



# CLOTHING INVENTORY & SALES ANALYSIS

- DA 282 - Final Project



Introduction

Analysis

Insights



# INTRODUCTION

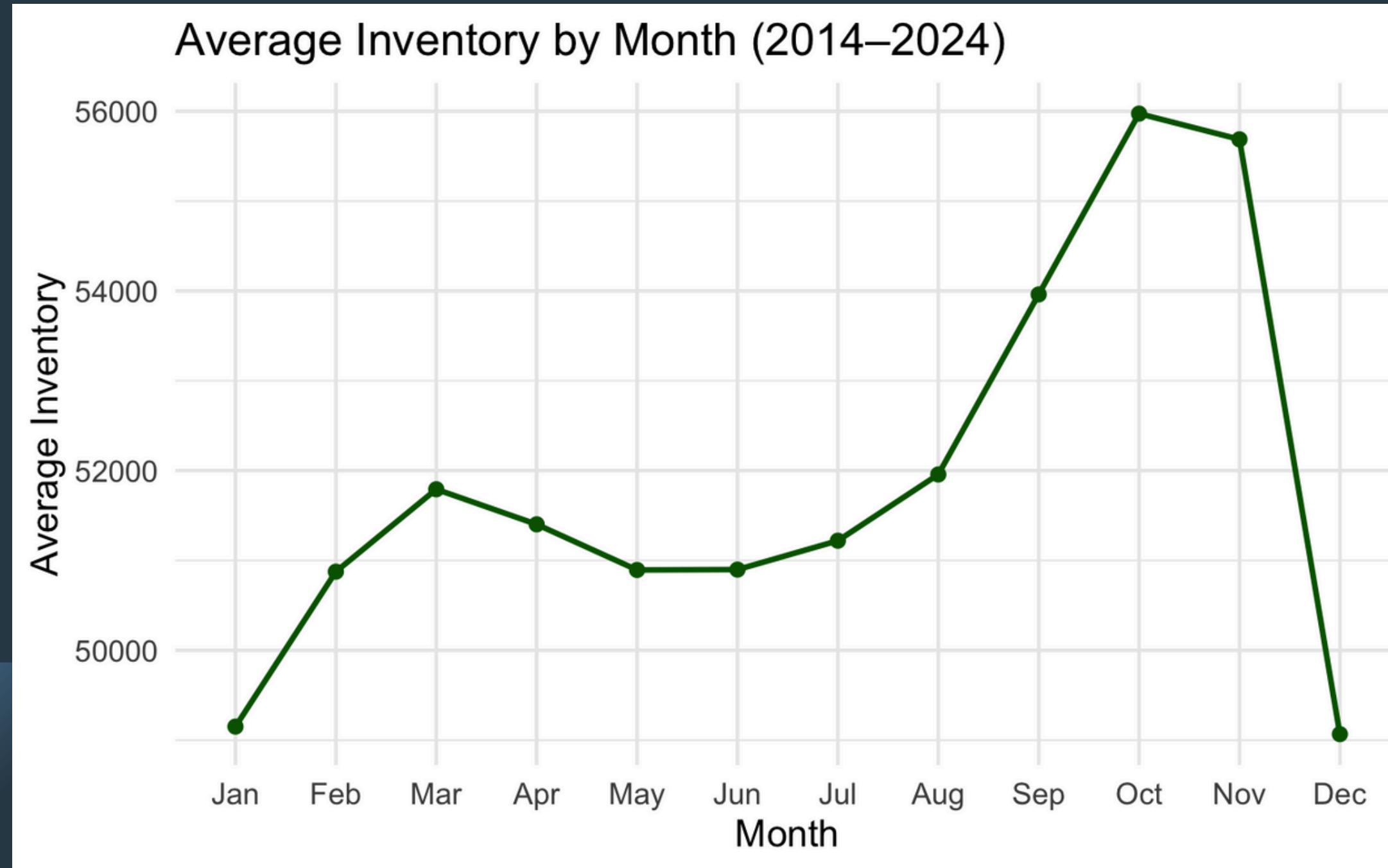
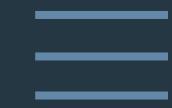
- Analyze 2014–2025 monthly data for a clothing retailer
- Focus on inventory patterns, sales trends, efficiency ratio, and regression modeling
- Understand how inventory behavior shapes sales + identify improvement strategies

# INVENTORY

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- Inventory rises steadily from September to November every year.
- December – January show the sharpest drop due to holiday sell-through.

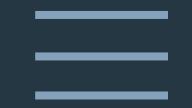
# SALES

- Strong seasonality: lowest sales in Jan–Feb, highest in Nov–Dec.
- December consistently performs 40–70% above annual average.
- Mid-year months (Mar–Sep) show moderate, stable sales.

