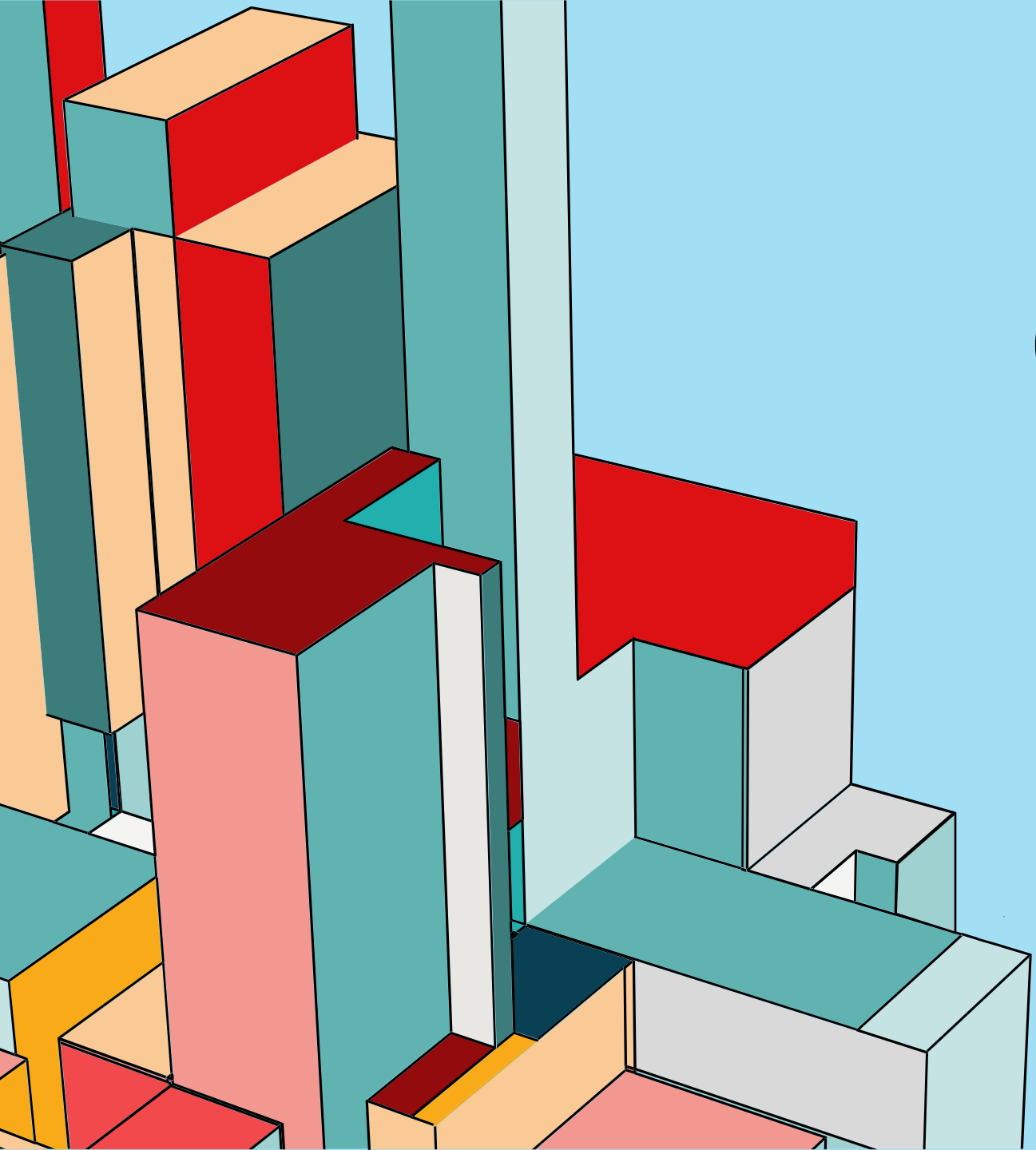


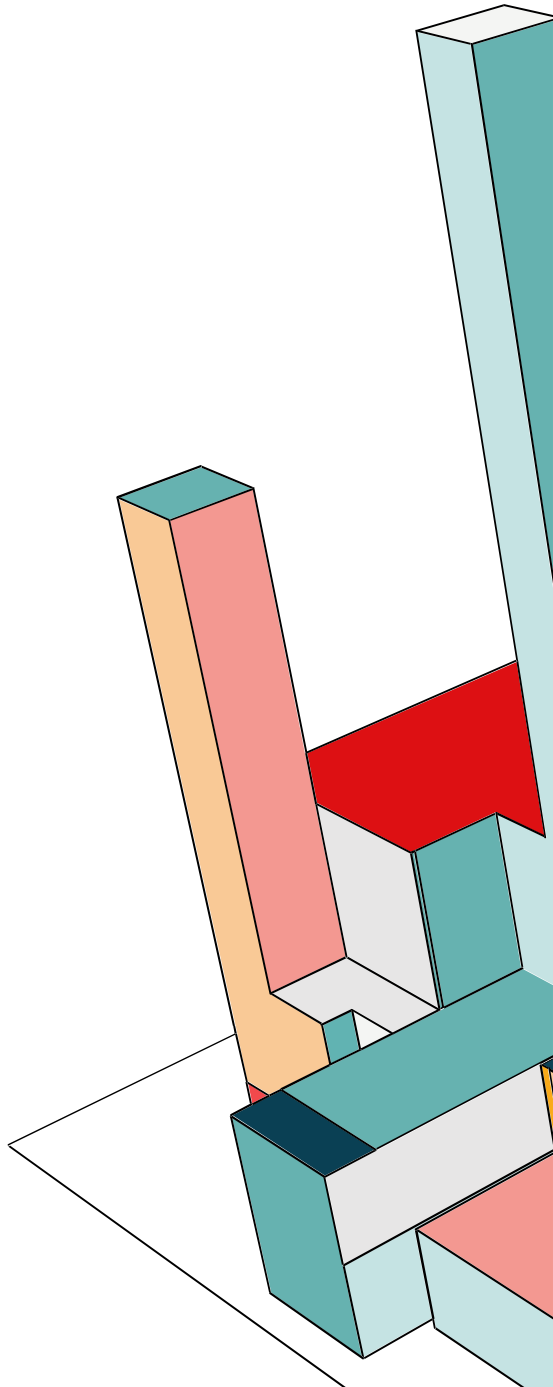
E-COMMERCE PRICE OPTIMIZATION

by Diptyajit Das

HOW MUCH IS MORE?

