BUSINESS DATA MANAGEMENT

FINAL SUBMISSION

Grocery Business Management Through Data Analysis

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❖ EXECUTIVE SUMMARY :

NCD Suppliers is a grocery suppling medium scale organisation operating in central Kolkata, West Bengal. It buys its products directly from farmers and its main customers constitute of mobile vendors, supermarket shops and also delivers for catering services who in turn arrange social gatherings like weddings, birthday parties and any such relevant occasions.

Its prime areas of business include Gariahat, Salt Lake, and Newtown. The company also has a retail store in Jadavpur area contributing a fair amount to the revenue.

It deals in almost all kinds of groceries both seasonal and daily needed ones. It stores its supplies at two strategically located positions in the city from where transportation is fairly easy. During the summer months it's quite difficult to perform the required tasks while the colder months are relatively easer for the organisation to coordinate its resources.

Daily need groceries like Potato, Onion, Garlic, Ginger, Tomato, Carrot, Brinjal, Chilli and seasonal items like Cauliflower, Peas, Cabbage, Pointed Gourd, Radish, Mango, Pumpkin, Okra, Ridge Gourd are the bestsellers while other items have relatively lower sales.

The company aspires to "Deliver fresh and healthy grocery to its customers thus facilitating a fruitful return on the initial investment while building a trustworthy relationship."

❖ EXPLANATION OF ANALYSIS PROCESS/METHOD :

Data which was previously recorded was cleaned and preprocessed accordingly.

- The amount of all major items sold and others(in Kg) was recorded along with the average selling price of the respective items over the time period was recorded. Using these the sale [Amount(Kg) * Price(₹/Kg)] of each of the items every month was calculated. Here we can observe the items that brought in the highest amount of revenue for the organisation and also the items that didn't sell enough in context of the organisation.

- The amount of all major items sold and others(in Kg) was recorded along with the average cost price of the respective items over the time period was recorded. These were used to compute the total cost price pertaining to each of the recorded items[Amount(Kg) * Price(₹/Kg)]. Now on subtracting the cost price of the items from the selling price of the respective items the profit generated from each of the items was calculated and we observe the items which have generated the most and least profits in the given months. We can also observe seasonal trends from this derived data and infer accordingly. Graphs corresponding to these data were made to study the data visually thus providing clear and

- The total revenue per month was calculated by summing up the daily sales. The expenditures for raw materials, electricity bill, labour costs, transportation costs, rents and other expenditures

per month which were recorded, were summed up to get the total expenditures per month which came pretty close to the ones previously calculated. Thereafter the gross profit earned per month [Total revenue(₹) – Total expenditure(₹)] was calculated. The corresponding data generated was analysed after being plotted into a pie chart which led to understand the most profit generating months as well as the ones generating least profits.

- The demand of each item recorded, was also used to plot in a monthly basis. This was done to identify the pattern of customer demand, sales, revenue at different points of time in the recorded time span.

- The items in most demand and those that generate most profits were identified among the recorded ones and were specifically analysed to infer hidden patterns in the data. Seasonal trends as well as trends arising due to local cultural events occurring all throughout the year can be easily observed in the data and corresponding visualisations.

- Other relevant descriptions were drawn from the recorded as well as generated data like the descriptive statistics.

- All the above derived and recorded data were analysed.

- After careful analysis of the data and further interpretation in contexts required, guided and informed decisions were made.

❖ RESULTS AND FINDINGS :

Here are some findings from after careful analysis of the data.

➢METADATA:

Variable	Data Type	Description
Month	String	Month for particular data
Expenditure	Float	Money spent by the Org
Selling Price	Float	B2B selling price
Buying Cost	Float	Cost Price
Revenue	Float	Total sales of the Org in a given period of time
Profit	Float	Total Profit earned by the Org
Quantity	Float	Amount of item sold/bought

➢DESCRIPTIVE STATISTICS:

