Big Mountain Ski Resort Ticket Pricing

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Problem Overview

- Big Mountain Ski Resort installed an additional chair lift -> increasing operational costs by $1.5 million this season
- They are re-examining current pricing strategy: charging a premium over the average price of resorts in its market segment
- They want guidance on how to select a better value for ticket price
- They are also considering a number of changes that they hope will either cut costs without undermining ticket price, or support an even higher price.

Problem Overview

- The business has shortlisted 4 cost-cutting / revenue increasing scenarios that need to be assessed
    1. Permanently closing down up to 10 of the least used runs. This doesn't impact any other resort statistics.
    2. Increase the vertical drop by adding a run to a point 150 feet lower down but requiring the installation of an additional chair lift to bring skiers back up, without additional snow making coverage
    3. Same as number 2, but adding 2 acres of snow making cover
    4. Increase the longest run by 0.2 mile to boast 3.5 miles length, requiring an additional snow making coverage of 4 acres

Recommendation and Key Findings

- Scenario 1:
  - Losing one run makes no difference. Closing 2 or 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.
- Scenario 2:
  - Increases support for ticket price by $1.99 and over the season expected revenue increase is 3.47 million. This model does not account for the additional capital expenditure however
- Scenario 3:
  - No difference to ticket price/revenue with respect to Scenario 2. This model also does not account for the additional capital expenditure
- Scenario 4:
  - Results in no change to ticket price / revenue

Recommendation: Scenario 2, Increasing Vertical Drop by 150 ft without additional snow making capabilities will increase support for ticket price by $1.99 and boost expected revenue by $3.5 million
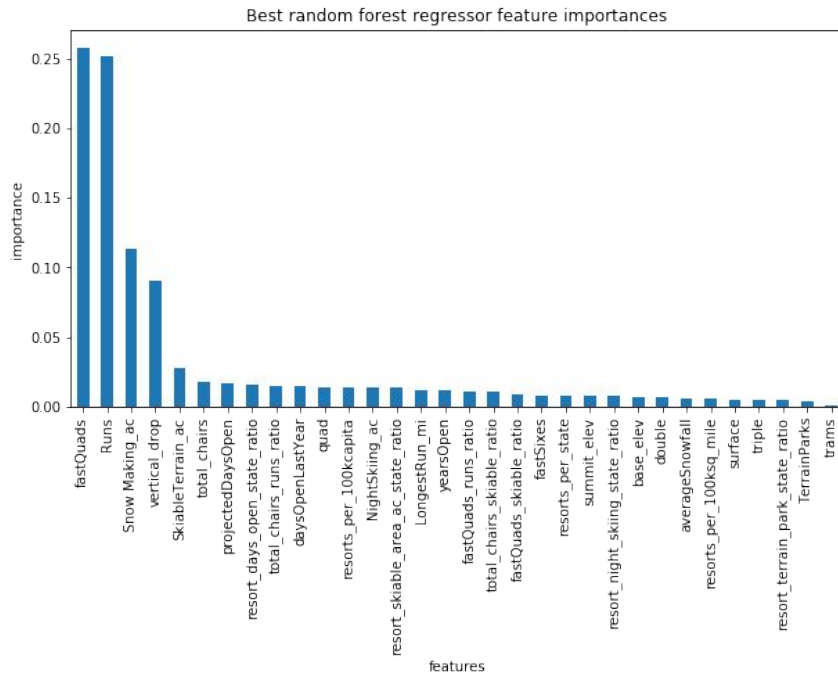
Modeling Results & Analysis (Pt.1)

Linear Regression Model:

```
vertical_drop          10.767857
Snow Making_ac          6.290074
total_chairs            5.794156
fastQuads               5.745626
Runs                    5.370555
LongestRun_mi           0.181814
trams                  -4.142024
SkiableTerrain_ac      -5.249780
dtype: float64
```
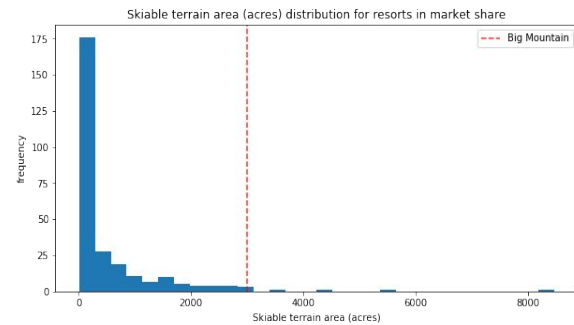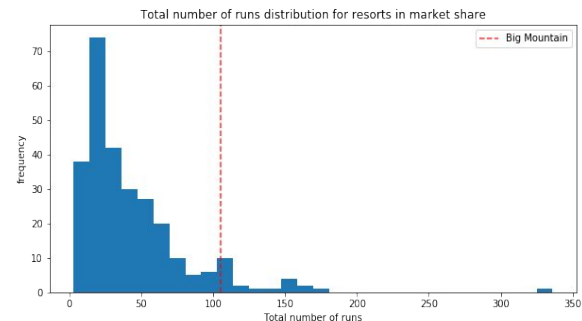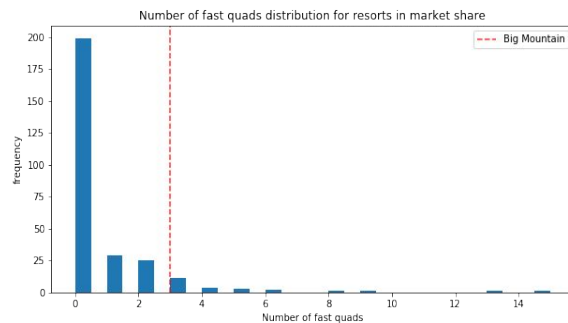
MAE = 10.499
STD = 1.62

