

Loblaw Data Science

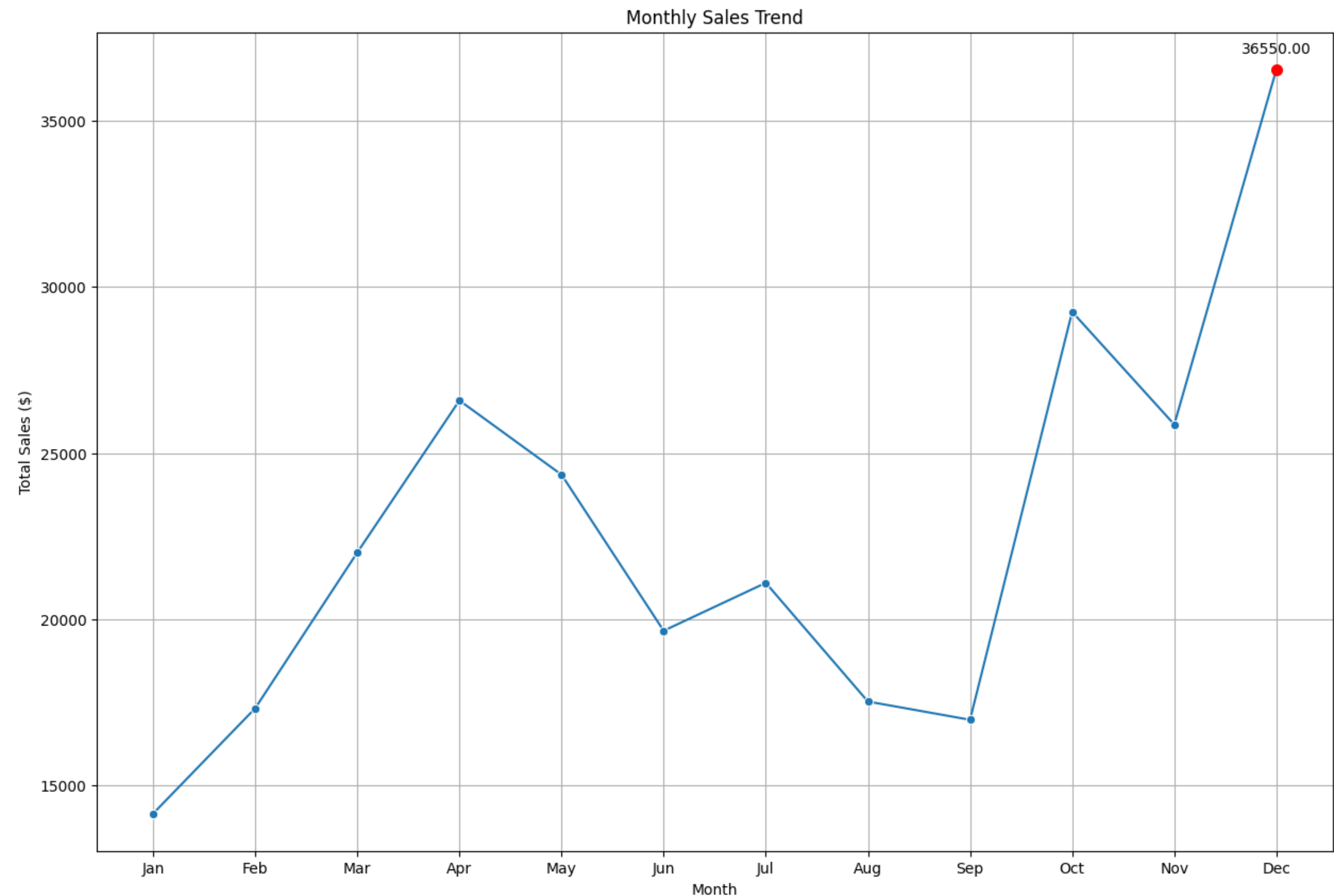
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Part A

