute to the overall understanding of its operational practices.

• **Pic of Sales record (Informal):** Link-6: [click here to open](#)

3. Metadata and Descriptive Statistics:

I diligently gathered an extensive dataset covering the period from April 1st to May 31st, 2024. Throughout these two months, I collected data using a combination of previously issued bills and book keeping records stored in the bill book. This approach ensured that I compiled a comprehensive dataset for the entire timeframe, which is essential for analyzing and gaining insights for my project.

Metadata:

Date	SALES QUANTITY									SELLING PRICE									REVENUE				
	ATTA	CHAWAL	ARHAR DAL	URAD DAL	MOONG DAL	CHOLE	RAJMA	REFINED	GHEE	ATTA	CHAWAL	ARHAR DAL	URAD DAL	MOONG DAL	CHOLE	RAJMA	REFINED	GHEE	ATTA	CHAWAL	ARHAR DAL	URAD DAL	MOONG DAL
1-Apr-24	11	31	10	13	8	14	6	14	7	₹328	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹3,608	₹1,209	₹1,650	₹1,625	₹1,000
2-Apr-24	10	30	13	14	7	15	5	17	6	₹328	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹3,280	₹1,170	₹2,145	₹1,750	₹875
3-Apr-24	9	29	11	13	8	14	4	13	8	₹328	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹2,952	₹1,131	₹1,815	₹1,625	₹1,000
4-Apr-24	9	30	14	15	9	12	5	18	6	₹328	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹2,952	₹1,170	₹2,310	₹1,875	₹1,125
5-Apr-24	11	29	15	11	8	13	6	16	7	₹328	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹3,608	₹1,131	₹2,475	₹1,375	₹1,000
6-Apr-24	11	32	15	10	7	14	5	15	8	₹328	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹3,608	₹1,248	₹2,475	₹1,250	₹875
7-Apr-24	10	30	13	12	10	13	3	17	6	₹329	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹3,290	₹1,170	₹2,145	₹1,500	₹1,250
8-Apr-24	11	30	12	14	8	12	5	16	5	₹329	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹3,619	₹1,170	₹1,980	₹1,750	₹1,000
9-Apr-24	10	29	11	12	9	10	3	19	7	₹329	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹3,290	₹1,131	₹1,815	₹1,500	₹1,125
10-Apr-24	10	28	9	11	6	11	3	15	8	₹329	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹3,290	₹1,092	₹1,485	₹1,375	₹750
11-Apr-24	9	31	10	9	7	13	6	20	9	₹329	₹39	₹165	₹125	₹125	₹150	₹160	₹115	₹460	₹2,961	₹1,209	₹1,650	₹1,125	₹875
12-Apr-24	10	32	12	10	8	14	4	17	7	₹329	₹39	₹168	₹125	₹125	₹150	₹160	₹115	₹470	₹3,290	₹1,248	₹2,016	₹1,250	₹1,000
13-Apr-24	12	32	13	11	9	12	3	17	6	₹330	₹39	₹168	₹125	₹125	₹150	₹160	₹115	₹470	₹3,960	₹1,248	₹2,184	₹1,375	₹1,125
14-Apr-24	11	31	10	10	10	13	3	18	8	₹330	₹39	₹168	₹125	₹125	₹150	₹160	₹115	₹470	₹3,630	₹1,209	₹1,680	₹1,250	₹1,250
15-Apr-24	10	30	15	12	9	13	4	16	6	₹330	₹39	₹168	₹125	₹125	₹150	₹160	₹115	₹470	₹3,300	₹1,170	₹2,520	₹1,500	₹1,125
16-Apr-24	10	31	14	14	7	14	3	15	7	₹330	₹39	₹168	₹125	₹125	₹150	₹160	₹115	₹470	₹3,300	₹1,209	₹2,352	₹1,750	₹875
17-Apr-24	10	31	13	13	8	12	4	14	8	₹330	₹39	₹168	₹125	₹125	₹150	₹160	₹115	₹470	₹3,300	₹1,209	₹2,184	₹1,625	₹1,000
18-Apr-24	9	29	14	12	7	10	5	14	6	₹330	₹40	₹170	₹125	₹125	₹150	₹160	₹115	₹470	₹2,970	₹1,160	₹2,380	₹1,500	₹875
19-Apr-24	11	30	12	12	8	11	4	15	6	₹330	₹40	₹170	₹125	₹125	₹150	₹160	₹115	₹470	₹3,630	₹1,200	₹2,040	₹1,500	₹1,000
20-Apr-24	11	29	11	11	9	13	5	16	6	₹331	₹40	₹170	₹125	₹125	₹150	₹160	₹125	₹470	₹3,641	₹1,160	₹1,870	₹1,375	₹1,125
21-Apr-24	12	32	9	9	7	13	3	17	7	₹331	₹40	₹170	₹125	₹125	₹150	₹160	₹125	₹480	₹3,972	₹1,280	₹1,530	₹1,125	₹875
22-Apr-24	11	30	10	10	6	10	3	16	7	₹331	₹40	₹170	₹125	₹125	₹150	₹160	₹125	₹480	₹3,641	₹1,200	₹1,700	₹1,250	₹750
23-Apr-24	10	30	14	14	8	10	6	17	6	₹331	₹40	₹170	₹125	₹125	₹140	₹160	₹125	₹480	₹3,310	₹1,200	₹2,380	₹1,750	₹1,000
24-Apr-24	10	29	13	13	10	12	4	16	5	₹331	₹40	₹170	₹125	₹125	₹140	₹160	₹125	₹480	₹3,310	₹1,160	₹2,210	₹1,625	₹1,250
25-Apr-24	11	28	10	10	9	14	3	17	4	₹331	₹40	₹170	₹125	₹125	₹140	₹160	₹125	₹480	₹3,641	₹1,120	₹1,700	₹1,250	₹1,125

