
# BDM Capstone Project Final Submission

**Title:** Devising Innovative Strategies to Improve Organizational Behaviour for Boosting Business Efficiency

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# INDEX:

## 1. Executive Summary and Title:

Kumar Milk Products (KMP) is a local vendor operating in North West Delhi, for the last 15 years, selling milk, and its allied products and a little portion of branded bakery products like breads, cookies, cakes, juices, carbonated drinks, chips, etc. KUMAR MILK PRODUCTS is a sole proprietorship-based business operating in a big, middle – class to affluent community. The operational expenses are moderately consistent, and also there are no major regulatory and compliance issues. Having said this, the key intention of the proprietor is to expand the business to enhance revenue in a limited geographical area. The only way to increase the business is to solicit more customers from the neighbourhood and stock more products aligned to the current business. The products currently being sold in large quantities like milk, are all branded and therefore have a limited profitability on the total sales. The current estimated annual turnover of the business is 1.5 – 1.75 crore (INR). This turnover reflects the top line of the business that is, the total sales or the total revenue. As the highest selling product is milk, it would be prudent on the part of the owner to sell the cow milk under his own brand name, as his name is a strong brand in the local community. The business problems discussed include:

- Raising sales revenue
- Increasing the share of digital payments
- Hiring and retaining good quality workers
- Unavailability of space to expand the business
- Threat from the competition.

The tools used for analysis include MS Excel, including the Data Analysis Tool Pak, using which regression and correlation have been determined. By taking price into consideration, revenue has been calculated (in INR) and has been analysed using bar charts and other statistical tools. Scatter plots have also been made to analyse the revenue quantity relation.

## 2. Detailed Explanation of Analysis Process/Method:

The data was collected for January – April 2023. The data collected showed us the daily sales of the top 04 SKUs of KUMAR MILK PRODUCTS, which includes Amul milk of 3 variants, Buttermilk of 4 variants, cottage cheese (Paneer) of 3 variants and various types of breads (7 variants). The data gave us the daily and monthly sale of these products. As the transactions are mostly based on cash, the receipts for the same cannot be provided. Since the owner refused to share the data for the past 12 months with us, the revenue or sales prediction cannot be done with accuracy. For the final submission, revenue analysis has been done with the data as the price of each variant has been taken into account.

As mentioned in the executive summary, correlation and regression analysis has also been conducted. In statistics, correlation helps us to establish a relationship between two or more variables. The value of correlation lies between -1 and 1. The closer the value is to +1, the stronger is the positive correlation, i.e., the variables are directly correlated. The closer the value is to -1, the stronger is the negative correlation. A positive correlation exists when two variables operate in unison so that when one variable rises or falls, the other does the same. A negative correlation is when two variables move opposite one another so that when one variable rises, the other falls.

In statistics, regression helps us determine the strength of the relationship between a dependent variable and a series of independent variables. In the data analysed by us, the dependent variable is Y (Quantity) and the independent variable is X (Price).

$$Y_i = f(X_i, \beta) + e_i$$

$Y_i$ = dependent variable
$f$ = function
$X_i$ = independent variable
$\beta$ = unknown parameters
$e_i$ = error terms

Figure 1 gives us the regression formula

To simplify our analysis, we will only consider price and quantity, and ignore all other variables. So,

$$Q = f(P)$$

This implies quantity is a function of price.

Additionally, bar charts and scatter plots were also used to gain insights from revenue. Using bar charts, monthly revenue has been analysed. For making scatter plots, the two variables used are quantity and revenue.

## 3. Results and Findings:

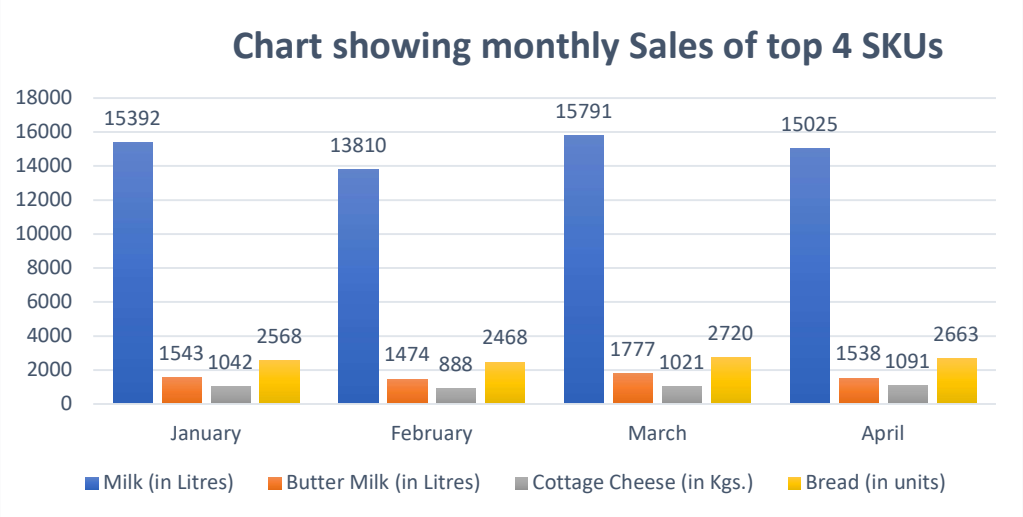


Figure 2 is a bar chart which shows the quantities all of products sold in the Months of January – April, 2023. As we can see, milk was the most revenue generating product consistently for a quarter.

