Big Mountain Resort: Data-Driven Pricing Strategy Recommendations

Executive Summary

Big Mountain Resort in Montana is renowned for its diverse offerings, including 105 trails, 11 lifts, and a vertical drop of 2,353 feet. With 350,000 visitors each year, the resort has recently invested in a new chair lift, increasing operating costs by $1,540,000. The overarching question was to provide guidance on how to select a better value for their ticket price, capitalizing on the facilities offered.

Data Preparation and Exploration

The initial dataset required significant data wrangling, including handling missing values, outlier treatment, and data transformation. Exploratory Data Analysis (EDA) was conducted to understand the feature distribution and correlations. The key features selected for modeling included vertical drop, snow making area, total chairs, fast quads, runs, longest run, trams, and skiable terrain.

Modeling Methodology

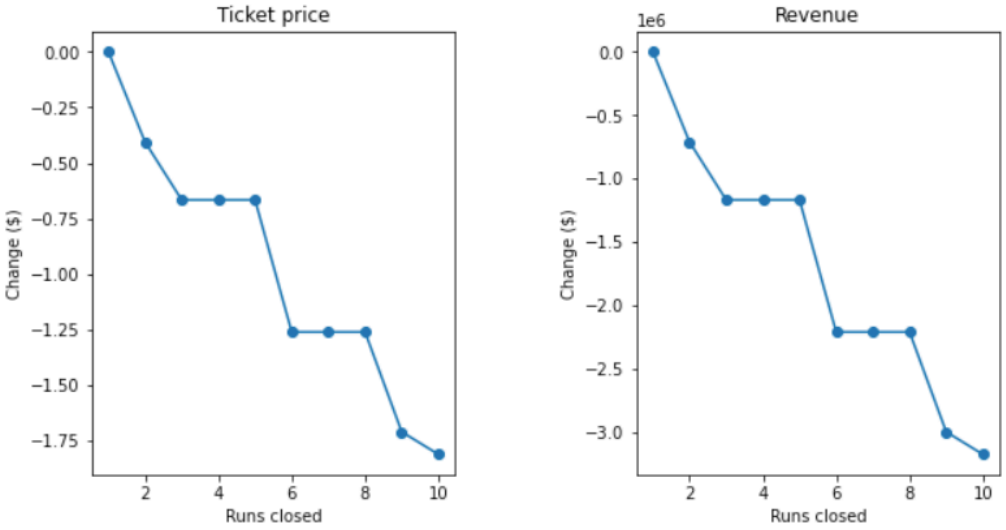
Several algorithms were experimented with, including linear regression and ensemble methods. The model's performance was evaluated using the mean absolute error (MAE), a metric reflecting the average absolute differences between actual and predicted ticket prices. Feature engineering was employed to create a refined set of features for modeling.

Winning Model and Scenario Analysis

The final selected model provided actionable insights into different scenarios:

- **Closing Runs:** Closing up to 10 least used runs had minimal impact on ticket price but required a careful balance of cost savings and potential revenue loss.
- **Increasing Vertical Drop with Chair Lift:** This scenario suggested significant potential for revenue growth.
- **Increasing Vertical Drop with Snow Making:** Similar to Scenario 2, with minimal impact from snow making.
- **Increasing Longest Run with Snow Making:** No significant impact on ticket price.

The following figures show Big Mountain's position in the market for ticket price and the analysis of closing the least used runs:



The side-by-side plots illustrate the predicted changes in ticket price and revenue for Scenario 1, based on closing up to 10 of the least used runs at Big Mountain Resort.

- **Left Plot (Ticket Price):** Shows the predicted change in ticket price as a function of the number of runs closed. Closing more runs leads to a gradual decrease in the predicted ticket price.
- **Right Plot (Revenue):** Shows the predicted change in total revenue, assuming each of the expected 350,000 visitors buys 5 tickets. The impact on revenue is more substantial, reflecting the combined effect of the ticket price change and the number of visitors.

The current ticket price of $81.00 aligns with the market valuation of Big Mountain's facilities. While the new chair lift adds $0.88 to the operating cost per ticket, the pricing analysis did not suggest an immediate increase in the ticket price. However, scenarios 2 and 3 offer opportunities for revenue growth and warrant further exploration.

Conclusion and Future Work

Big Mountain Resort's facilities justify its premium positioning in the market. The data-driven analysis provides clear insights into potential scenarios for improvement, cost reduction, and revenue growth. Continuous collaboration with business analysts, integration of detailed cost data, and development of a user-friendly interface for the model will foster informed decision-making and strategic planning.

By leveraging this model, Big Mountain can ensure that its ticket pricing strategy is optimized to reflect the value provided, capitalize on its unique offerings, and navigate the competitive landscape of the skiing industry. The alignment of data-driven insights with business goals will be instrumental in sustaining Big Mountain's success in the market.