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Guided Capstone Project Report
Springboard: Data Science Bootcamp

In an effort to remain competitive in the marketplace, Big Mountain Ski Resort in Montana is keen to implement a more data-driven approach to determine ticket pricing and long-term investment strategies. In fulfillment of this objective, Big Mountain Ski Resort has asked for the creation of a predictive model for ski resort ticket pricing. The model was created using a dataset compiled from Big Mountain Ski Resort and other resorts that are part of the same market share. The data included information such as ticket pricing as well as resort amenities/feature information, such as the number of runs at each resort and the resort's base elevation. Through creation of a predictive ticket pricing model, Big Mountain Ski Resort aims to optimize their ticket pricing relative to competing ski resorts in the market to maximize their profits and facilitate long-term infrastructure investments so the resort will continue to remain profitable in the future.

The predictive model generated to correlate ticket pricing to ski resort features made use of a random forest regressor model. A plot of the ski resort features found to be of highest importance to the random forest regressor model is shown below in Figure 1. The total number of runs, total number of fast quad chairs, total snowmaking acres, and vertical drop at each ski resort were found to be the features that were the highest determinants of ticket pricing. The random forest regressor model generated indicated that Big Mountain Ski Resort could charge up to $91.36 per ticket, which is a $10 increase from current ticket pricing.

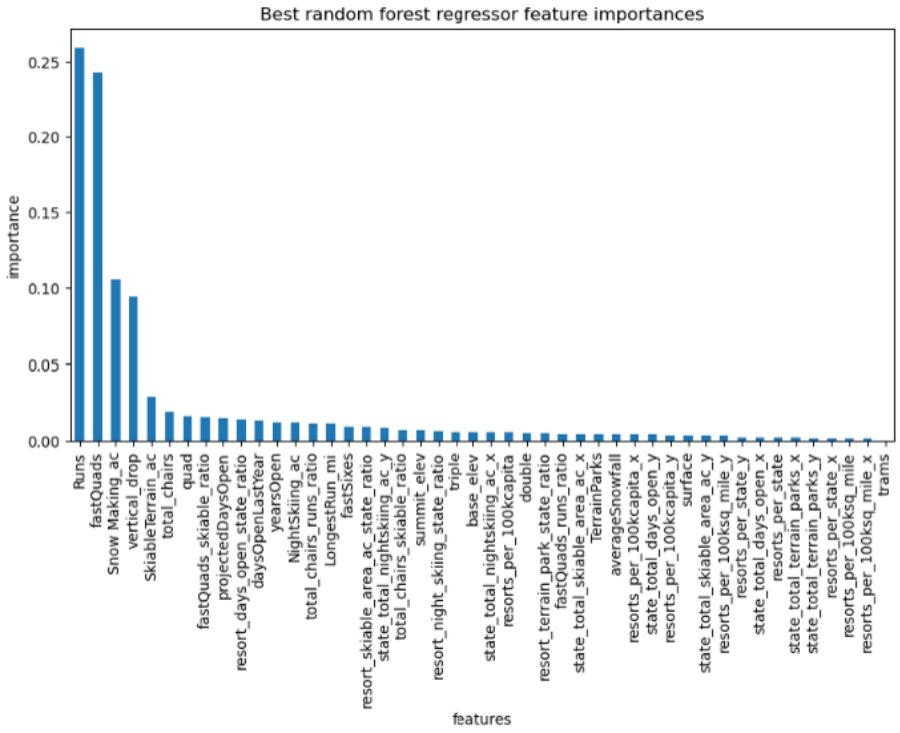

Figure 1. Importance of each ski resort feature in predictive ticket pricing model using random forest regressor. The total number of runs, total number of fast quads, total snowmaking acres, and total vertical drop were found to have the greatest impact on ticket pricing.

To help evaluate if a $10 increase in ticket pricing at Big Mountain Ski Resort is practical, the distributions of each of the features found to be key determinants of ski resort ticket pricing were analyzed to see how Big Mountain Ski Resort compared to the other resorts in each of these areas. Histograms of the key determinants of ticket pricing- total number of runs, total number of fast quads, total snowmaking acres, and total vertical drop- were constructed and are shown below in Figure 2. The vertical redline on each histogram indicates where Big Mountain Ski Resort lies within each distribution. From the distributions of each key feature, Big Mountain Ski Resort has superior or comparable amenities when compared to competing ski resorts.