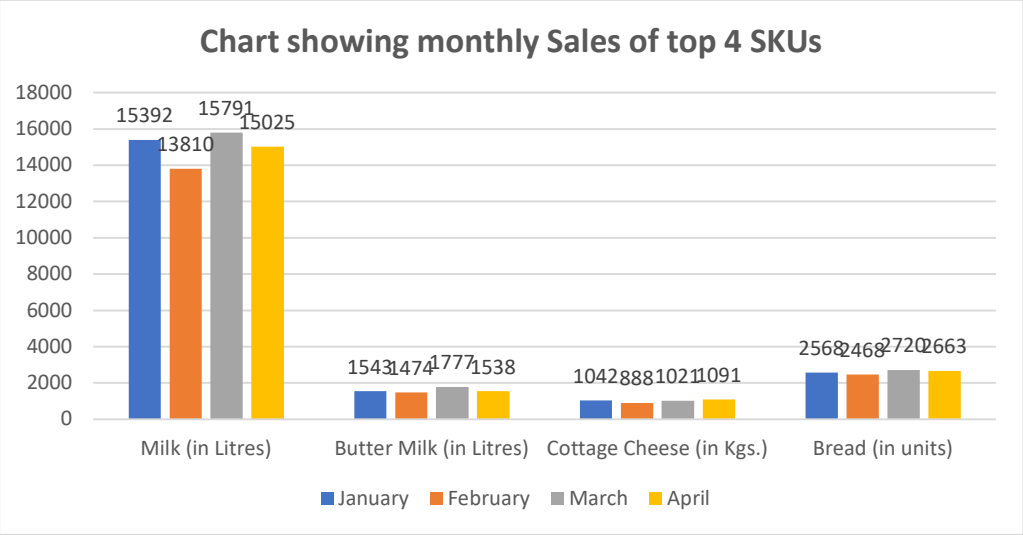


Figure 3 highlights that the best - selling product is milk, of all types.

Bar charts were made to analyse the monthly revenue, as well as the most revenue making products. Scatter plots are used to observe relationship between variables.

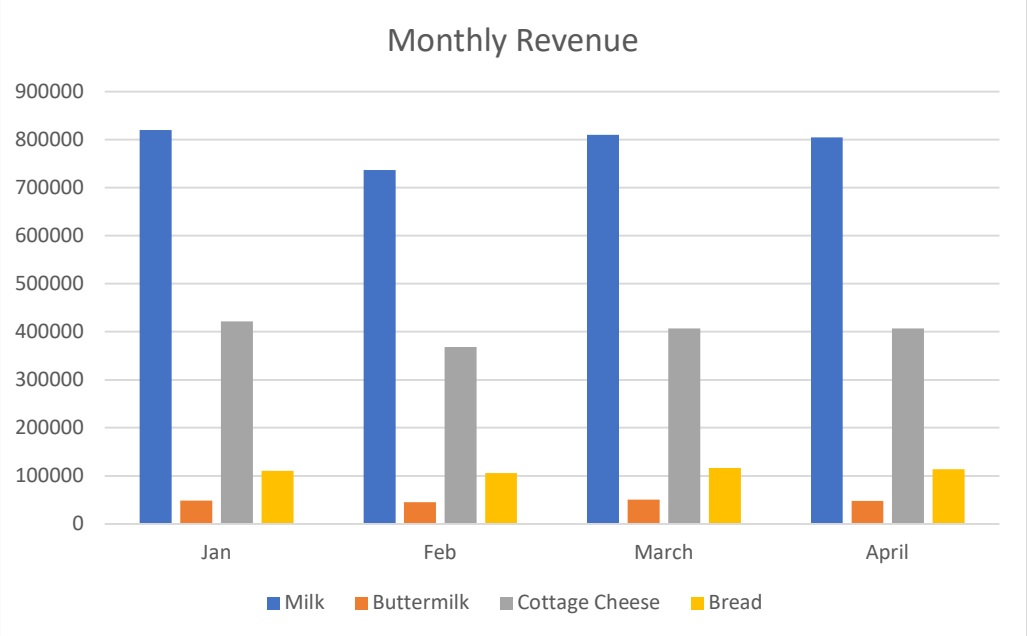


Figure 4 shows the revenue bar chart for the top SKUs. Milk is always the highest revenue making product, for all the months.

