Guided Capstone Project Report

Big Mountain Resort is a premium ski resort located in Montana USA which sees around 350,000 visitors annually. The company is struggling to identify what they should price their tickets at and/or which of their existing facilities, or those not yet actualized, visitors are willing to pay more for. Therefore, the question/problem to ask is what investments and/or price adjustments, if any, can Big Mountain Resort take to maximize its revenue from ticket sales?

To answer this question, we began with data wrangling a refined dataset that ended up with over 275 resorts across the country. It included factors such as the total number of ski runs, snow making machines, ticket price, etc.

Looking to find any potential links to ticket price, exploratory data analysis revealed several promising relationships. The scatterplots below show some of those relationships: a positive correlation between vertical drop and ticket price and a positive correlation between total number of runs and ticket price.

A group of blue dots

Description automatically generatedA group of blue dots

Description automatically generated

Fig. 1a Fig 1b

Having identified several promising features, we wanted to preprocess and train a model that utilized them to predict what the ticket price of Big Mountain Resort should be. We tried several models and settled on a random forest regressor which predicted our test data with the best coefficient of determination after being trained on a subset of the data.

We then used this model to predict the price of Big Mountain’s Resort’s ticket price against the actual price and found the resort may be undercutting its price by around $15. This cannot be definitively stated, however, due to a mean absolute error around $10 and possible price-dictating factors not included in the dataset.

Several investment or elimination scenarios were run. Two of those showed the most promising results. The first was to see how many ski runs could be eliminated before dramatically impacting how much Big Mountain Resort could price their tickets. It looks as if eliminating up to 5 runs would only reduce ticket price value by ~$0.65. (see fig 2)

A graph of a price

Description automatically generated with medium confidence

Fig. 2

The next promising scenario indicated that adding a single run, increasing the vertical drop by 150 ft, and installing an additional chair lift would support a $2 increase in ticket price, bringing in an additional 1.4 million dollars annually if the visitor number remained stable and each visitor bought an average of 2 tickets.

Given the entirety of these price indicators, we would recommend increasing the price of Big Mountain Resort tickets by $5, which is safely within the absolute margin of error for what our model predicts the market price to be. This would boost annual Big Mountain Resort revenue by 3.5 million if the visitor number remained stable and each visitor bought an average of 2 tickets.

To conclude, we took data of various resort features, built a predictive model, and identified that Big Mountain Resort is likely underpricing its ticket value and it is advisable for it to be marginally increased.

For further scope and investments, we recommend gathering maintenance expenditure for the resort’s runs as well as price estimates for increasing the vertical drop before proceeding with any company investments to boost revenue as suggested by scenario 1 and 2.