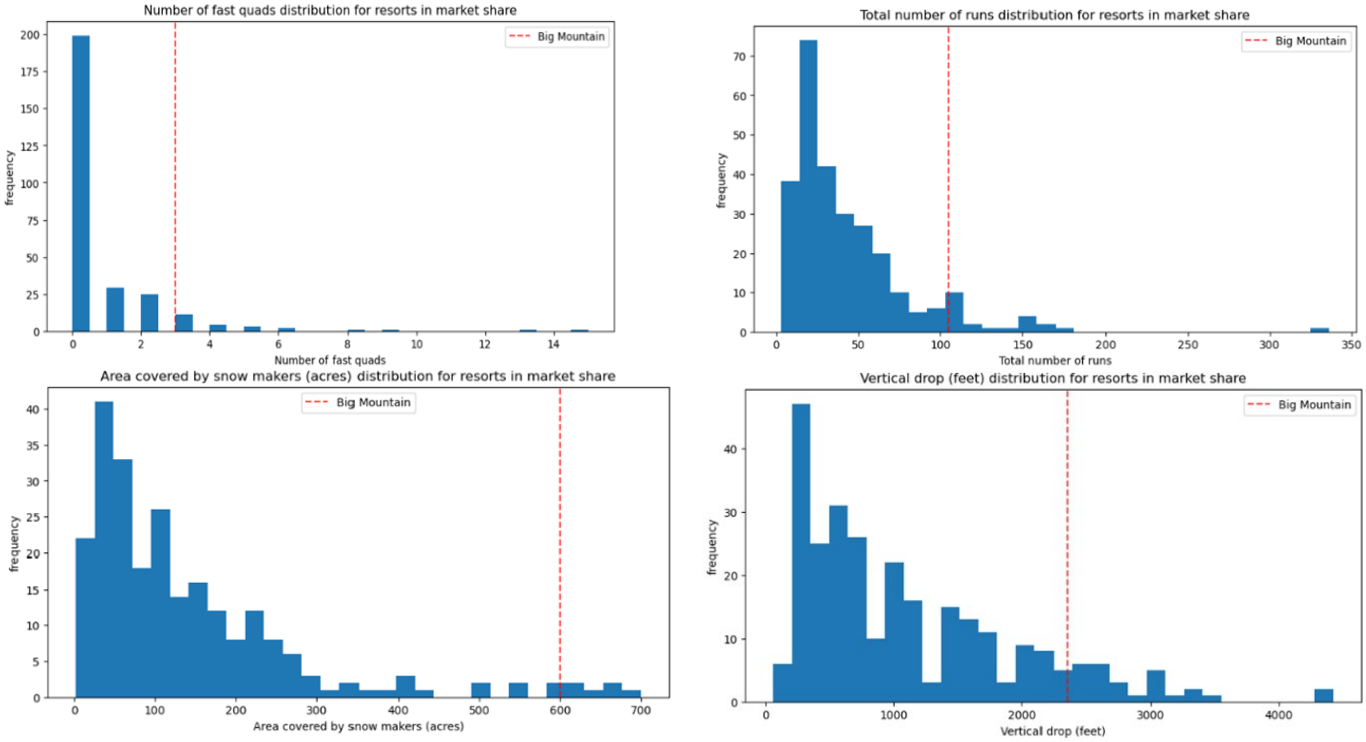

Figure 2. Histograms showing the distribution across all ski resorts of each key feature identified to be a critical determinant of ticket pricing from the random forest regressor model. The vertical redline on each distribution shows where Big Mountain Ski Resort lies for each feature.

Additionally, a histogram was created showing the distribution of ticket prices for each ski resort in the dataset and is shown in Figure 3. Again, Big Mountain Ski Resort is indicated by a vertical redline.

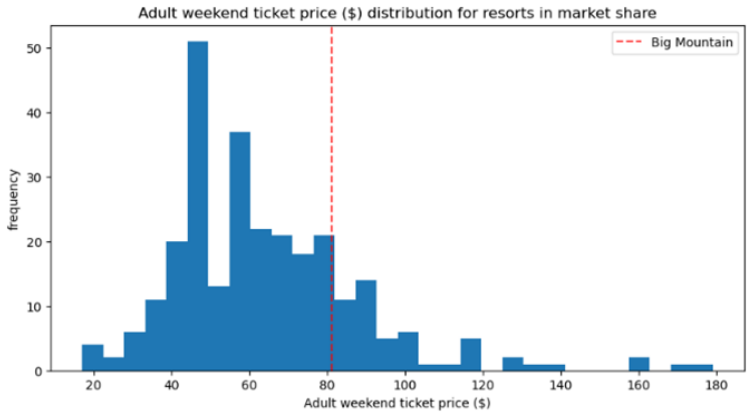

Figure 3. Histogram showing distribution of ski resort ticket prices in dataset. A vertical redline shows where Big Mountain Ski Resort lies within the distribution.

The histograms of each feature found to be a critical determinant of ski ticket price by the model showed evidence that Big Mountain Ski Resort was superior or comparable to competing ski resorts. Additionally, the histogram of ticket prices shows that several competing ski resorts charge higher ticket prices than Big Mountain Ski Resort, despite likely having comparable or less favorable amenities than Big Mountain Ski Resort. The distributions of key features and ticket prices provide justification that a $10 ticket price increase at Big Mountain Ski Resort is warranted and would be a suitable way for the resort to maximize profits and generate revenue that could be reinvested into long-term improvement projects that could improve existing resort amenities.