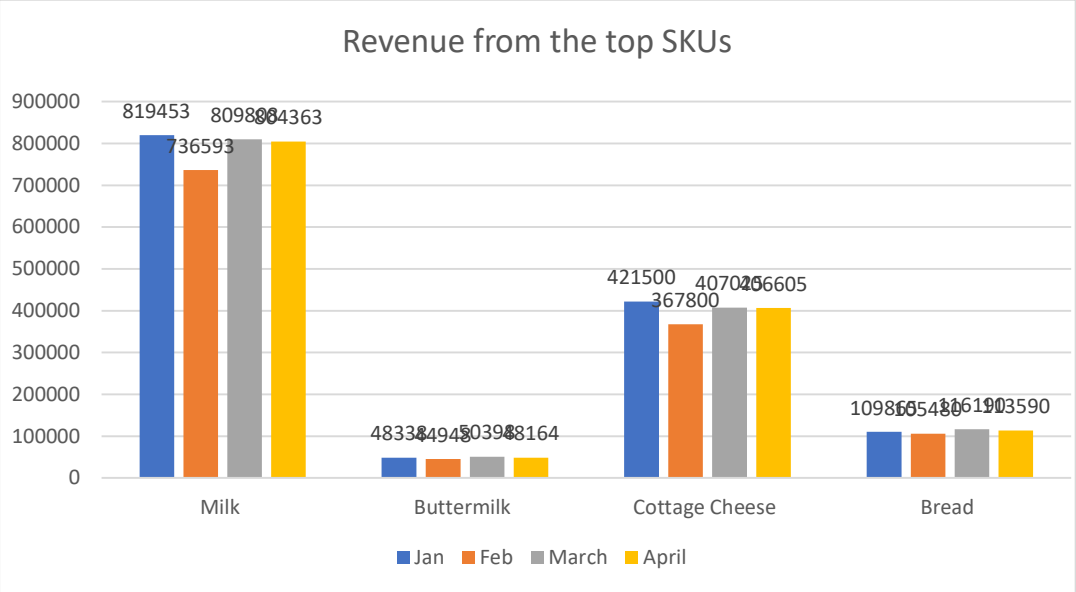


Figure 5 shows the revenue earned from top SKUs. The highest revenue making product is milk, followed by cottage cheese, followed by bread. The least revenue generating product is buttermilk.

**Regression and Correlation Analysis of milk:**

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.395614216 |
| R Square | 0.156510608 |
| Adjusted R Squar | -0.05436174 |
| Standard Error | 17.09587887 |
| Observations | 6 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 1 | 216.9237022 | 216.924 | 0.74221 | 0.437537587 |
| Residual | 4 | 1169.076298 | 292.269 | | |
| Total | 5 | 1386 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 31.36967323 | 14.17623517 | 2.21284 | 0.09134 | -7.989865526 | 70.72921199 | -7.989865526 | 70.72921199 |
| Quantity | 0.000913428 | 0.00106026 | 0.86151 | 0.43754 | -0.002030326 | 0.003857182 | -0.002030326 | 0.003857182 |

The regression equation is Q = 31.36 + 0.0009P

Figure 6 shows the regression analysis obtained using the Data Analysis Tool Pak. By looking at the quantity coefficients, the coefficient value is extremely low. This

means for every one unit increase in price, quantity of milk sold increases by 0.00091 units. This means there is little change in milk sold if price increases.

| | A | B | C |
|---|---|---|---|
| 1 | | *Price* | *Quantity* |
| 2 | Price | 1 | |
| 3 | Quantity | 0.395614 | 1 |
| 4 | | | |

Figure 7 shows the correlation analysis. This means there is a positive correlation, which implies that as the price of milk increases or decreases, the quantity demanded increases or decreases respectively.

**Regression and Correlation Analysis of buttermilk:**

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.962218908 |
| R Square | 0.925865227 |
| Adjusted R Square | 0.888797841 |
| Standard Error | 1.155173543 |
| Observations | 4 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 1 | 33.33114817 | 33.33115 | 24.97789 | 0.037781092 |
| Residual | 2 | 2.668851827 | 1.334426 | | |
| Total | 3 | 36 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 118.2085221 | 21.0589361 | 5.613224 | 0.030302 | 27.59923325 | 208.817811 | 27.59923325 | 208.817811 |
| Quantity | -0.028342813 | 0.005671071 | -4.99779 | 0.037781 | -0.05274346 | -0.0039422 | -0.05274346 | -0.00394217 |

The regression equation is Q = 118.20 + (-0.028) P

Figure 8 shows the regression analysis obtained using the Data Analysis Tool Pak. By looking at the quantity coefficients, the coefficient value is negative. This

means for every one unit increase in price, quantity of buttermilk sold decreases by 0.028 units. This means there is change in buttermilk sold if price increases.

| | A | B | C |
|---|---|---|---|
| 1 | | *Price* | *Quantity* |
| 2 | Price | 1 | |
| 3 | Quantity | -0.96222 | 1 |

Figure 9 shows the correlation analysis. This means there is a negative correlation, which implies that as the price of buttermilk increases or decreases, the quantity demanded decreases or increases respectively, which is in accordance with our regression analysis.