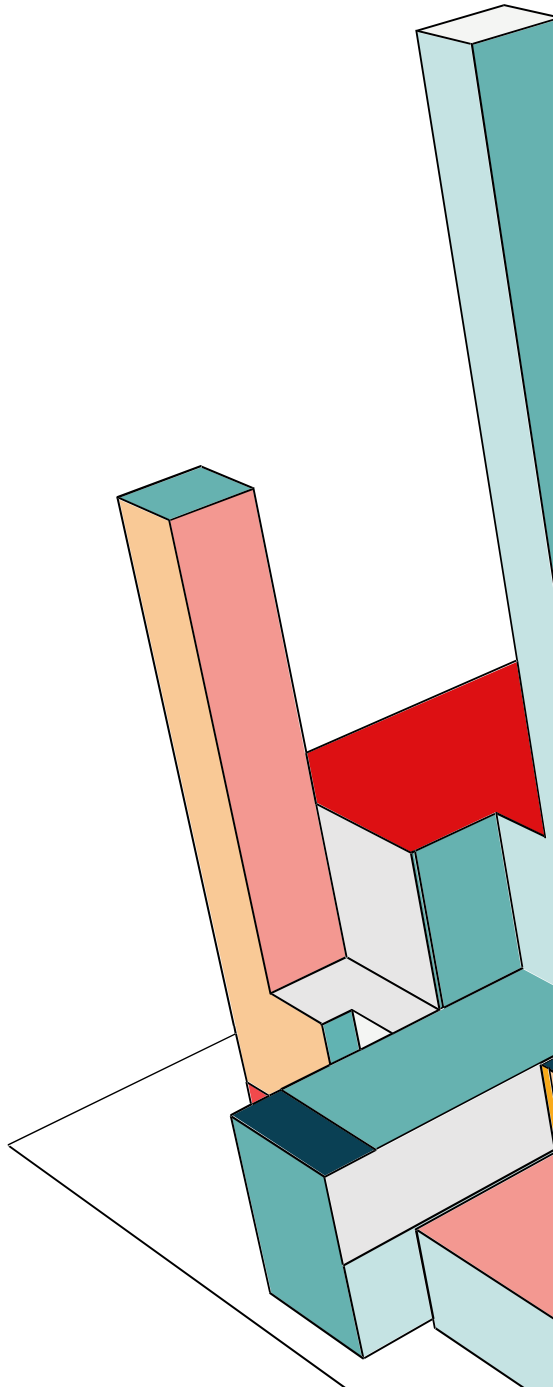
AGENDA

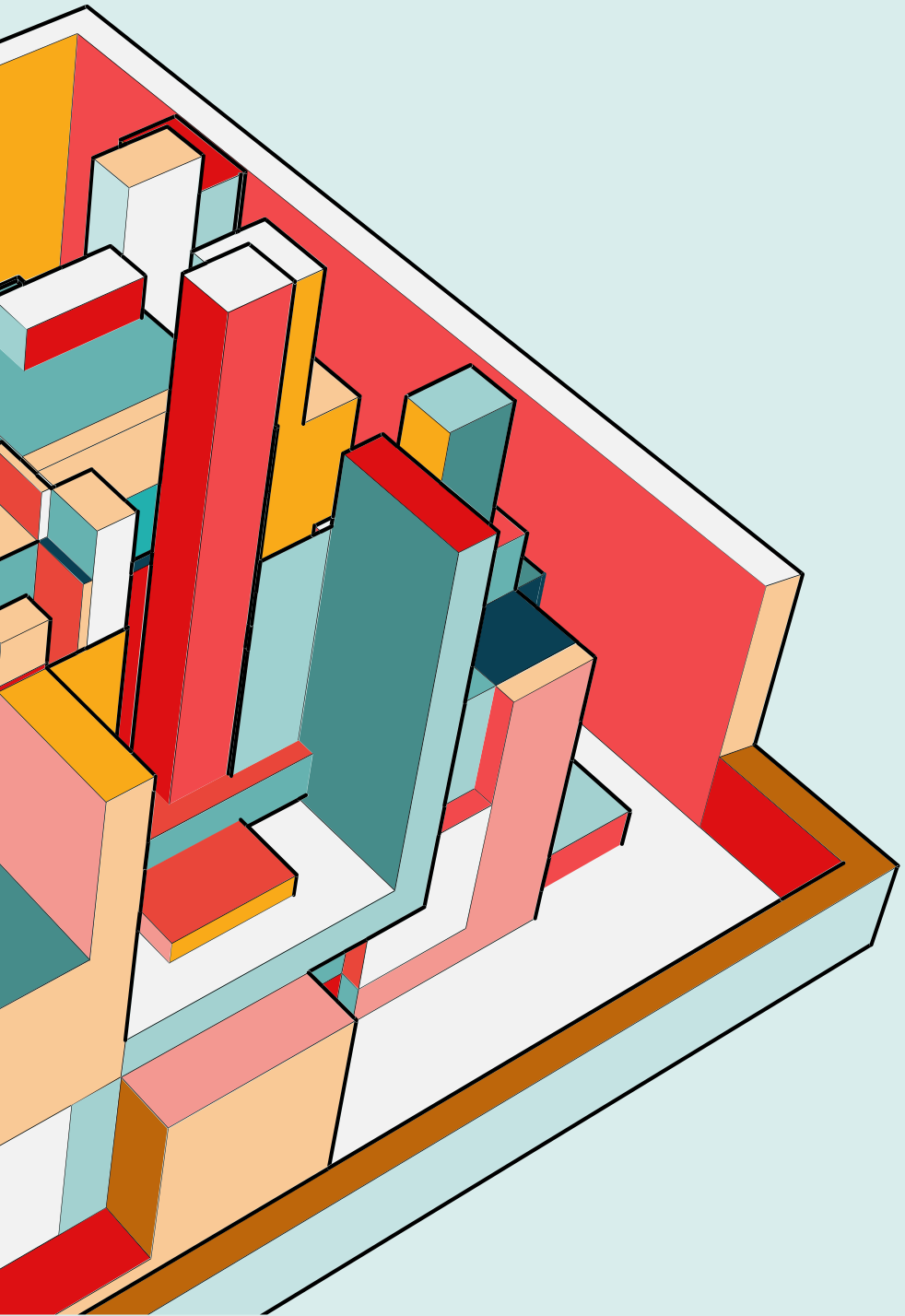
- Introduction
- Exploratory Data Analysis
- Machine Learning
- Recommendations



