Big Mountain Resort Ticket Pricing Analysis

Executive Summary

Big Mountain Resort currently charges $81 for an adult weekend ticket. Our random forest model, trained on peer resort data, predicts an optimal price of $100.55, revealing a potential undervaluation. This $19.55 gap suggests an estimated missed revenue of $34.2M given 350,000 annual visitors averaging 5 tickets each. The analysis highlights infrastructure features such as vertical drop, lifts, and runs as the strongest drivers of ticket prices. Scenario testing indicates that adding runs, vertical drop, and lifts significantly improves revenue potential, while snowmaking expansions show minimal effect.

Methodology

We built and compared several models: - Baseline: average ticket price across resorts (poor accuracy). - Linear Regression: feature selection via SelectKBest. - Random Forest Regressor: chosen due to higher accuracy, lower mean absolute error, and stability across folds. Preprocessing included median imputation, optional scaling, and grid search over key hyperparameters.

Results

Model	Mean Absolute Error (Test)	Key Notes
Baseline (Average)	~$15+	Benchmark only, poor performance
Linear Regression	≈ $11.8	Selected features improved interpretability
Random Forest	≈ $10.0	Best performing model, more stable

Feature importance (RF): Vertical drop, fastQuads, runs, and snowmaking area were dominant drivers.

Scenario Analysis

Scenario	Description	Impact
1	Close up to 10 runs	Negligible until >2 closures; large revenue drop beyond
2	Add 1 run, 150ft vertical, +1 chair	+$2.25 per ticket, ≈ +$393,750 revenue
3	Scenario 2 + 2 acres snowmaking	No significant additional effect
4	Add 0.2 miles run + 4 acres snowmaking	No measurable effect

Recommendations

- Adjust pricing upward to align closer with $100.55 model-predicted value. - Prioritize investments in vertical drop, runs, and lifts for measurable revenue impact. - Deprioritize snowmaking expansion as it shows limited contribution to price. - Use the random forest model iteratively for strategic decision-making.

Limitations & Further Work

The analysis relies solely on facility-based features and assumes peer resorts set prices fairly. Operational costs, demand elasticity, and brand effects were not included. Future work should integrate cost data, customer willingness-to-pay surveys, and pricing tier structures for more holistic recommendations.