**Regression and correlation analysis of cottage cheese:**

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.59941178 |
| R Square | 0.35929448 |
| Adjusted R Square | -0.28141104 |
| Standard Error | 5.65997138 |
| Observations | 3 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 1 | 17.964724 | 17.96472 | 0.560779 | 0.590802434 |
| Residual | 1 | 32.035276 | 32.03528 | | |
| Total | 2 | 50 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 89.4989305 | 6.83898506 | 13.08658 | 0.048552 | 2.601386125 | 176.39647 | 2.601386125 | 176.396475 |
| Quantity | -0.0007045 | 0.000940772 | -0.74885 | 0.590802 | -0.012658139 | 0.0112491 | -0.01265814 | 0.01124914 |

The regression equation is Q = 89.49 + (-0.0007) P

Figure 10 shows the regression analysis obtained using the Data Analysis Tool Pak. By looking at the quantity coefficients, the coefficient value is negative. This means for every one unit increase in price, quantity of cottage cheese sold decreases by 0.0007 units. This means there is change in cottage cheese sold if price increases.

| | A | B | C |
|---|---|---|---|
| 1 | | *Price* | *Quantity* |
| 2 | Price | 1 | |
| 3 | Quantity | -0.59941 | 1 |

Figure 11 shows the correlation analysis. This means there is a negative correlation, which implies that as the price of cottage cheese increases or decreases, the quantity demanded decreases or increases respectively, which is in accordance with our regression analysis.

**Regression and correlation analysis of bread:**

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.74506635 |
| R Square | 0.55512386 |
| Adjusted R Square | 0.46614863 |
| Standard Error | 2.76160245 |
| Observations | 7 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 1 | 47.58204516 | 47.58205 | 6.239083315 | 0.0546359 |
| Residual | 5 | 38.13224055 | 7.626448 | | |
| Total | 6 | 85.71428571 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 51.5778454 | 3.371034284 | 15.3003 | 2.16336E-05 | 42.91232588 | 60.243365 | 42.9123259 | 60.24336487 |
| Quantity | -0.0053791 | 0.002153524 | -2.49782 | 0.0546359 | -0.010914918 | 0.0001567 | -0.01091492 | 0.000156704 |

The regression equation is Q = 51.57 + (-0.0053) P

Figure 12 shows the regression analysis obtained using the Data Analysis Tool Pak. By looking at the quantity coefficients, the coefficient value is negative. This means for every one unit increase in price, quantity of bread sold decreases by 0.0053 units. This means there is change in bread sold if price increases.

| | A | B | C |
|---|---|---|---|
| 1 | | *Price* | *Quantity* |
| 2 | Price | 1 | |
| 3 | Quantity | -0.74507 | 1 |

Figure 13 shows the correlation analysis. This means there is a negative correlation, which implies that as the price of bread increases or decreases, the quantity demanded decreases or increases respectively, which is in accordance with our regression analysis.

Further, scatter plots have been made for revenue – quantity analysis product wise, taking into account all 4 months data.

The scatter plots have been made for total sales and total revenue in the month and not on the daily sales data. As the scatter plots have been made taking total quantity of the product and respective revenue, not much can be inferred from the scatter plots. Therefore, it is better to rely on the correlation analysis done in excel.

Moreover, line charts have also been drawn for the revenues generated by each product in 4 months.

