The skiing resort was asking that I create a model that would help determine a solution to increase revenue to compensate the increase in chairs. To come up with a model, it was necessary to review the data of all of the resorts in every state. Once the data was collected, there were two questions that needed to be resolved: which ticket price (ticket price during the weekday and ticket price during the weekend) should be used as reference, and what parts of the data provided are not useful. Data that would not be considered useful was missing data, and missing data accounted for about 16% of resorts. These values had to be removed. As for ticket prices, weekend prices have the least missing values of the two, thus that was chosen. With the cleaning out of the way, the next step was to find correlations between the Adult Weekend ticket prices and other features of resorts. One way to disentangle this interconnected web of relationships is via principal components analysis (PCA). This technique will find linear combinations of the original features that are uncorrelated with one another and order them by the amount of variance they explain.

Chart, line chart

Description automatically generated

As it is shown here, two of the principal components explain over 75% of the variance. These two components were then plotted against each other.

Chart

Description automatically generated

As you can see, the first and second component do not show a pattern with price. Instead, a heatmap was used to find feature correlations.

Chart

Description automatically generated

The takeaway from this was there are correlations for There's a strong positive correlation with vertical\_drop, fastQuads, Runs and total\_chairs with respect to ticket price. A Random Forest Model was created and cross validated. The model was conducted on these features and was concluded that adding 2 acres of snow making and increasing the vertical drop by 150 ft would yield the highest ticket price support.