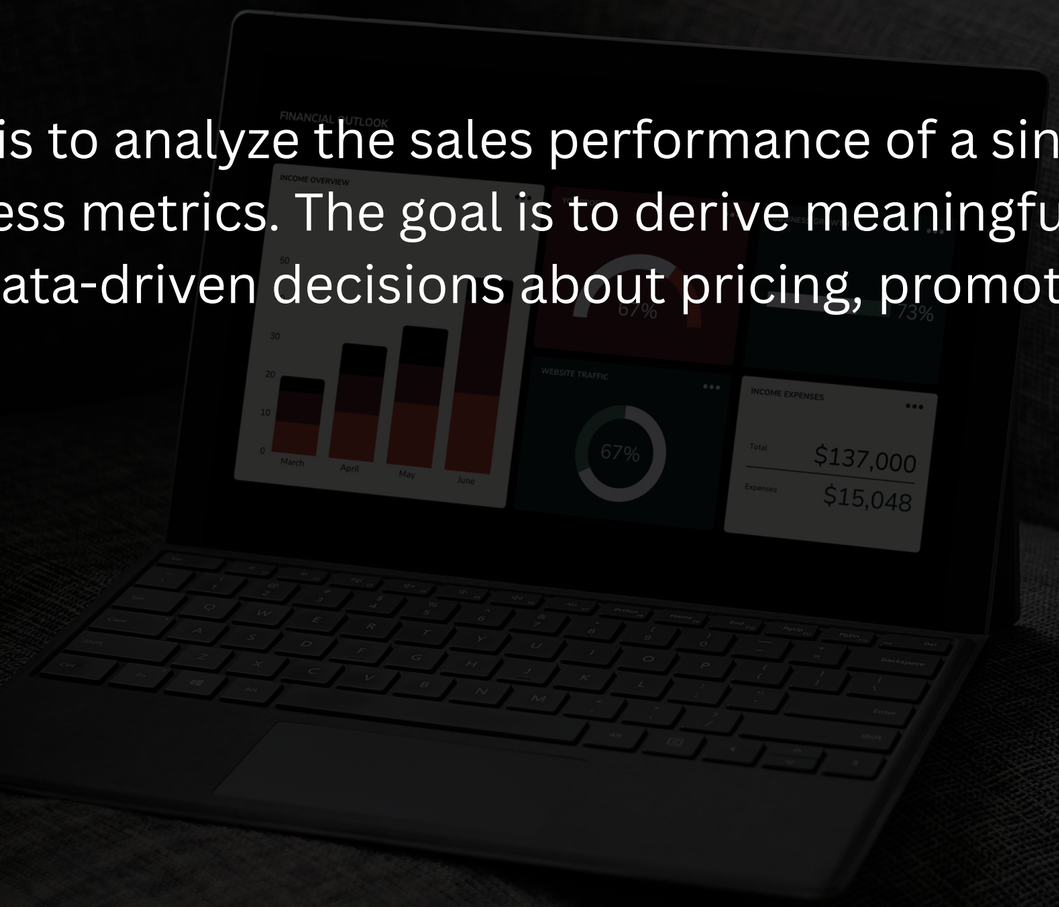
PRESENTATION

# SALES ANALYSIS

# OBJECTIVE

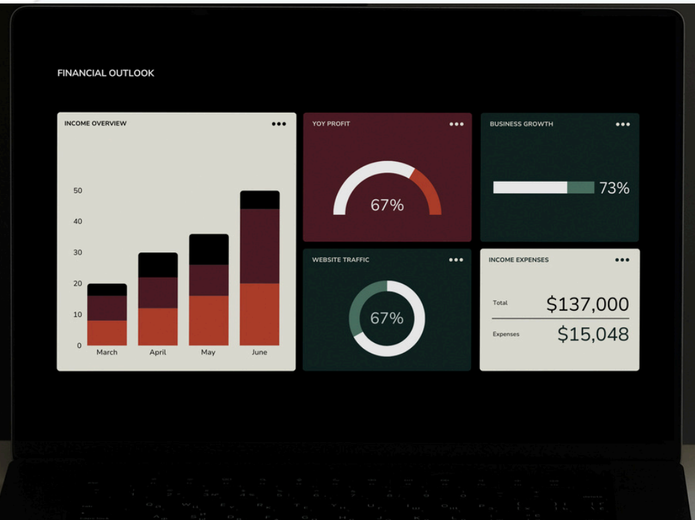
This case study is to analyze the sales performance of a single product in a retail store using business metrics. The goal is to derive meaningful insights that can help the store make data-driven decisions about pricing, promotions, and profitability.




## TOOLS USED

Excel
Python

| | Date | Sales | Cost Of Sales | Quantity Sold |
|---|---|---|---|---|
| 0 | 30/12/2013 | 223937.96790 | 230079.62100 | 6827 |
| 1 | 31/12/2013 | 300345.48460 | 306986.12050 | 9268 |
| 2 | 1/1/2014 | 86782.46773 | 87986.31821 | 2678 |