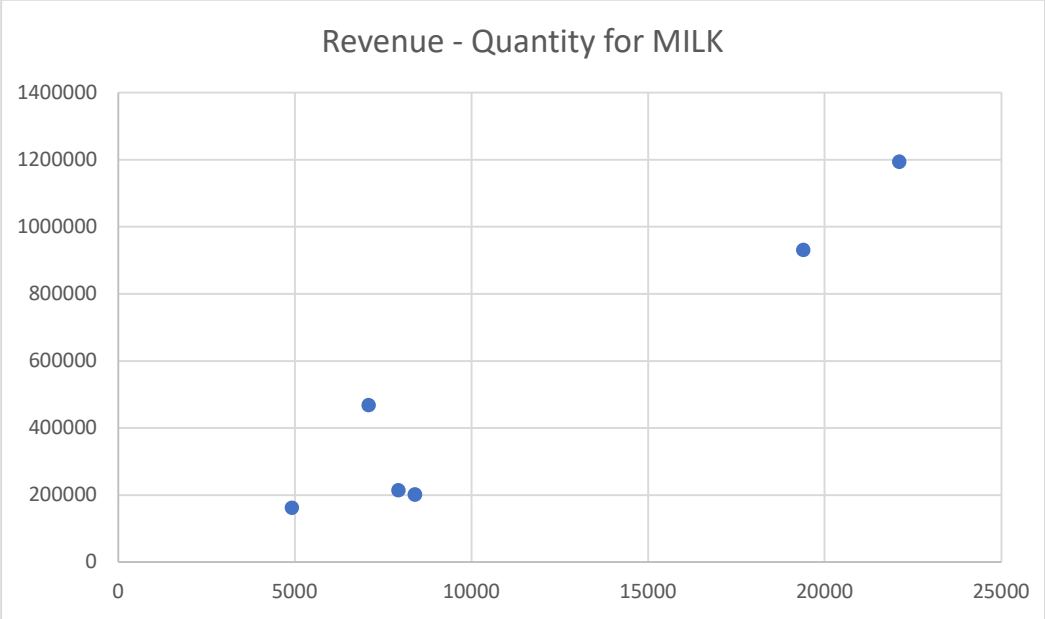


Figure 14 shows the scatter plot for milk.

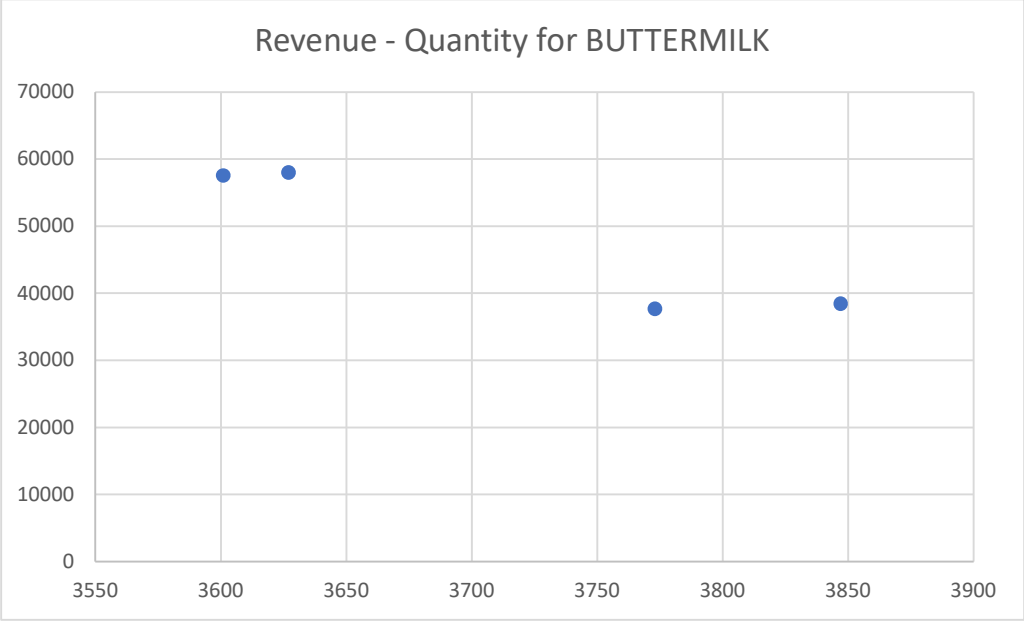


Figure 15 shows the scatter plot for buttermilk.

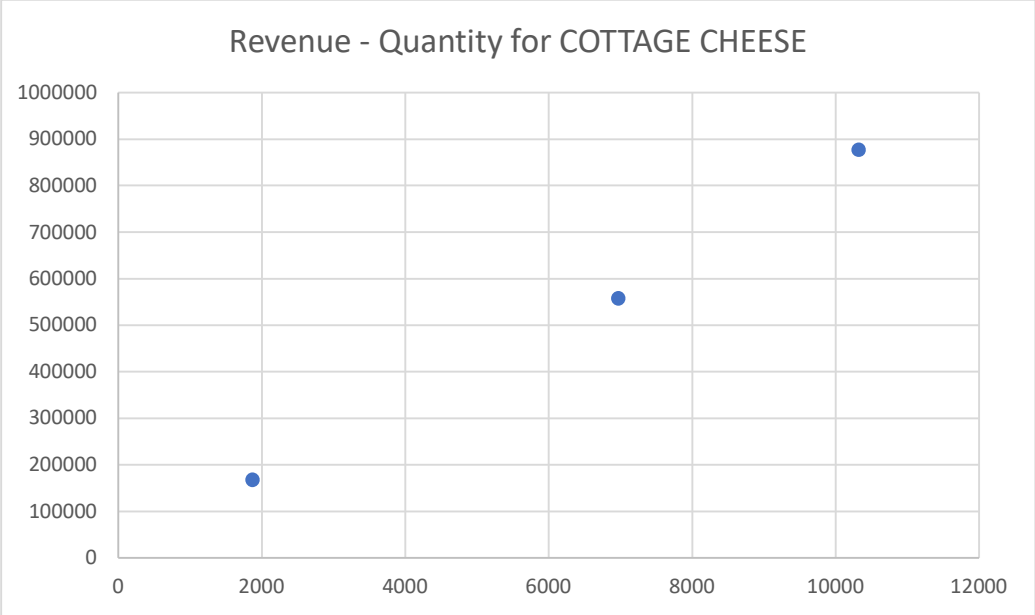


Figure 16 show the scatter plot for cottage cheese.