INTRODUCTION

- **Price optimization** aims to find the ideal balance between pricing and customer demand to maximize revenue and sales volume.
- This approach leverages data-driven strategies to set competitive prices that attract customers while ensuring profitability.
- The goal is to enhance sales and customer satisfaction through smart, balanced pricing techniques, supported by **EDA, time series analysis, and ML regression models**.





EXPLORATORY DATA ANALYSIS

KEY FINDINGS

Correlations:

- Positive: freight_price & weight, total_price & quantity

- Negative: weekday & weekend counts

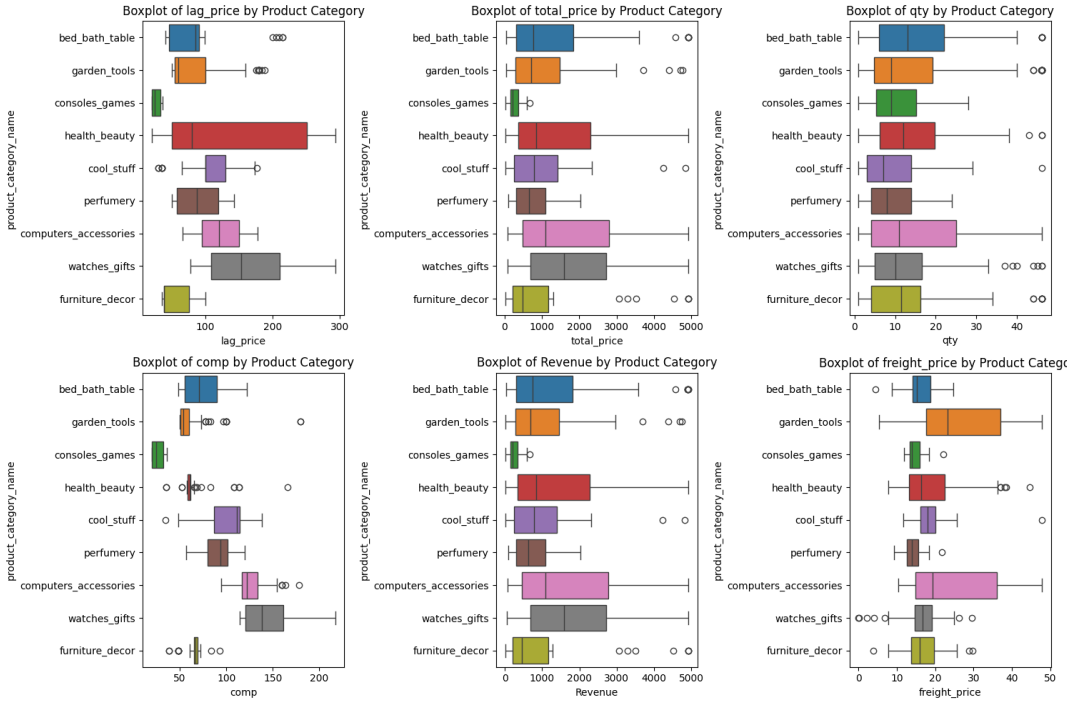
Popular categories and products[Revenue wise]:

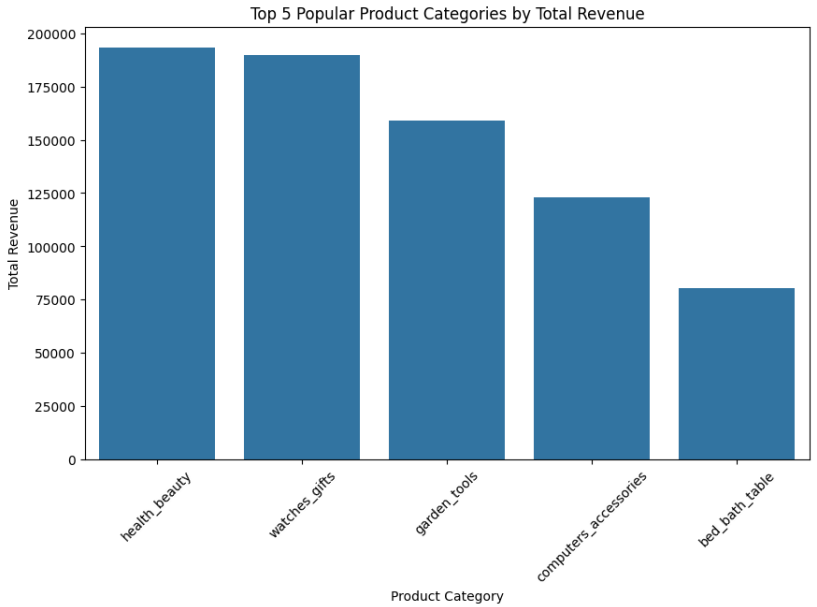
- **health_beauty**, **watches_gifts**, **garden_tools**, **`computer_accessories`**.

- Popular products: **health5**, **health2**, **bed2**, **health7**

Revenue peak in November 2017.

unit_price higher than competitor prices.





KEY FINDINGS

Stable Metrics:

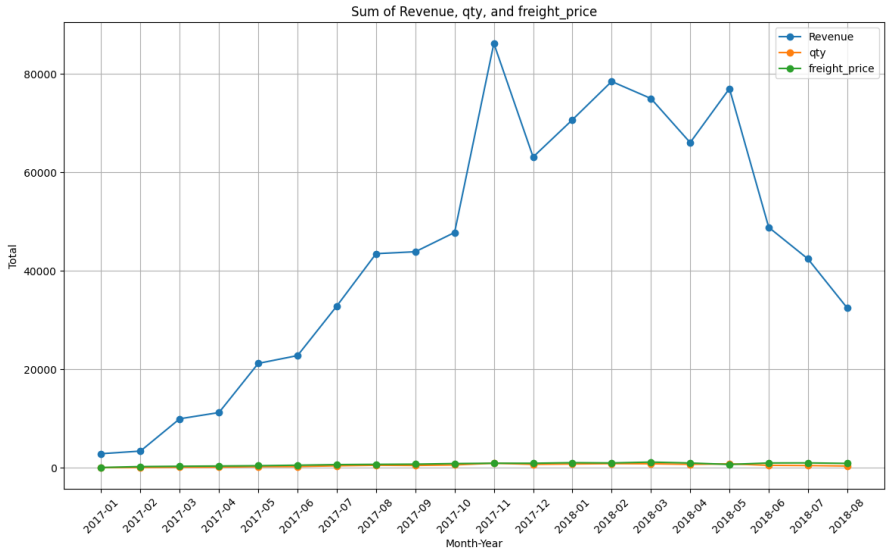
- freight_price and qty consistent over time.

