

**Client: Big Mountain Resort**  
**Prepared By: Do Duong (Consultant)**

## Stakeholders

- Jimm Blackburn (Director of Operations)
- Alesha Eisen (Database Manager)

## Problem Statement

***What is the Big Mountain ski resort's pricing strategy to not only produce a return on a recent chair lift investment, but also support future investments over the next 3 years?*** Consider that BH recently invested \$1.54M in a new lift and believes its current pricing is premium for the Montana market. For future planning, BM would like to identify offerings to maximize offerings (for revenue), while cutting costs in other offerings.

## The Process

### Data Wrangling

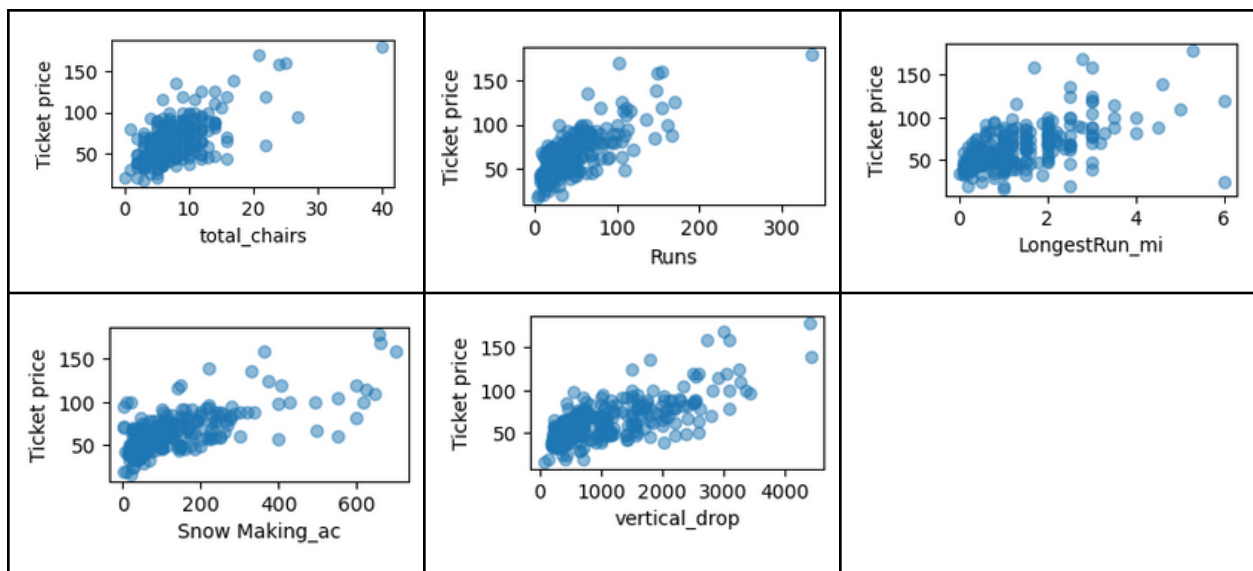
Initial exploration found Big Mountain resort details in a dataset w/ 30 columns, 330 entries.

- Target features identified in *WeekDayPrice* and *WeekendPrice* columns.
- Cleaned up columns and rows, to ensure less skewed results
- Calculated state-wide summary of data, while including statewide data

### Exploratory Data Analysis

Data analysis by state did not show consistent findings between price and features, so we leverage more statistical packages and methods.

- Leveraged PCA (Principal Component Analysis) to map features to each other and price
- Surface five features correlated with *WeekendPrice*



