

## Guided Capstone Project Report: Big Mountain Resort Price Analysis

### Problem Statement

Big Mountain Resort (BMR) is a ski resort located in Montana, with vast facilities that operate heavily during the ski season hosting around 350,000K visitors year over year. BMR includes over 10 lifts across the entire skiable area, which longest run is approximately 3.3 miles in length. To keep raising the bar amongst other resorts, BMR recently installed a new chair lift to increase distribution across the mountain. This expense will increase operational costs by 1.5 million USD, which is causing them to rethink their ticket pricing strategy to capitalize on their investment. Our client, BMR, needs a data driven approach to assess their ski ticket pricing structure. They want to make sure the pricing structure is competitive, but at the same time reflects on the scale of their operations, which they believe is in the higher end of the market across the United States.

### Cleaning and Organizing the Data

The dataset provided by our client include information from resorts across the United States. It gave us important information like location, ski resorts pricing, number of runs & chairs. Through the organization and cleaning of the data, we ended with 277 rows of data & determined our analysis will be based on ticket prices across the weekend. These had similar values to those of ticket prices during the week, so there wasn't a need to retain that information throughout the remainder of the analysis.

### Exploring and Visualizing

As we progressed through the Data Science Method (DSM), we attempted to find correlations between ticket prices and other features across the resorts (number of runs, elevation, etc.). We ran a Principal Cumulative Analysis (PCA) among these and plotted a multiple scatter plots that showcased a positive correlation amongst features like Runs, SnowMaking\_AC & fastQuads.

### Preprocessing & Training

We averaged out the ticket pricing amongst all the resorts (\$83.81 per ticket) to benchmark our model against it. We used two types of models to train our data, the Mean Absolute Error & the Random Forrest Model. The latter ended up giving us a better variability against the mean ticket price of \$83.81, even after inputting our top 4 features that have a positive correlation with ticket prices amongst all resorts.

### Modeling & Price Recommendation

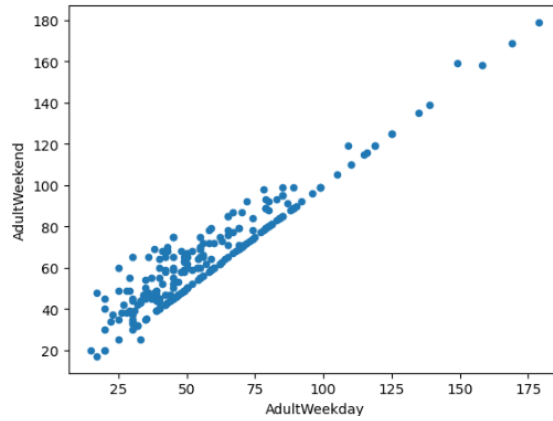
We added more features to our final analysis for benchmarking purposes, to visualize where BMR stands out from others and determine if it's a criteria we can leverage to justify the price adjustment. We recommend adjusting the price from anywhere between \$91.00 per ticket to \$96.62 per ticket as BMR is a leader in many categories for resorts across the entire United States.

### Conclusion and Future Analysis

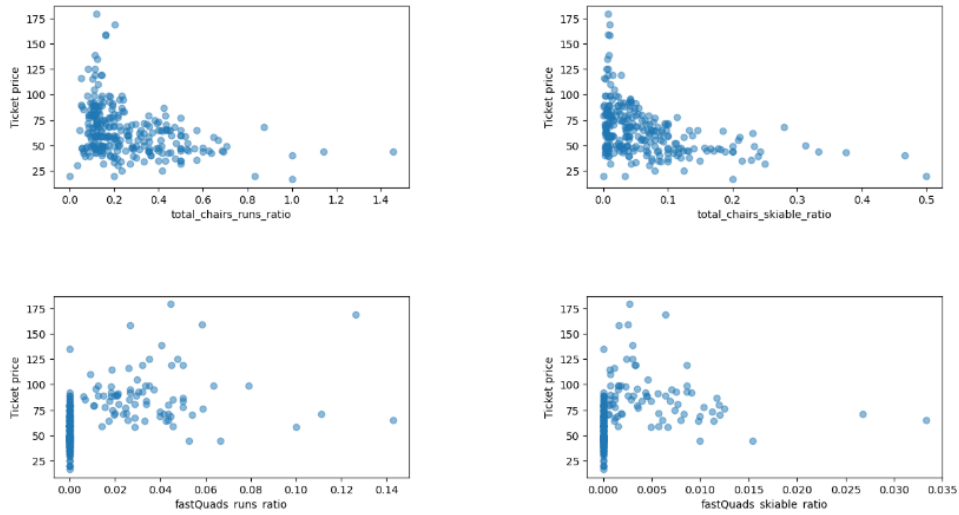
BMR's current pricing doesn't reflect the scope of services, features nor benefits it offers its customers year-round. Throughout our analysis we determined is a superior resort, because it leads in the main categories that have a positive relationship with pricing: Skiable Area, Area Covered by Snow, Number of Runs, Longest Run, Vertical Drop, Total Chairs & Fast Quads. At the same time, we looked into reducing operating costs to increase profits and our model showed BMR has the ability to close up to 5 runs without having a big impact in revenue if it's another avenue they want to take. This model is useful for future analysis BMR or any other resort only if the type of features that impact pricing remain the same. However, it is important to highlight that it is based on the data provided by BMR, which could be outdated or biased as some other ski resorts might also be underpricing their tickets. We are looking forward to the increase in revenue BMR will see soon and how it keeps paving the way for other resorts in the industry.