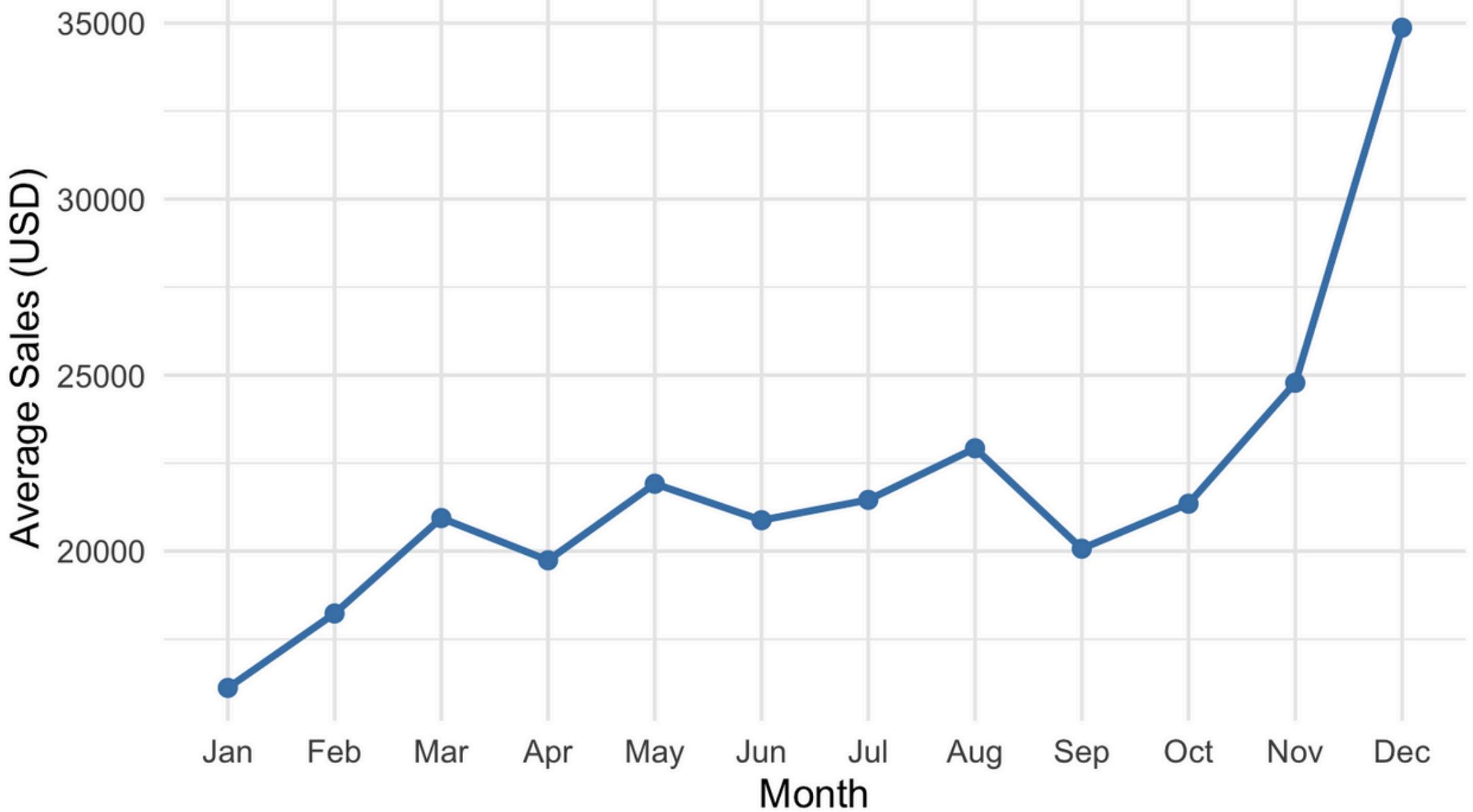
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Average Monthly Sales (2014–2024)