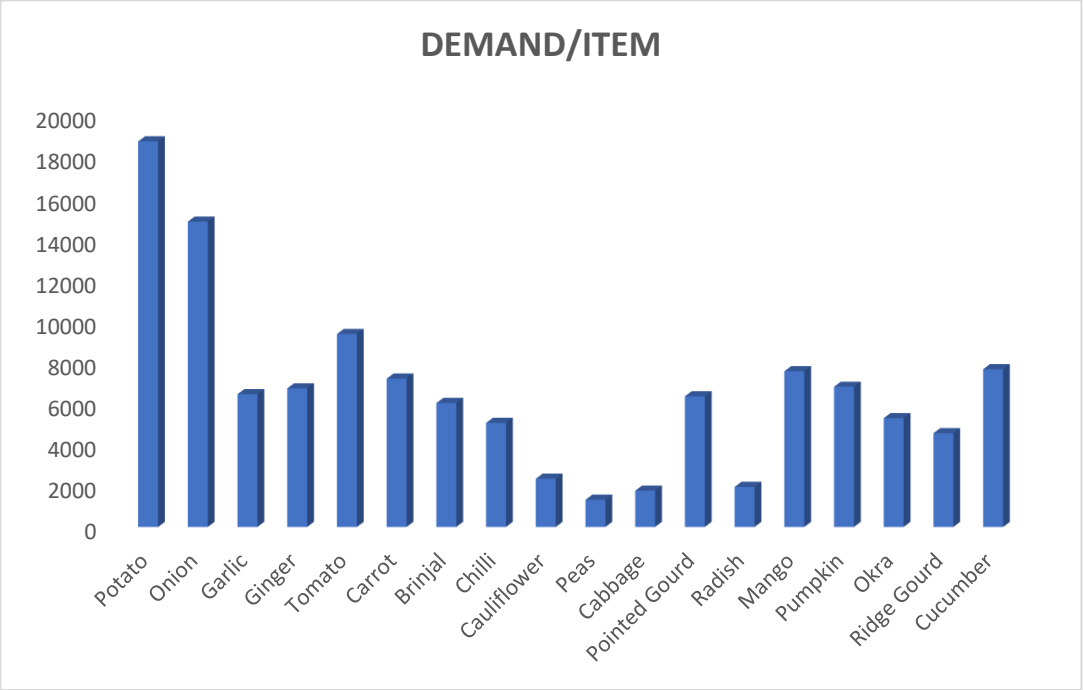
STATS	N	RANGE	MIN	MAX	MEAN	STD. DEV.	VARIANCE
Revenue	10	₹ 5,37,825.00	₹6,04,670.00	₹11,42,495.00	₹7,92,063.40	146227.45	21382466571
Expenditure	10	₹ 4,27,058.00	₹5,35,526.00	₹9,62,584.00	₹6,87,501.20	116324.81	13531461216
Profit	10	₹ 1,10,767.00	₹ 69,144.00	₹1,79,911.00	₹1,04,562.20	30634.701	938484880.6
Quantity	10	7,318.00	10,746.00	18,064.00	12,437.70	1989.4889	3958066.01

Table 01 – Descriptive Statistics of NCD Suppliers' data

In Table 01:

- N represents the number of months for which data has been recorded.
- Mean column show the mean revenue, Expenditure and Profit over the observed time span.
- Highest revenue collected was over 10 Lakhs, while the lowest was even less than 7 Lakhs. **This tells us that there is lack of stability in the business strategy which was being followed during the recorded time.**
- **We observe that although revenue generated is quite high the profit earned is not substantial with respect to it.**

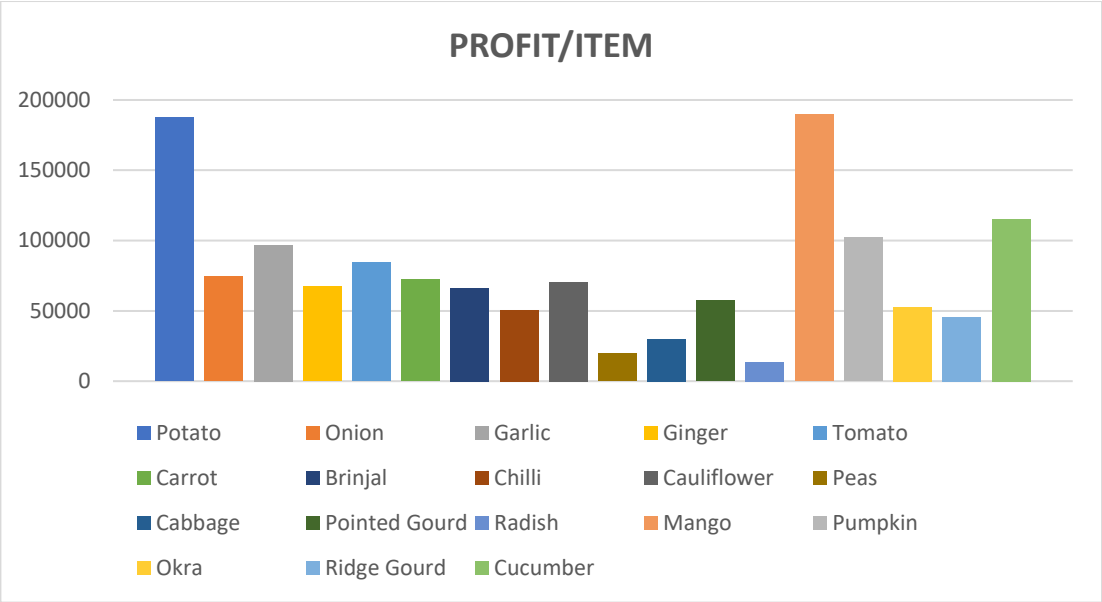
➢SALES VOLUME OF EACH ITEM:



Graph 02 – Sales volume each item

- Using the secondary data, the above bar graph was plotted for the sales volume of each item sold for the observed period of time.
- X - Axis represents the different types of items sold while the Y - Axis the quantity in Kg of the item sold.
- **We can observe that Potato and Onion are predominantly sold higher than any other item, followed by Tomato, Cucumber and Mango.**
- **Peas , Cabbage and Radish are the items which are least in demand**, maybe due to seasonal trends, which can't be inferred from this particular graph.
- According to the owner, near about 250Kg items were damaged or got rotten or pest ridden due to inefficient storage management, extreme weather conditions, during loading and unloading of bulk amounts and during transportation too.

➢PROFIT EARNED PER ITEM:



Graph 03 – Profit earned per item

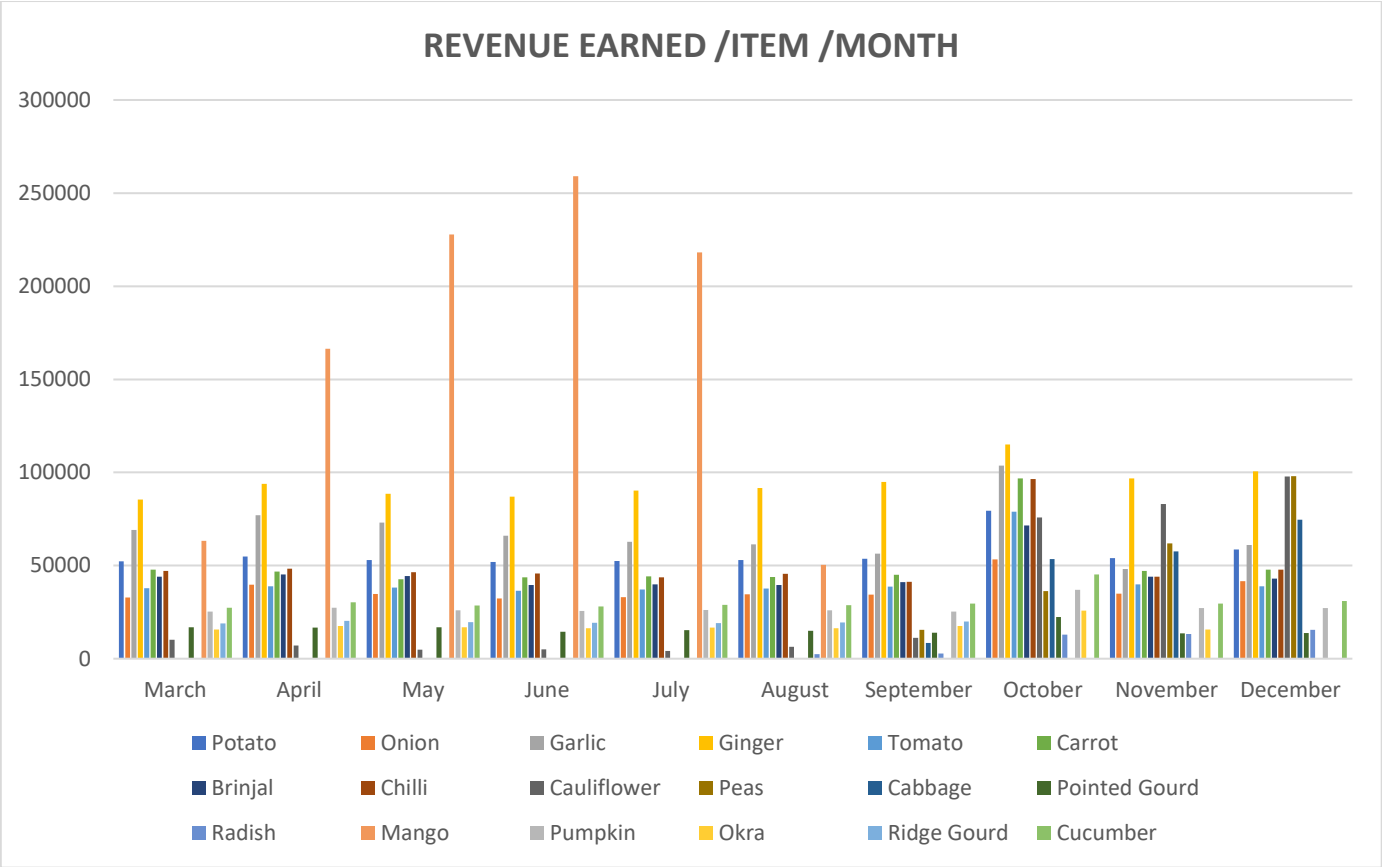
- Using secondary data, the above bar graph was plotted for the total profit generated by each of the major items for the observed period of time.

