Guided Capstone Project Report by Victoria Brigola

Introduction

Big Mountain Resort aims to refine its ticket pricing strategy to enhance revenue while maintaining a competitive edge. The current ticket price of $81 appears lower than comparable resorts, suggesting an opportunity for optimization. This project evaluates resort data, identifies key pricing influences, and proposes an optimal ticket price that aligns with market standards and the resort's long-term objectives.

Problem Analysis

The objective was to develop a pricing strategy that accurately reflects the resort's value while considering potential enhancements. Examples of optional enhancements include improved snowmaking capabilities, additional amenities, or infrastructure upgrades. The goal was to determine an optimal price point that balances revenue growth with maintaining strong customer demand while covering potential operational costs.

Data Preparation

To ensure data reliability and accuracy, the following preprocessing steps were applied:

- **Handling Missing Values**: Missing data points were resolved through mean imputation for numerical variables, ensuring dataset completeness.
- **Standardizing Formats**: Data consistency was achieved by normalizing categorical and numerical data fields.
- **Integrating Multiple Sources**: Key attributes such as resort features, ticket pricing, and operational details were merged to establish a comprehensive dataset.

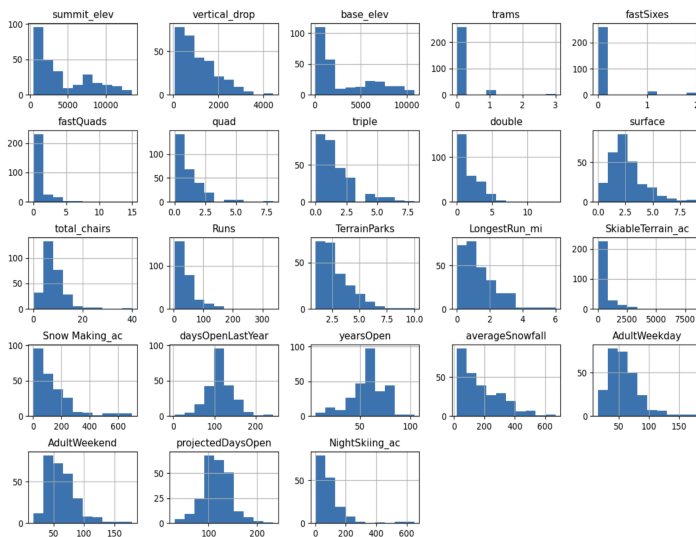The refined data provided a robust foundation for subsequent analyses (See Figures 1).

Figure 1: Data Cleaning Overview

Exploratory Data Analysis (EDA)

An exploratory analysis was conducted to identify key trends impacting pricing:

- **Current Pricing vs. Market Standards**: At **$81**, Big Mountain Resort's ticket pricing is below comparable resorts, suggesting potential for an increase.
- **Seasonal Pricing Trends**: Adjustments during peak seasons could maximize revenue without reducing visitor numbers.
- **Facility Attributes and Pricing Influence**: Factors such as vertical drop, number of runs, and snowmaking capabilities significantly impact pricing potential (See Figure 2).
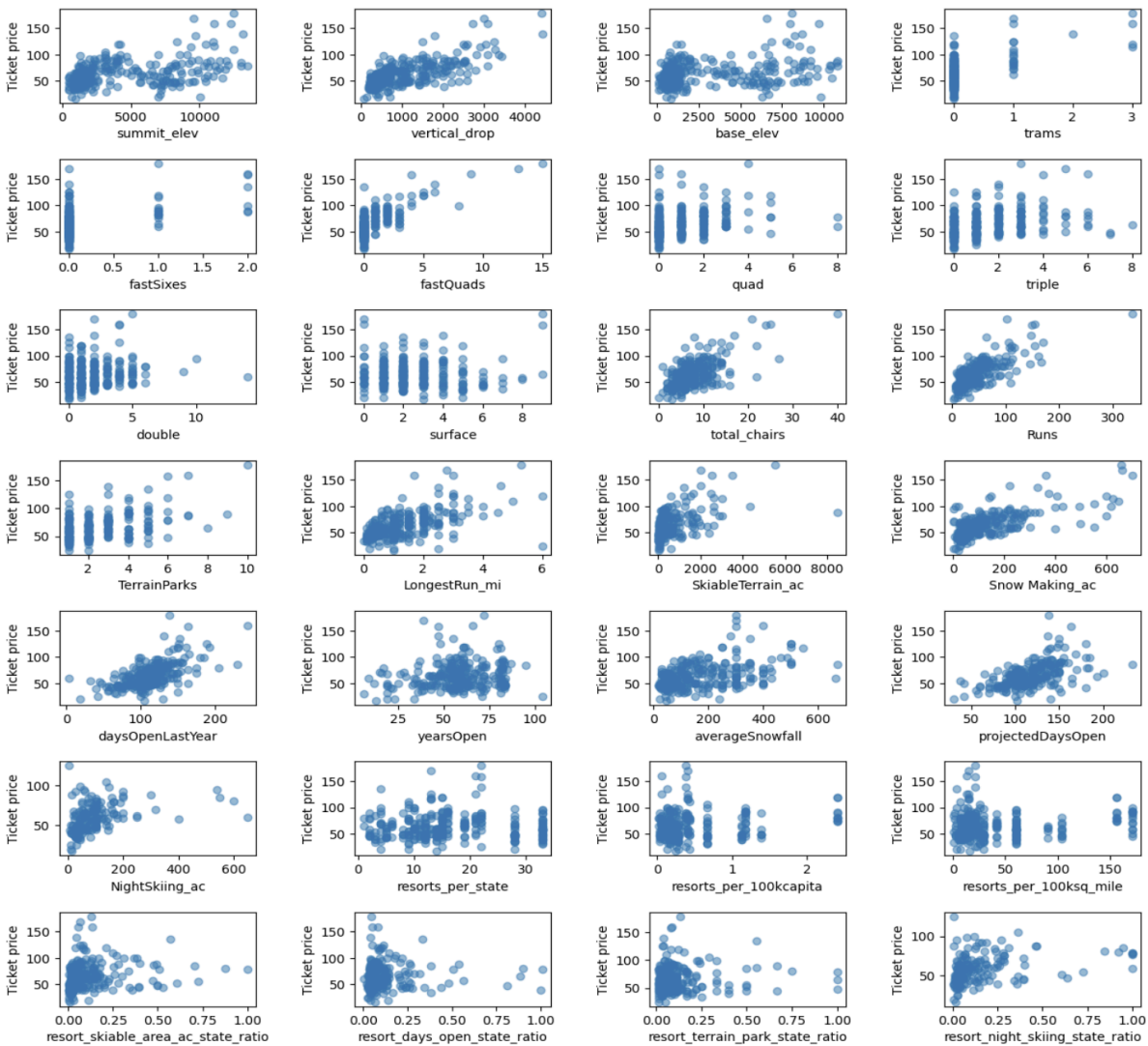

