📊 Walmart Sales Insights & Forecasting Analysis

A Data-Driven Overview of Trends, Drivers, and Strategic Opportunities

Presented by:
Sarah Effiong

🔍 Executive Summary

- Analyzed Walmart's weekly sales data across stores and departments

- Evaluated the impact of Markdown campaigns and external factors like fuel prices

- Forecasted future sales trends using Prophet

- Key goal: Inform data-driven promotional and inventory strategies

📈 Weekly Sales Trends (2010–2012)

- Consistent seasonal spikes observed around November–December, likely driven by Black Friday and Christmas promotions.

- Sales generally range between $4M and $8M, with significant surges during the holiday season.

- Indicates strong holiday dependence in Walmart's revenue streams.

📊 Weekly Sales Over Time
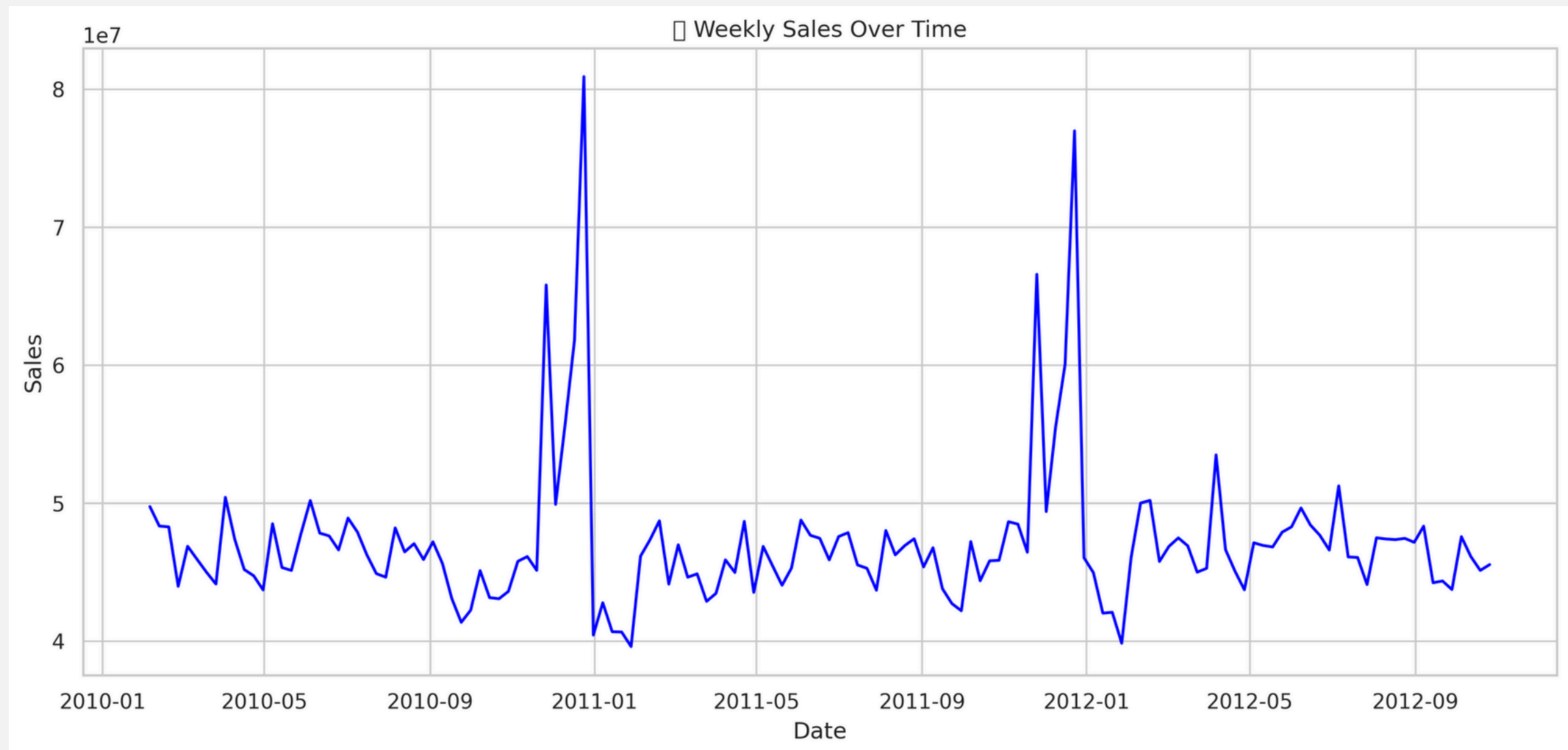
🏬 Total Sales by Store Type

- Store Type A contributes the highest total sales
- Type B and C significantly trail behind in performance
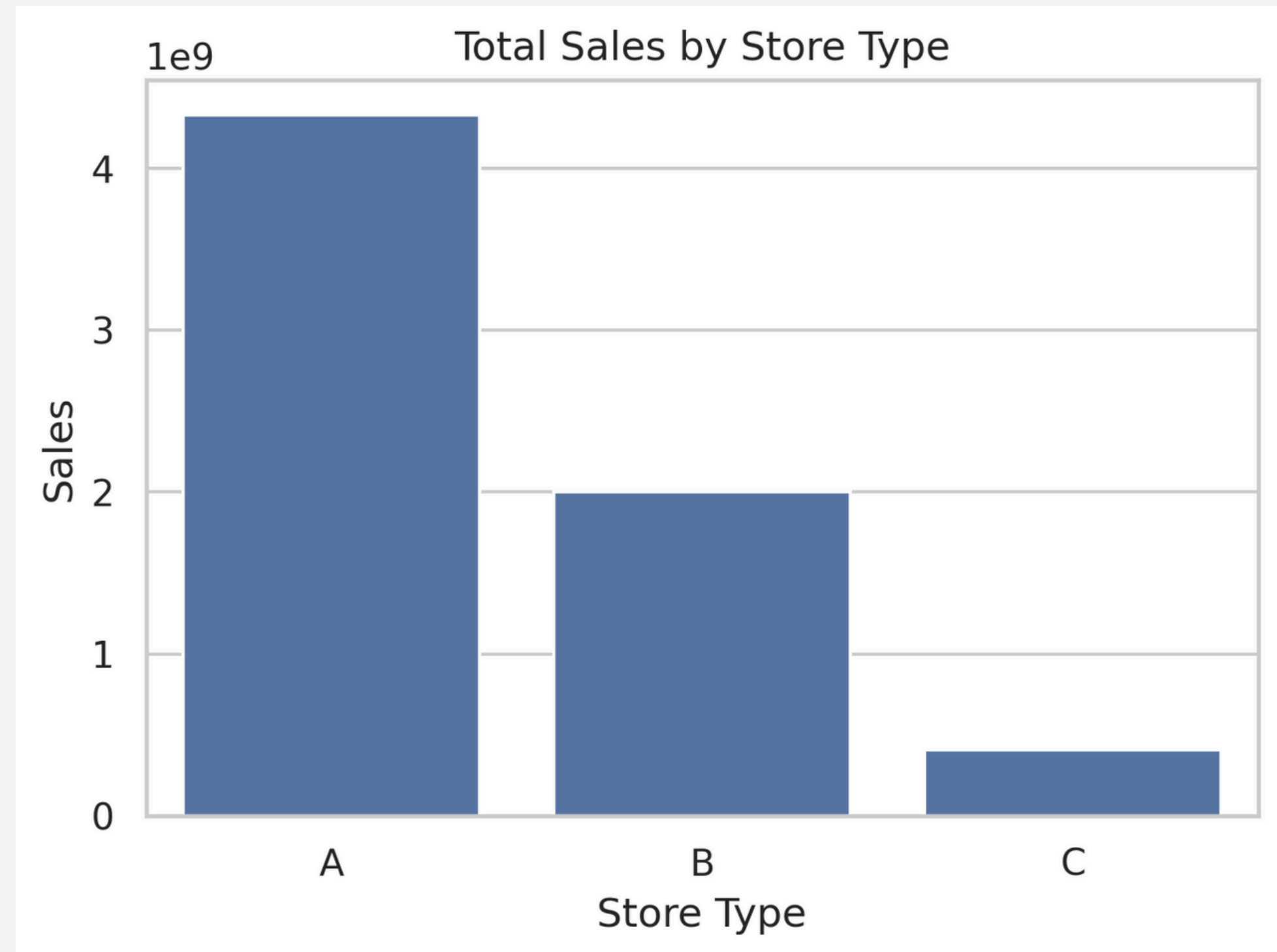
# 🛒 Total Sales by Department

