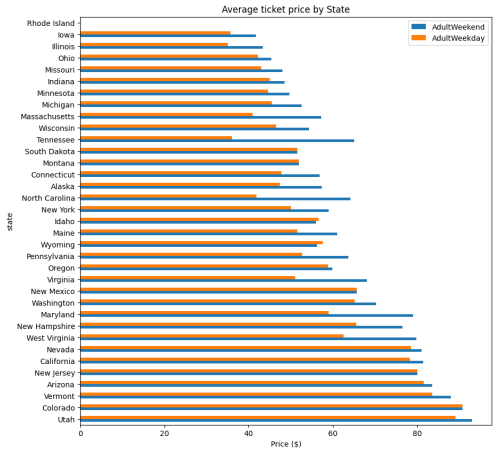
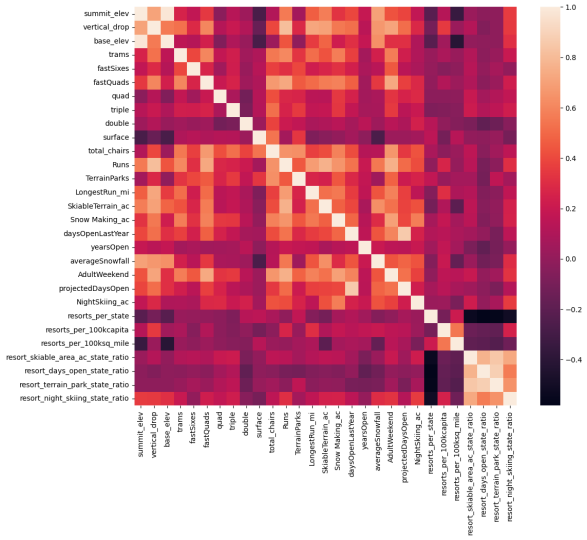
How can Big Mountain select a better value for their ticket price that takes into account the investments they make in facilities and infrastructure and raise their profits by 10% over the next year?

To view the relationship between price and state, I graphed an average of both price columns per each state.



After observing there are more missing values in the 'AdultWeekday' column than the 'AdultWeekend', I decided to rely solely on the 'AdultWeekend' column for the analysis.

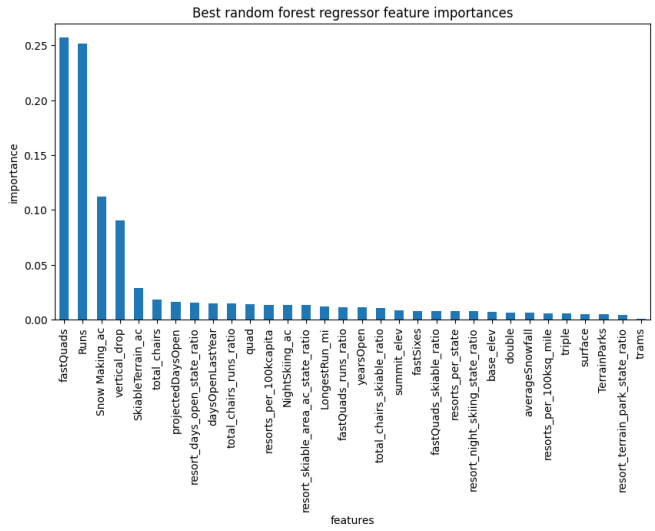
A PCA analysis between the state features (land size, population size) and average price per state did not show a clear correlation. So I decided to analyze the resorts' features and prices.



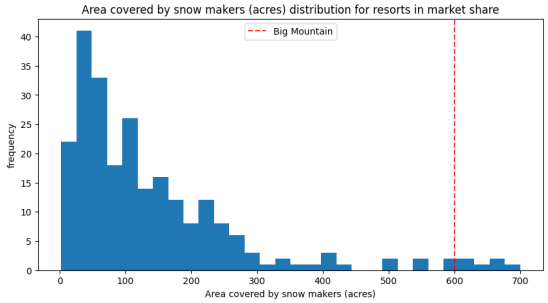
With the help of this feature correlation heatmap, I noted that the features that appear to be positively correlated with the price are: 'fastQuads', 'Runs', 'Snow_Making_ac', 'resort_night_skiing_state_ratio' and 'total_chairs'.

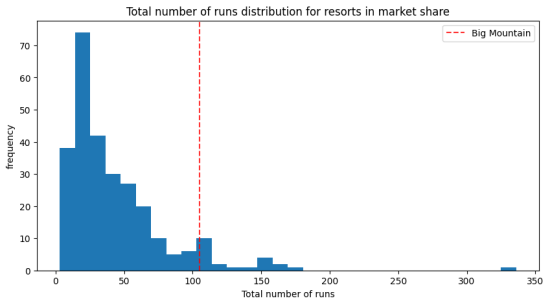
So I decided to ignore state labels, instead focusing on numerical values for modelling.

To choose the model I will be using, I cross-validated different models using the mean absolute error to compare. The Random Forest Model shows the lowest Mean Absolute Error and the lesser variability and confirms the features we had selected as the most relevant.



Based on the model, it seems that Big Mountain has been underpricing their tickets, not taking into account the fact that in every measurement, the resort has well above average facilities:





Currently Big Mountain charges 81 dollars. According to the model, Big Mountain should charge 94.45 dollars. Even with a mean absolute error of 10.39 there would be room for an increase in ticket price. I would suggest to the business leadership that the investments they have made for the resort's features and facilities warrant a higher price in the marketplace.

Of the modelled scenarios adding a run, I would recommend increasing the vertical drop by 150 feet, and installing an additional chair lift, which would justify an increase of 1.65 dollars per ticket. If closing runs is to be considered, the model shows that one closing would have no effect on ticket price and revenue. Closing 2 runs would have the same effect as closing 5, which would save more

in operational costs. Closing more than 5 runs would have a more dramatic drop in ticket price and revenue.

This model can be used to predict an accurate price relative to their features anytime Big Mountain is considering an upgrade or downgrade in facilities. All the company needs is to input the features they want to change, and how much they want to change them by, and the model will return a price prediction.