| 3 | 2/1/2014 | 200173.11680 | 202881.17770 | 6175 |
| 4 | 3/1/2014 | 326906.07420 | 333806.29190 | 10084 |
| 5 | 4/1/2014 | 307043.93540 | 313652.34830 | 9470 |
| 6 | 5/1/2014 | 179188.88450 | 183083.28500 | 5524 |
| 7 | 6/1/2014 | 306351.95090 | 313446.06810 | 9448 |
| 8 | 7/1/2014 | 224020.41000 | 229533.97370 | 6911 |
| 9 | 8/1/2014 | 101836.40220 | 99381.96752 | 2990 |




```
[7]  data.isnull().sum()
```

| | 0 |
|---|---|
| Date | 0 |
| Sales | 0 |
| Cost Of Sales | 0 |
| Quantity Sold | 0 |

dtype: int64

```
data.shape
```

```
(1053, 4)
```

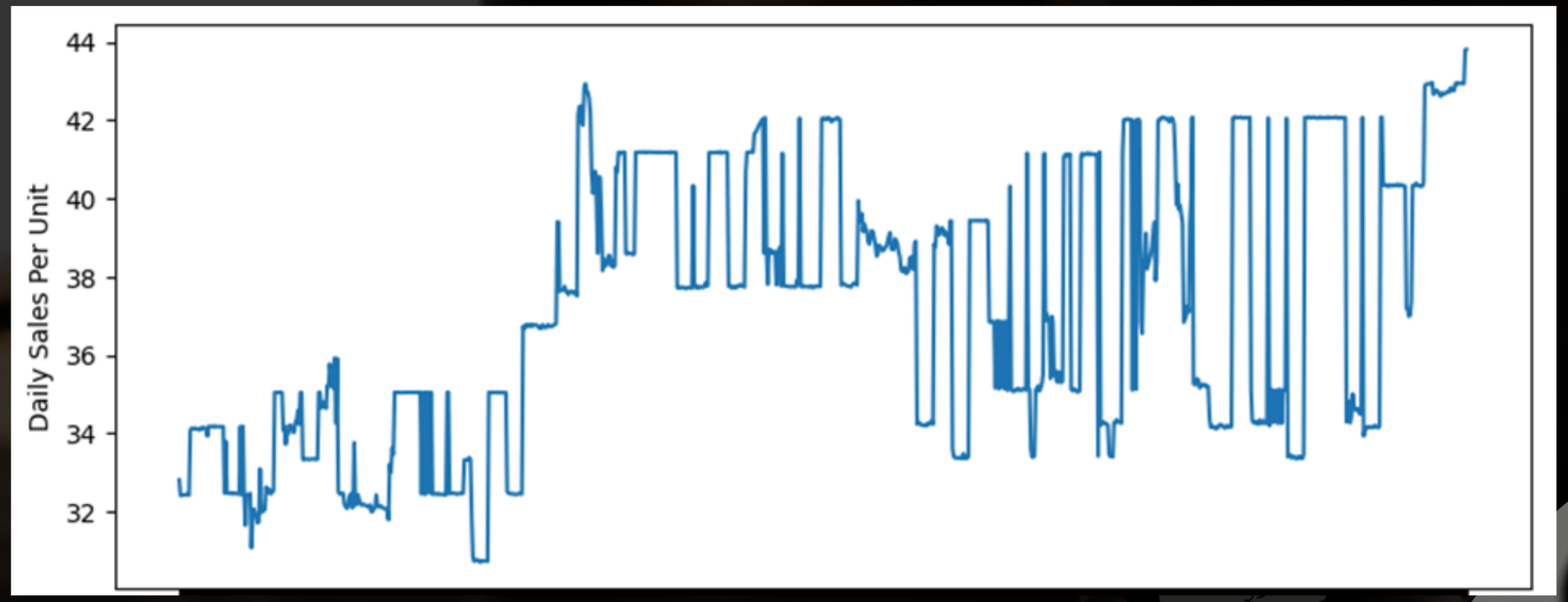
```
data.duplicated().sum()
```

```
np.int64(0)
```