- Department 92 stands out as the top revenue generator, significantly outperforming all other departments.

- Other strong performers include Departments 38, 40, and 72, each contributing over $300 million in total sales.

- Departments 1 to 13 also show consistent mid-to-high performance, likely comprising core retail categories.

- Smaller departments (e.g., 31, 45, 59, etc.) have relatively low sales, possibly indicating niche categories or underperformance.


Total Sales by Department
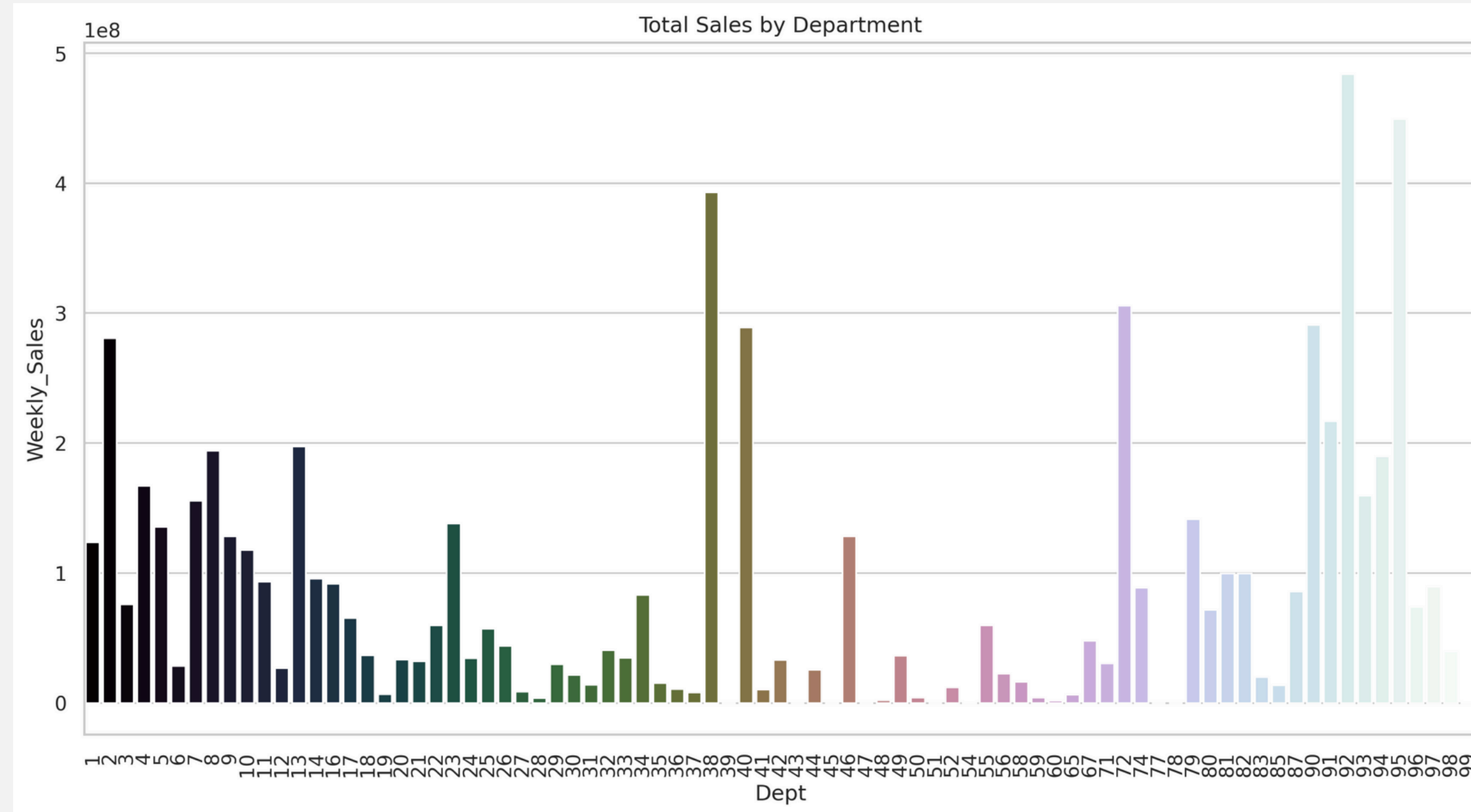
🏪 Total Sales by Store

- Top-performing stores include Store 5, Store 13, and Store 20 , each generating over $300M in total sales.

- There is a wide performance gap across stores, indicating varied store sizes, demographics, or management efficiency.

- Several stores such as Store 6, Store 33, and Store 45 show significantly lower sales, suggesting potential for growth interventions.