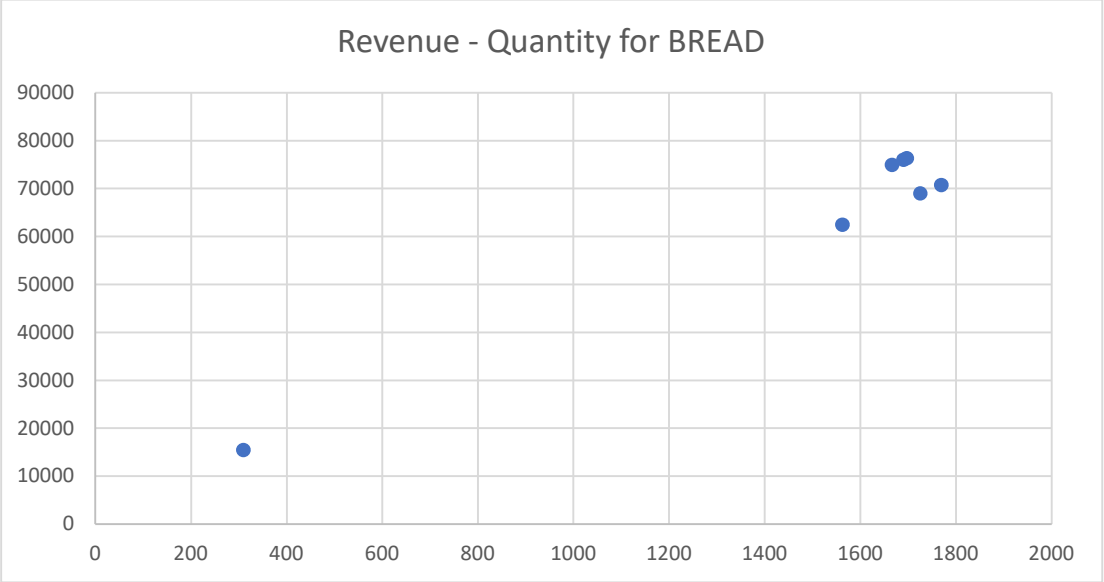


Figure 17 shows the scatter plot for bread.

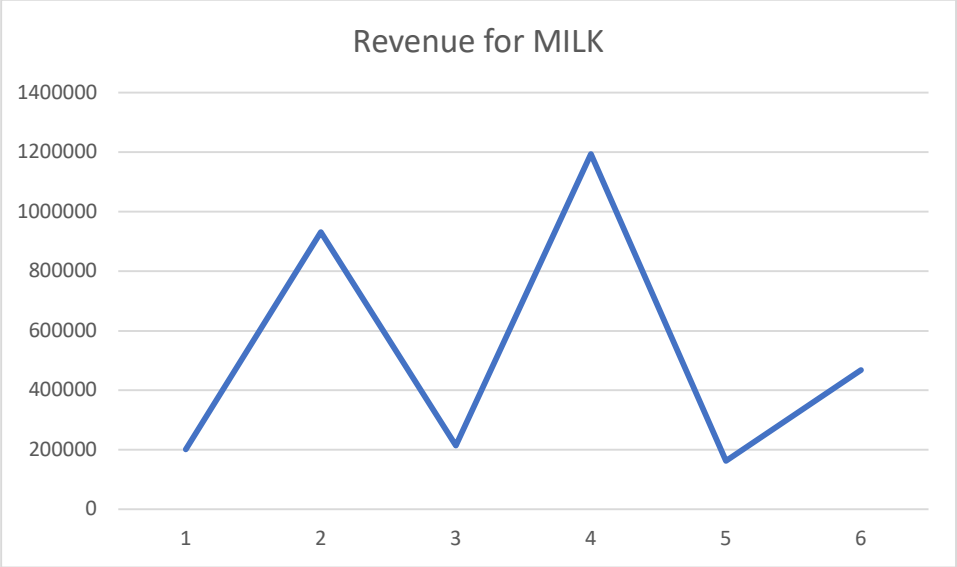


Figure 18 shows the revenue line for milk over a period of 4 months. Unexplainable fluctuations can be seen.