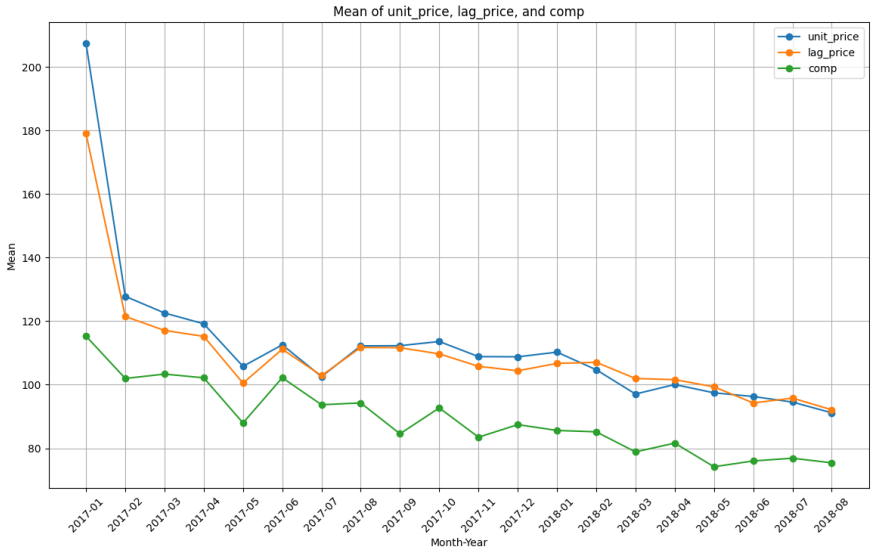
Mean Comparisons:

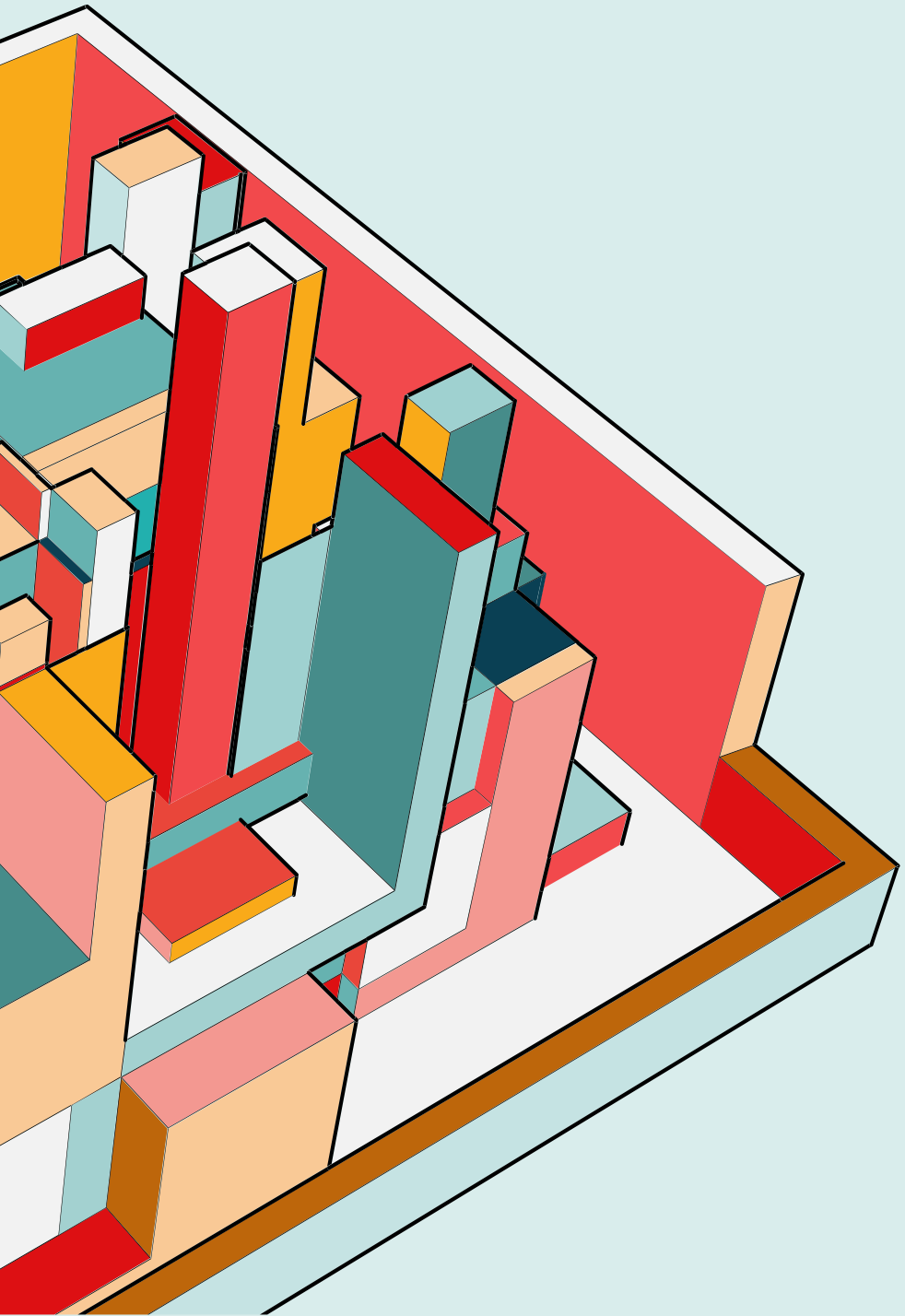
- No significant differences in weekday, weekend, and holiday counts.

