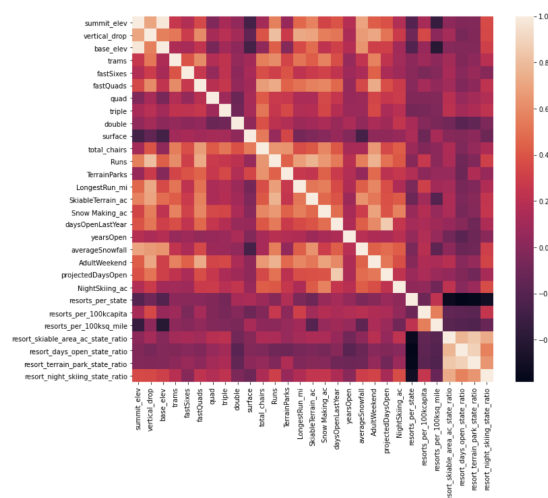
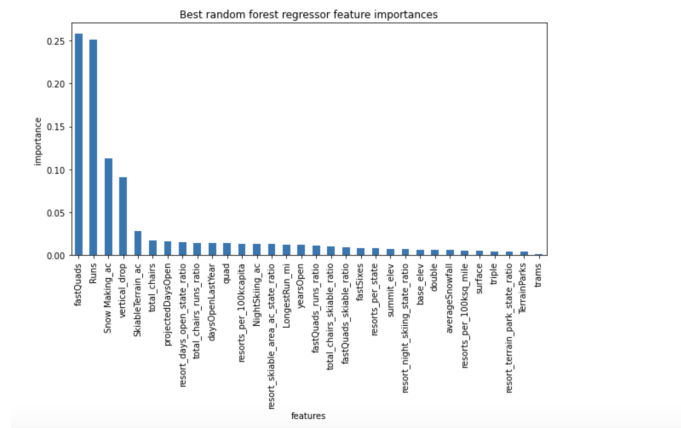


In this project, we aim to solve a pricing problem for Big Mountain Resort. Big Mountain, a ski resort located in Montana, has recently installed an additional chair lift that increased their operating costs by \$1,540,000 this season. Therefore, they are looking for guidance on how to select a better value for their ticket price (currently charged based only on market average.) They also want to know what changes should be made to either cut costs without undermining the ticket price or support an even higher ticket price.

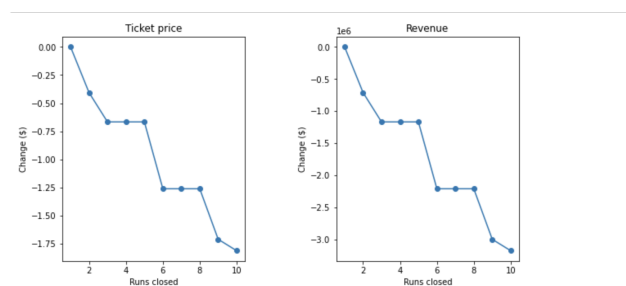
To solve the problem, we are using information on 330 resorts across the country. After cleaning the data, we got useful information on 277 resorts. We also drop or correct a few feature values that are not very plausible . Moreover, we find out the two kinds of ticket prices, AdultWeekday and AdultWeekend, are positively and strongly correlated, which means it would be sufficient to use only one of the two. And we choose AdultWeekend since it has the least missing value of the two. In the end, there are 277 resorts, 24 features, and 1 label left for us to use. Before making our predictions, we also investigate possible correlations between the features and find out the most correlated features with the price by plotting a heatmap (seen below) to help with our next steps of fitting models and making predictions.



In the next step, we split the data into a train set and a test set, and fill the null values with the median of its feature values. Later, we manipulate the technique of pipeline to fit and predict our data. Using one of sklearn's feature selection functions, SelectKBest, we found a list of features that are most useful:



We also decide on using RandomForest to make our prediction. The predicted price is \$95.87, which is \$14.87 higher than the current price. It means that there's room for an increase in the price even with the expected mean absolute error of \$10.39. Big Mountain should higher its ticket price to generate higher revenue. We also test a few scenarios, where we find the number of runs open would highly influence the ticket price.



As shown in the graph above, closing one run does not have much impact on the ticket price, whereas closing 2-3 or 4-5 would result in a lower price. Adding a run also would increase the price by \$1.99. Therefore, Big Mountain should only close one run if they want to lower cost without undermining the ticket price.