I ran the first 10 rows of the sales table using Google Colab to get an initial view of the dataset. This allowed me to explore the structure of the data, including the column names and sample values. It was a quick way to check for data types, shape, missing values, and potential patterns or outliers before doing deeper analysis or cleaning. I took the step to understand what kind of information the table holds and how I might want to approach the next stages of my data analysis.

Daily Sales Per Unit was calculated to understand how much revenue is made per each day. It shows how the selling price is performing over time and it shows how business is operating on the daily basis.

| | Date | Sales | Cost Of Sales | Quantity Sold | Daily Sales Per Unit |
|---|---|---|---|---|---|
| 0 | 30/12/2013 | 223937.96790 | 230079.62100 | 6827 | 32.801812 |
| 1 | 31/12/2013 | 300345.48460 | 306986.12050 | 9268 | 32.406720 |
| 2 | 1/1/2014 | 86782.46773 | 87986.31821 | 2678 | 32.405701 |
| 3 | 2/1/2014 | 200173.11680 | 202881.17770 | 6175 | 32.416699 |
| 4 | 3/1/2014 | 326906.07420 | 333806.29190 | 10084 | 32.418294 |
| 5 | 4/1/2014 | 307043.93540 | 313652.34830 | 9470 | 32.422802 |
| 6 | 5/1/2014 | 179188.88450 | 183083.28500 | 5524 | 32.438248 |
| 7 | 6/1/2014 | 306351.95090 | 313446.06810 | 9448 | 32.425058 |
| 8 | 7/1/2014 | 224020.41000 | 229533.97370 | 6911 | 32.415050 |
| 9 | 8/1/2014 | 101836.40220 | 99381.96752 | 2990 | 34.058997 |




**The graph shows data from 2013- 2016**

The daily unit price has been going up and down because of promotions, discounts, and other outside factors. But still, it rose from R32.80 in 2013 to R43.81 in 2016. This shows that even with all the changes, the pricing strategy helped the unit price go up over time.

The average unit sales price came out to R37.07, which gives a good overall picture of how much revenue was generated per item sold. This value helps simplify the data and shows that, on average, each unit brought in just over R37. Despite any daily price changes caused by promotions or discounts, this average reflects the general pricing trend during the period analyzed.