- Mid-range stores (Stores 18–30) generally show stable sales but are not scaling as high as the top tier.
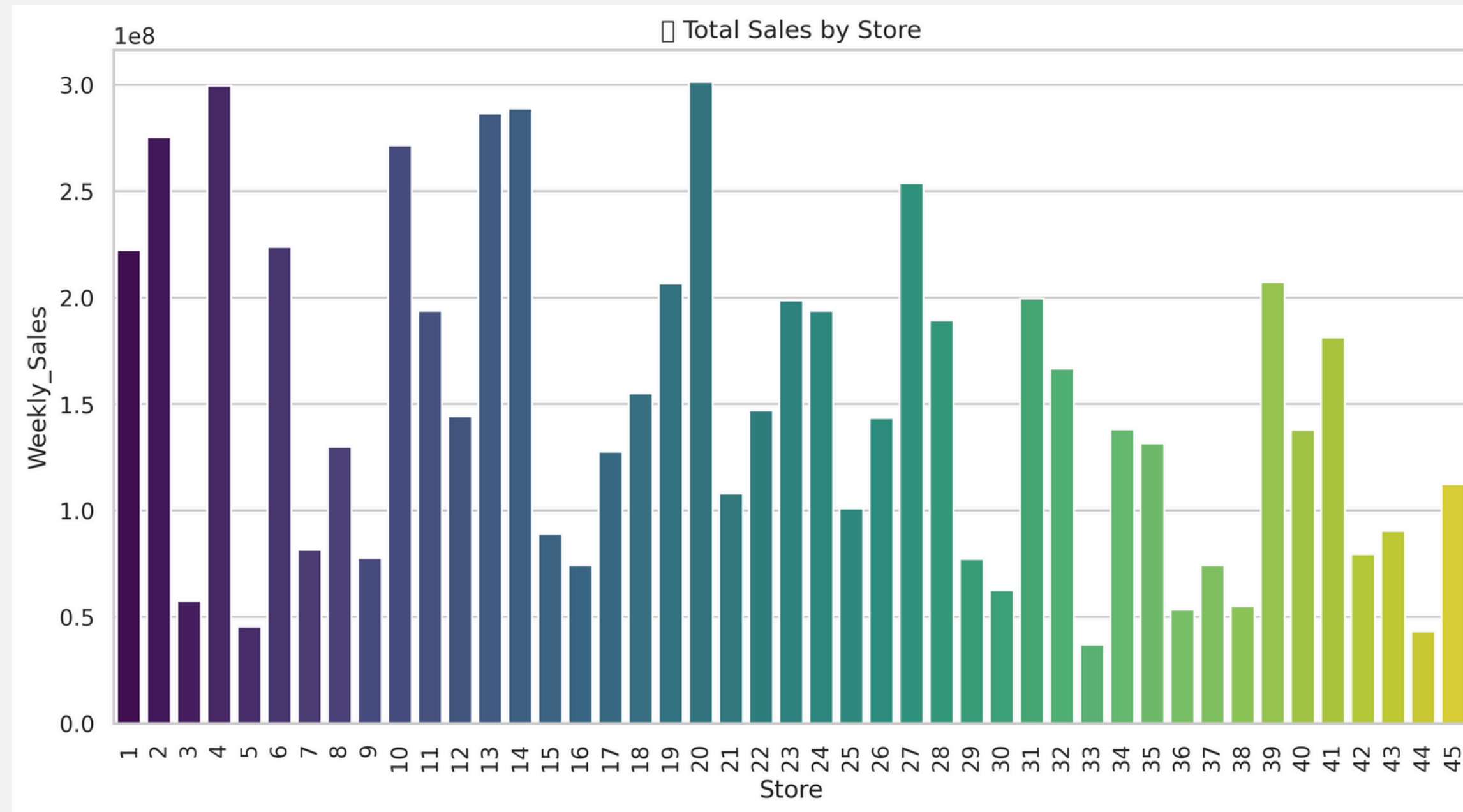