Figure 1: Snapshot of Sales

Figure 2: Snapshot of Inventory

Date	ATTA	CHAWAL	ARHAR DAL	URAD DAL	MOONG DAL	CHOLE	RAJMA	REFINED	GHEE	TOTAL DAILY INVENTORY	AVERAGE DAILY INVENTORY	Date
1-Apr-24	69	34	60	60	38	72	25	87	3	448	50	1-Apr-24
2-Apr-24	58	3	50	47	30	58	19	73	56	394	44	2-Apr-24
3-Apr-24	48	193	37	33	23	43	14	56	50	497	55	3-Apr-24
4-Apr-24	74	164	26	20	15	129	45	43	42	558	62	4-Apr-24
5-Apr-24	65	134	112	90	86	117	40	25	36	705	78	5-Apr-24
6-Apr-24	54	105	97	79	78	104	34	9	29	589	65	6-Apr-24
7-Apr-24	43	73	82	69	71	90	29	139	21	617	69	7-Apr-24
8-Apr-24	33	43	69	57	61	77	26	122	15	503	56	8-Apr-24
9-Apr-24	62	13	57	43	53	65	21	106	70	490	54	9-Apr-24
10-Apr-24	52	194	46	31	44	55	18	87	63	590	66	10-Apr-24
11-Apr-24	42	166	37	20	38	144	50	72	55	624	69	11-Apr-24
12-Apr-24	33	135	117	81	91	131	44	52	46	730	81	12-Apr-24
13-Apr-24	63	103	105	71	83	117	40	35	39	656	73	13-Apr-24
14-Apr-24	51	71	92	60	74	105	37	143	33	666	74	14-Apr-24
15-Apr-24	40	230	82	50	64	92	34	125	25	742	82	15-Apr-24
16-Apr-24	30	200	67	38	55	79	30	109	79	687	76	16-Apr-24
17-Apr-24	60	169	53	24	48	65	27	94	72	612	68	17-Apr-24
18-Apr-24	50	138	40	11	40	153	58	80	64	634	70	18-Apr-24
19-Apr-24	41	109	111	74	103	143	53	66	58	758	84	19-Apr-24
20-Apr-24	75	79	99	62	95	132	49	51	52	694	77	20-Apr-24
21-Apr-24	64	50	88	51	86	119	44	155	46	703	78	21-Apr-24
22-Apr-24	52	218	79	42	79	106	41	138	39	794	88	22-Apr-24
23-Apr-24	41	188	69	32	73	96	38	122	92	751	83	23-Apr-24
24-Apr-24	76	158	55	18	65	86	32	105	86	681	76	24-Apr-24
25-Apr-24	66	129	42	5	55	174	63	89	81	704	78	25-Apr-24
26-Apr-24	55	101	112	79	106	160	60	72	77	813	90	26-Apr-24