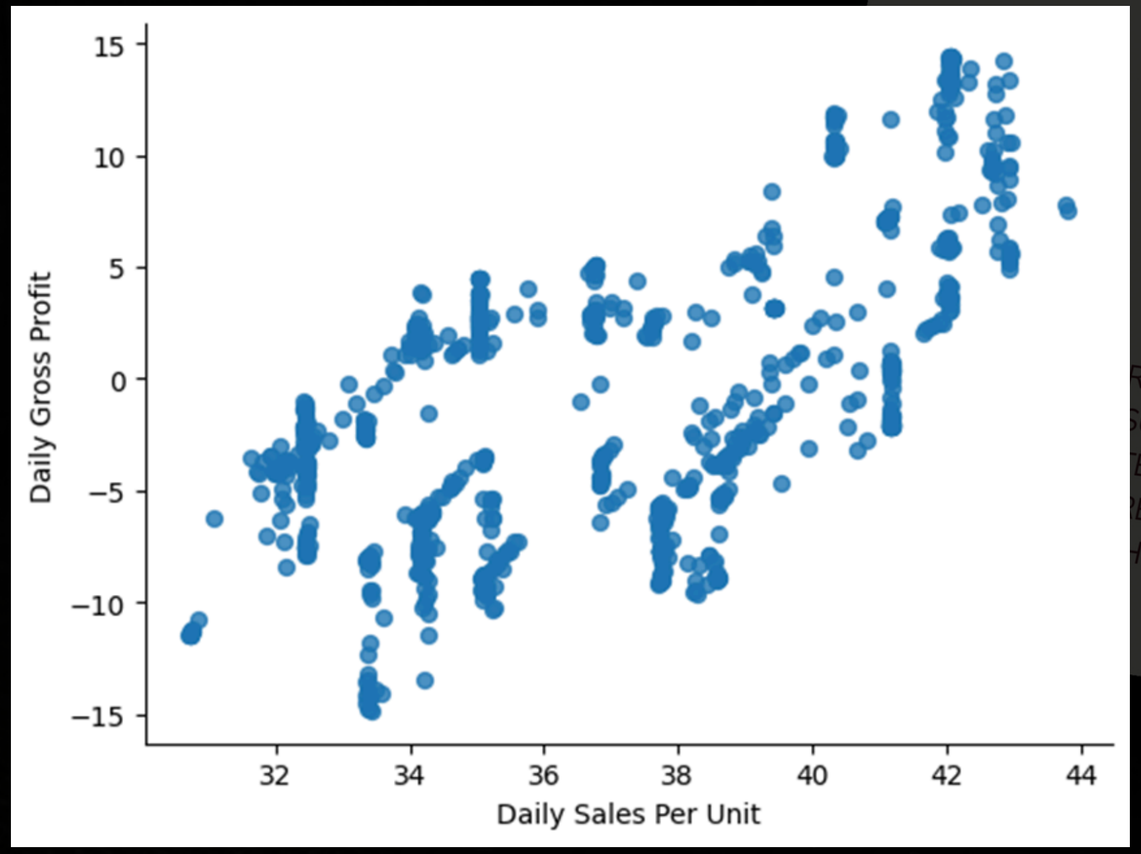
```
print(Sales['Daily Sales Per Unit'].mean())
```

```
37.07285158158666
```

Daily gross profit is calculated to measure how much money a business is actually making each day after covering the cost of goods sold (COGS). This metric is important because it shows whether the business is truly profitable on a daily basis — not just bringing in sales, but keeping money after paying for what was sold.

| | Date | Sales | Cost Of Sales | Quantity Sold | Daily Sales Per Unit | Daily Gross Profit |
|---|---|---|---|---|---|---|
| 0 | 30/12/2013 | 223937.96790 | 230079.62100 | 6827 | 32.801812 | -2.74 |
| 1 | 31/12/2013 | 300345.48460 | 306986.12050 | 9268 | 32.406720 | -2.21 |
| 2 | 1/1/2014 | 86782.46773 | 87986.31821 | 2678 | 32.405701 | -1.39 |
| 3 | 2/1/2014 | 200173.11680 | 202881.17770 | 6175 | 32.416699 | -1.35 |
| 4 | 3/1/2014 | 326906.07420 | 333806.29190 | 10084 | 32.418294 | -2.11 |
| 5 | 4/1/2014 | 307043.93540 | 313652.34830 | 9470 | 32.422802 | -2.15 |
| 6 | 5/1/2014 | 179188.88450 | 183083.28500 | 5524 | 32.438248 | -2.17 |
| 7 | 6/1/2014 | 306351.95090 | 313446.06810 | 9448 | 32.425058 | -2.32 |
| 8 | 7/1/2014 | 224020.41000 | 229533.97370 | 6911 | 32.415050 | -2.46 |
| 9 | 8/1/2014 | 101836.40220 | 99381.96752 | 2990 | 34.058997 | 2.41 |

