# Inventory Optimization for T.T INC

Ву

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Software used:

Postgres Sql

## A case study on T.T Inc







## **Objectives**



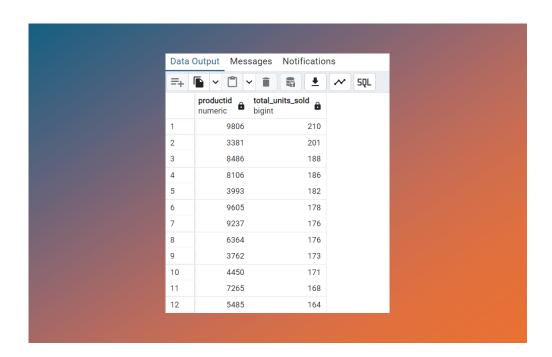
Optimize inventory levels to minimize overstock and understock situations.

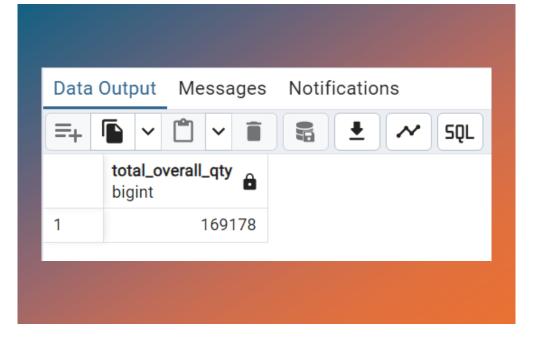


Understanding seasonal trend of sales for different products.



Improve customer satisfaction by ensuring product availability.





# Tasks 1: What is the total number of units sold per product SKU?

## Using the command;

select productid, sum(inventoryquantity) as total\_units\_sold

from salesgroup by productid

order by total\_units\_sold desc;

I able to deduct that the product with highest number of units sold was 9806

## Also using the command;

 $select\ sum (s.inventory quantity)\ as\ total\_over all\_qty$ 

from sales sjoin product p on s.productid = p.productid

join factors f on s.salesdate = f.salesdate;

I was able to deduct that the total overall quantity sold was 169178

## Data Output Messages Notifications SQL productcategory sales\_volume bigint Home\_Appliances 551 Electronics 518 3 292 Laptops **SmartPhones** 61 4

# Tasks 2: Which product category had the highest sales volume last month?

## Using the command;

select p.productcategory, sum(s.inventoryquantity) as Sales\_volume from sales s
join product p on s.productid = p.productid
where s.sales\_year = '2022' and s.sales\_month = '11'
group by p.productcategoryorder by Sales\_volume desc;

## Insight:

I able to deduct that the product category with highest sales volume last month was

Home Appliances with a sales volume of 551 and Smartphone was the lowest with 61 indicating weak performance relative to other categories.

- 1. **Boost Smartphone Sales**: Reevaluate promotion or marketing strategy for Smartphones.
- 2. Capitalize on Home Appliances: Focus marketing efforts on this high-performing category.
- 3. **Improve Laptop Positioning:** Strengthen promotions or product differentiation to boost sales.
- 4. Enhance Electronics: Leverage its consistent performance with targeted offers or new product features.
- 5. **Analyze Trends**: Investigate why Smartphones are lagging behind and make strategic adjustments.

# Tasks 3: How does the inflation rate correlate with sales volume for a specific month?

## Using the command;

select s.sales\_month, s.sales\_year, round(avg(f.inflationrate),1) as avg\_inflation, sum(s.inventoryquantity) as Sales\_Volume

from sales s

join factors f on s.salesdate = f.salesdategroup by s.sales\_year, s.sales\_month

order by s.sales\_year desc, s.sales\_month desc;