- The X – Axis contains bars which represent individual items under observation while the Y – Axis represents the total profit generated by the corresponding item in the recorded period.

- **One can easily infer that the profits earned due to potato and mango are off the charts. They are followed by Cucumber, Pumpkin and Garlic in order which add to the overall profit.**

- **Peas, Radish and Cabbage earn miserably low profits, which is reasonable as their demands are also much lower relative to the other items under observation as seen previously.**

➢REVENUE PER ITEM PER MONTH:



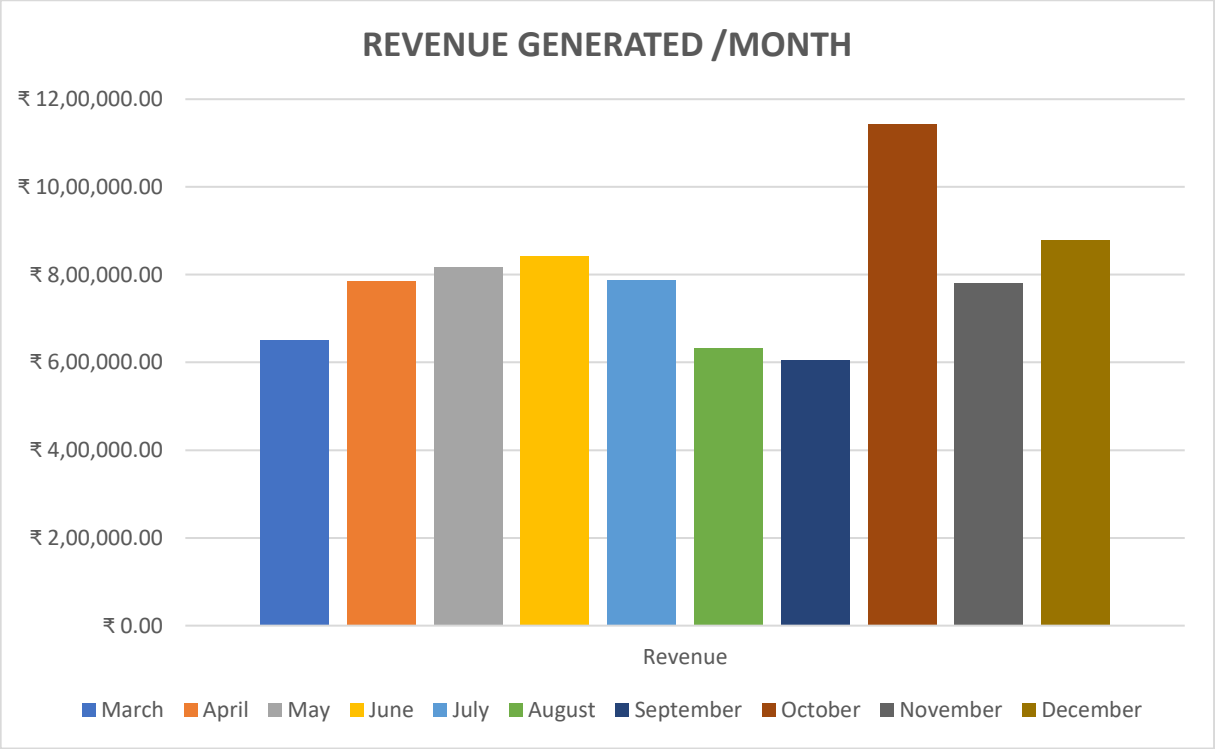
Graph 04 – Revenue earned per item per month

- Using secondary data, the above bar graph was plotted for the revenue earned by each of the major items per month for the observed period of time.

- X - Axis represents the different types of items sold each month while the Y - Axis the revenue generated by the item.

- **It can be observed that revenue generated by Potato, Tomato, Ginger and Onion are stable all thought the period. While Mango revenue for mango spikes during the extreme summer months of April, May, June and July. While the revenue for Cauliflower and Peas rises during the winters at the end of the year. An overall rise in revenue can be observed during the months of October and December.**

➢REVENUE GENERATED PER MONTH:



Graph 05 – Revenue generated per month

- Using secondary data, the above bar graph was plotted for the total revenue generated by each month for the observed period of time.