Daily gross profit changed significantly over the days, even showing a quite number of negative values which is not good for the business. This usually happens due to excessive discounts, cost price increases, or operational inefficiencies.




## Daily sales per unit Vs Daily Gross Profit

Positive Correlation: As daily sales per unit rise, gross profit generally increases. That means boosting unit sales can directly contribute to stronger profitability.

- Frequent Sales Bands: Clusters around 34–42 units suggest these are common sales volumes. That’s your “sweet spot” where performance seems most stable.
- Outliers: A few points show negative gross profit despite moderate sales, hinting at days where pricing, costs, or inefficiencies may have eaten into margins.

first 5 rows:

| | Date | Sales | Cost Of Sales | Quantity Sold | \ |
|---|---|---|---|---|---|
| 0 | 30/12/2013 | 223937.96790 | 230079.62100 | 6827 | |
| 1 | 31/12/2013 | 300345.48460 | 306986.12050 | 9268 | |
| 2 | 1/1/2014 | 86782.46773 | 87986.31821 | 2678 | |
| 3 | 2/1/2014 | 200173.11680 | 202881.17770 | 6175 | |
| 4 | 3/1/2014 | 326906.07420 | 333806.29190 | 10084 | |

| | Daily Sales Per Unit | Daily Gross Profit | Gross Profit Per Unit(%) |
|---|---|---|---|
| 0 | 32.801812 | -2.74 | -2.74 |
| 1 | 32.406720 | -2.21 | -2.21 |
| 2 | 32.405701 | -1.39 | -1.39 |
| 3 | 32.416699 | -1.35 | -1.35 |
| 4 | 32.418294 | -2.11 | -2.11 |

last 5 rows:

| | Date | Sales | Cost Of Sales | Quantity Sold | \ |
|---|---|---|---|---|---|
| 1048 | 12/11/2016 | 164998.84460 | 156263.14950 | 3843 | |
| 1049 | 13/11/2016 | 97946.78305 | 93112.60891 | 2281 | |
| 1050 | 14/11/2016 | 87834.25368 | 83068.26903 | 2046 | |
| 1051 | 15/11/2016 | 95509.13498 | 88104.20453 | 2181 | |
| 1052 | 16/11/2016 | 77229.97189 | 71428.87000 | 1763 | |

| | Daily Sales Per Unit | Daily Gross Profit | Gross Profit Per Unit(%) |
|---|---|---|---|
| 1048 | 42.934906 | 5.29 | 5.29 |
| 1049 | 42.940282 | 4.94 | 4.94 |
| 1050 | 42.929743 | 5.43 | 5.43 |
| 1051 | 43.791442 | 7.75 | 7.75 |
| 1052 | 43.805997 | 7.51 | 7.51 |

Daily Gross Profit and % Gross Profit Per Unit are moving in the perfect sync.