Price Strategy:

- unit_price close to lag_price, potential for pricing adjustments.







MACHINE LEARNING

MODEL INSIGHTS & PERFORMANCE

Models Used:

- xgboost Regression models for predicting total_price, qty, and unit_price.

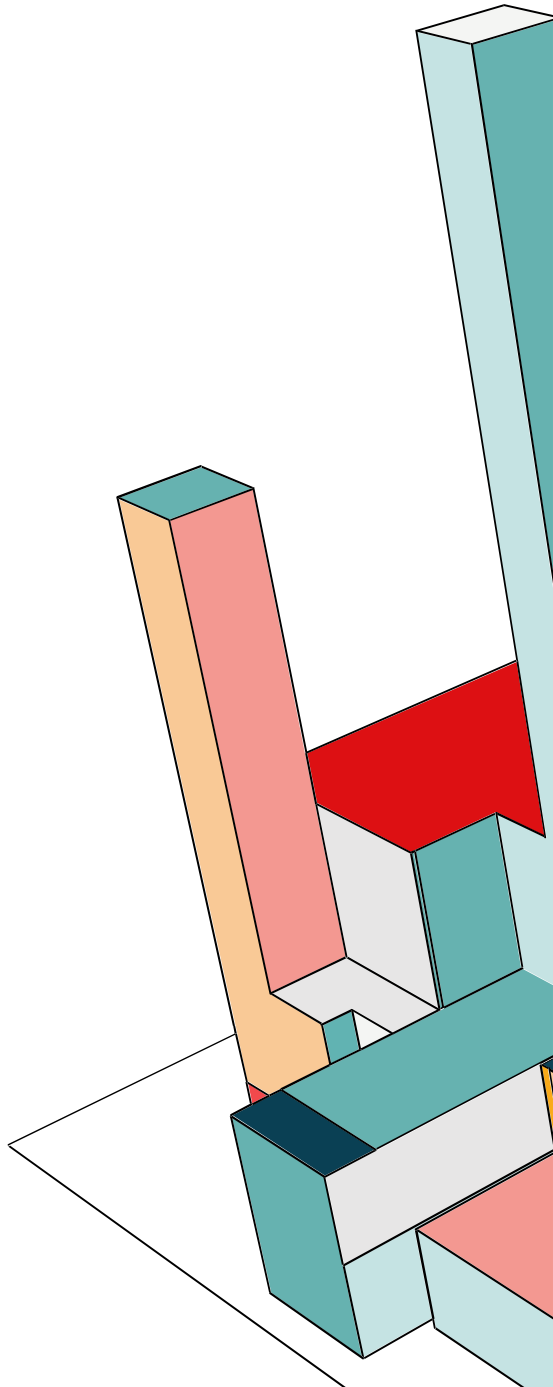
- Prophet library utilized to predict metrics product, category level.