Figure 2: Snapshot of Inventory

Figure 3: Snapshot of Purchase

Date	PURCHASE QUANTITY										PURCHASE PRICE										COST								
	ATTA	CHAWAL	ARHAR DAL	URAD DAL	MOONG DAL	CHOLE	RAJMA	REFINED	GHEE	ATTA	CHAWAL	ARHAR DAL	URAD DAL	MOONG DAL	CHOLE	RAJMA	REFINED	GHEE	ATTA	CHAWAL	ARHAR DAL	URAD DAL	MOONG DAL	CHOLE	RAJMA	REFINED	GHEE
1-Apr-24	0	0	0	0	0	0	0	0	60	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹25,800
2-Apr-24	0	220	0	0	0	0	0	0	0	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹0	₹8,140	₹0	₹0	₹0	₹0	₹0	₹0	₹0
3-Apr-24	35	0	0	0	0	100	35	0	0	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹11,130	₹0	₹0	₹0	₹0	₹13,800	₹4,900	₹0	₹0
4-Apr-24	0	0	100	85	80	0	0	0	0	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹0	₹0	₹15,500	₹9,350	₹8,800	₹0	₹0	₹0	₹0
5-Apr-24	0	0	0	0	0	0	0	0	0	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0
6-Apr-24	0	0	0	0	0	0	0	145	0	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹15,805	₹0
7-Apr-24	0	0	0	0	0	0	0	0	0	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0
8-Apr-24	40	0	0	0	0	0	0	0	60	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹12,720	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹25,800
9-Apr-24	0	210	0	0	0	0	0	0	0	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹0	₹7,770	₹0	₹0	₹0	₹0	₹0	₹0	₹0
10-Apr-24	0	0	0	0	0	100	35	0	0	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹0	₹0	₹0	₹0	₹0	₹13,800	₹4,900	₹0	₹0
11-Apr-24	0	0	90	70	60	0	0	0	0	₹318	₹37	₹155	₹110	₹110	₹138	₹140	₹109	₹430	₹0	₹0	₹13,950	₹7,700	₹6,600	₹0	₹0	₹0	₹0
12-Apr-24	40	0	0	0	0	0	0	0	0	₹318	₹37	₹158	₹110	₹110	₹138	₹140	₹109	₹430	₹12,720	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0
13-Apr-24	0	0	0	0	0	0	0	125	0	₹316	₹37	₹158	₹110	₹110	₹138	₹140	₹109	₹440	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹13,625	₹0
14-Apr-24	0	190	0	0	0	0	0	0	60	₹316	₹37	₹158	₹110	₹110	₹138	₹140	₹109	₹440	₹0	₹7,030	₹0	₹0	₹0	₹0	₹0	₹0	₹26,400
15-Apr-24	0	0	0	0	0	0	0	0	0	₹316	₹37	₹158	₹110	₹110	₹138	₹140	₹109	₹440	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0
16-Apr-24	40	0	0	0	0	0	0	0	0	₹316	₹37	₹158	₹110	₹110	₹138	₹140	₹109	₹440	₹12,640	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0
17-Apr-24	0	0	0	0	0	100	35	0	0	₹316	₹37	₹158	₹110	₹110	₹138	₹140	₹109	₹440	₹0	₹0	₹0	₹0	₹0	₹13,800	₹4,900	₹0	₹0
18-Apr-24	0	0	85	75	70	0	0	0	0	₹316	₹38	₹160	₹110	₹110	₹138	₹140	₹109	₹440	₹0	₹0	₹13,600	₹8,250	₹7,700	₹0	₹0	₹0	₹0
19-Apr-24	45	0	0	0	0	0	0	0	0	₹316	₹38	₹160	₹110	₹110	₹138	₹140	₹109	₹440	₹14,220	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0
20-Apr-24	0	0	0	0	0	0	120	0	0	₹316	₹38	₹160	₹110	₹110	₹138	₹140	₹119	₹440	₹0	₹0	₹0	₹0	₹0	₹0	₹14,280	₹0	₹0
21-Apr-24	0	200	0	0	0	0	0	0	60	₹316	₹38	₹160	₹110	₹110	₹138	₹140	₹119	₹450	₹0	₹7,600	₹0	₹0	₹0	₹0	₹0	₹0	₹27,000
22-Apr-24	45	0	0	0	0	0	0	0	0	₹316	₹38	₹160	₹110	₹110	₹125	₹140	₹119	₹450	₹14,220	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0
23-Apr-24	0	0	80	75	60	0	0	0	0	₹316	₹38	₹160	₹110	₹110	₹125	₹140	₹119	₹450	₹0	₹0	₹12,800	₹8,250	₹6,600	₹0	₹0	₹0	₹0
24-Apr-24	0	0	0	0	0	100	35	0	0	₹316	₹38	₹160	₹110	₹110	₹125	₹140	₹119	₹450	₹0	₹0	₹0	₹0	₹0	₹12,500	₹4,900	₹0	₹0
25-Apr-24	35	0	0	0	0	0	0	115	0	₹314	₹38	₹168	₹110	₹110	₹125	₹140	₹119	₹450	₹10,990	₹0	₹0	₹0	₹0	₹0	₹0	₹13,685	₹0
26-Apr-24	0	225	0	0	0	0	0	0	60	₹314	₹38	₹168	₹110	₹110	₹125	₹140	₹119	₹450	₹0	₹8,550	₹0	₹0	₹0	₹0	₹0	₹0	₹27,000
27-Apr-24	40	0	0	0	0	0	0	0	0	₹314	₹38	₹168	₹110	₹110	₹125	₹140	₹119	₹450	₹12,560	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0
28-Apr-24	0	0	0	0	0	100	35	0	0	₹314	₹38	₹168	₹120	₹110	₹125	₹140	₹119	₹450	₹0	₹0	₹0	₹0	₹0	₹12,500	₹4,900	₹0	₹0
29-Apr-24	0	0	75	80	55	0	0	0	0	₹314	₹38	₹168	₹120	₹110	₹125	₹140	₹119	₹450	₹0	₹0	₹12,600	₹9,600	₹6,050	₹0	₹0	₹0	₹0
30-Apr-24	30	0	0	0	0	0	0	0	0	₹314	₹38	₹168	₹120	₹110	₹125	₹140	₹119	₹450	₹9,420	₹0	₹0	₹0	₹0	₹0	₹0	₹0	₹0

Figure 3: Snapshot of Purchase

Column Name	Description
Date	Date of the transaction in the format "DD-Month-YY". This column indicates the specific day when the transaction occurred.
Item Name	Name or description of the item being sold or purchased in the transaction. This helps in identifying the specific product involved in each transaction.
Quantity	The quantity of the item sold or purchased, expressed in kilograms (kg), liters (ltr), or packets, indicates the amount of the product involved in each transaction.

