Guided Capstone Project Report: Big Mountain Resort Pricing Strategy

# Introduction

Big Mountain Resort is evaluating its current pricing strategy to ensure it aligns with market expectations and optimizes revenue. Through a detailed analysis leveraging machine learning models, I assessed the potential for adjusting ticket prices based on the resort's facilities and amenities compared to other resorts. This report summarizes the findings and provides recommendations for an optimized pricing strategy that aligns with market conditions and operational objectives.

# Data Overview and Analysis

The analysis was conducted using a dataset that included various features of ski resorts, such as vertical drop, number of runs, number of lifts, snowmaking area, and ticket prices. Data wrangling and exploratory data analysis were performed to clean the data and understand key patterns and correlations.

Key features influencing ticket prices were identified as:

* Vertical Drop: The difference in elevation from the summit to the base.
* Snow Making Area: The acreage covered by artificial snow-making capabilities.
* Total Chairs and Fast Quads: The number of chair lifts and high-speed quad lifts.
* Runs and Longest Run: The number of ski runs and the length of the longest run.

# Model Development and Evaluation

A random forest regression model was selected as the best model for predicting optimal ticket prices based on its superior performance compared to other models. The model was trained using data from all resorts except Big Mountain, ensuring unbiased predictions for the resort.

Model Performance: The model achieved a mean absolute error (MAE) of $10.39, indicating a strong predictive capability for estimating ticket prices.

# Findings and Recommendations

## 1. Current Pricing and Suggested Price

* Current Price: $81 for an adult weekend ticket.
* Modeled Suggested Price: $95.87, suggesting an increase of approximately $14.87 based on market conditions and resort amenities.
* Recommendation: Gradually increase ticket prices to close the gap between the current and suggested prices, starting with an initial increment of around $5-$7. Monitor customer response and adjust as needed.

## 2. Operational Scenarios and Impact

* Scenario Analysis: Different operational changes, such as adding a run, increasing vertical drop, or enhancing snowmaking capabilities, were simulated to assess their impact on the optimal ticket price.
* Key Recommendation: Focus on Scenario 2, which involves adding a new run, increasing vertical drop, and installing an additional chair lift. This scenario showed a potential increase in ticket price support by $1.99 and could lead to an additional $3.47 million in revenue over the season.

## 3. Cost Considerations

* Any price adjustments should consider the additional operating costs of new installations, such as the chair lift. A detailed cost-benefit analysis should be performed to ensure that increased ticket prices cover these expenses without diminishing profit margins.

## 4. Data Deficiencies and Future Improvements

* Data Gaps: The analysis was limited by the absence of comprehensive financial data, such as detailed operating costs, maintenance expenses, and customer demographics.
* Future Data Collection: Including these data points in future analyses will provide a more holistic view and enable more precise pricing strategies.
* Model Accessibility: Developing an interactive dashboard for business analysts would enable continuous testing of various scenarios without requiring direct involvement from the data science team.

# Conclusion

Based on the findings, Big Mountain Resort has an opportunity to adjust its pricing strategy to better align with market conditions and optimize revenue. The resort can enhance its competitive position by gradually increasing ticket prices and considering targeted operational improvements while ensuring sustainable profitability. Future efforts should focus on closing data gaps and implementing tools to facilitate ongoing analysis and decision-making.