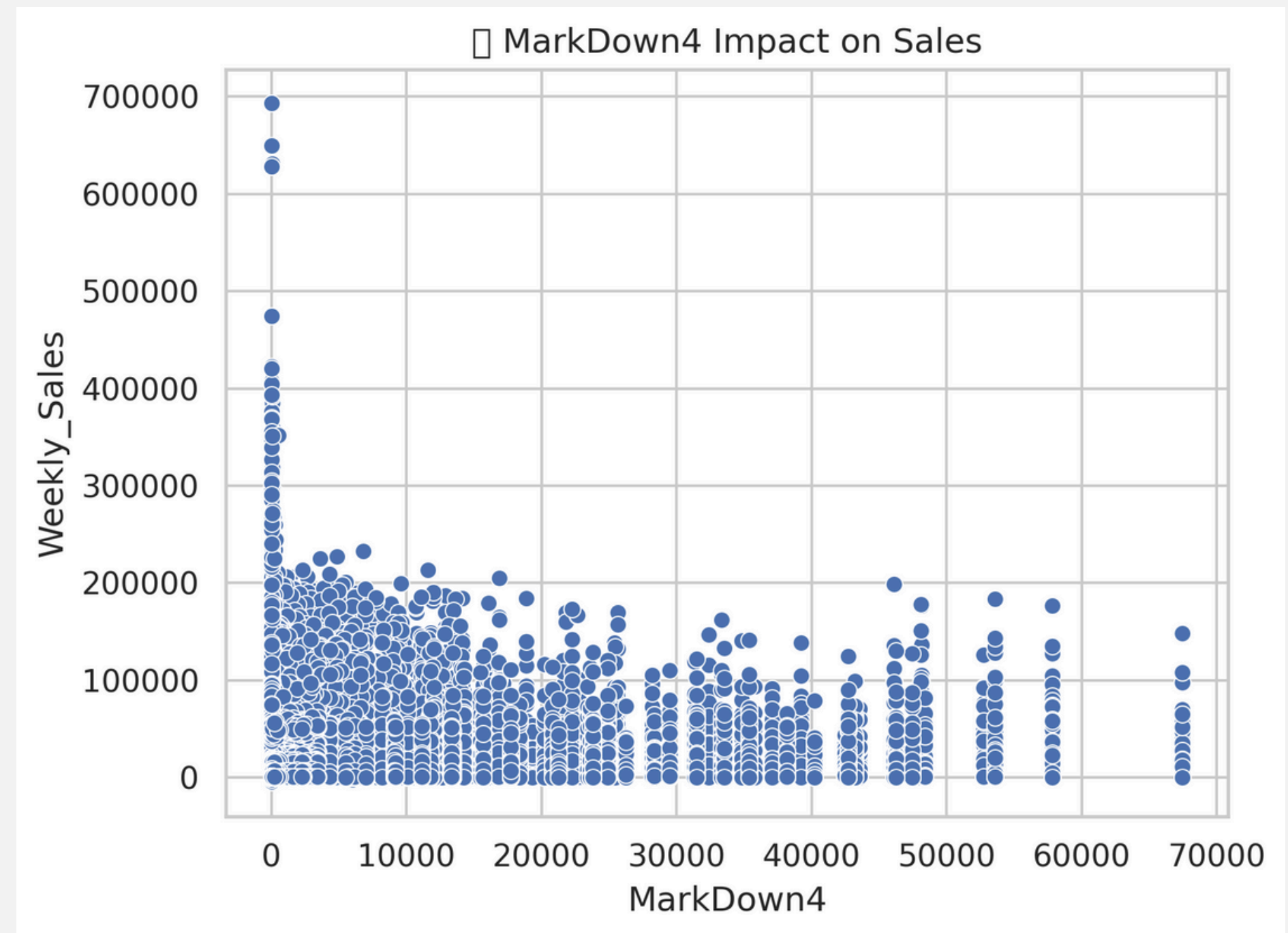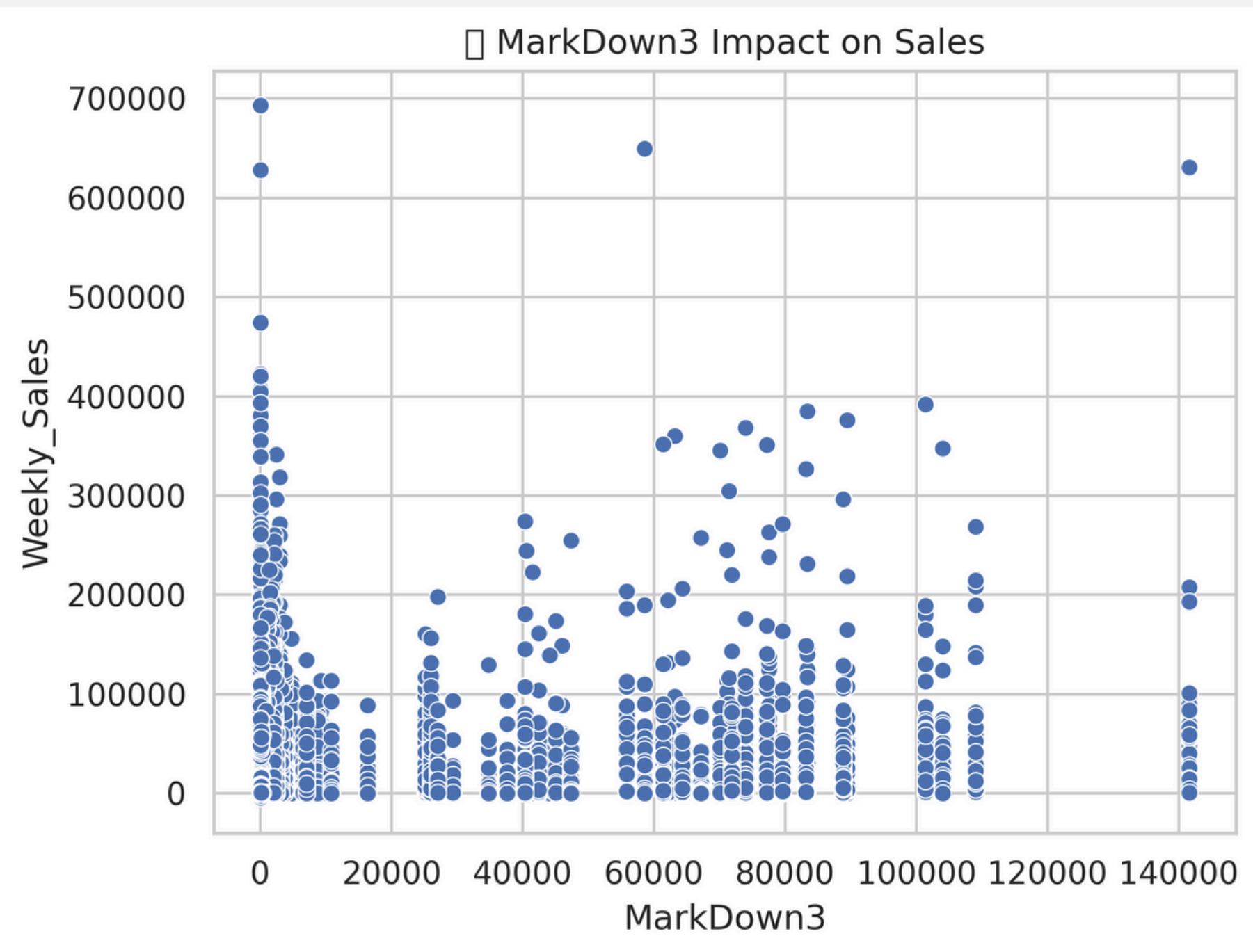
MarkDown2, 3 & 4 Impact on Sales