Rate	Price per unit or rate of the item sold or purchased. This column indicates the cost or selling price per unit of the product.
Amount	Total amount for the item sold or purchased, calculated by multiplying quantity by rate. This provides the monetary value of each transaction.
Transaction Type ✓ Sales Sheet ✓ Purchase Sheet ✓ Inventory Sheet	This helps in distinguishing b/w different types of transactions through the organization of data across different sheets. • Contains sales transactions • Contains purchase transactions • Contains inventory details

<div align="center">Table 1: Metadata</div>

▪ **Link of Dataset:** Link-7: <u>click here to open</u>

Descriptive Statistics:

BASIS	SALES	PURCHASE	INVENTORY
MEAN	₹ 16,109.13	₹ 17,410.66	₹ 799.31
STANDARD ERROR	₹ 118.84	₹ 1,309.59	₹ 22.33
MEDIAN	₹ 16,240.00	₹ 14,280.00	₹ 807.00
MODE	₹ 16,697.00	₹ 17,400.00	₹ 867.00
STANDARD DEVIATION	₹ 928.14	₹ 10,228.20	₹ 174.43
SAMPLE VARIANCE	₹ 8,61,446.58	₹ 10,46,16,076.23	₹ 30,424.52
KURTOSIS	0.035	-0.617	-0.563
SKEWNESS	-0.595	0.347	-0.203
RANGE	₹ 4,186.00	₹ 38,590.00	₹ 744.00
MINIMUM	₹ 13,575.00	₹ 0.00	₹ 394.00
MAXIMUM	₹ 17,761.00	₹ 38,590.00	₹ 1,138.00
SUM	₹ 9,82,657.00	₹ 10,62,050.00	₹ 48,758.00
COUNT	61	61	61

<div align="center">Table 2: Descriptive Statistics</div>

➢ **Sales:**

- Mean: ₹16,109.13 - This is the average sales amount. =AVERAGE(range)

- Median : ₹ 16,240 – The middle value, which close to mean, suggesting a relatively symmetrical distribution. =MEDIAN(range)

- Mode : ₹ 16,697 – Most frequently occurring value. =MODE.SNGL(range)

- Standard Deviation: ₹928.14 - Indicates the variability in sales; lower variability means there is more consistent sales. =STDEV.S(range)

- Kurtosis: 0.035 - indicates that the dataset has a near-normal distribution, with tails slightly flatter or similar to a normal distribution. =KURT(range)

- Skewness: -0.595 - moderate negative skew, meaning the data distribution is slightly skewed to the left, with a longer tail on the left side. =SKEW(range)

- Range: ₹4,186.00 - Difference between the highest and lowest sales values.
  =MAX(range)-MIN(range)

- Minimum: ₹13,575.00 - The lowest sales value. =MIN(range)

- Maximum: ₹17,761.00 - The highest sales value. =MAX(range)

- Sum: ₹9,82,657.00 - Total sales over the period. =SUM(range)

- Count: 61 - Number of sales observations. =COUNT(range)

> - In above formulas, **"range"** refers to the column of data to which descriptive statistics has been applied.
> - The same formulas are applied to all other columns of table Descriptive Statistics.

➤ Purchase:

- Mean: ₹17,410.66 - The average purchase amount.

- Median: ₹14,800.00 - The middle value, indicating a distribution with some large deviations.

- Mode: ₹17,400 - Most frequently occurring value.

- Standard Deviation: ₹10,228.30 - indicates significant variability in the data, with values spread widely   .   around the mean.

- Kurtosis: -0.617 -data has flatter tails and less pronounced peaks compared to a normal distribution.

- Skewness: 0.347 - indicates a slight positive skew, meaning the data distribution has a minor tail on the right side..

- Range: ₹38,590.00 - Wide range indicating significant differences between the highest

and lowest purchase values.

- Minimum: ₹0.00 - The lowest purchase value.

- Maximum: ₹38,590.00 - The highest purchase value.

- Sum: ₹10,62,050 - Total purchases over the period.

- Count: 61 - Number of purchase observations.

➢ **Inventory:**

   • Mean: ₹799.31 - The average inventory amount.

   • Median: ₹807.00 - The middle value, slightly above the mean.

   • Mode: ₹867.00 - Most frequently occurring value.

   • Standard Deviation: ₹174.43 - ow variability in the data, with values closely clustered around the mean.

   • Kurtosis: -0.563 - a platykurtic distribution, indicating the data has flatter tails and a less sharp peak compared to a normal distribution.

   • Skewness: -0.203 - indicates a slight negative skew, meaning the data is approximately symmetric with a minor tail on the left side.

   • Range: ₹744.00 - Difference between the highest and lowest inventory values.

   • Minimum: ₹394.00 - The lowest inventory value.

   • Maximum: ₹1,138.00 - The highest inventory value.

   • Sum: ₹48,758.00 - Total inventory over the period.

   • Count: 61 **-** Number of inventory observations.

❖ **General Insights:**

- Sales are consistent with minimal variability, a near-normal distribution, and a slight negative skew.

- Purchases show significant variability with a wide range, slight positive skew, and flatter-than-normal distribution tails.

- Inventory is consistent with low variability, a near-symmetric distribution, and slightly flatter tails compared to a normal distribution.

Purchases exhibit significant variability, as reflected by a high standard deviation of ₹10,228.30 and a wide range of ₹38,590. This indicates substantial differences between individual purchase values. The slight positive skew suggests that a few higher values are pulling the distribution slightly to the right, while the platykurtic kurtosis (-0.617) implies the data has flatter tails, with fewer extreme values than a normal distribution. Overall, this highlights diverse purchasing patterns over the observed period.