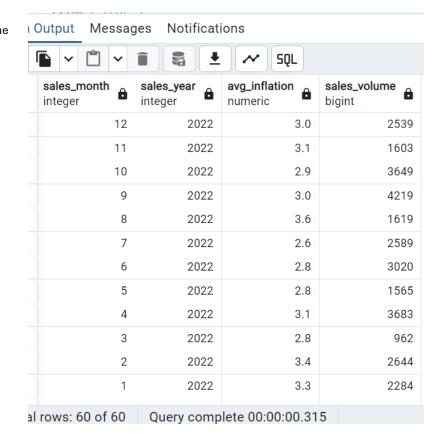
## Insights:

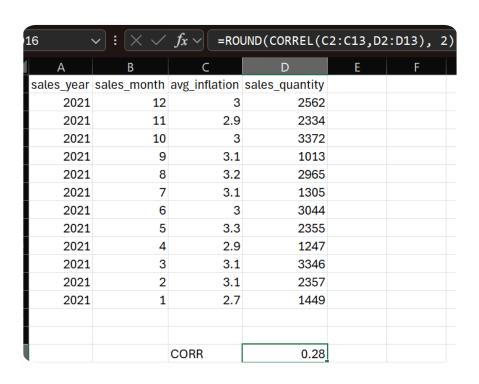
I was able to deduct that there is a very weak and almost no positive correlation,

suggesting that changes in inflation rate have little to no impact on the sales volume

for the specific months provided in the dataset.

- 1. Focus on Demand: Base stocking on demand trends, not inflation.
- 2. Efficient Turnover: Optimize inventory to reduce excess stock.
- 3. **Diversify Products**: Offer varied products to balance sales fluctuations.
- 4. Monitor Costs: Control stocking costs independently of inflation.
- 5. Adapt Quickly: Stay flexible to adjust stock levels as market changes.





## Tasks 4: What is the correlation between the inflation rate and sales quantity for all products combined on a monthly basis over the last year?

## Using the command;

select s.sales\_year, s.sales\_month, round(avg(f.inflationrate),1) as avg\_inflation, sum(s.inventoryquantity) as sales\_quantityfrom sales s join factors f on s.salesdate = f.salesdate where s.sales\_year = '2021' group by s.sales\_year, s.sales\_month order by s.sales\_month desc;

## Insights:

Using the **correl** function in excel I deducted that there is a correlation of 0.28 which indicates a weak relationship between inflation rate and sales quantity

- 1. **Demand Forecasting**: Focus on historical sales data to predict stock needs.
- 2. **Diversify Suppliers**: Ensure flexible supply chains to manage cost fluctuations.
- 3. Optimize Inventory: Use just-in-time or lean inventory practices to avoid overstocking.
- 4. Monitor Market Trends: Track consumer behavior and market shifts, not just inflation.
- 5. **Agile Stocking**: Implement adaptive stocking strategies to respond to real-time demand changes.

# Tasks 5: Did promotions significantly impact the sales quantity of products?

## Using the command;

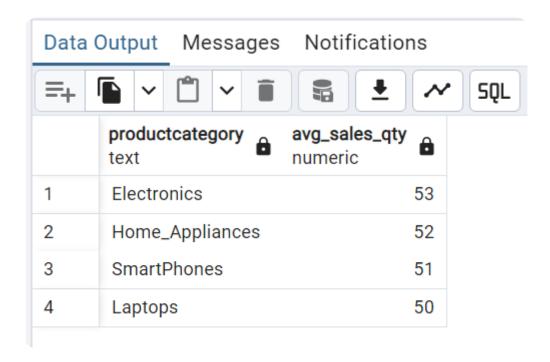
select p.productcategory, round(avg(s.inventoryquantity)) as avg\_sales\_quantity, p.promotions from sales s
join product p on s.productid = p.productid
where p.promotions = 'No'group by p.productcategory, p.promotions
union all
select p.productcategory, round(avg(s.inventoryquantity)) as avg\_sales\_quantity, p.promotions
from sales s
join product p on s.productid = p.productid
where p.promotions = 'Yes'group by p.productcategory, p.promotions;

## Insights:

I was able to deduct that promotions did not significantly impact sales quantity of products

- 1. **Refine Targeting**: Focus on the right audience for better impact.
- 2. Optimize Channels: Invest in the most effective promotional platforms.
- 3. **Enhance Offers**: Make promotions more attractive or valuable.
- 4. A/B Test Strategies: Experiment with different promotions to find what works.
- 5. Measure ROI: Continuously track and optimize based on performance.