- MarkDown1 shows the most frequent usage and moderate positive effect on sales, especially at lower discount levels.
- MarkDown2 to MarkDown4 display scattered and inconsistent relationships with sales, indicating weaker impact.
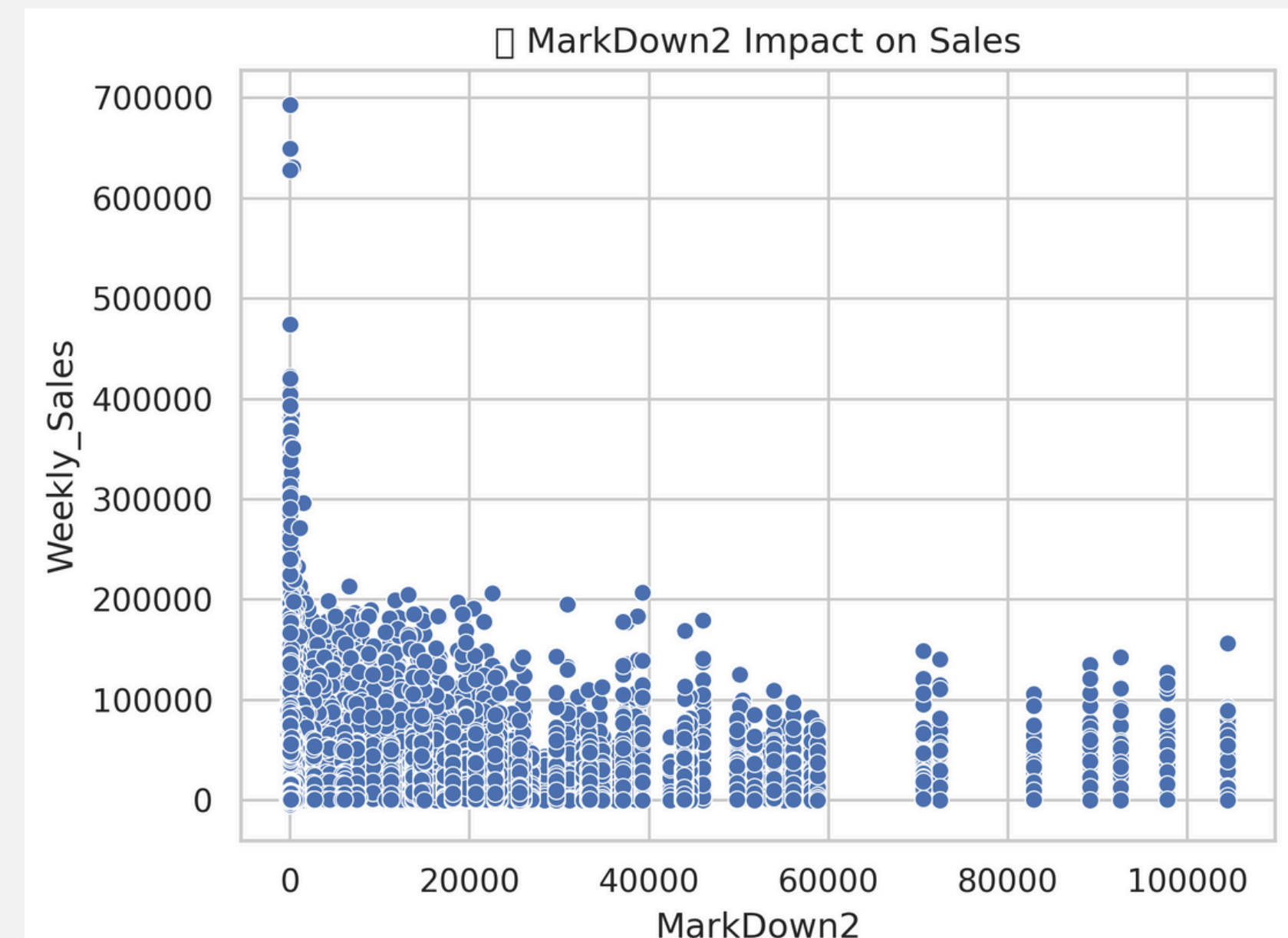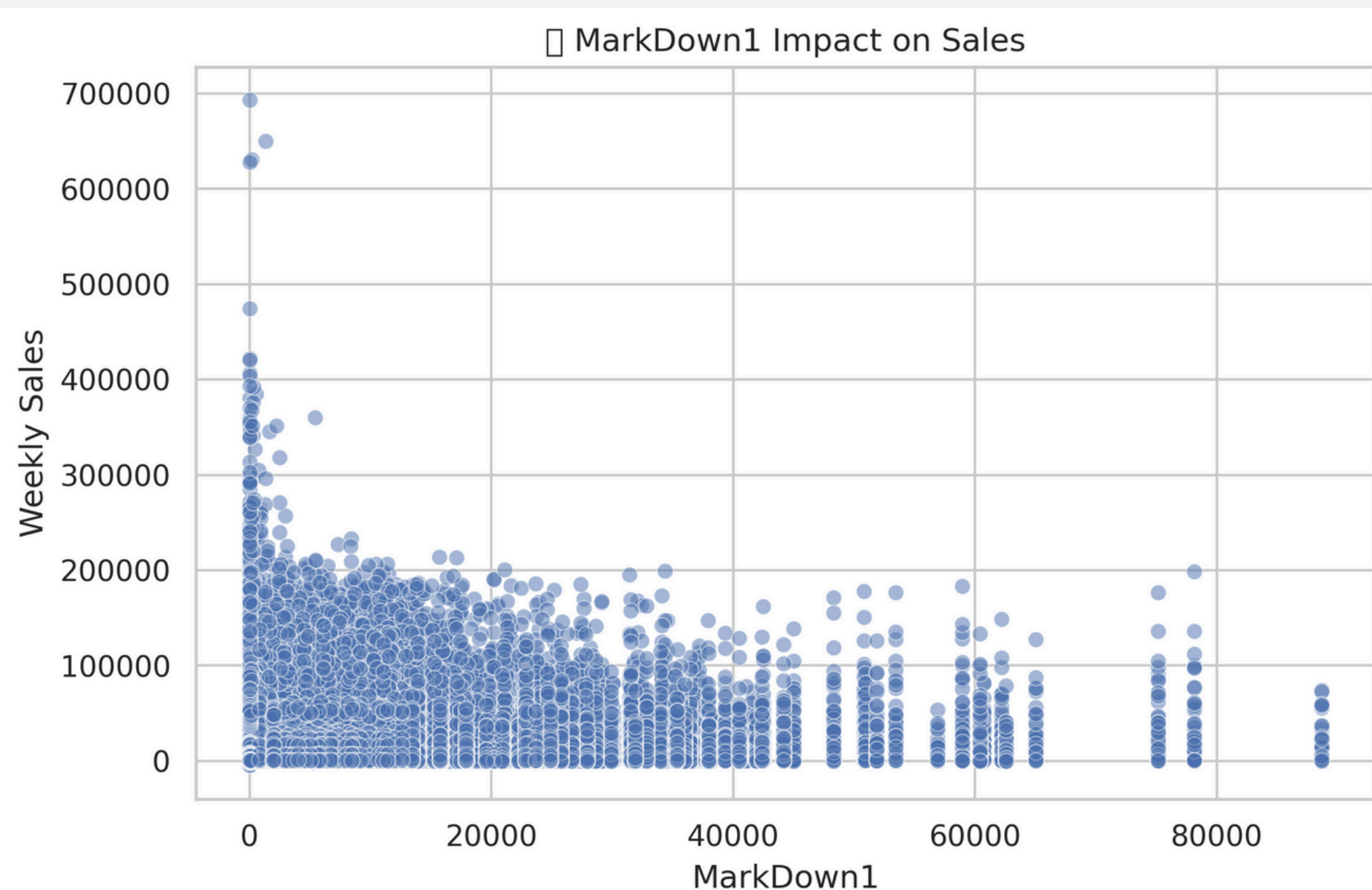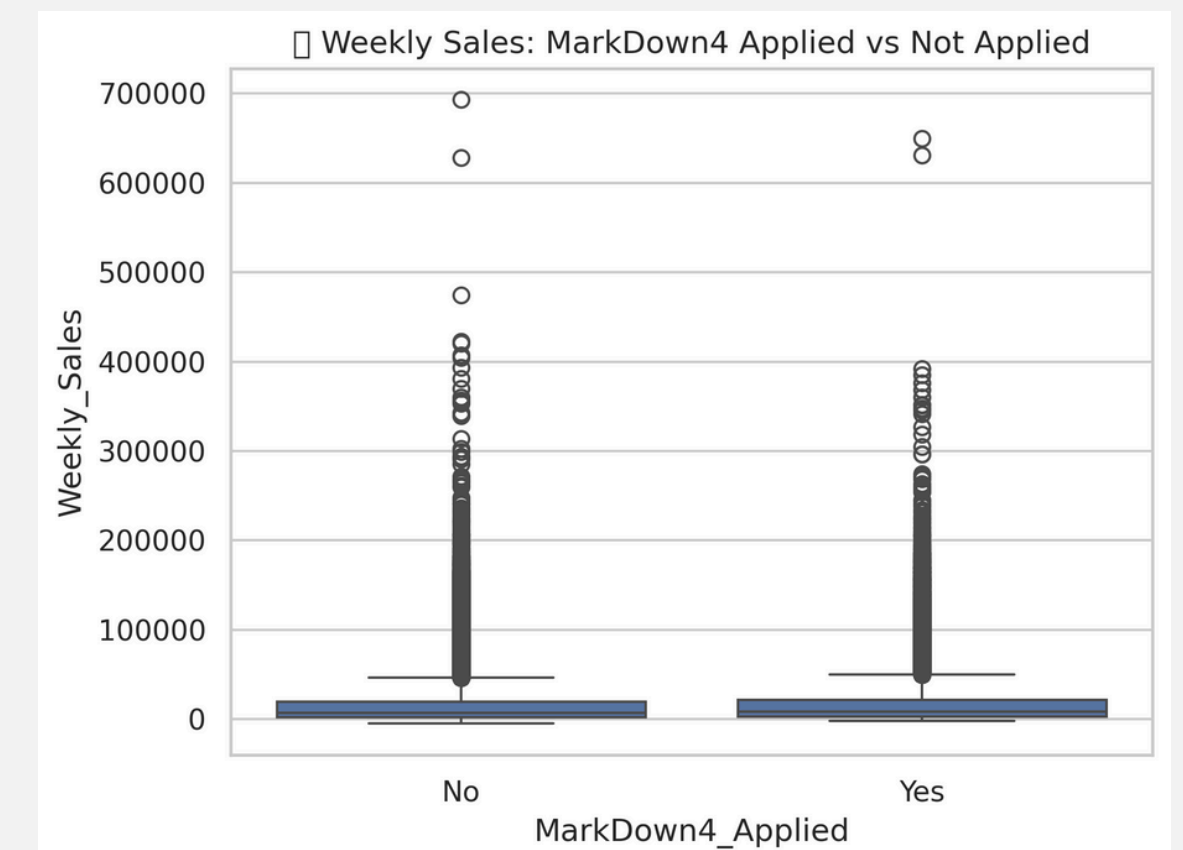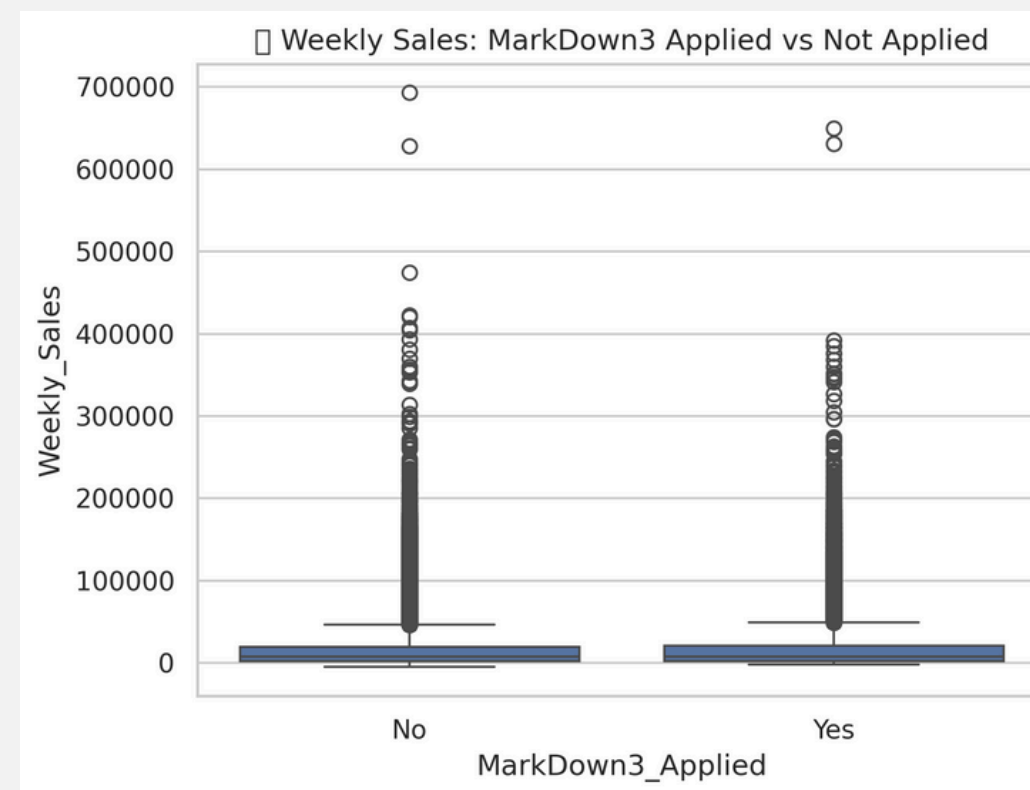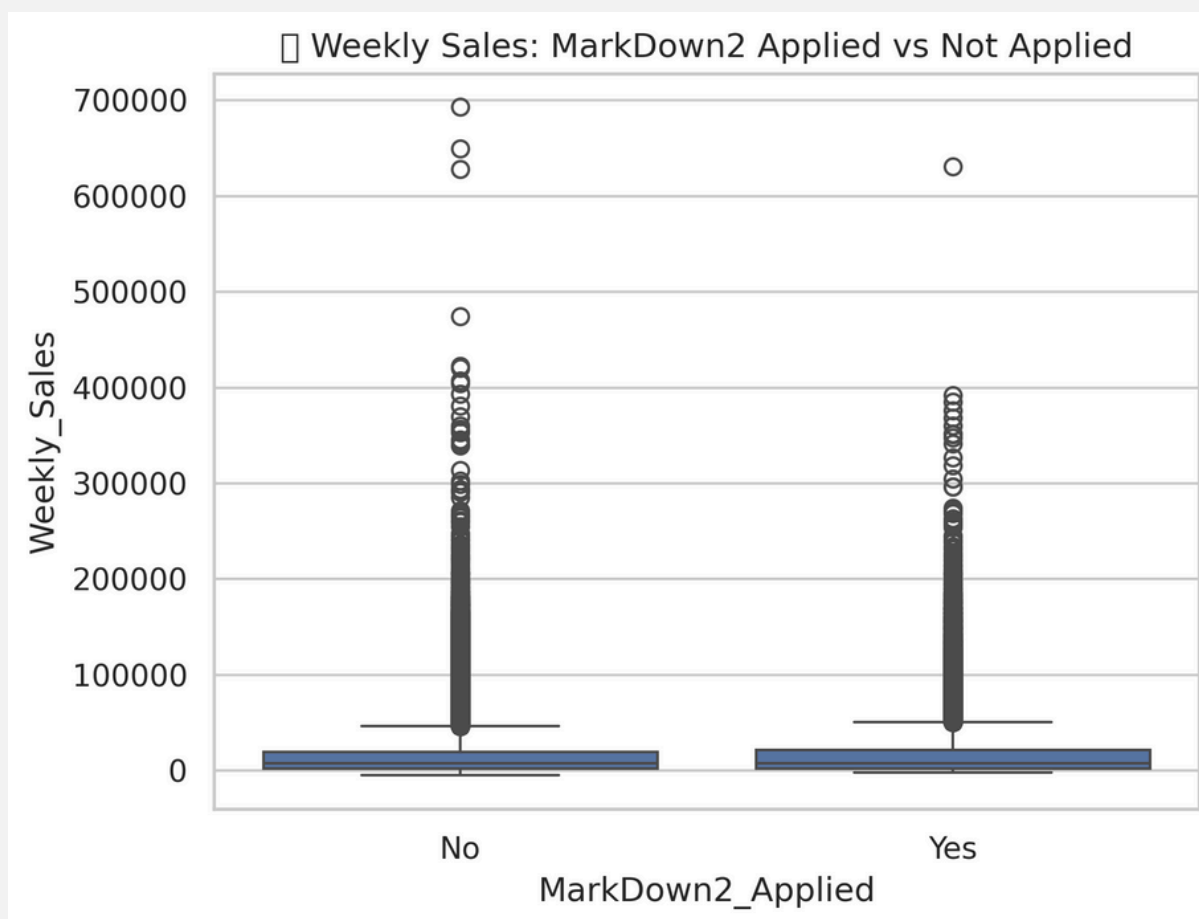
MarkDown2, 3 & 4 Impact on Sales

