

Optimizing Machine Learning Models for Ticket Price Prediction at Big Mountain Resort

Oct-2023 Pramod Acharya



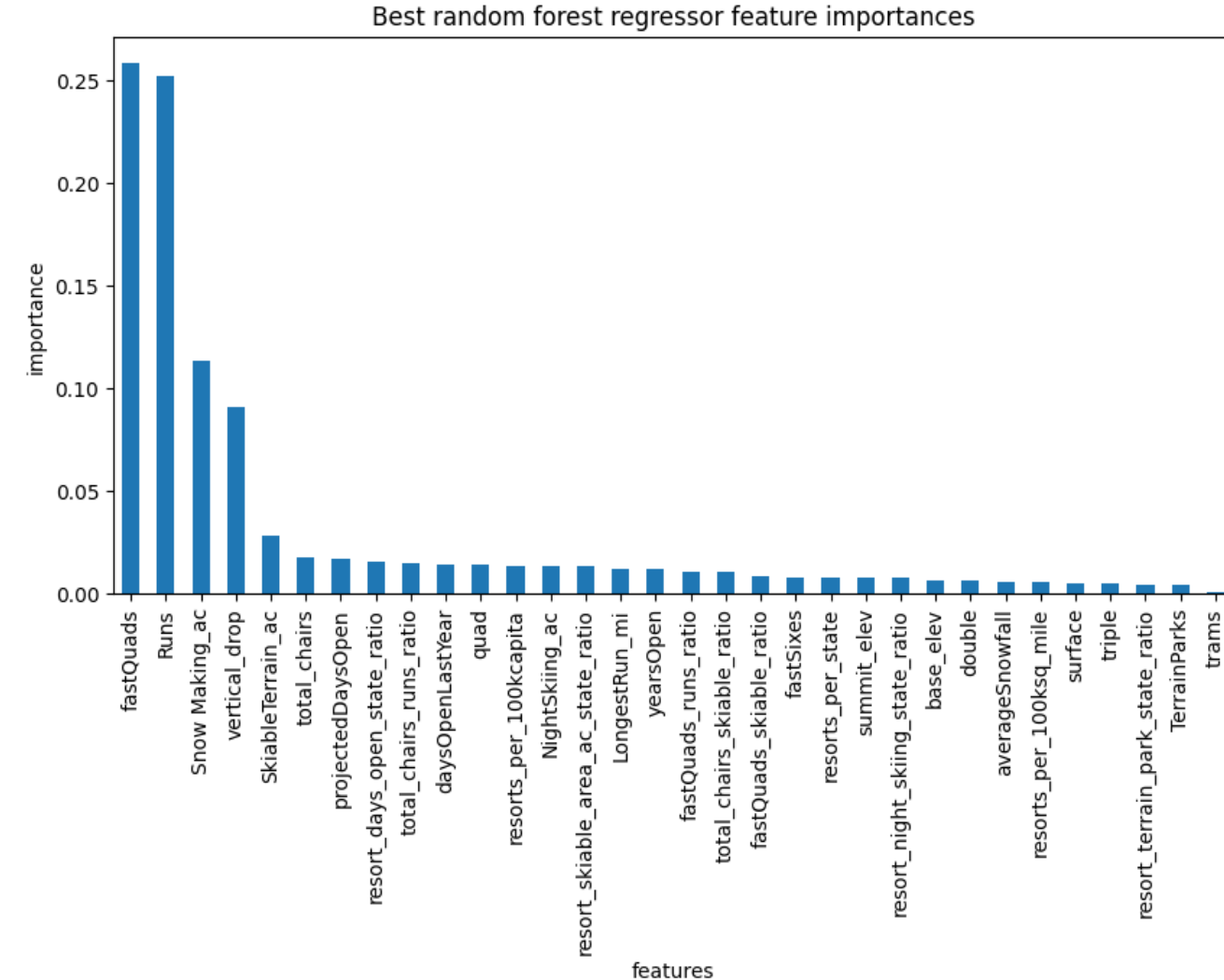
Problem Identification

- Big Mountain resort installed new chairs lift
- This would enhance the flow of visitors throughout the resort
- Adds an additional \$1.54 million in operation costs
- Big Mountain Resort currently charges \$81.00 per ticket

❖ Despite an \$1.54M chair lift addition, the pricing strategy may be holding back its potential. The resort seeks a data-driven approach to optimize ticket pricing and consider cost-effective changes while staying competitive.