*\*For reference, visuals can be found in the appendix section for each topic o*

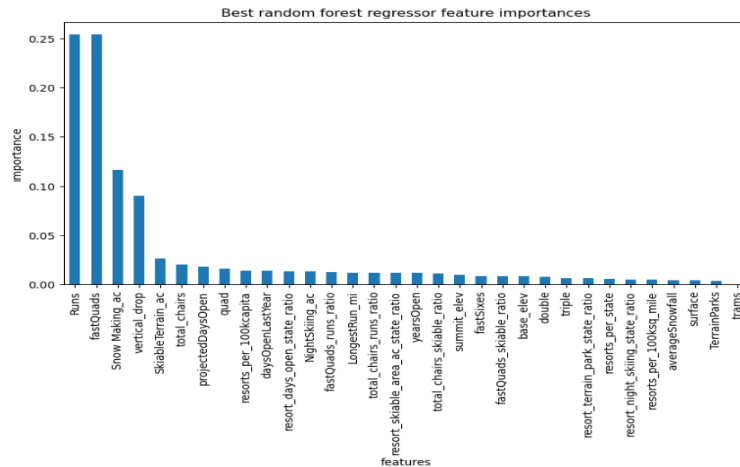
## Appendix A – Data Cleaning



## Appendix B – Data Exploration

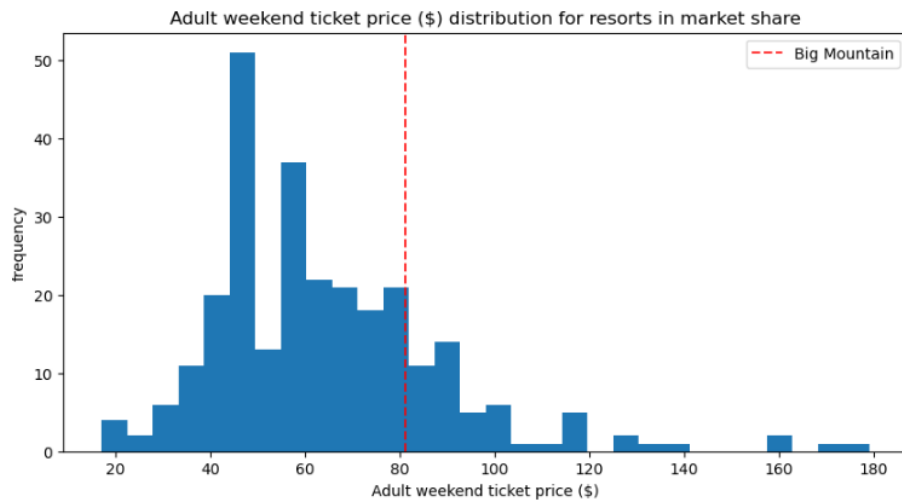


## Appendix C – Preprocessing & Training

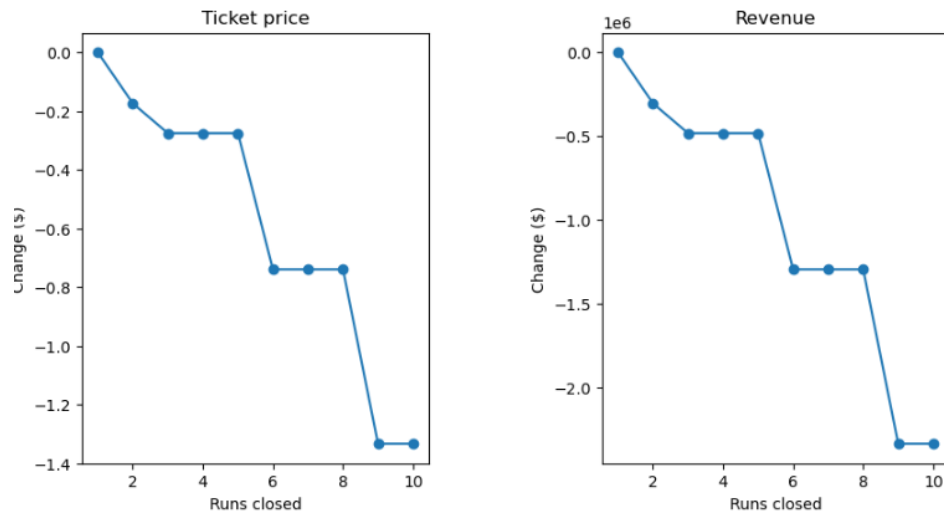


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## Appendix D – Pricing Analysis



## Appendix E – Cost Reduction Through Fewer Routes



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