Data Output Messages Notifications			
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	productcategory avg_sales_quantity numeric	â	promotions text
1	Home_Appliances	50	No
2	Electronics	54	No
3	SmartPhones	53	No
4	Laptops	51	No
5	Home_Appliances	54	Yes
6	Electronics	52	Yes
7	SmartPhones	49	Yes
8	Laptops	50	Yes



## Tasks 6: What is the average sales quantity per product category?

## Using the command;

select p.productcategory, round(avg(s.inventoryquantity)) as avg\_sales\_qty
from sales s
join product p on s.productid = p.productid

group by p.productcategory order by avg\_sales\_qty desc;

## Insights:

I was able to deduct that Electronics has the highest sales quantity at 53 and

Laptops has the lowest at 50 and there is no indication on KPI here

- 1. **Targeted Promotions**: Focus on specific customer segments.
- 2. Improve Product Mix: Offer high-demand and complementary products.
- 3. **Enhance Marketing:** Use data-driven campaigns to boost visibility.
- 4. **Optimize Pricing**: Implement competitive pricing strategies.
- 5. **Boost Customer Retention**: Use loyalty programs to increase repeat sales.

## Tasks 7: How does the GDP affect the total sales volume?

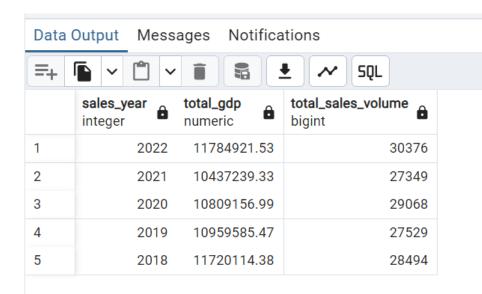
## Using the command;

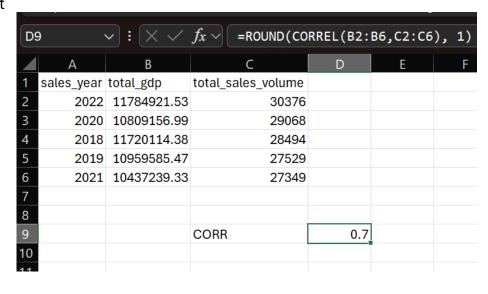
select s.sales\_year, sum(f.gdp) as Total\_gdp, sum(s.inventoryquantity) as total\_sales\_volume from sales s
join factors f on s.salesdate = f.salesdate
group by s.sales\_year
order by s.sales\_year desc;

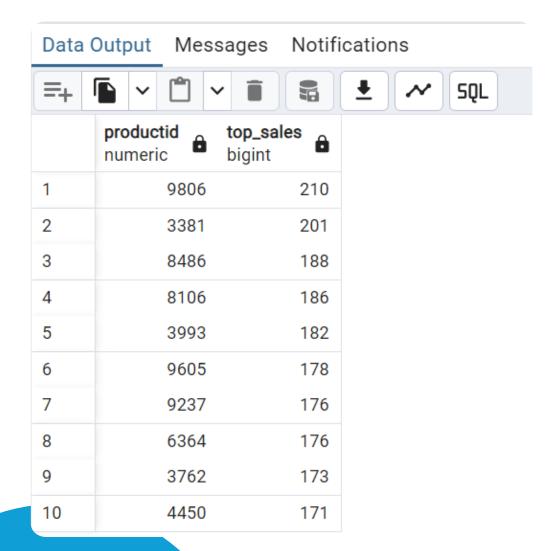
## **Insights:**

It was deducted that there is a 0.7 correlation between GDP and sales volume, this means that sales volume rises when GDP grows, and the business is sensitive to economic growth 2022 has the highest GDP which correlates with a high sales volume and 2021 has the lowest

- 1. **Monitor GDP**: Align sales strategies with economic growth trends.
- 2. Forecast Demand: Use GDP trends for accurate sales projections.
- 3. **Diversify Products**: Reduce reliance on GDP-sensitive products.
- 4. Invest in Growth: Expand during economic booms to maximize sales.
- 5. **Prepare for Downturns**: Build resilience for periods of slow GDP growth.