Recommendation and key findings

- The expected number of visitors over the season is 350,000 and, on average, visitors ski for five days.



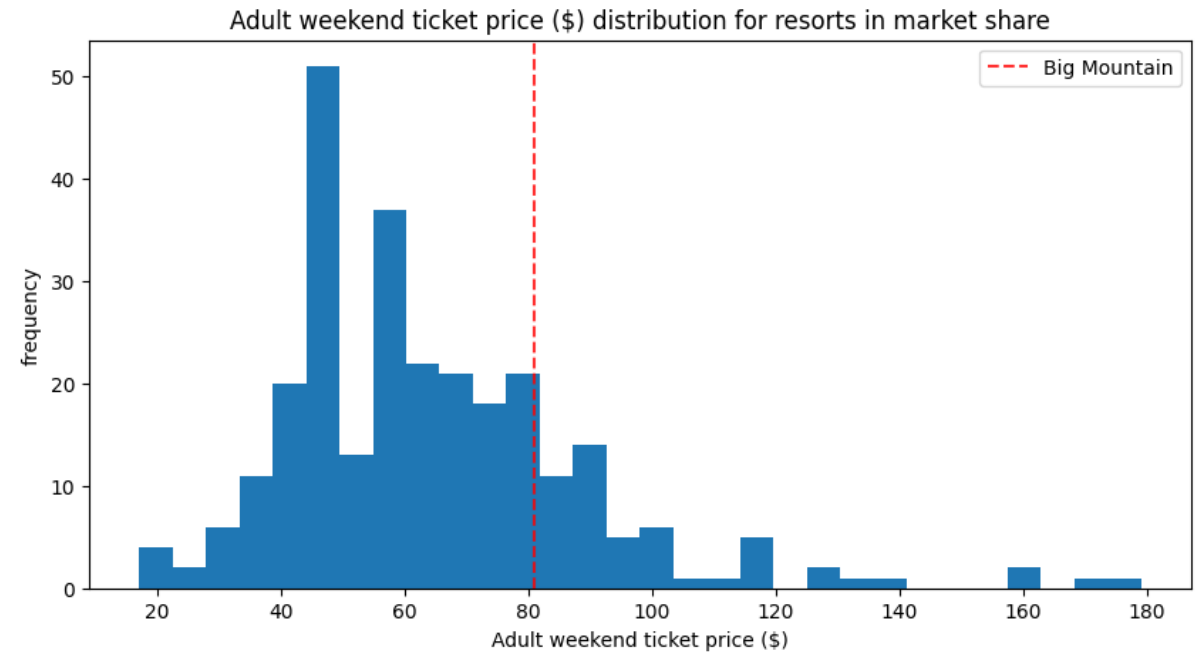
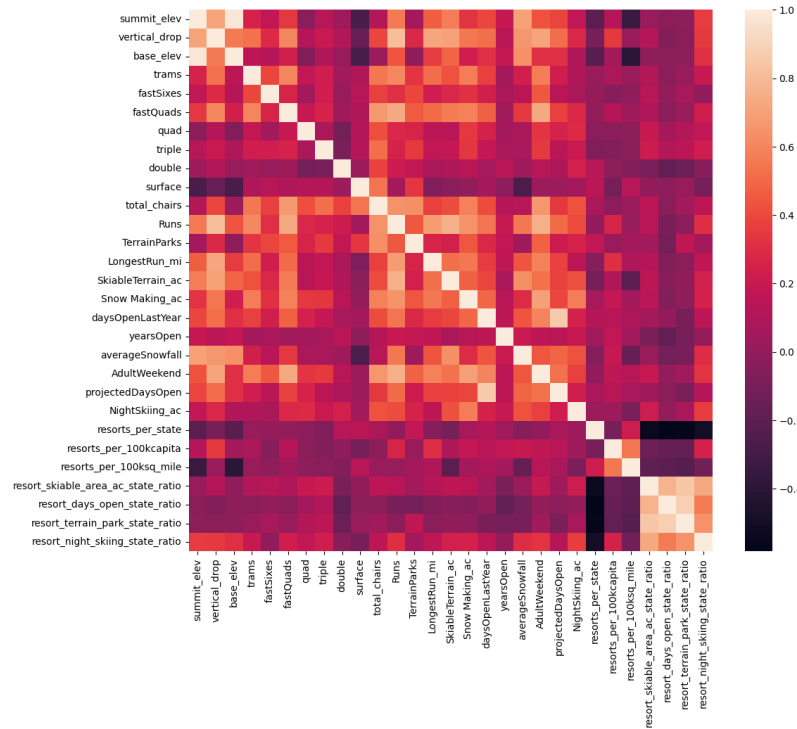
Dominant top four features

