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Big Mountain Resort, a ski resort located in Montana, has installed an additional chair lift to help increase the distribution of visitors across the mountain. The additional chair increases operating costs by more than 1.5 million dollars. The resort's strategy is to increase its ticket price above the average price of resorts in its market segment. However, this strategy is suspect given the resort might not be capitalizing on its well-performing (or underperforming) facilities. The problem is thus: is there evidence that Big Mountain Resort is undercharging given their facilities and their competitors' facilities? If so, how much should the ticket price be increased? If it isn't the case that Big Mountain Resort is undercharging, what is a careful and efficient way of reducing operating costs?

Upon exploring the data, it is clear that Big Mountain Resort stands on the right side of the distribution to most other resorts in the nation in terms of both facilities available (some of which have a positive relationship with higher ticket pricing) and ticket pricing. In fact, Big Mountain Resort's ticket pricing is considerably higher than most other resorts in the nation, not including resorts exclusively in Montana. So, an increase in ticket pricing isn't warranted unless it is clear that the resort's facilities are valuable to the market (i.e., the ticket buyers).

In the preprocessing and training stage, two models' performances were gauged by their magnitude (i.e., numerical distance) from the average pricing. A simple regression line was one of the said models trained, and its performance improved gradually, as evinced by its results on the test set. The second model trained was the random forest regressor, which, surprisingly (to me), had superior performance than the regression model. Taking into account the mean absolute error of just over $10, it became clear that Big Mountain Resort's adult weekend ticket price of $81 had significant room to change given the model's predicted ticket price of $95.87.

As to how much to increase it remains to be answered. However, as mentioned, Big Mountain Resort has several features that are valuable to visitors and has quantities of them that surpass most of their competitors with few, rare exceptions. This further supports the stance for increasing ticket pricing.

Another question that remains to be answered is if the cutting of operating costs by the reduction or cutting off of facilities is plausible. And so, it becomes an either-or case, where the resort has two potential scenarios for reviewing: either the increase of revenue from ticket prices or the cutting of costs. But given the resort operates within a market where visitors are willing to pay more for certain facilities and less for others, it becomes important to get a sense of how certain facilities support (or undermine the support) a given ticket price. Using one of the utilities of our model, I sought to see if the cutting of certain features would affect (either positively or negatively) the ticket pricing –and therefore, the revenue. The model shows that closing one run makes no difference; however, the closing of two or three runs reduces the support for the ticket price. If the resort closes three runs, they may as well close four or five runs, as there is no further loss in the ticket price. When the closing of six or more runs is done, however, the support largely drops.

In conclusion, the model suggests an increase in the ticket price, but this increase will likely come through the making of additional enhancements to the facilities in the resort. However, the potential costs of certain enhancements might be a good thing as the resort will likely have more visitors and increase its competitive advantage.