4) Detailed Explanation of Analysis Process/Method:

Over two-month period, I carefully gathered, cleaned, and organized data using Excel Sheets for analysis. This process involved several key steps to ensure that the data is accurate, relevant, and useful for decision-making. Below is an in-depth breakdown of the approach I used:

i) Data Cleaning and Organization:

- I systematically reviewed the dataset to ensure it was well-organized and structured properly for analysis. This included checking for completeness and ensuring that all necessary fields were present and accurately recorded.
- I identified and addressed inconsistencies, such as duplicate or misclassified items. And also took steps to correct any missing or incomplete data entries that could affect the analysis.

ii) Descriptive Statistical Analysis:

- I applied various descriptive statistical techniques to summarize and explore the data.
- Measures such as mean, average, profit, and inventory stocks were calculated to gain insights into the overall dynamics of the shops.

These statistical calculations provided deep insights of the business and helped to establish benchmark for comparing future performance

iii) Data Visualization:

- I used column, bar, line, and pie charts to visually represent revenue, profit of SKUs, purchase price, and their respective proportions.
- These charts offer a straightforward and concise overview of the performance and distribution of different business metrics.
- They assist in spotting trends, recognizing patterns, and highlighting key areas for decision-making.

iv) Pareto Chart for Revenue or Profit:

- I created a combined line and bar chart to represent the Pareto Chart for revenue or profit across all SKUs.
- The bar chart part shows the revenue or profit values for individual SKUs, arranged in descending order from the highest to the lowest.
- This combined chart clearly highlights the most significant SKUs contributing to the overall revenue or profit.
- By visualizing both individual and cumulative data together, it identifies the SKUs following

the 80/20 rule, where a few SKUs contribute most of the total revenue or profit.

- Such a representation is especially useful for focusing on key products that drive the business while also understanding the contribution of smaller contributors.

v) Pie Chart for Profit Proportions:

- I used pie chart to display the proportions of profit for different SKUs.
- The pie chart effectively shows the relative contribution of each SKU to the total profit by dividing a circular graph into slices.
- Each slice represents a specific SKU, with its size proportional to the profit it generates, where larger slices indicate higher profit contributions.

vi) Line Chart for Trends:

- I used a line chart to visualize the trends in revenue and purchasing price over two months.
- The chart provides a clear depiction of how these variables evolve, helping to identify patterns, fluctuations, and trends. By displaying both revenue and purchasing price on the same graph, it enables easy comparison and highlights any correlation between the two.

Through the combination of descriptive statistics and visualization techniques, I gained a comprehensive understanding of how the business is performing. This analysis not only sheds light on the current state of the shop's operations but also provides actionable insights into areas that need improvement. By identifying key patterns and trends, the findings help in making data-driven decisions to enhance profitability. Additionally, the analysis highlights opportunities for optimizing inventory management, pricing strategies, and customer relationships. It also offers recommendations for strengthening supplier relations and addressing seasonal fluctuations, ensuring the business remains competitive and sustainable in the long run.

5) Results and Findings:

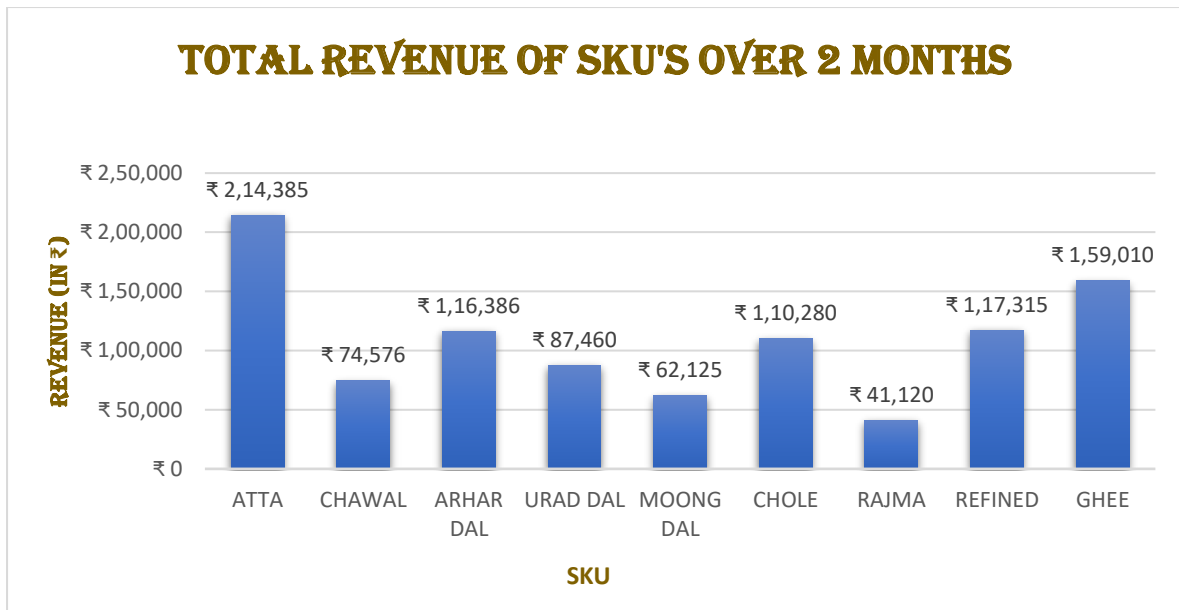Below is the data analysis and visualization based on the collected information:

Chart 1: Total Revenue of all the SKU's over 2 months

- Top Revenue Generating Items: Atta, Ghee, Refined and Arhar dal are the highest revenue generators, indicating their strong demand in the market.