## Tasks 8: What are the top 10 best-selling product SKUs?

Using the command;

select productid, sum(inventoryquantity) as top\_sales

from sales

group by productid

order by top\_sales desc

limit 10;

## **Insights:**

It was deducted that product 9806 tops the chart with 210 sales units

## Tasks 9: How do seasonal factors influence sales quantities for different product categories?

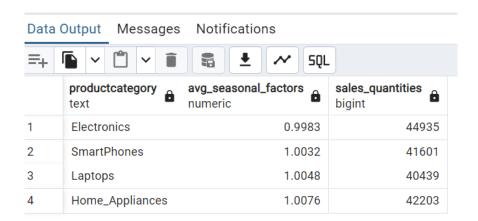
## Using the command;

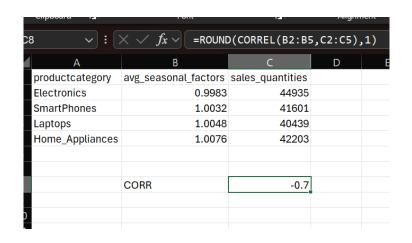
select p.productcategory, round(avg(f.seasonalfactor),4) as avg\_seasonal\_factors,
sum(s.inventoryquantity) as sales\_quantities
from sales s
join factors f on s.salesdate = f.salesdate
join product p on s.productid = p.productid
group by p.productcategory
order by avg\_seasonal\_factors;

## **Insights:**

- **Home Appliances** seem to experience slightly more seasonality compared to Electronics, Smartphones, and Laptops.
- Seasonal factors do not appear to be the primary driver of large fluctuations in sales, indicating that sales in these categories are fairly steady throughout the year.

- 1. Focus on Consistency: Maintain stable sales efforts year-round.
- 2. **Boost Promotions**: Slightly increase marketing for Home Appliances during peak seasons.
- 3. **Diversify Strategies**: Target steady sales categories like Electronics and Smartphones.
- 4. Monitor Trends: Track subtle seasonal shifts for optimized stock levels.
- 5. Limit Seasonal Spending: Avoid heavy seasonal campaigns due to minimal impact.





### Data Output Messages Notifications SQL productcategory avg\_sales\_qty promotion\_count bigint text numeric Electronics 53 212 1 Home\_Appliances 52 220 SmartPhones 3 51 212

4

Laptops

50

## Tasks 10: What is the average sales quantity per product category and how many products within each category were part of a promotion

## Using the command;

select p.productcategory, round(avg(s.inventoryquantity)) as avg\_sales\_qty,
count (case when p.promotions = 'Yes' then 1 end) as promotion\_count
from sales s
join product p on s.productid = p.productid
group by p.productcategory
order by avg\_sales\_qty desc;

## Insights:

219

- Home Appliances seems to have the highest number of promotions of 220.
- It can be deducted that Home Appliances relies heavily on seasonal promotion which is beneficial in the long run has it helps generate high sales volume.
- Electronics and smartphones are performing well without excessive promotion.

- 1. **Reduce Promotions**: Lower promotion frequency for Electronics and Smartphones.
- 2. **Optimize Strategy**: Improve promotional targeting for Laptops.
- 3. **Focus on Value**: Highlight product features over discounts for Home Appliances.
- 4. **Analyze ROI**: Evaluate promotion effectiveness by product category.
- 5. Leverage High Performers: Prioritize Electronics and Smartphones in marketing efforts.