No visible correlation; effect is inconsistent.

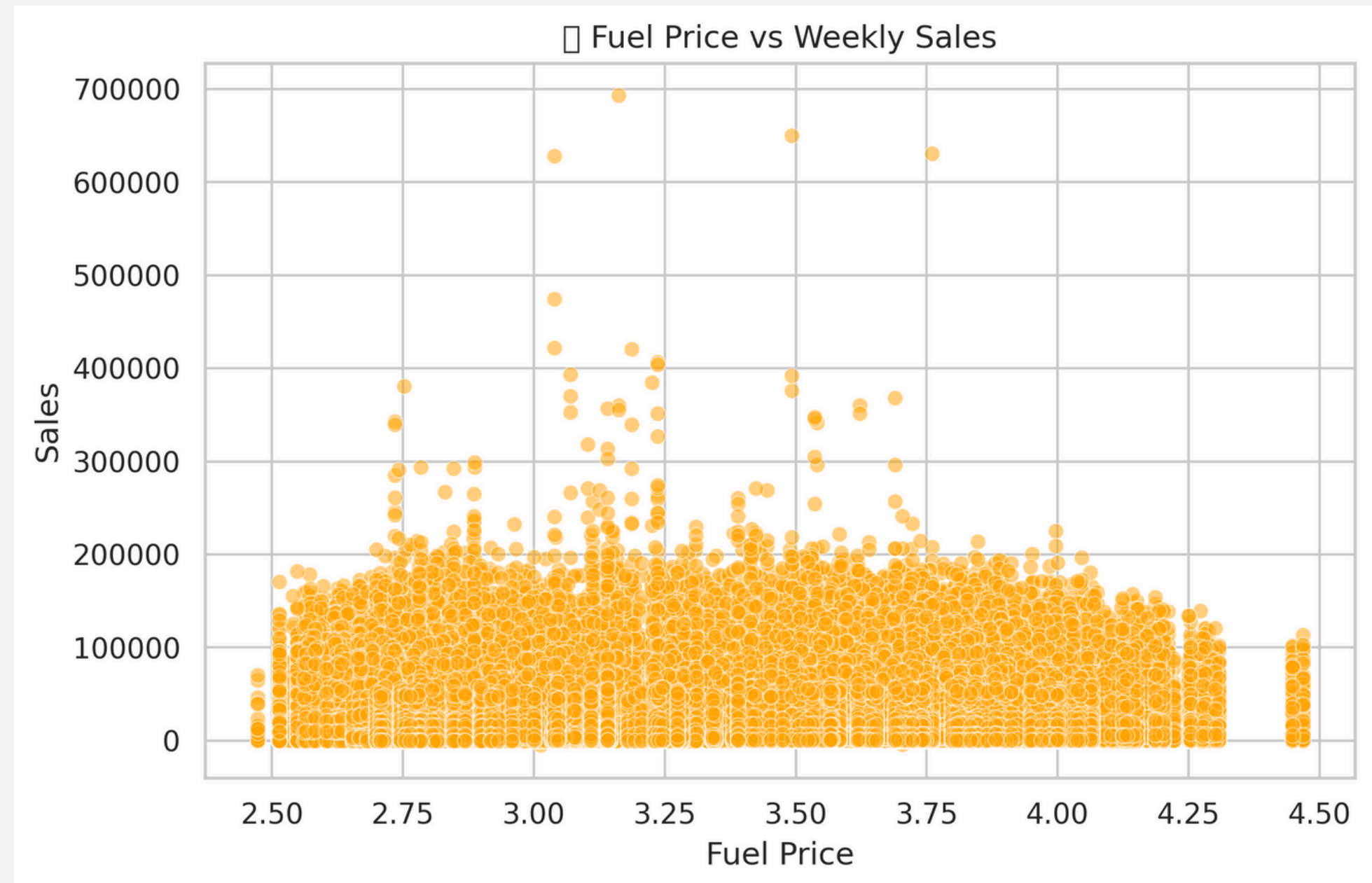# 📊 Sales Comparison: Markdown vs No Markdown