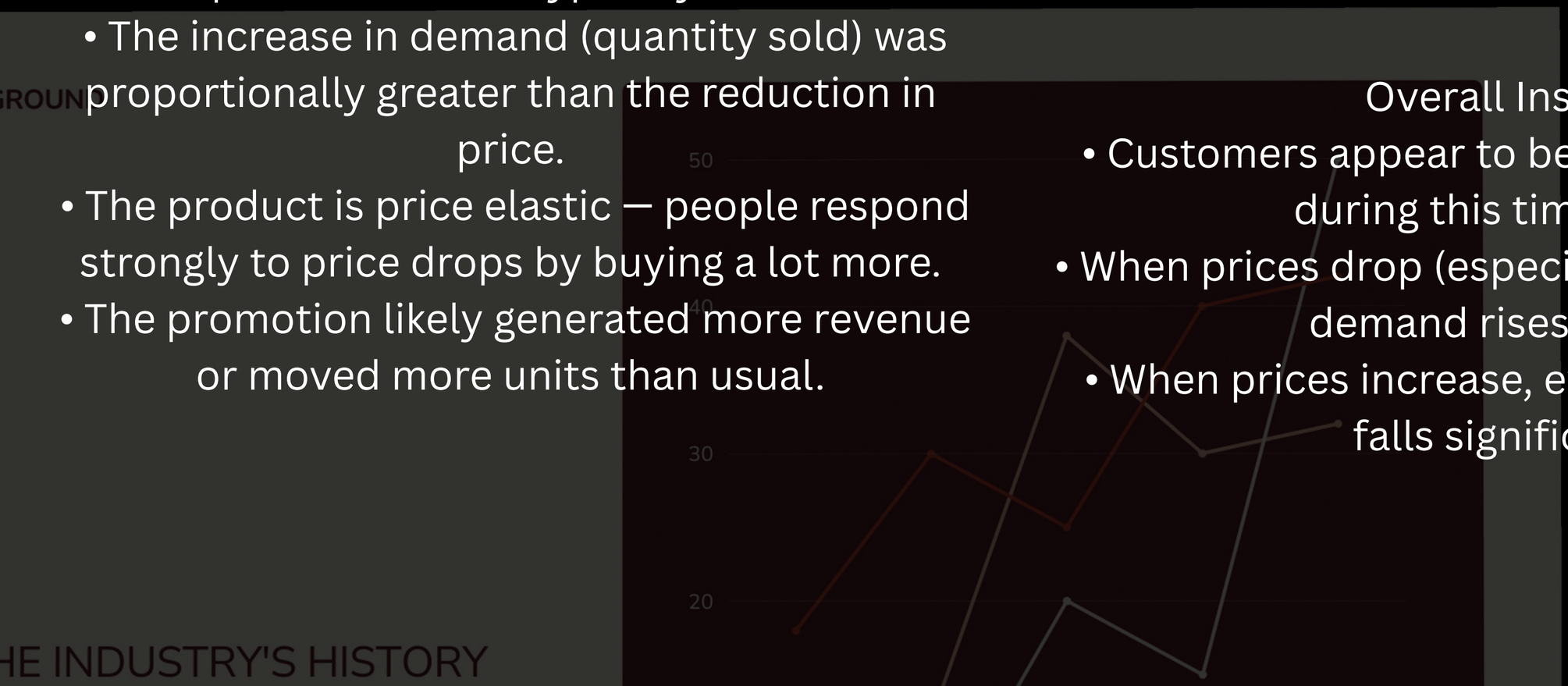
| | Date | Quantity Sold | Daily Sales Per Unit | Promo Score |
|---|---|---|---|---|
| 458 | 2/4/2015 | 18936 | 37.760466 | 1.250088 |
| 359 | 24/12/2014 | 11809 | 41.174555 | 1.235481 |
| 724 | 24/12/2015 | 9540 | 41.114061 | 1.143265 |

A promo score > 1 typically means:

- The increase in demand (quantity sold) was proportionally greater than the reduction in price.
- The product is price elastic — people respond strongly to price drops by buying a lot more.
- The promotion likely generated more revenue or moved more units than usual.