Figure 2: Facility Attributes and Pricing

Optimizing Data for Predictive Modeling

To enhance model performance, the following transformations were applied:

- **Feature Engineering:** New variables were created to better assess pricing influences, such as ratio-based metrics for chairs, terrain, and snowmaking.
- **Encoding Categorical Variables:** Resort-specific categorical features were encoded for better predictive modeling.
- **Data Normalization:** Key numerical features were scaled to maintain consistency across attributes.

These modifications improved the accuracy of predictive pricing models (Please See Figure 3: Feature Engineering Summary).
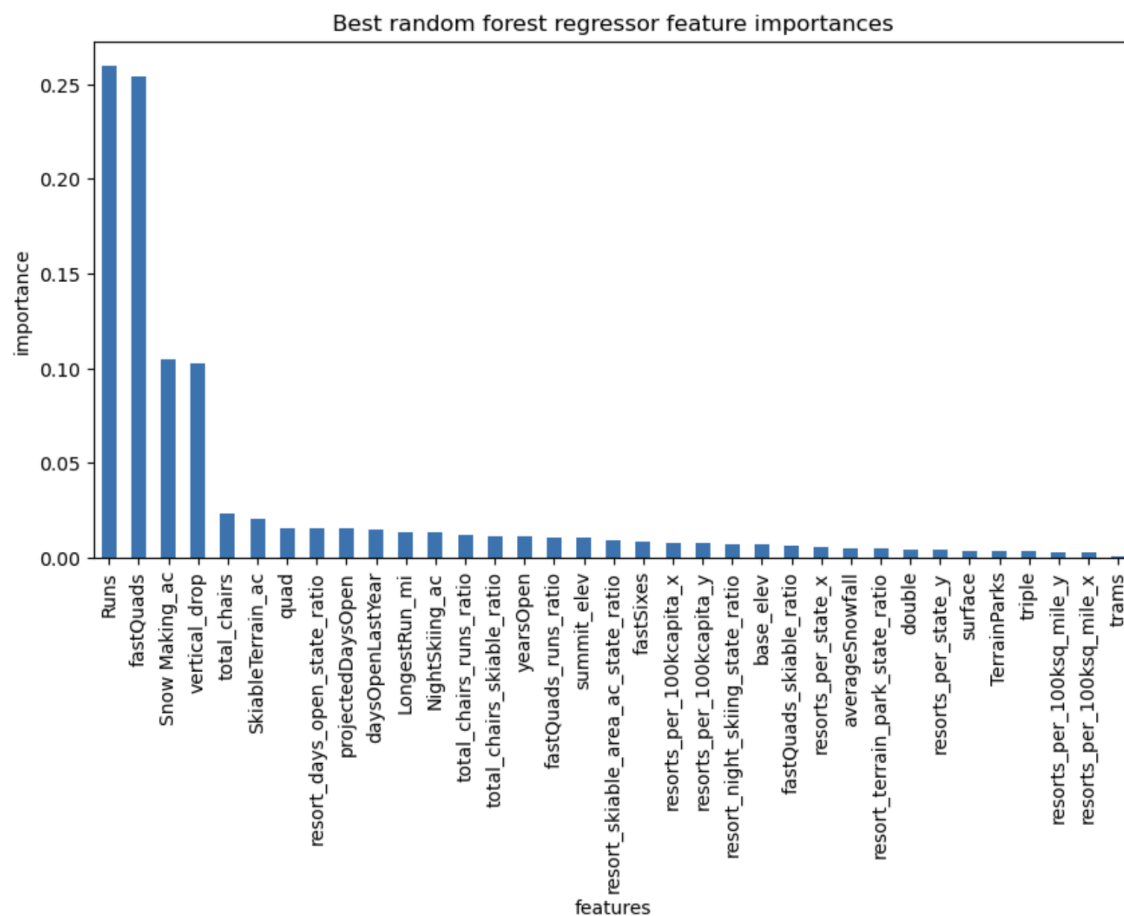
Figure 3: Feature Engineering Summary