- Revenue Contributions: Atta contributed the most with ₹2,14,385, followed by Ghee with ₹1,59,010, and Refined with ₹1,17,315, highlighting their critical role in driving revenue growth.
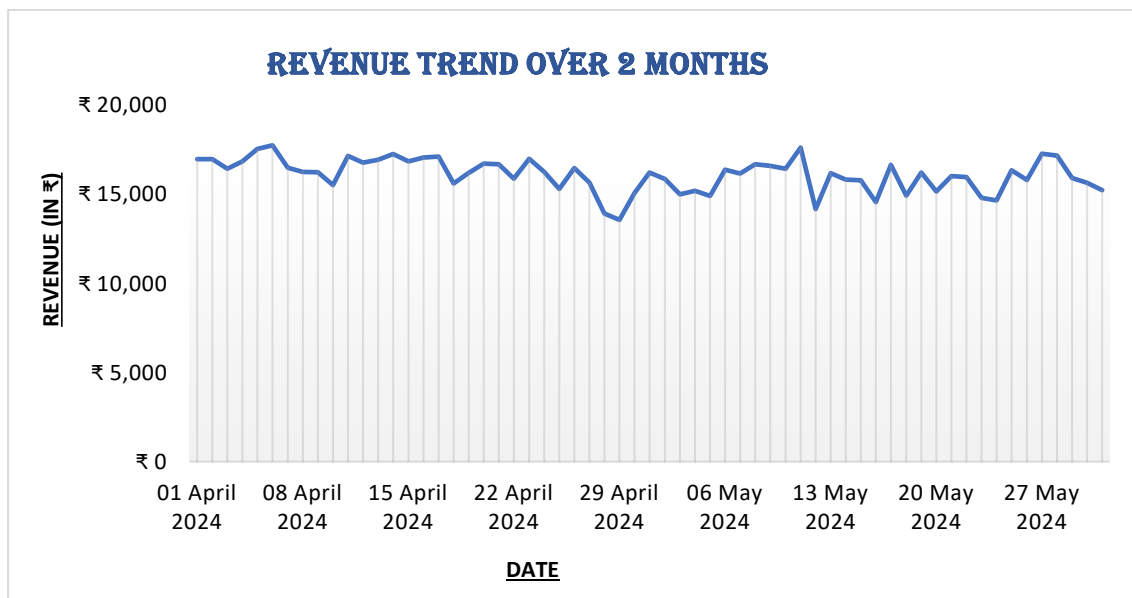

Chart 2: Total Revenue Trend observed over 2 months

- Daily Revenue Variation: The total daily revenue shows fluctuations, with a general upward trend towards the end of the period, indicating growing demand or improved sales strategies.

- Highest Revenue Day: The peak revenue day recorded a total of ₹17,761.
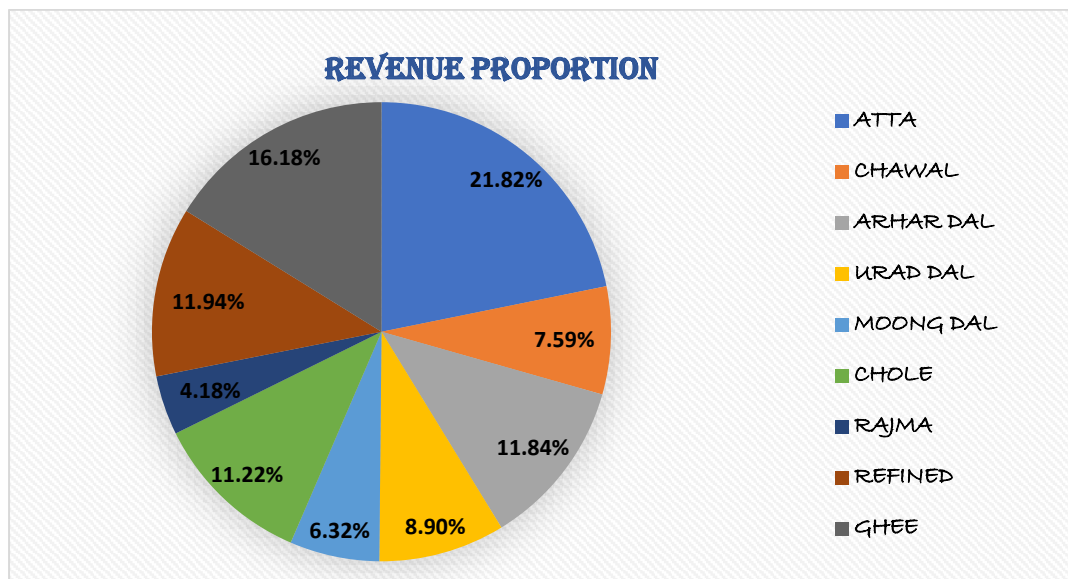
Chart 3: SKU's proportion to Total Revenue