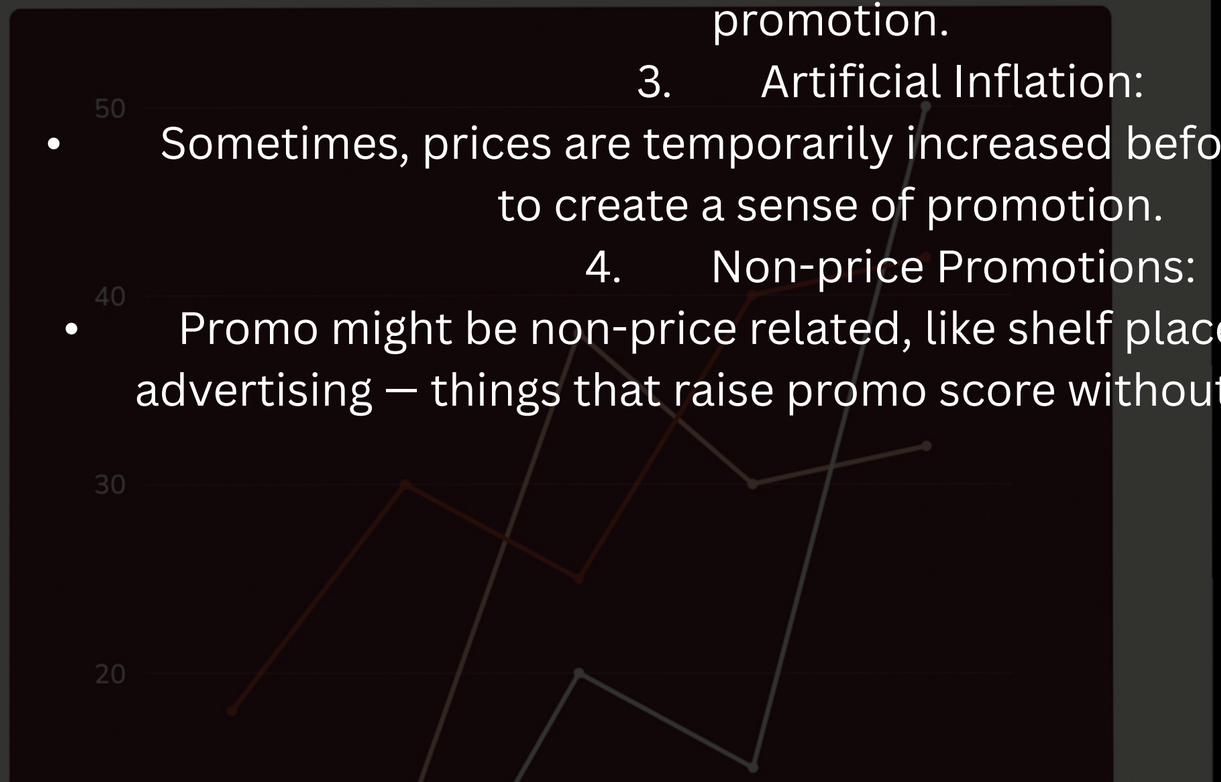
Overall Insight :

- Customers appear to be very price-sensitive during this time period.
- When prices drop (especially with promotions), demand rises sharply.
- When prices increase, even slightly, demand falls significantly.



**Quite “High” Sales Observed Under High Price and High Promotional Activity, possible reasons:**

1. Premium Promotions:
   - The promotion is applied even though the price is high, possibly targeting loyal or less price-sensitive customers.
   - Example: “Buy one, get something extra”, or a perceived value offer rather than a direct discount.
2. Effective Marketing:
   - The promotion might be strong enough to still drive sales despite the higher price.
   - Promo score > 1 indicates customers are responding well to the promotion.
3. Artificial Inflation:
   - Sometimes, prices are temporarily increased before applying a “discount” to create a sense of promotion.
4. Non-price Promotions:
   - Promo might be non-price related, like shelf placement, free samples, or advertising — things that raise promo score without cutting price.




HE INDUSTRY'S HISTORY