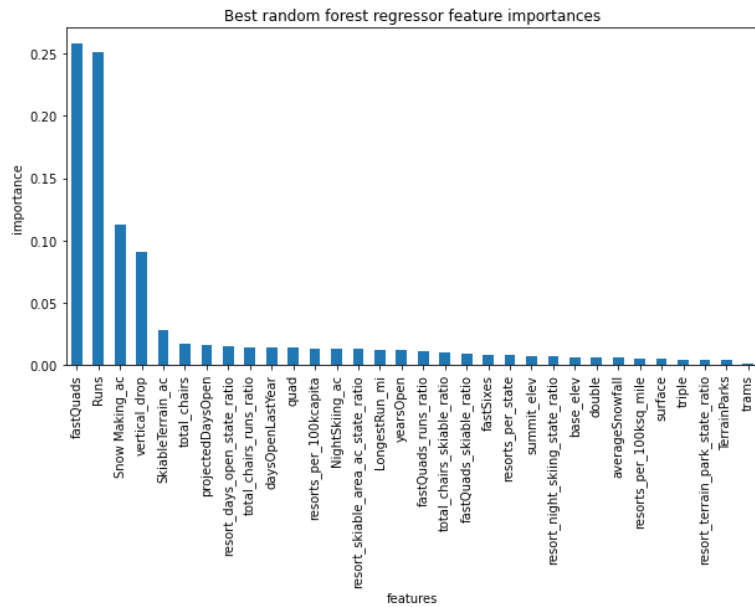# Big Mountain Resort Report

Best random forest regressor feature importances

As the bar chart shows, features that came up as important in the modeling included:

- Snow Making_ac
- total_chairs
- fastQuads
- Runs
- LongestRun_mi
- trams
- SkiableTerrain_ac
- vertical _drop

Big Mountain Resort can increase revenue by either cutting costs or increasing revenue (from ticket prices). First, look at the 4 options the resort want to explore:

1. closing down up to 10 of the least used runs.
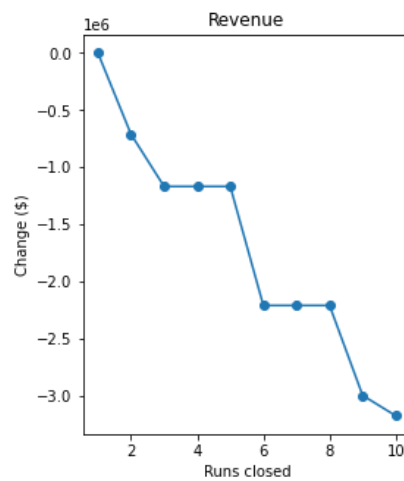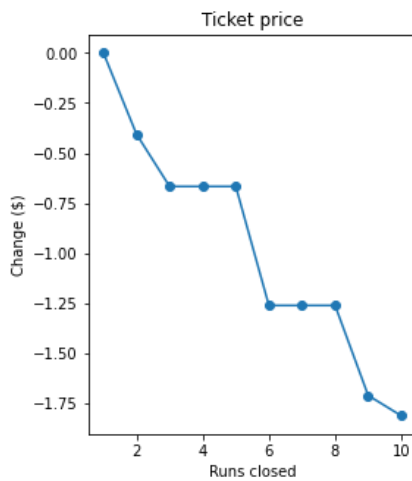
The model says closing one run makes no difference. Closing 2 and 3 successively reduces support for ticket price and so revenue. If Big Mountain closes down 3 runs, it seems they

may as well close down 4 or 5 as there's no further loss in ticket price. Increasing the closures down to 6 or more leads to a large drop.

2. The model shows adding a run, increasing the vertical drop by 150 feet, and installing an additional chair lift, will increase the ticket price by $1.99. Over the season, this could be expected to amount to $3474638
3. Same as number 2, and adding 2 acres of the snow-making cover makes no difference.
4. Increase the longest run by 0.2 miles to boast 3.5 miles length, requiring additional snow making coverage of 4 acres, makes no difference either.

Finally, Big Mountain Resort modelled price is $95.87, actual price is $81.00.
Even with the expected mean absolute error of $10.39, there is room for an increase.

So my recommendation for Big Mountain Resort is to:
1. Depending on the cost of maintaining runs, the resort can compare the cost saved to the revenue reduce by closing least used runs to determine if they should close runs and how many runs to close.
2. If the cost of increasing the vertical drop by 150 feet, and installing an additional chair lift is much less than the expected increase of $3474638, the resort should do it.
3. Increase the ticket price to $86-$95