# Problem identification

1. Big Mountain Resort, a ski resort located in Montana. Every year about 350,000 people ski at Big Mountain.

2. Big Mountain Resort invested in additional chair lift, this additional chair increases the operating costs by $1,540,000 this season.

How can we maximize profits?

- By increasing the tickets price (above average already)

- By reducing cost by closing some facilities.

Recommendation and key findings(4 scenarios)

- Using our mode we found out that the ticket price for Big Mountain Resort modelled price is $96.84, when the actual price is $81.00.

1. Close up to 10 of the least used runs. The number of runs is the only parameter varying.
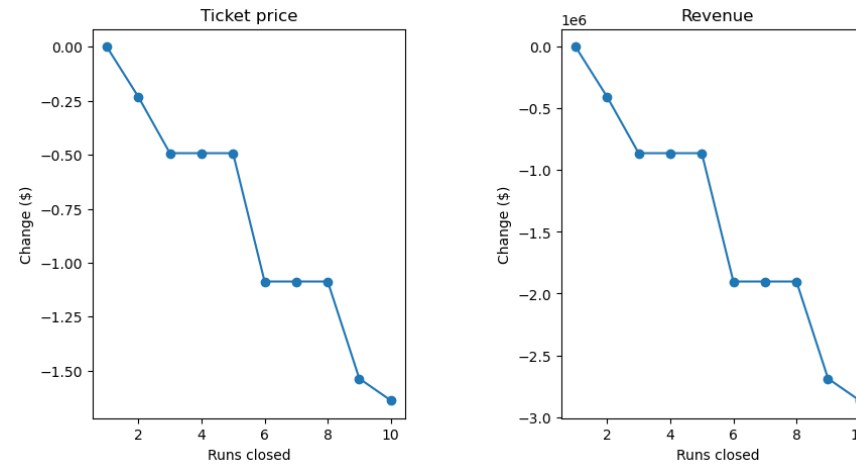
2. The model show that closing 2 and 3 successively reduces support for ticket price and so revenue, closes down 3 runs 4 or 5 as there's no further loss in ticket price. Increasing the closures down to 6 or more leads to a large drop in revenue.

Recommendation and key findings(4 scenarios)

2) **Big Mountain is adding a run, increasing the vertical drop by 150 feet, and installing an additional chair lift.**

This scenario increases support for ticket price by $1.99 Over the season, this could be expected to amount to $3,474,638

3) Same as 2 but adding 2 acres of snow making.

No difference whatsoever compare to 2

4) This scenario calls for increasing the longest run by .2 miles and guaranteeing its snow coverage by adding 4 acres of snow making capability.

No difference whatsoever.

Modeling results and analysis

- How we develop the model:

- We build machine learning models, to assign values to the missing prices.

- We found the most important features correlated with ticket price.

Best random forest regressor feature importances
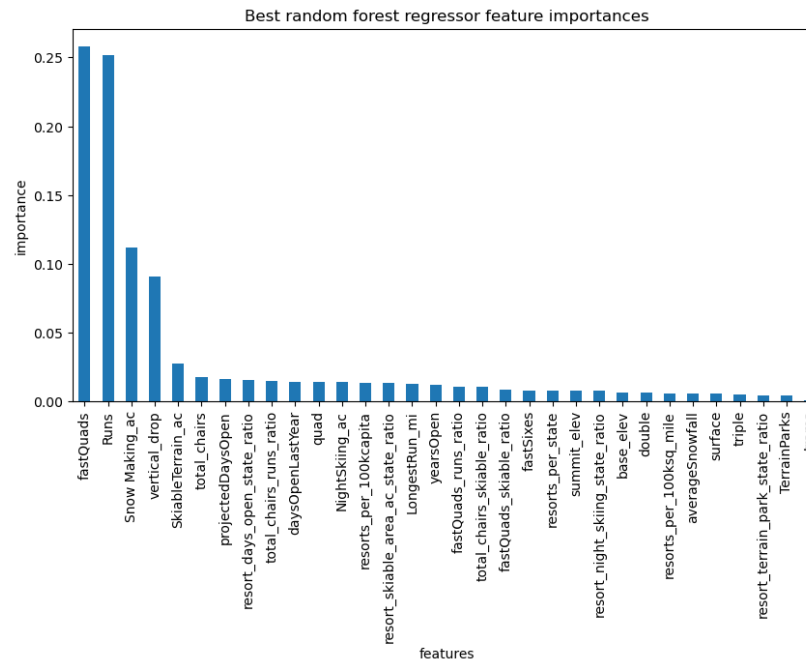
Modeling results and analysis