Performance Metrics:

- Quantity: R^2 = 0.89, RMSE = 3.85

- Total Price: R^2 = 0.998, RMSE = 63.98

- Unit Price: R^2 = 0.84, RMSE = 28.01



RECOMMENDATIONS

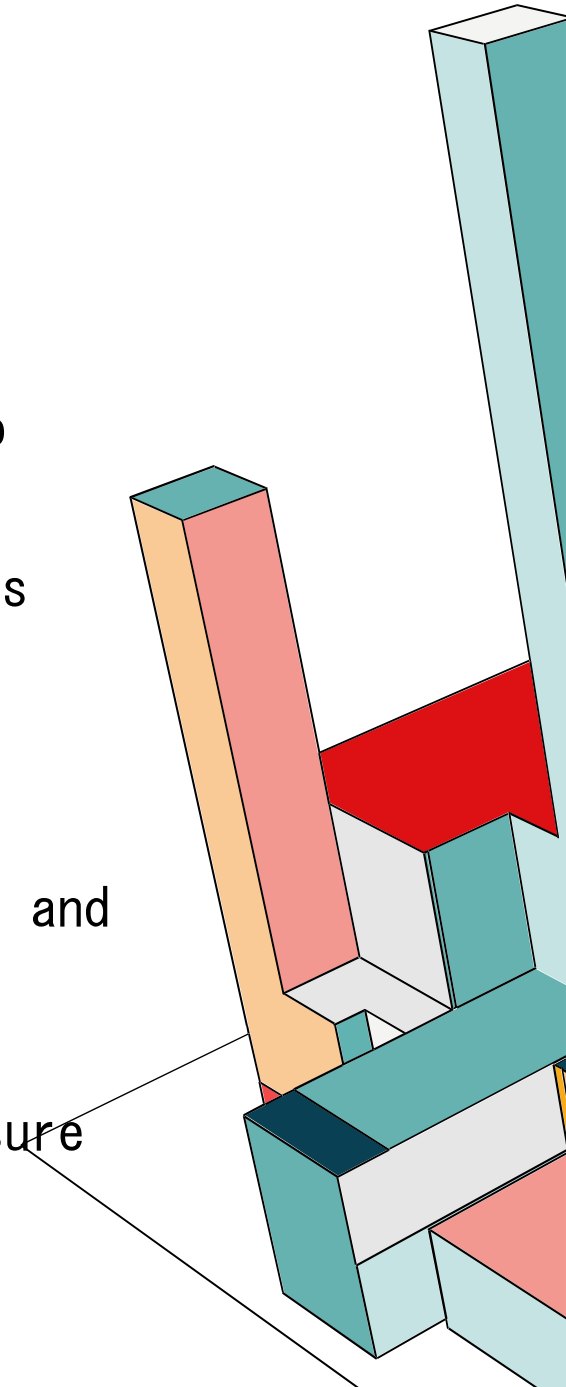
1. **Implement targeted discount strategies** : for popular products to attract more customers and increase revenue.

2. **Focus marketing efforts** : on high-revenue categories and products (e.g., `health_beauty` and products like `health5`).

3. **Monitor competitive pricing** and adjust `unit_price` to stay competitive while maintaining profitability.

4. **Leverage the predictive models** to forecast `total_price`, `qty`, and `unit_price` for various scenarios to plan pricing and inventory effectively.

5. **Continue evaluating and refining** models against baselines to ensure sustained accuracy and performance.



THANK YOU

NOTEBOOK

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