Ski Resort Ticket Pricing Project Report

Analysis by Faheem Zia

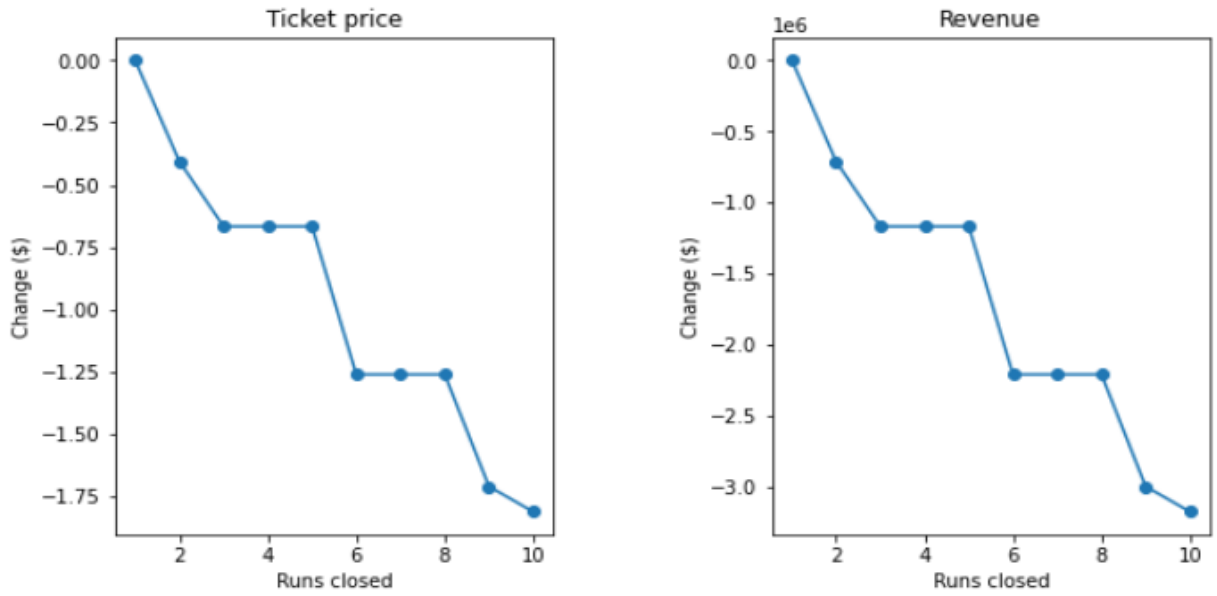
Big Mountain Resort, a ski resort located in Montana, has asked for assistance in pricing strategy. The management has expressed a need to offset higher operation costs due to installation of an additional chair lift, which has increased prices by $1,540,000. The purpose of this project is to provide a detailed report on ticket pricing strategy based on resorts across America. Based on the results, we can provide Big Mountain Resort's management with information on how they can increase ticket prices, as well as other areas where costs can be saved.

The data used for this project is a file containing information about resorts across America, including Big Mountain Resort. A total of 330 resorts are accounted for. Information for each resort includes adult ticket prices, location information, and numeric information for the resort's buildings and statistics. Before analysis the data was cleaned. Resorts with missing data were dropped from the analysis. A second data set containing state information was merged with the resort data set. By the time the data had been cleaned and modified, 277 resorts remained.

Next, with the cleaned data set, exploratory data analysis was performed. The purpose of this step was to highlight key relationships between features. As a result of the analysis, the several features showed a high correlation with ticket pricing. These features include: fastQuads, Runs, total_chairs, and Snow Making_ac. These features are important to highlight, as they will likely be important when making a machine learning model to predict ticket pricing.

The next step was creating a model to predict adult weekend price. Two models were created, a linear model and a random forest model. These two models were assessed for accuracy. We found the random forest model worked best at predicting adult weekend price, so we saved the model for use in the next step.

Finally, the random forest model was deployed. Using this model, we can answer questions provided by the Big Mountain resort management team. Big Mountain provided four scenarios to be tested. Of the four scenarios, the first and second were most important to consider based on our testing. The first scenario was to permanently close down the 10 least used runs. Here are our results from our model assuming this was done:



From this graph we can see the relationship between runs closed vs ticket price and revenue. Closing runs results in a decreased ticket price, and therefore, less revenue. It is worth noting closing one run has no effect on ticket price/revenue. It is also worth noting that closing 3, 4 or 5 runs results in the same change in price. We would suggest closing 5 runs, assuming the loss in revenue is acceptable.

The second scenario involved Big Mountain adding a run, increasing the vertical drop, and installing an additional chair lift. Assuming these to be true, our model concluded the following:

```
This scenario increases support for ticket price by $1.99
Over the season, this could be expected to amount to $3474638
```

Our model supports increasing the ticket price in this situation. The third and fourth scenarios should not be considered as neither provide a benefit over the second scenario.

In conclusion, Big Mountain Resort should implement the first two scenarios that were provided. They should close at least 1 of the least used runs in order to save money, as this has no effect on ticket pricing. Future runs could be closed, assuming the cost gained outweighs the loss in revenue. Furthermore, the resort should implement their second suggested scenario. Doing so would allow them to increase the adult weekend ticket price by ~$2, resulting in an increased revenue of $3,474,638. A combination of these two scenarios should be able to offset the additional operating costs of $1,540,000.