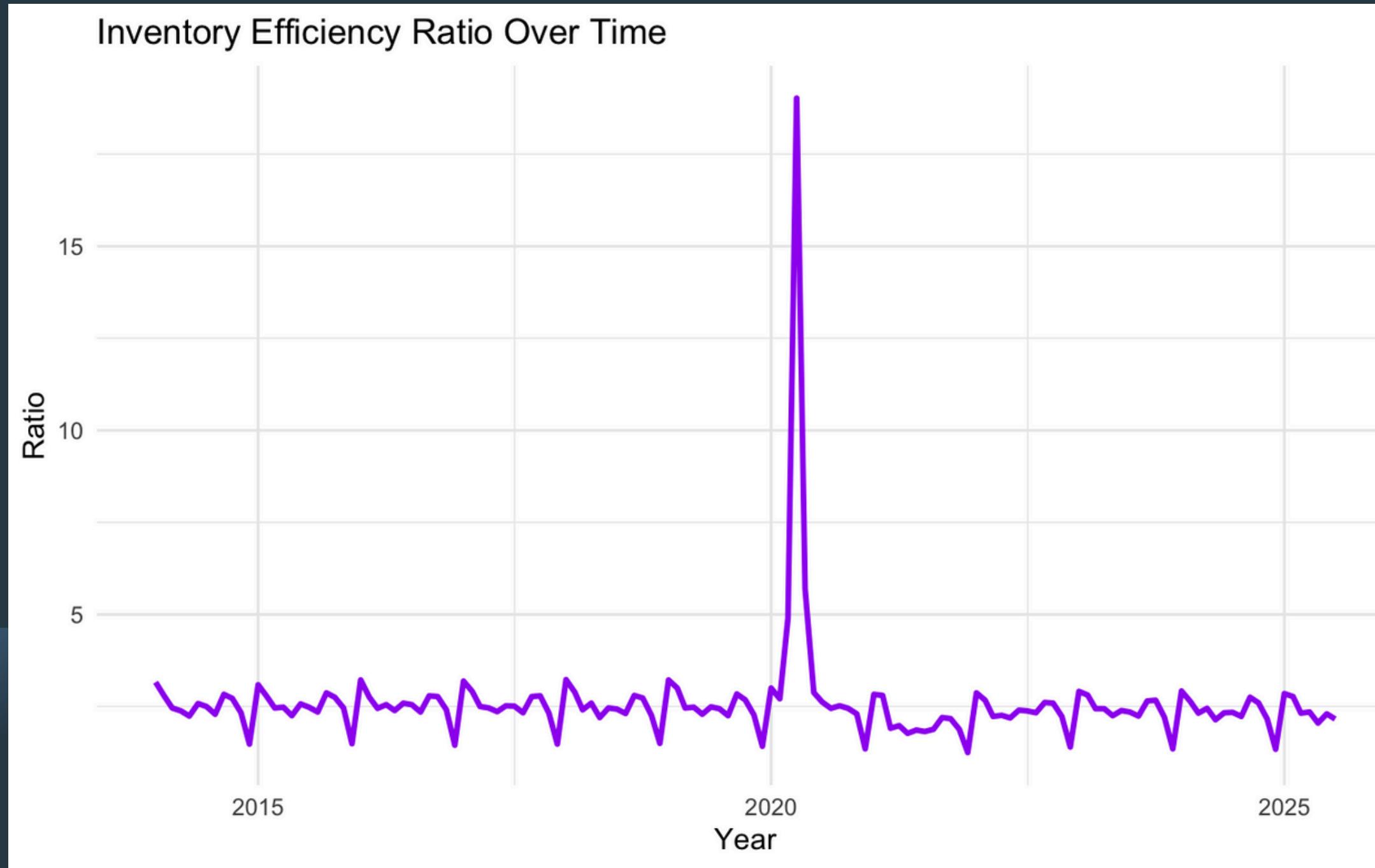
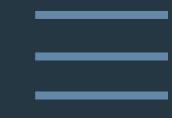


# INVENTORY EFFICIENCY RATIO

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- Mostly stable between 2–3, indicating balanced operations.
- A sharp spike occurs in 2020, reflecting a sudden decline in sales relative to inventory availability.
- The Ratio returns to typical levels shortly after, suggesting operational recovery.

# LINEAR REGRESSION

- Sales tend to decline in months when inventory increases more than usual.
- Sales drop more noticeably when inventory grows faster than demand.
- Overall, sales are strongly affected by how well inventory levels align with actual demand.

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Call:

```
lm(formula = sales ~ delta_inventory + Ratio, data = clothing)
```

Residuals:

Min	1Q	Median	3Q	Max
-11213.1	-1756.4	76.1	1814.0	7323.0

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	26806.9559	514.9908	52.05	<2e-16 ***
delta_inventory	-1.3552	0.1163	-11.66	<2e-16 ***
Ratio	-1787.7752	173.5487	-10.30	<2e-16 ***

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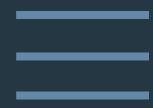
Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 3042 on 135 degrees of freedom

(1 observation deleted due to missingness)

Multiple R-squared: 0.672, Adjusted R-squared: 0.6671

F-statistic: 138.3 on 2 and 135 DF, p-value: < 2.2e-16



# BUSINESS IMPACTS

## Marketing

- Promotions and budget allocation.
- Clearance and retention campaigns.

## Finance

- Carrying costs and ties up capital
- Cash flow stability and reduces markdown risk.