- fastQuads
- Runs
- Snow Making_ac
- vertical_drop

Random Forest Model price: \$95.87

- ✓ Big Mountain Resort has significant enough facilities to justify this cost

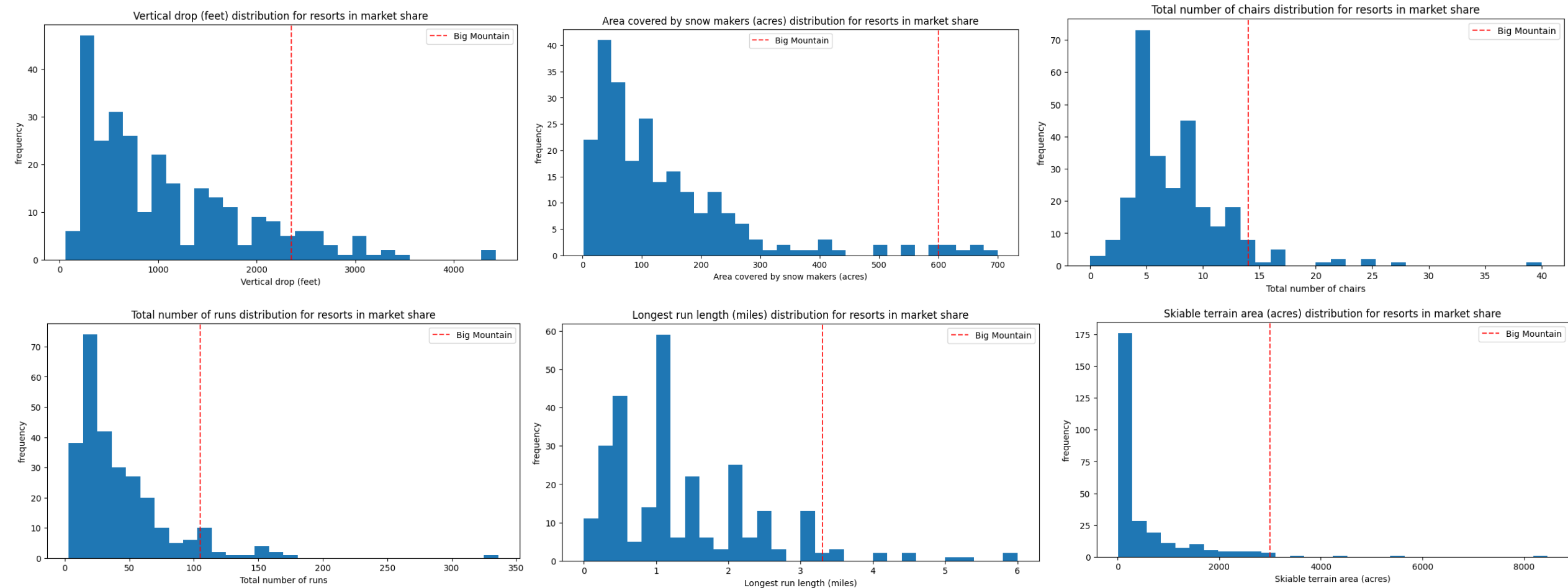
Modeling Results and Analysis



Features that came up as important in the modeling (random forest model)