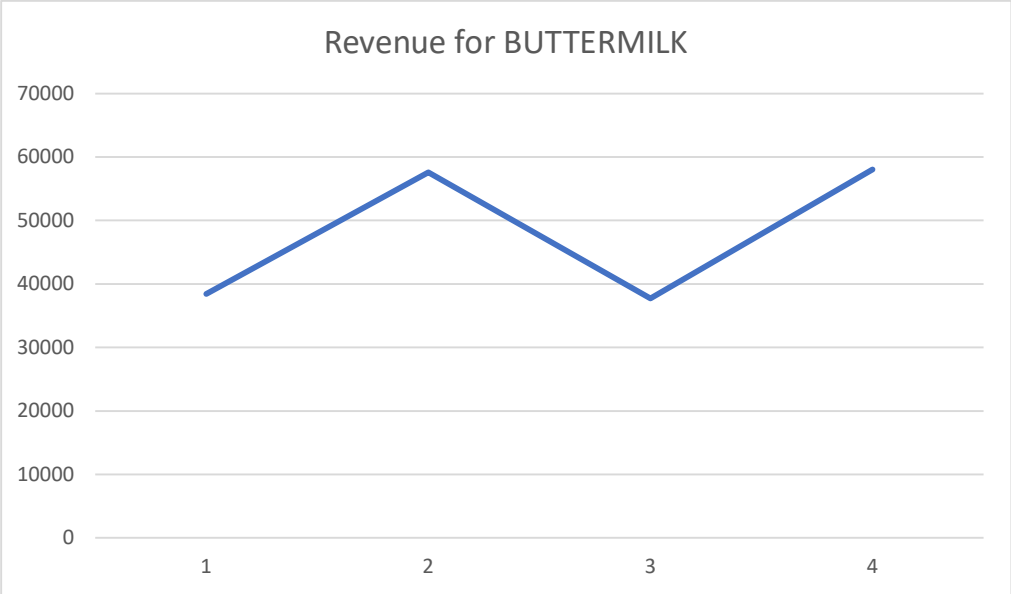


Figure 19 shows the revenue line for buttermilk over a period of 4 months. These fluctuations can be explained by the changing weather the city of Delhi witnessed in the months for which data was taken.

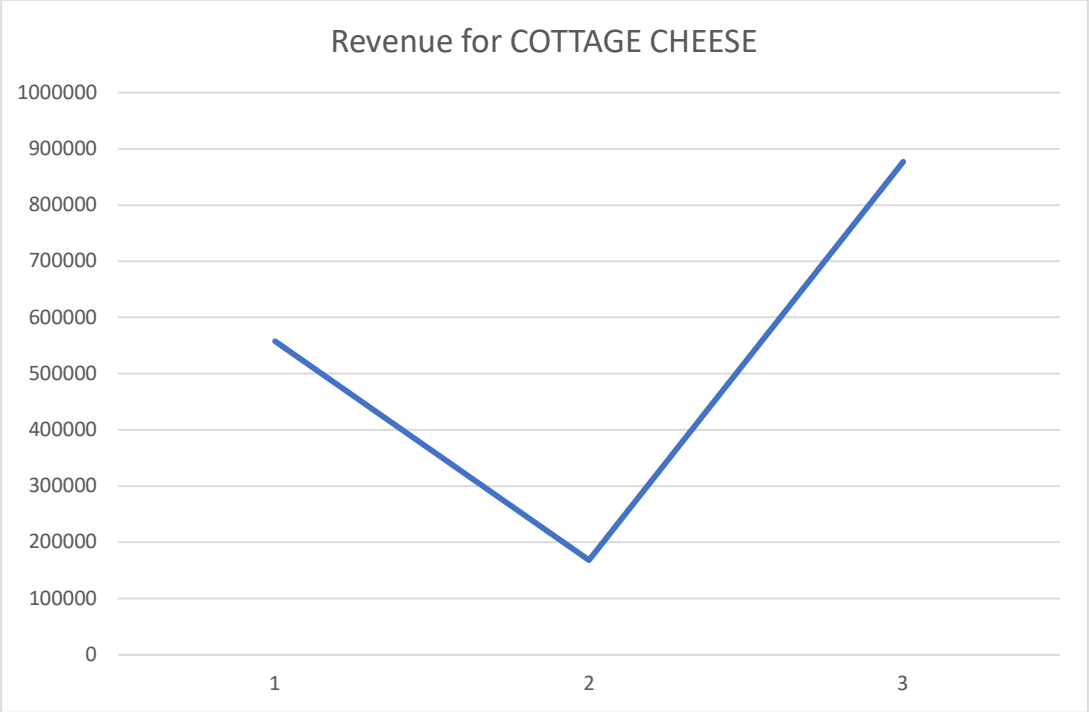


Figure 20 shows the revenue line for cottage cheese over a period of 4 months. Unexplainable fluctuations can be seen.