Sales Trend Insights

Seasonal Sales Growth in December

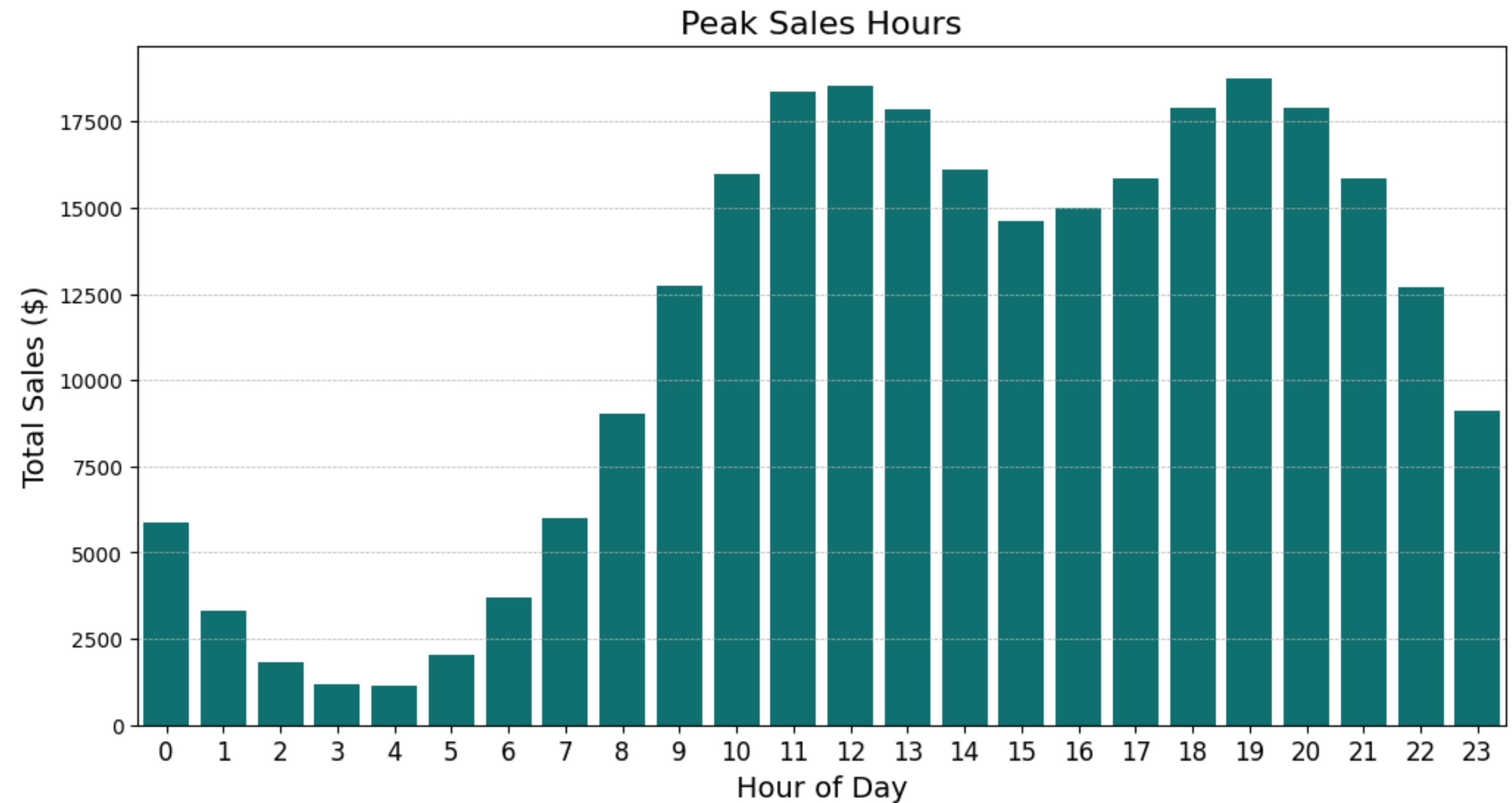
- Key Insights
 - December has the highest sales indicating seasonal trends (Likely due to the holiday season)
- Action Steps
 - Increase Inventory during Holiday Season
 - Offer holiday discounts and marketing campaigns