- We used this 6 parameters : fastQuads, Runs, Snow Making_ac, vertical_drop, Total number of chairs and Skiable terrain area. To explore where Big Mountain fit compare to other ski resorts.
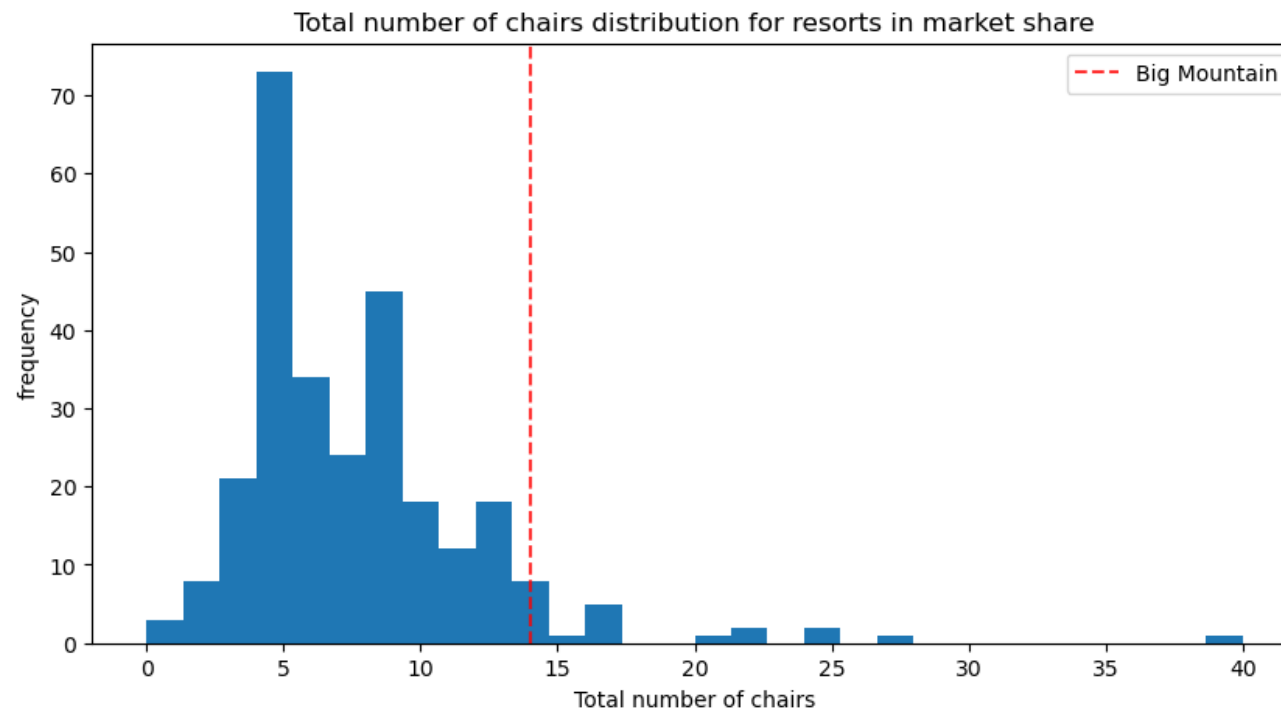
Summary and conclusion

- We found out using our model that the ticket price for Big Mountain Resort is $96.84, when the actual price is $81.00.

- We found out that adding a run, increasing the vertical drop by 150 feet, and installing an additional chair lift.

This scenario increases support for ticket price by $1.99 Over the season, this could be expected to amount to $3,474,638