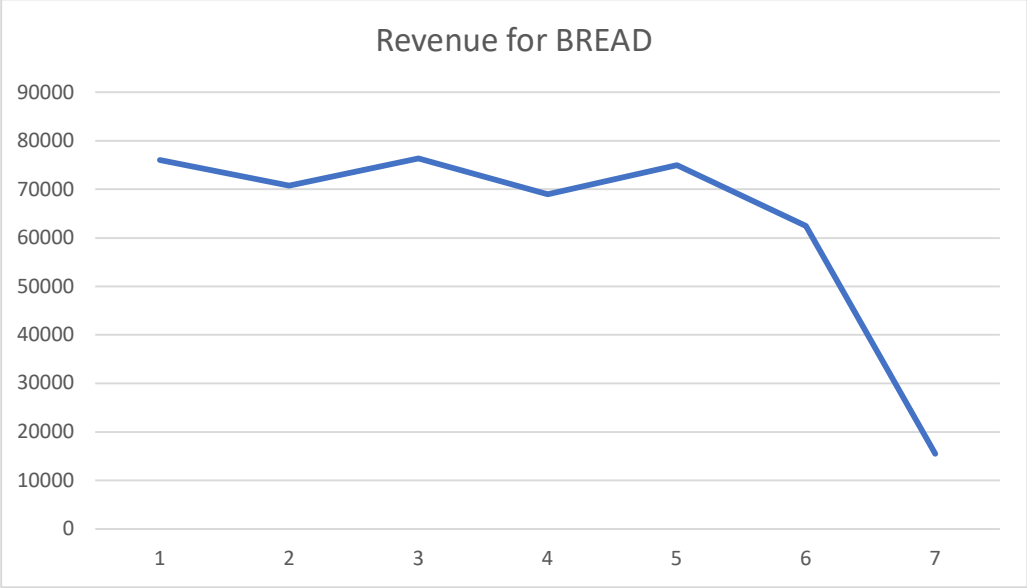


Figure 21 shows the revenue line for bread over a period of 4 months. Decreasing revenue for bread can be seen. This decrease can be due to many reasons.

## 4. Interpretation of Results and Recommendation:

By analysing our regression and correlation results, we can interpret milk to be the safest product, with all the other products somewhat safe. As no major changes can be observed due to increase in price, buttermilk, cottage cheese, and bread are all safe products. This shows the stability of the business and lessens any chances of the shop going out of business. The top SKUs are essential products which means the shop can operate even in times of lockdown, as witnessed in 2020 and 2021.

The problems identified for the business are mentioned below, along with possible solutions for each of them:

- Raising sales revenue

By identifying the business's unique selling proposition, the business can figure out what sets it apart the most from its competitors and that product can then be highlighted, as KUMAR MILK PRODUCTS keeps a variety of products, it gives the shop a comparative advantage over other, smaller shops selling similar items. By expanding the product range and offering a wider variety of milk and related products to cater to different customer preferences, the business can include options such as organic milk, lactose-free milk, flavoured milk, flavoured yogurt, and other dairy products. He can also improve the existing product display and ensure that the products are attractively displayed and easily accessible to customers. Targeted marketing can also be done, for example, by keeping juices and milkshakes at counters with lower heights so that they are more accessible to kids.

- Increasing the share of digital payments

To increase the share of digital payments in the business, a pre-paid card system maybe recommended, where the user first pays and then consumes. A good existing example of this system includes the Delhi Metro system, where the user first deposits some amount in the card and the user just needs to tap it on the system. This system is far more convenient than cash and should encourage higher sales, as it eliminates long queues as well as the need to carry change. So, the owner of KUMAR MILK PRODUCTS can implement a similar system. This reduces the

transaction time and helps in attracting more customers. By implementing this system, the owner would get a comparative advantage over other shops doing similar business but not following this payment method, and hence would be able to increase customer retention.

- Hiring and retaining good quality workers

Hiring and retaining workers is a challenge in these kinds of small businesses. It is extremely difficult to objectively measure the efficiency and performance of the worker. Training can be provided to the workers to be more efficient and productive. Various incentives, monetary and otherwise, can also be provided. By taking care of their social and financial needs, for example, helping them financially by giving them token amount in case of financial emergencies; assisting them with finding suitable accommodation in the local community; helping them with their kids' admission in the local school; making them aware of the various government schemes applicable to them; and other such options maybe explored by the business owner.

- Unavailability of space to expand the business

The lack of availability of space problem can be tacked by optimizing the shop layout as the owner has done. Using wall mounted shelves and organizing better, the owner has maximised his space and was able to expand his product line. Using vertical storage, more products can be stocked by using less space. By offering a variety of products, the owner attracted more customers and will be able to generate higher sales.

- Threat from the competition.

The threat from the competition to KUMAR MILK PRODUCTS can be dealt with by using unique marketing and promotion strategies. By offering discounts on combined products, launching monthly saving schemes, giving freebies on a fixed amount of purchase will all go a long way in boosting sales. KUMAR MILK PRODUCTS can leverage its central location in the area and attract a larger customer base, while retaining the existing one. Various pricing strategies can be

used to maximize on its potential. Posters for the same can be made and put around the locality, especially in areas where the competitors exist. This will help to attract new customers. To make the most of the posters, the promotions should be highlighted, and the posters can be made attractive.

As the highest selling product is milk, it would be prudent on the part of the owner to sell the cow milk under his own brand name, as his name is a strong brand in the local community. He can then expand this to other products as well, such as paneer, butter, etc. and can become an even stronger brand in the community. As the business is family – run, there is tremendous scope for growth opportunities, as well as the motivation to invest in the business.