## Operation

- Operational burden and storage needs
- Identify when purchasing adjustments



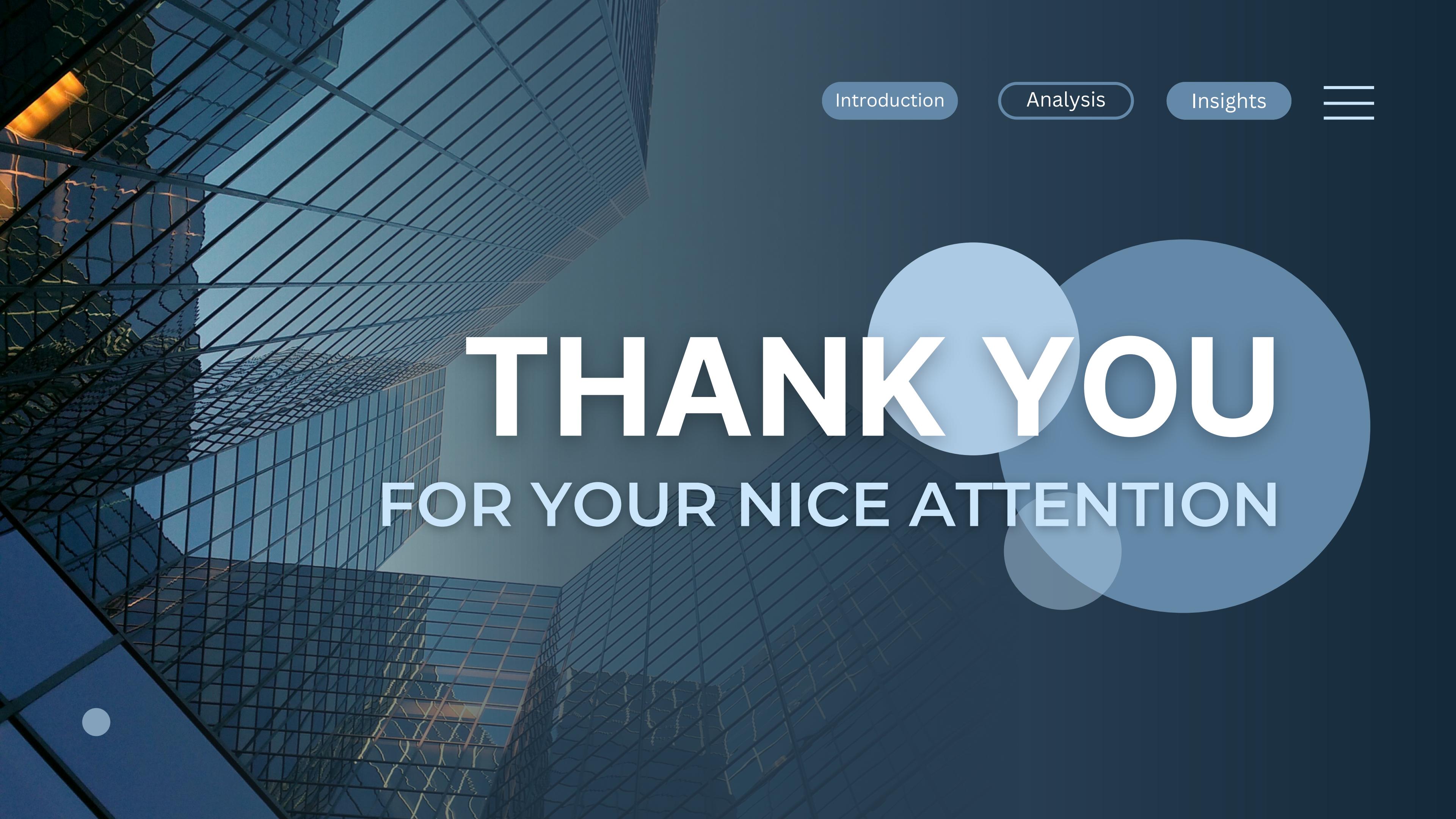
# RECOMMENDATIONS

- Use forecasting to adjust inventory levels, since inventory increases during low-demand months were linked to lower sales.
- Align purchasing with seasonal sales cycles, increasing stock before Nov–Dec and reducing orders in Jan–Feb to match demand patterns.
- Improve coordination between inventory and sales planning.
- Support holiday demand with targeted marketing and staffing, as December consistently shows the highest sales.



# LIMITATIONS & FUTURE WORK

- The analysis does not include factors such as pricing, promotions, or economic shifts, which may also affect sales.
- The regression model uses only two inventory-related predictors, additional variables could improve accuracy.
- Apply advanced forecasting methods (e.g., ARIMA, Prophet, machine learning models) to better capture seasonality and improve prediction accuracy.

The background of the slide features a photograph of a modern skyscraper with a distinctive curved glass and steel facade. The building's surface reflects the surrounding environment, creating a complex pattern of light and shadow. The perspective is from a low angle, looking up at the building's upper levels.

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THANK YOU  
FOR YOUR NICE ATTENTION