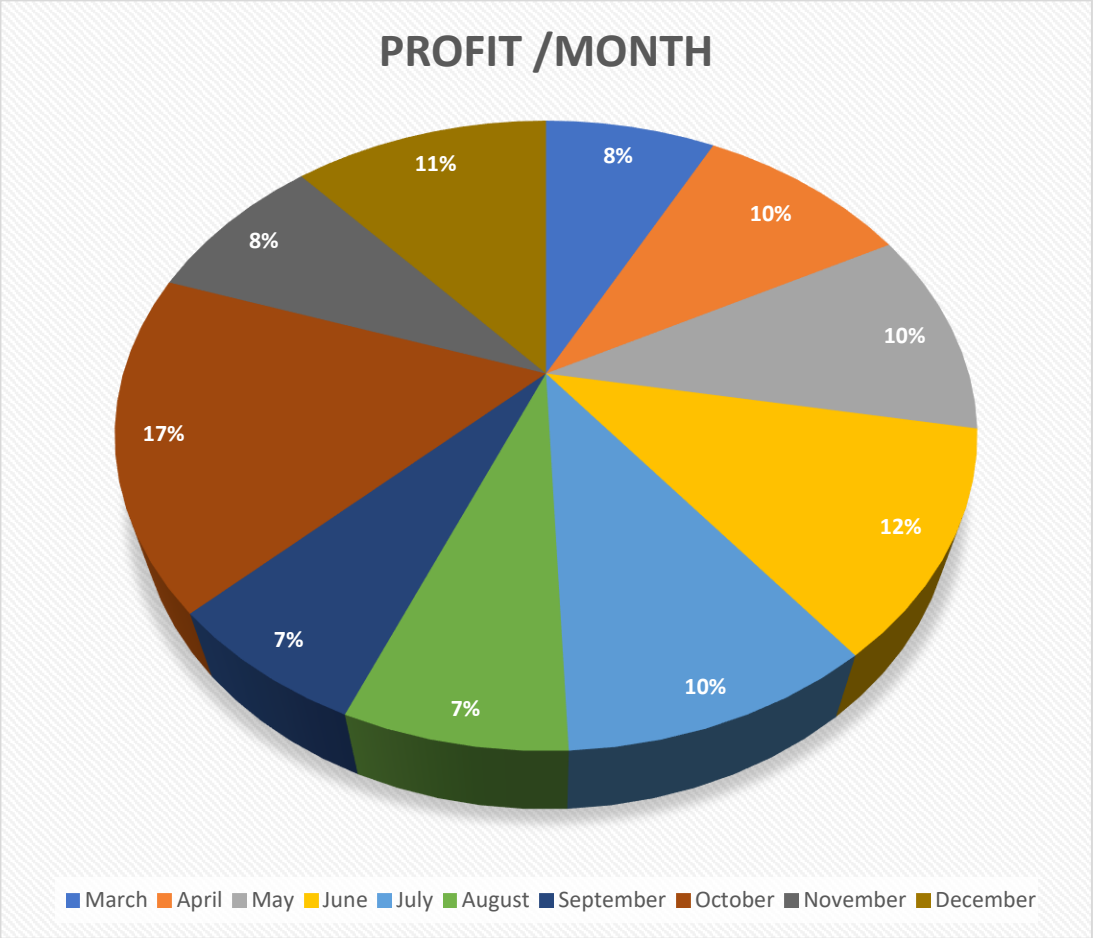
- The X – Axis contains bars which represent individual month under observation while the Y – Axis represents the total revenue generated by the corresponding item.

- **One can observe a mild peak in the revenue generated in June which is the peak summer month during the year.**

- **The highest revenue generated spikes on the months of October followed by December and November.**

- **The lowest revenue generating months include August and September.**

➢PROFIT EARNED PER MONTH:



Graph 06 – Profit earned per month

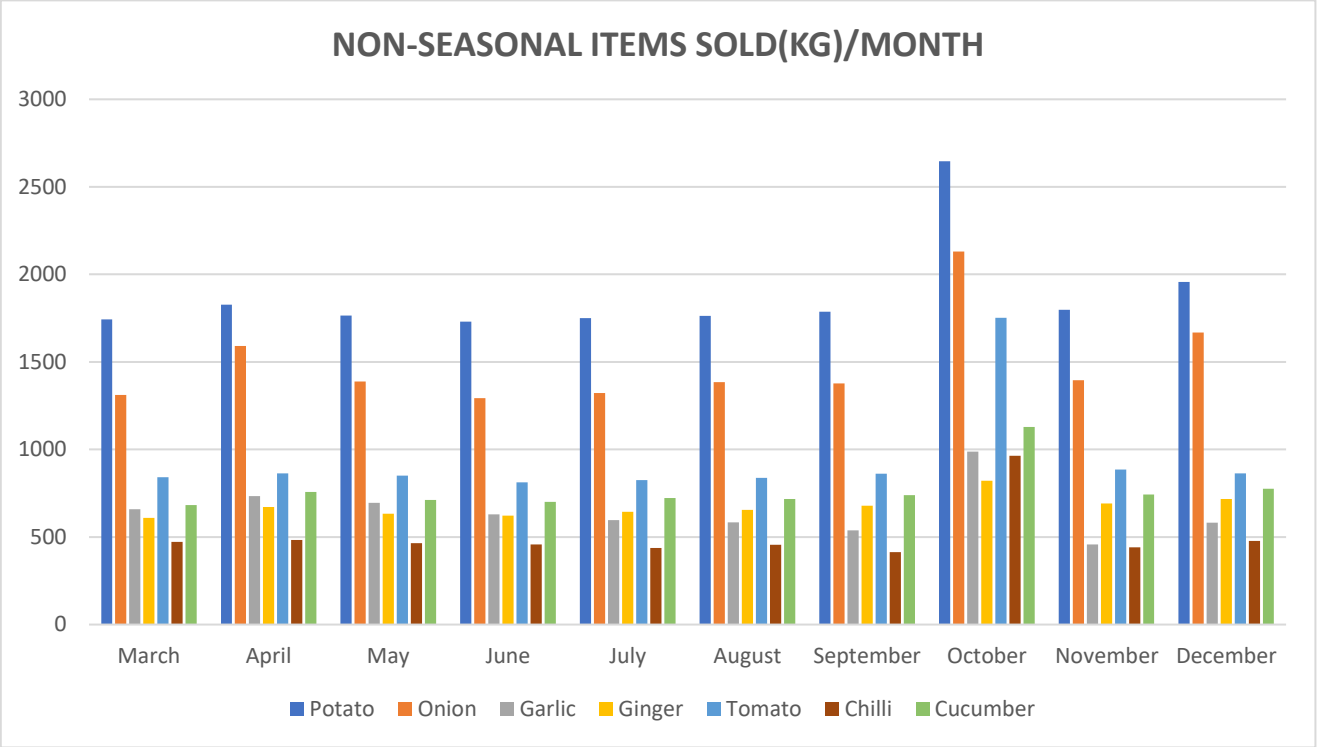
- Using secondary data, the above pie chart was plotted for the revenue earned by each of the major items per month for the observed period of time.

- The above pie chart gives the profit earned per month proportional to the area of the pie

- **Clearly October, June and December produced highest profits in order.**

- **The months of August and September tend to be the lowest profiting month for the organisation.**

➢NON-SEASONAL ITEM DEMAND/ MONTH:



Graph 07 – Non-Seasonal items demand per month

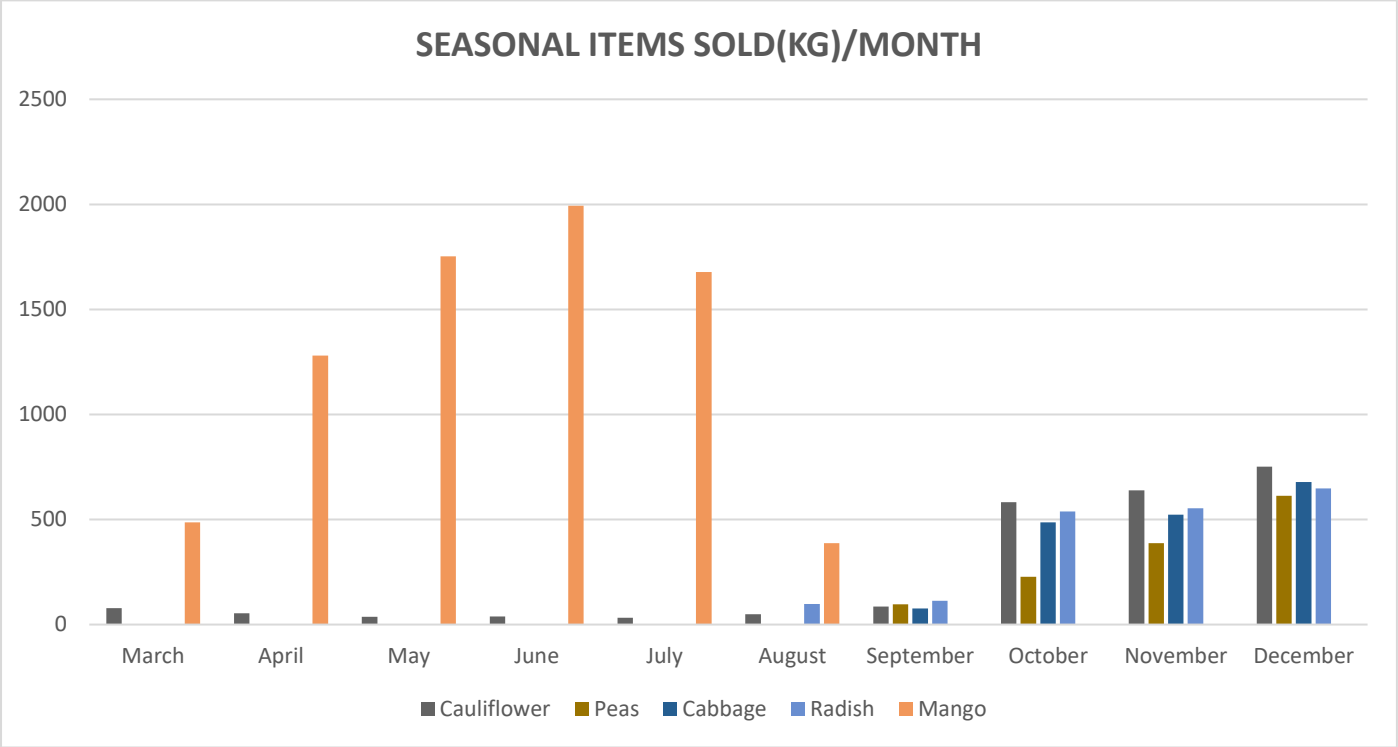
- Using secondary data, the above bar graph was plotted for the total amount of non-seasonal items sold per month for the observed period of time.

