TICKET PRICE REVISION PROPOSAL: SUMMARY, FINDINGS, & ANALYTICS

BIG MOUNTAIN SKI RESORT

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PROBLEM STATEMENT REVIEW

Primary Question:

- Do ticket prices reflect the value Big Mountain provides patrons?

Ancillary Questions:

- Do assets in place support current or higher prices?
- Will management's proposed shortlist of cost-cutting/revenue-generating strategies work?

SUMMARY FINDINGS:

TICKET PRICING

- Big Mountain tickets for adult weekend passes are **undervalued**.
- Current adult weekend ticket price ($81.00) can be increased to $108.30 (+34%).
- Ticket prices at Big Mountain still exhibit significant upside potential, if we subtract the model's margin of error ($10.39) from our estimate of $108.30.

SUMMARY FINDINGS:

ASSETS IN PLACE

- Not all resort assets add value to Big Mountain experience.
- Assets that best support and justify higher ticket prices include:
  - Vertical drop, snow making capacity, total number of lift chairs, fast quads, runs, longest run in miles, trams, and skiable terrain.

SUMMARY FINDINGS:

MANAGEMENT'S SHORTLIST OF REMEDIES

- Losing 2 and 3 runs successively reduces support for ticket price increases.
- Closing 3, 4, or 5 runs results in the same drop in ticket price.
- 6 run closures would be very bad.

SUMMARY FINDINGS:

MANAGEMENT'S SHORTLIST OF REMEDIES

- **Do not** add two acres covered by snow makers.
- **Do not** increase the longest run by .2 miles.
- **Do not** add 4 acres of snow making capability.

METHODOLOGY:

DATA WRANGLING

- The data set contained 277 rows, 27 features, and 34 states.
- ~16% of AdultWeekday & ~15% of AdultWeekend data were missing of values.
- The fastEight feature was dropped, as were rows missing price data.
- Adjustments for missing values normalized some of their distributions.
- Resort data were supplemented by state-level data fetched from the web.
- Per Montana specifically, more weekday prices were missing than weekend.
- The AdultWeekday feature was dropped.
- We elected to focus on modeling weekend pricing.
- Missing values across all resorts revealed a quantile pattern.

METHODOLOGY:

DATA EXPLORATION

- Montana was the third largest of the top 20 states in our data set.
- Resorts per state appeared unrelated to state size.
- Adult weekend ticket price was positively influenced by fastQuads, along with Runs and Snow Making_ac.
- Resort_night_skiing_state_ratio seemed to be the most correlated with ticket price.
- Runs and total_chairs are also well correlated with ticket price. SkiableTerrain_ac appears less useful than snow making.
- Vertical_drop understandably raises ticket prices.
- The data were scaled and subjected to Principal Component Analysis.
- Two components explained ~77% of the variance. Four data points were imputed.
- We engineered 4 additional features.
- The total_runs_ratio and total_chairs_skiable_ratio indicated resorts with fewer chairs charge premiums.

METHODOLOGY:

DATA PROCESSING & TRAINING

- A standard 70/30 split was used to partition the data into training and test sets.
- We dropped the name, state, and region variables and treated all states equally.
- The baseline forecast was 63.81.
- Feature medians were used to impute any missing values.
- We began with an OLS model.
- We selected the k-best features in a 5-fold, cross-validation (CV) process.
- This added minimal clarity to our analysis, even when we expanded the number of acceptable features from 5 to 15.
- A Random Forest (RF) model was constructed using 5-fold CV, followed by a gridCV search.
- Further CV analysis indicated we had trained, cross-validated, and test on a sufficient amount of data.
- The MAEs for the linear and RF models were 11.79 and 9.5, making our RF model the clear winner.

METHODOLOGY:

MODELING & FORECASTING

- Using our Random Forest model, we predict a supportable ticket prices of is 108.30.
- Our approach to ticket pricing was based on the assets of the resorts.
- Assets that were determinative of ticket price included vertical_drop, Snow Making_ac, total_chairs, fastQuads, Runs, LongestRun_mi, trams, and SkiableTerrain_ac.
- Big Mountain is competitive along all dimensions.
- Each management proposal was evaluated by running it through our Random Forest model.

CONCLUSION:

REMARKS & RECOMMENDATIONS

- Big Mountain has a profitable future ahead of it!
- Even a modest price increase of $3 could bring in ~$5 million in incremental sales.
- Price increases can and should occur during the current inflationary period.
- Marketing material should stress those features most vital to supporting the ticket increase.
- Our data were limited insofar as no company financials were provided.
- For analytics contemplating the Company’s cost structure, contact our sales department.