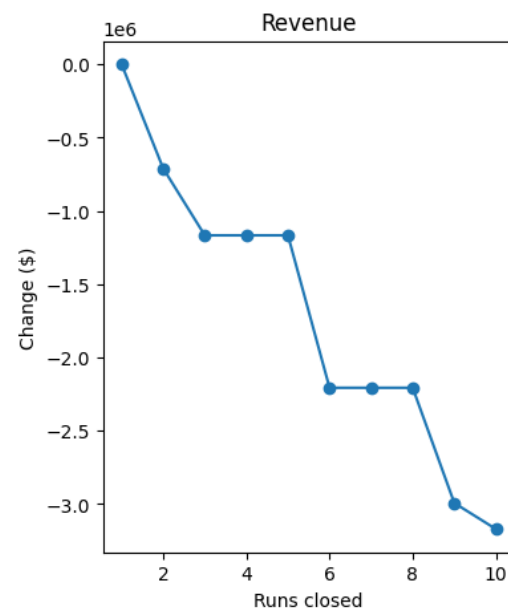
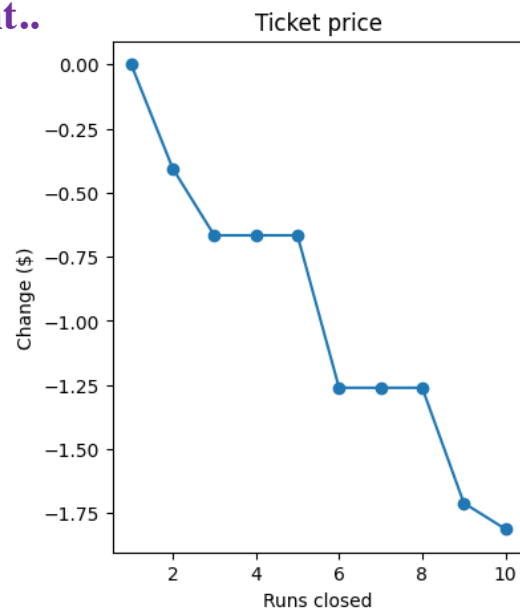
- ☐ vertical_drop
- ☐ Snow Making_ac
- ☐ total_chairs
- ☐ fastQuads
- ☐ Runs
- ☐ LongestRun_mi
- ☐ Trams
- ☐ SkiableTerrain_ac

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- Big Mountain is doing well for vertical drop, but there are still quite a few resorts with a greater drop.
- Big Mountain is very high up the league table of snow making area.
- Big Mountain has amongst the highest number of total chairs, resorts with more appear to be outliers.
- Big Mountain compares well for the number of runs. There are some resorts with more, but not many.
- Big Mountain is amongst the resorts with the largest amount of skiable terrain.
- Big Mountain has one of the longest runs. Although it is just over half the length of the longest, the longer ones are rare.

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Closing one run has no impact. Closing 2 or 3 successively reduces ticket price and revenue. Closing 3, 4, or 5 runs shows no further loss in ticket price. However, closing 6 or more leads to a significant drop

- Scenario 1 analyzed run closures, revealing limited impact on pricing until six or more runs were closed, causing a significant drop.
- Scenario 2 proposed resort improvements: Adding a run, increasing the vertical drop by 150 feet, and installing an additional chair lift, projecting a \$1.99 ticket price increase and potential \$3.5M revenue boost.
- Scenario 3 proposed snow-making expansion: Repeat scenario 2 conditions but adding 2 acres of snow making. This support for ticket price by \$1.99 over the season and similar \$3.5M revenue boost. This just showed marginal pricing influence
- Scenario 4 proposed increasing the longest run by 0.2 miles and guaranteeing its snow coverage by adding 4 acres of snow making capability. The extension and snow-making addition had negligible effects.

Summary and conclusion

- ❖ Big Mountain Resort currently charges \$81.00 per ticket, but it has the capacity to support a slightly higher price point, approximately \$95.87
- ❖ Scenario 2 proposed resort improvements: Adding a run, increasing the vertical drop by 150 feet, and installing an additional chair lift , projecting a \$1.99 ticket price increase and potential \$3.5M revenue boost.
- ❖ There is ample opportunity to increase revenue and offset the extra operational expenses. Any of these suggestions should ensure the continued operation of Big Mountain Resort for years to come
- ❖ To enhance the analysis, additional data on operational expenses such as maintenance, staffing, and marketing is needed. It is crucial to survey business executives for their expectations regarding pricing strategy alignment.

Thanks ! Question?