- X - Axis represents the different types of items sold each month while the Y - Axis the amount sold of each item.

- **One can observe an almost constant sale amount for these major items throughout the time span. This ensures a stable and constant revenue generation for the organisation.**

- **The collective sales of all of the items mentioned spike noticeably during the October and a bit in December. Among these items Potato sells the most, followed by Onion, Tomato and Ginger.**

➢SEASONAL ITEM DEMAND/MONTH:



Graph 08 – Seasonal items demand per month

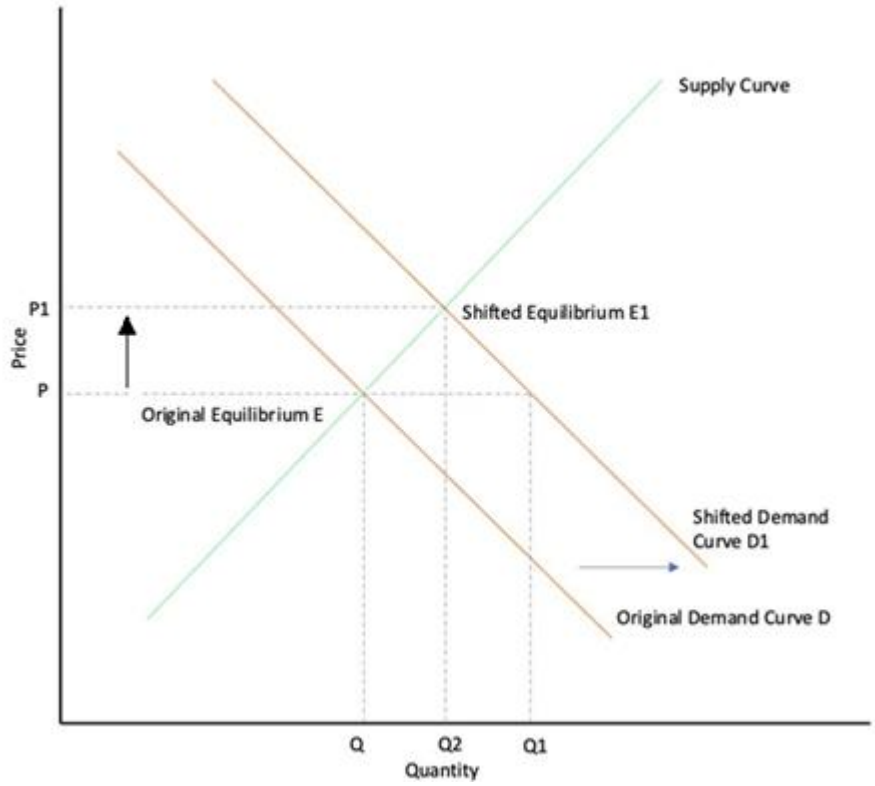
- Using secondary data, the above bar graph was plotted for the total amount of non-seasonal items sold per month for the observed period of time.

- X - Axis represents the different types of items sold each month while the Y - Axis the amount sold of each item.