- Median sales remain similar regardless of Markdown presence
- High sales outliers occur even without markdowns

⛽ Fuel Price vs Weekly Sales

- No strong trend or correlation identified
- Minor dispersion in sales regardless of fuel price range

# 📊 Seasonality and Trend Analysis

- Trend line shows a slight upward growth until mid-2012, with a dip afterward.

- Seasonality spikes clearly align with holiday periods confirming recurring year-end sales booms.

- Residuals highlight weekly anomalies that could stem from local events or markdown campaigns.

- Reinforces Walmart's cyclical sales behavior, useful for inventory and staffing planning.
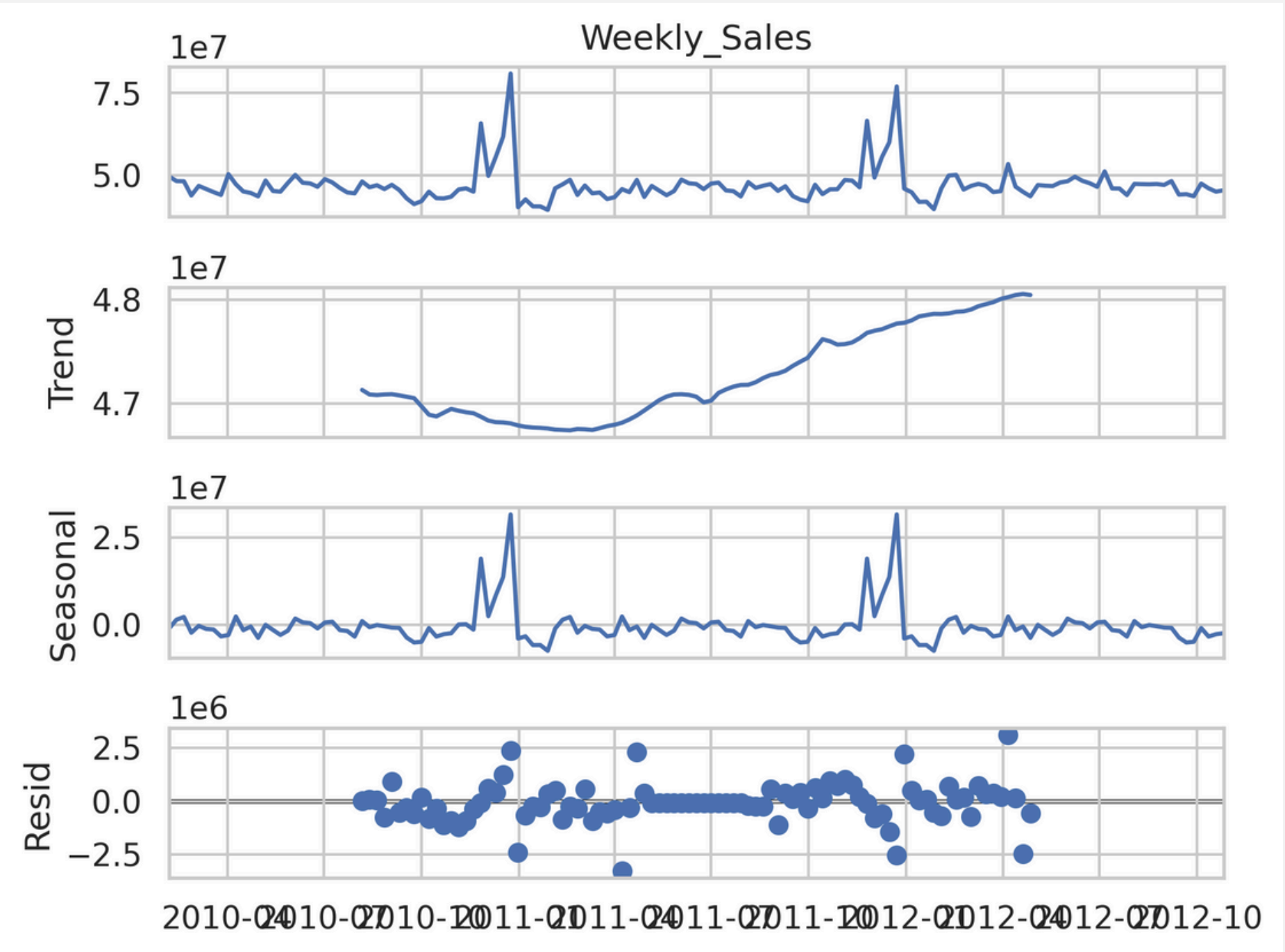
📅 Sales Forecast Using Prophet

- Forecast model captures holiday surges

- Confidence intervals widen in late 2012–2013

- Helps in preparing for seasonal peaks

Forecast: Weekly Sales
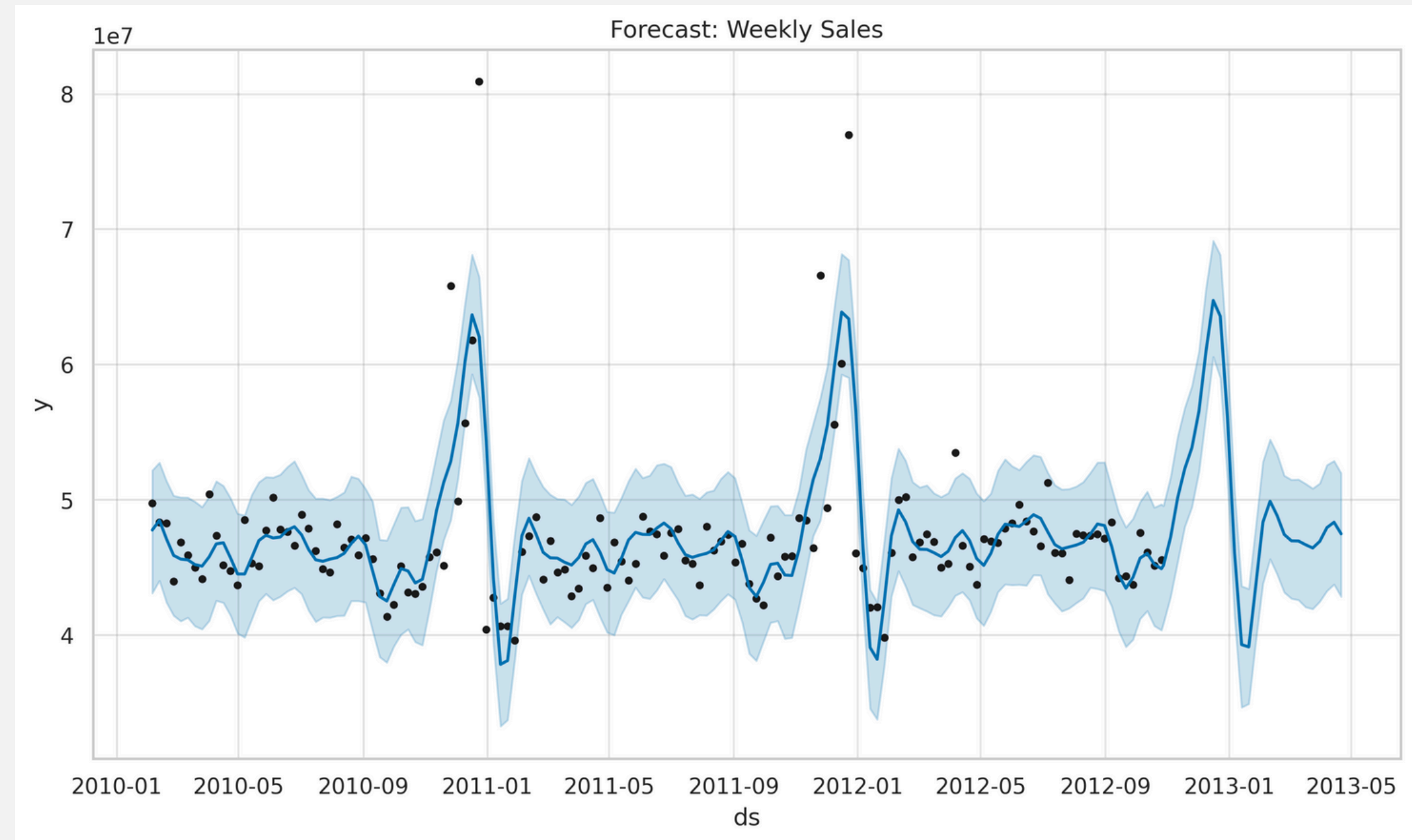
💡 Key Insights

- Seasonal peaks observed, especially around major holidays, indicate strong demand fluctuations.

- Markdown promotions show minimal and inconsistent impact on overall sales performance.

- Store Type A consistently outperforms others, contributing the highest share of total revenue.

- Fuel prices have negligible correlation with weekly sales trends.

- Sales forecasting unlocks foresight, enabling data-driven, proactive retail decisions.

📌 Recommendations

- Reallocate promotion budget from less impactful Markdown2–4 to higher-performing initiatives.

- Utilize sales forecasting to optimize staffing, inventory, and logistics during seasonal peaks.

- Conduct an In-depth analysis into Store Type A to identify scalable operational and sales best practices.

- Evaluate markdown impact at the department level for more targeted promotional effectiveness.

- Implement A/B testing to measure real-time ROI of discounts and promotional campaigns.

THANK YOU....