- Major Contributors: Atta, Chawal and Ghee together contribute a significant portion of the total revenue.
- Least Contribution: Rajma contributes the least to the total revenue.
- **Revenue Insights:** Focusing on the top contributors can help prioritize inventory and marketing strategies, while analyzing low-performing items like Rajma may reveal opportunities for improvement or reallocation of resources.
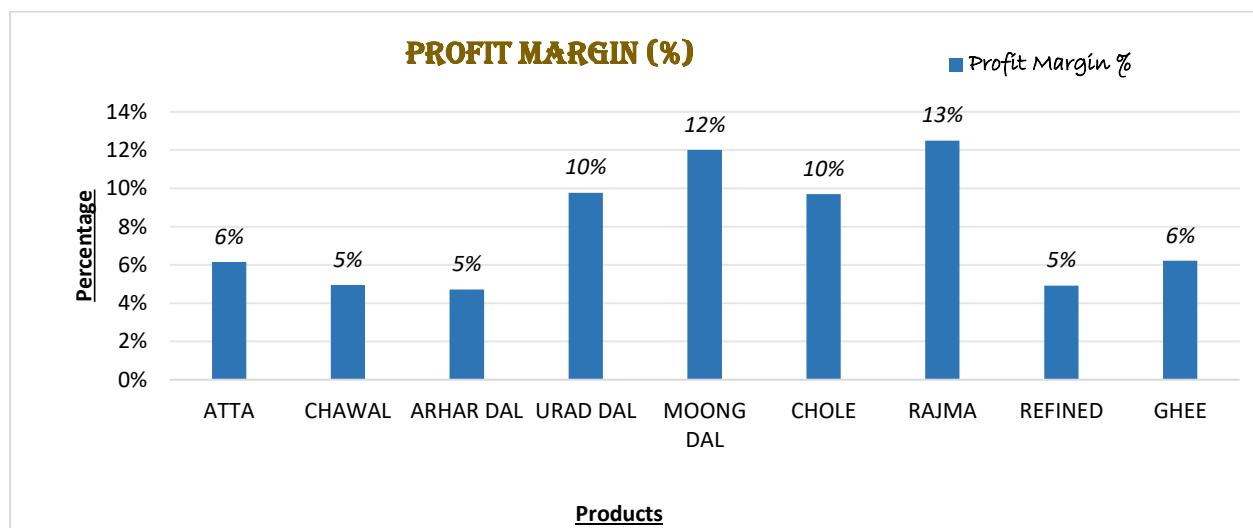
Chart 4: SKU's Profit Margin percentage

- High Margin Items: Rajma, Moong Dal, Urad Dal and Chole have high-profit margins.
- Low Margin Items: Refined, Chawal, Arhar Dal and Ghee have the lowest profit margins.

- **Profitability Focus:** Emphasizing high-margin items can boost overall profits, while strategies for cost optimization or pricing adjustments might improve the profitability of low-margin items.

Chart 5: Purchase Price of all the SKU's over a period of 2 months
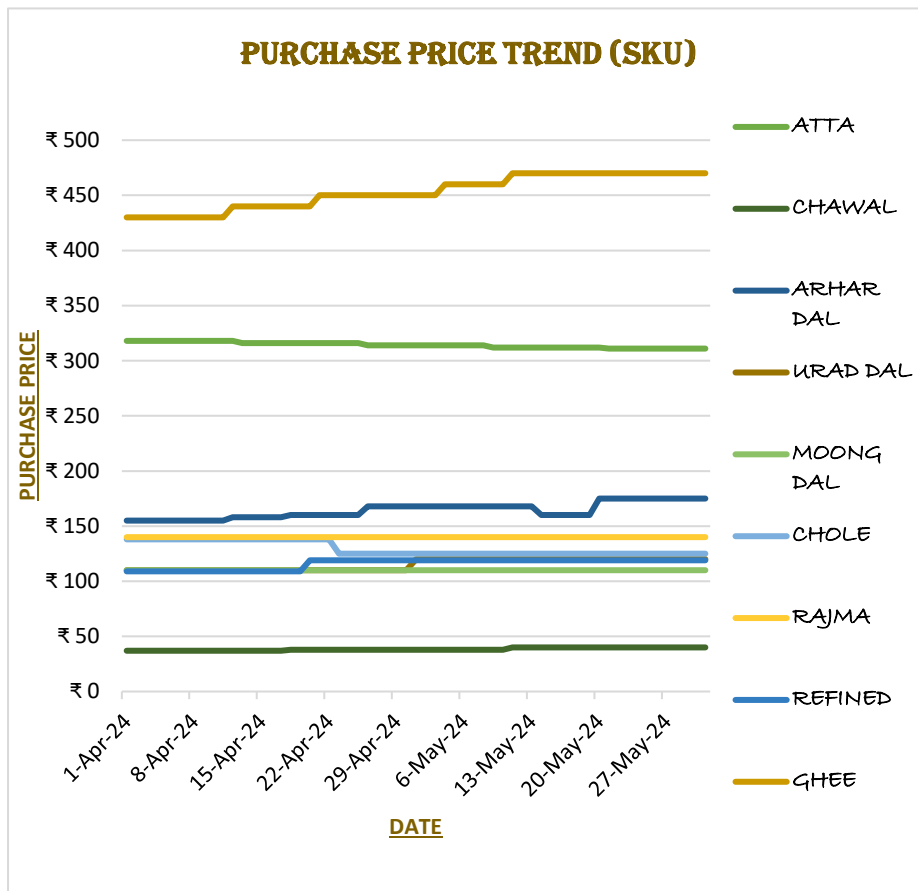
- Price Stability: Items like Chawal, Moong dal and Rajma showed stable prices.
- Price Variations: Items such as Makhana, Urad Dal and Arhar Dal showed significant price fluctuations.
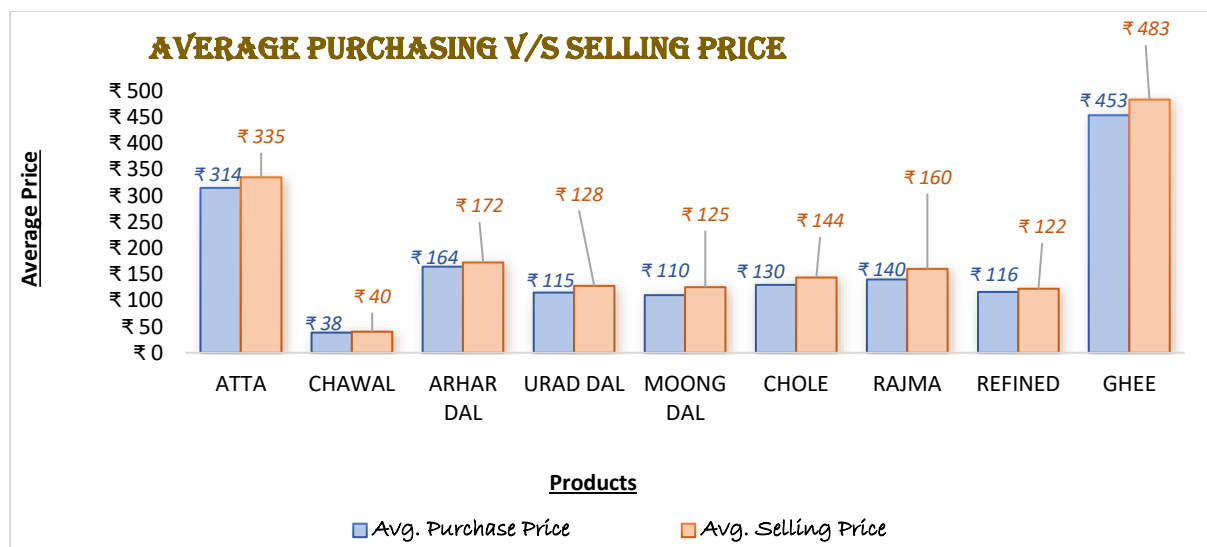
Chart 6: Avg. Purchase Price vs Avg. Selling Price