Peak Sales Hour

Optimal Sales Hour

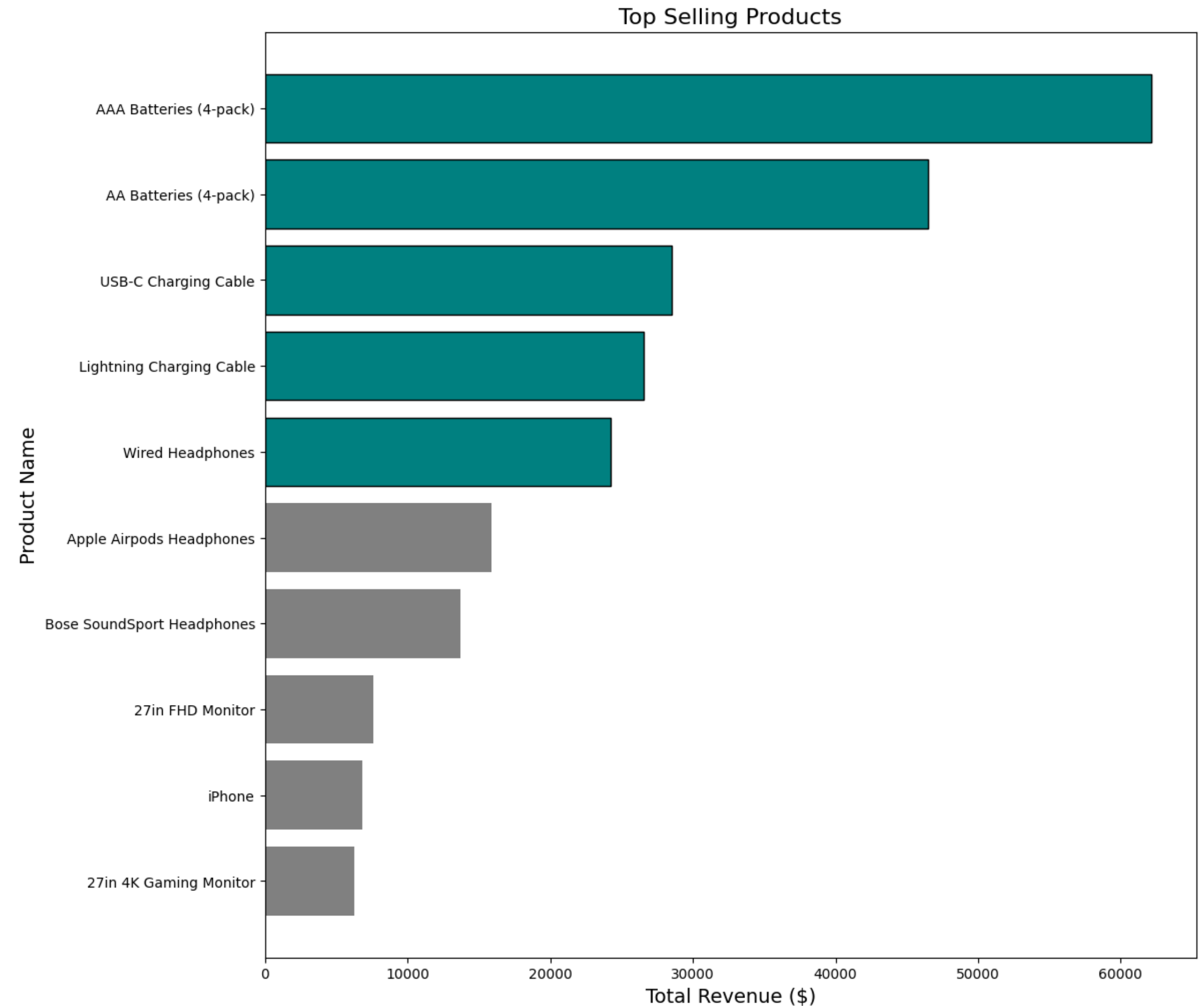
- Key Insights
 - Peak sales occurs between 11am - 1pm and 6 pm - 8 pm
 - Lowest sales in the morning
- Action Steps
 - Organize promotions during peak hours
 - Staffing changes during peak sales



Best Selling Products

Maximizing Revenue with Popular Products

- Key Insights
 - Batteries are the best selling products
 - Top 10 items are from electronics department
- Action Steps
 - Offer bundle offers
 - Optimize product placement for impulsive buying



Top 5 Sales Quantity Prediction Model

Created 5 models for sales prediction of the top 5 selling products in dollar value

- Key Findings
 - Random Forest algorithm provides robust performance across top 5 products, with low MAE and RMSE.
 - Calculated time-based features (day, month, week, day-of-week, weekend indicator) combined with lag and rolling features to capture trends.
- Actionable Insight
 - Sales prediction model to optimize inventory level
 - Identify seasonal trends to adjust marketing campaigns.

Part B

Identifying Risk Factors for Diabetes

Analysis 1: Identifying Risk Factors for Diabetes

- Chi-square test for categorical variables:
 - All tested factors (e.g., HighBP, HighChol) are significantly associated with diabetes.
- T-test for continuous variables:
 - BMI, and Age, and Income show strong significant differences between diabetics and non-diabetics.
- Conclusion:
 - Several lifestyle and health factors contribute to diabetes risk.

Does Higher BMI Increase Diabetes Risk?

Analysis 2: Does Higher BMI Increase Diabetes Risk?

- Independent t-test:
 - BMI is significantly higher in diabetics compared to non-diabetics
- Effect size:
 - Indicates a moderate association between BMI and diabetes.
- Conclusion:
 - Individuals with higher BMI are more likely to develop diabetes.

BMI & Diabetes After Adjusting for Lifestyle Factors

Analysis 3: BMI & Diabetes After Adjusting for Lifestyle Factors

- Two-Way ANOVA:
 - BMI remains a major factor for diabetes, even after a control on Smoking & Physical Activity
- Stratified T-tests:
 - BMI has highest impact on diabetes risk in all groups
- Conclusion:
 - BMI affects diabetes risk, even when taking into account for lifestyle choices.