## Pre-processing

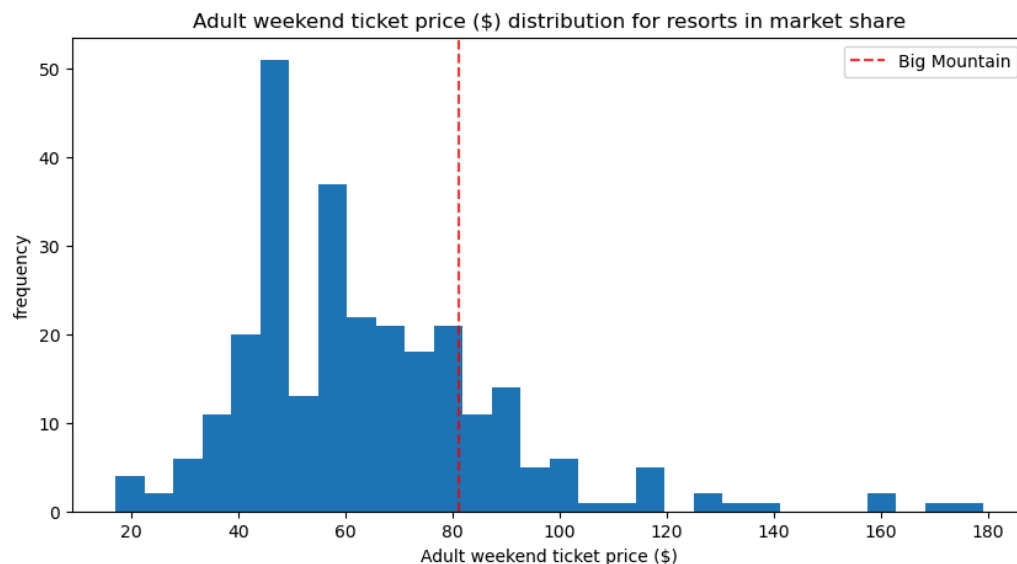
Using Python's Sklearn pipelines to impute data, feature scale, run regressions (linear and random forest), make predictions on both train and test sets; and cross-validate our results.

Model	Top Features Discovered
Linear	vertical_drop, Snow Making_ac, total_chairs, fastQuads, Runs, and LongestRun_mi
Random Forest Regressor	fastQuads, Runs, Snow Making_ac, and vertical_drop

## Modeling

The model suggests that there's room for BH to increase price by up to \$4.50, given existing features. Before modeling scenarios, we identified that BH is very strong in 5 of 6 features, such as number of chairs, vertical feet drop, snow making area, # of runs, and # fastquads. (Just no trams but almost nobody has trams).

*Though BH charges the highest price in the Montana market, its pricing is not highest across the market. There is opportunity to understand which strengths can maximize pricing.*



## Scenarios and Results

The following ideas were collected from BH executive team to model the impact potential of additions or removals to the resort.

Sce	Business Description	Model Result
1	Permanently closing down up to 10 of the least used runs. This doesn't impact any other resort statistics.	Closing more 2 to 5 runs reduces support for ticket price by as much as $-\$0.70$ ; closing 5+ runs, by $-\$1.25$ ; closing 9+ runs, $-\$1.80$ (and a nearly $-\$3.2m$ revenue impact)
2	Increase the vertical drop by adding a run to a point 150 feet lower down but requiring the installation of an additional chair lift to bring skiers back up, without additional snow making coverage.	Increases support for ticket price by $\$1.99$ . Over the season, this could be expected to amount to $\$3.47M$ .
3	Same as number 2, but adding 2 acres of snow making cover.	Adding snow making does not increase support for snow– no difference from 3.
4	Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres	No difference.

## Recommendations

- Price and Monitor
  - Since BH is already incurring the  $1.47M$  increase in operating cost, immediately increase prices by  $\$2$  to monitor ( $\$3.5m$  in annual revenue).
  - If the new revenue trajectory is one track for over  $\$3M$ , plan to make a change by re-allocating 1 run's costs to adding chairs to increase the vertical drop for another  $\$2m$  increase ( $\$3.5m$  in annual revenue)
- Marketing Message
  - Given BH strong nationwide position on key features (ie. skiable area, total runs, longest runs, snow making), marketing should message these strengths. This would create demand from non-Montana customer
- Procure Additional Data
  - Data that would be useful for tuning the model would be customer survey, customer home location, and customer income. All would provide sensitivity related to attitude towards the resorts and its features, local vs. traveling customer, and ability to spend.