- Markups: Significant markups are seen in items like Ghee,Atta ,Chole and Rajma, contributing to higher profit margins.
- Competitive Pricing: Minimal price differences are observed in commodities like Chawal, Arhar dal, Urad dal and Refined, suggesting a more competitive market for these items.
- **Pricing Strategy:** By applying higher markups on certain products, like Ghee and Rajma, the business can increase its overall profitability. At the same time, keeping the prices competitive on common items such as Chawal and Arhar Dal helps attract customers and stay ahead of competitors in the market. This balance can improve both profit margins and customer loyalty.
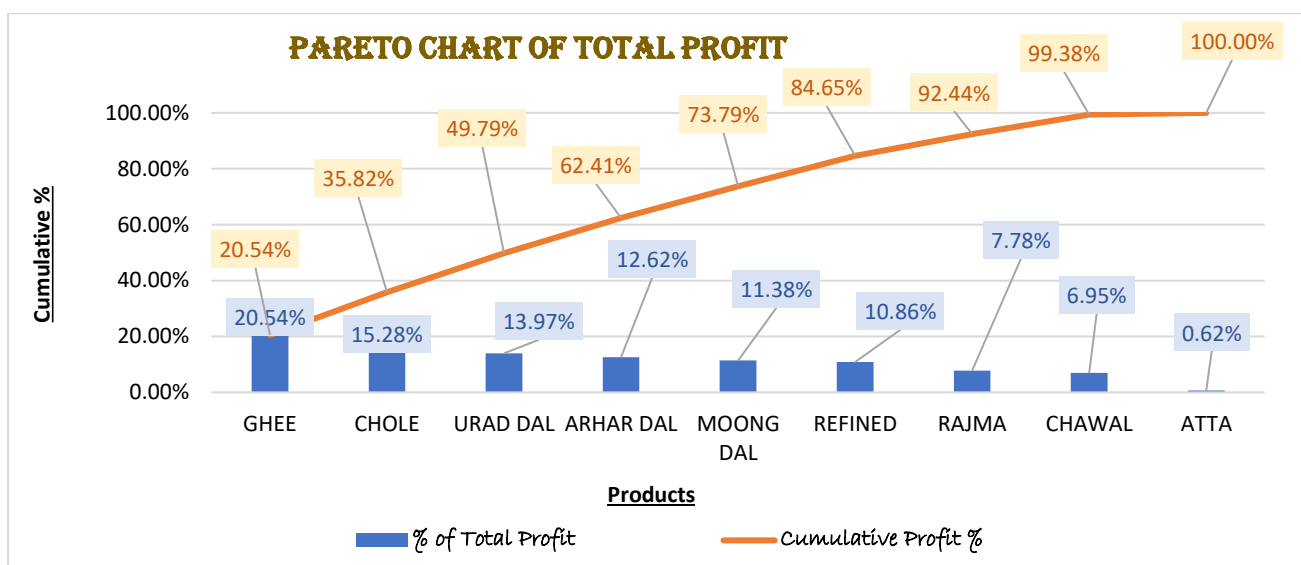

Chart 7: Pareto Chart of Total Profit

- Ghee, Chole, Urad Dal, and Arhar Dal contribute to more than 80% of the cumulative profit. These are the most profitable products and should be prioritized for inventory management and promotions.
- Insight:Ensuring top products are available during peak seasons to maximize profit margins efficiently.