- **It can be seen that Mango is by far the highest selling item among the seasonal ones during the summer months. While Cauliflower is scare during the starting months, during the winters its sales increase gradually.**

- **Radish, Peas and Cabbage sell only during winters i.e. during the year end.**

➢DEMAND AND SUPPLY TRENDS:



Graph 09 – Demand – Supply graph

- X – Axis represents the Quantity or Demand and Y – Axis represents the Price of items.
- **Cross elasticity between Potato, Onion, Tomato, Ginger and Garlic would be positive, since they are compliments.**
- **Law of Demands :** As price increases demand decreases.
- **Law of Supply :** As supply increases price decreases.

❖ INTERPRETATION OF RESULTS AND RECOMMENDATIONS:

➢INTERPRETATIONS :

- **Graph 02 – Sales volume each item :**
  Potato, Onion, Tomato, Cucumber are staple items in the diet of people in Kolkata thus ensuring high demand. Mango is a popular delicacy during the extreme summers thus leading to high demands.
- **Graph 03 – Profit earned per item :**
  Potato being in demand throughout the year it generates high profit even though it has a low profit margin. Mango is highly profitable both due to the huge demand and also due to a relatively large profit margin.
- **Graph 04 – Revenue earned per item per month :**
  Potato, Onion, Ginger, Garlic and daily use items like these generate steady revenues throughout the year. Mango attracts explosive revenue during the extreme summer months due to high price as well as high demands. During the winters Peas, Cauliflower and other items account for an average revenue.
- **Graph 05 – Revenue generated per month :**
  The revenue in the summer months of April, May, June and July have a good average revenue due to the seasonal items and a few festivals. October shows the highest revenue being the month of numerous frequent festivals and celebrations, followed by December, which is the wedding season in Kolkata thus demands skyrocket during these months yielding huge revenue for the organisation. May, August and September present least revenue as neither do they have any festivals as such nor do the seasonal items arrive.

- **Graph 06 – Profit earned per month :**
  October, December account for the most profits generated due to the frequent festivities and celebrations in these months, while the seasonal items contribute hugely during June. Other months result in average profits.
- **Graph 07 – Non-Seasonal items demand per month :**
  Items like Potato, Tomato, Onion, Ginger, Garlic are everyday need items thus their demand remains almost same across months. There are slight rises in demands during October and December due to festivals and celebrations.
- **Graph 08 – Seasonal items demand per month :**
  Mango is the highly demanded item during the peak summer months of April, May, June and July leading to huge profits. Peas, Cauliflower, Cabbage and Radish are fairly in demand during the winter months of October, November and December.
- **Graph 09 – Demand-Supply graph :**
  With increase in the price of everyday items like Potato, Onion, Ginger, Garlic and Tomato the demand will decrease by some amount but not drastically as food is necessary for survival. While if price decreases demand will surely increase.

➢RECOMMENDATIONS :

- # Inventory –

  On careful analysis it can be inferred that Potato, Onion, Tomato and Cucumber are the daily use thus, if inventory is increased then it can be easily sold as they are of daily use thus could increase profits.

  Seasonal items like Mango have high demand thus, the inventory for different varieties of Mango can be increased as they won't remain unsold during the peak summer months.

  While during Peas and Cauliflower become of daily use in their meals. Increasing the inventory for these items and decrease inventory of Radish.

  During the months of October and December, the organisation should maintain a higher overall inventory during this time due to high demands.

- # Introducing newer items –

  Recently with the younger generation being the dominant consumer in the recent markets non-traditional vegetable items are in demand nowadays which have high nutritional benefits. These items tend to attract customers who maintain their fitness specifically. Items like Broccoli, Avocado, Kiwi Blueberries and so on are in demand. These items are high priced thus the profit margin can be higher than traditional items.

- **Advertisement –**

  Online advertisements can provide much high reach. Free online Advertisement services like Google Ads show advertisements to targeted and probable customers who have shown interest in subjects relevant to our organisation's business thus being really effective in this respect. There being no physical bounds people from all over the state can get these ads and interact with the organisation and become customers.

- **Collection & Distribution –**

  The organisation gets its supply for brokers who collect these items at various local markets where farmers come to sell their produce. These brokers then buy these items and report to the warehouses where the goods are unloaded, checked and then sent for delivery according to orders placed beforehand, and the rest are stored in the warehouse. Thus, the number of contact points can be increased so as to bring in larger volume of goods to cater to larger demands of all or required items according to the time of the year.

- **Weak Management –**

  An experienced and specialised management is needed for smooth and strategic functionality of the organisation. Managerial as well as labour work should be divided into people with expertise and trust to ensure growth and sustainability of the organisation.

- **Pricing Strategy –**

  The organisation may increase the prices of the daily use products by a very little amount, the demand being inelastic can ensure more profits. Seasonal items can yield better profits too if prices are made a little higher. The vast demand will lead to a large aggregate profit. But the prices should be regulated ethically and not driven with greed of earning huge profits.

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