Modeling and Key Findings

A predictive model was developed to assess price determinants:

- **Snowfall and Visitor Traffic:** A strong correlation was identified between snowfall levels and visitor volume, affecting optimal pricing.
- **Market-Supported Ticket Price:** The model suggests a ticket price of $98.17, with a mean absolute error of $10.43.
- **Impact of Additional Costs:** Factoring in the new chair lift installation, the model estimates an increase of approximately $2.22 per ticket, potentially generating an additional $3,888,889 in seasonal revenue. (See Figure 4).

Scenario Testing and Recommended Pricing

Multiple pricing scenarios were analyzed:

- **Inflation and Competitive Positioning:** Adjusting the price closer to $95 aligns with inflation trends and competitor pricing.
- **Dynamic Pricing Strategy:** A flexible pricing tool could optimize revenue by adjusting rates based on demand fluctuations.
- **Pilot Testing:** Implementing price adjustments during peak weekends or select ticket categories can help gauge customer response before full-scale implementation (See Figure 4).
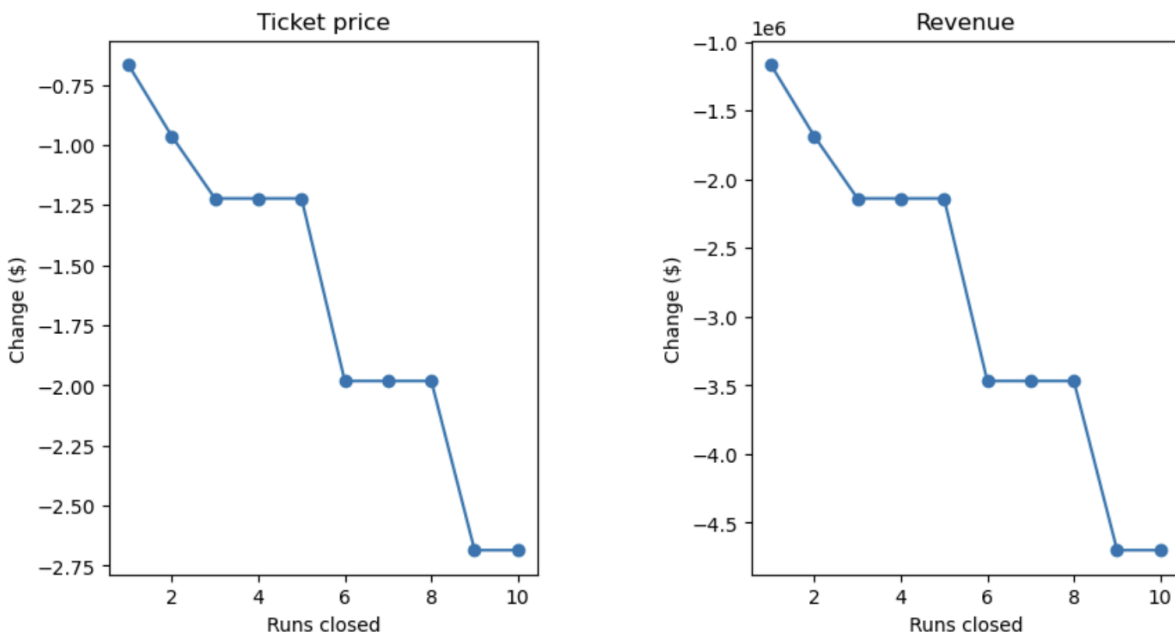
Figure 4: Pricing Model Results and Scenario Analysis Overview.

Final Recommendation

Based on the findings, increasing ticket prices to $95 is advised to align with market trends while ensuring customer retention. Seasonal price adjustments could further optimize revenue without negatively impacting demand. Additionally, a self-service pricing tool for business analysts could streamline future scenario testing and strategic decision-making.

Conclusion

The analysis indicates that Big Mountain Resort has room for a ticket price increase while maintaining market competitiveness. Implementing dynamic pricing and pilot testing will help refine strategies for maximizing revenue and visitor engagement. Future work should explore additional cost factors and customer elasticity studies to fine-tune pricing further.

Next Steps

- Develop a pricing dashboard for business analysts to evaluate different pricing strategies.
- Expand cost analysis to incorporate staffing, maintenance, and other operational expenses for improved accuracy.
- Conduct customer perception studies to assess pricing sensitivity and optimize future pricing models.