

## **Big Mountain Resort: Predictive Pricing and Operational Strategy Report**

Big Mountain Resort is seeking to optimize its pricing strategy and operational investments to maximize revenue and enhance the guest experience. This project leverages a detailed dataset of North American ski resorts to model ticket prices and provide actionable recommendations for Big Mountain Resort's leadership team.

The dataset provided includes detailed attributes for over 330 ski resorts, covering variables such as summit elevation, vertical drop, skiable area, lift infrastructure, terrain features, and regional market characteristics. Initial data wrangling focused on cleaning and standardizing these inputs, handling missing values, and engineering additional features to better capture operational efficiency and competitive positioning. Key engineered features included ratios such as chairs per run, chairs per skiable area, and terrain park and night skiing availability normalized to state-level benchmarks.

Exploratory data analysis revealed several clear trends. Resorts with higher summit elevations, larger vertical drops, and more expansive skiable areas consistently commanded higher ticket prices. Additionally, the presence of high-speed lifts, specifically fast quads and six-packs, showed to be a strong indicator of premium pricing. Geographic patterns were also notable: resorts in well-known ski markets such as Colorado and Utah exhibited significantly higher average ticket prices compared to less competitive regions.

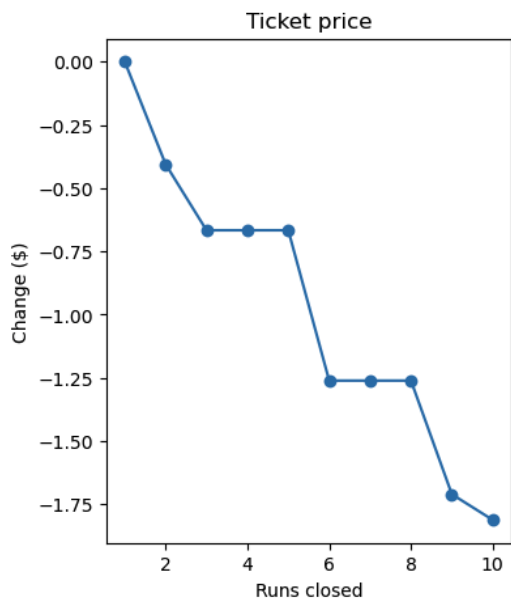
In building the predictive model, feature engineering played a central role. By transforming raw attributes into ratios that reflect operational efficiency and guest experience, the model was able to more accurately capture the drivers of pricing variation. The model's feature importance plot indicates that a tree-based algorithm, likely a Random Forest or Gradient Boosting model, were employed.

The most influential factors in predicting ticket prices were vertical drop, summit elevation, skiable area, number of high-speed quad lifts, and terrain park availability. These insights guided scenario modeling exercises, which explored how operational investments could impact pricing potential. The modeling suggests that adding high-speed quad lifts presents a clear opportunity to elevate Big Mountain Resort's market positioning and support higher price points. Scenario modeling results (shown in Figure 1) demonstrate the predicted ticket price impacts of run closures. Additional scenario results (printed outputs in the notebook) illustrate impacts of increasing vertical drop and adding fast quads. We could create visual scenario model plots to further enhance future analyses. Expanding skiable terrain and optimizing the vertical drop offering through actual expansion or improved marketing of existing assets are also means to yield measurable pricing gains. Additionally, different offerings such as terrain parks and night skiing appeal to specific market segments and can drive additional revenue streams if promoted properly.

Based on these findings, it is recommended that Big Mountain Resort prioritize infrastructure investments in its lift system, particularly the addition or upgrade of high-speed

quad lifts. Strategic expansion of skiable terrain and enhanced promotion of vertical drop features should also be pursued to enhance perceived value and competitive positioning. Additionally, marketing efforts should highlight differentiated amenities such as terrain parks and night skiing to attract younger and more diverse customer segments.

In conclusion, Big Mountain Resort should adopt a dual strategy that combines targeted operational enhancements with market repositioning strategically. Infrastructure improvements will support core pricing power, while differentiating themselves from competitors through unique experiences can broaden the resort’s appeal. Looking forward, it is recommended that the resort integrate seasonal revenue trends and visitor demographic data to further refine pricing models. Conducting A/B testing of pricing strategies following these investments will provide important insights and support continuous optimization. Additionally, adopting dynamic pricing models that incorporate real-time factors such as weather conditions, holidays, and competitor activity could further enhance revenue management capabilities.



(Figure 1)  
Scenario Modeling Result