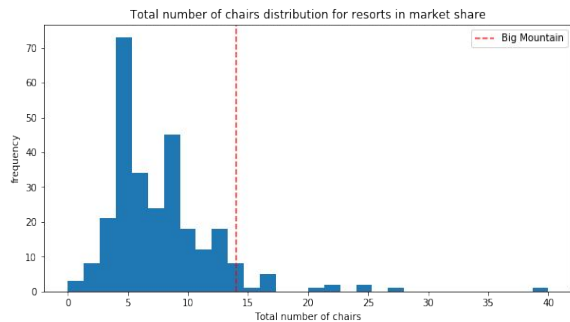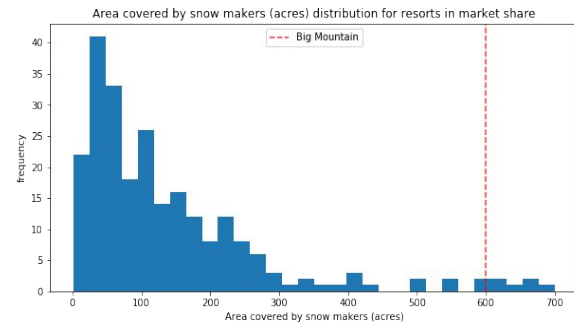**Random Forest Model:**

Best random forest regressor feature importances

MAE = 9.645
STD = 1.35

Modeling Results & Analysis (Pt.2)

Cross-validation score as training set size increases
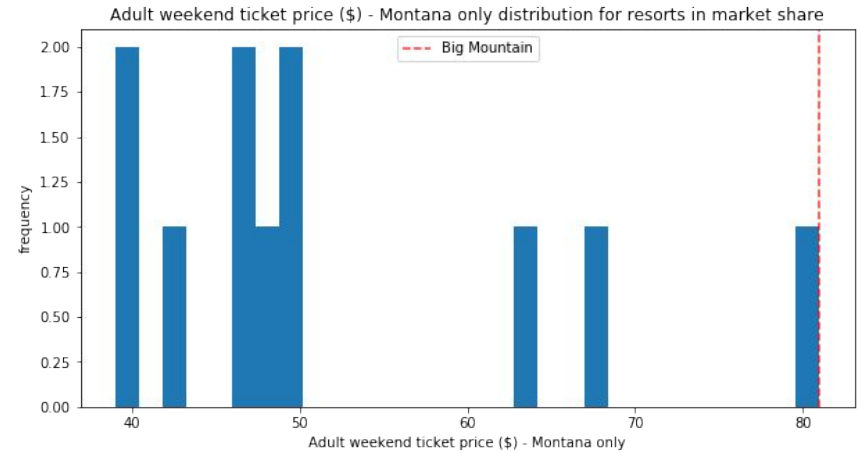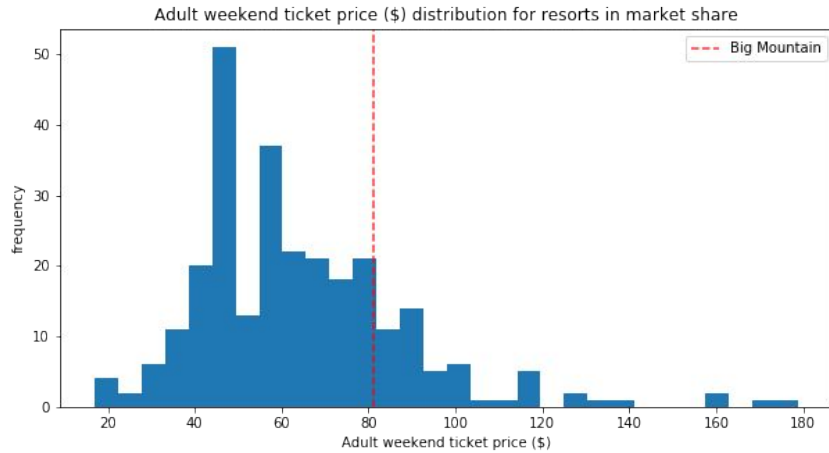
This shows that we seem to have plenty of data. There's an initial rapid improvement in model scores as one would expect, but it's essentially levelled off by around a sample size of 40-50.

Modeling Results & Analysis (Pt.2)
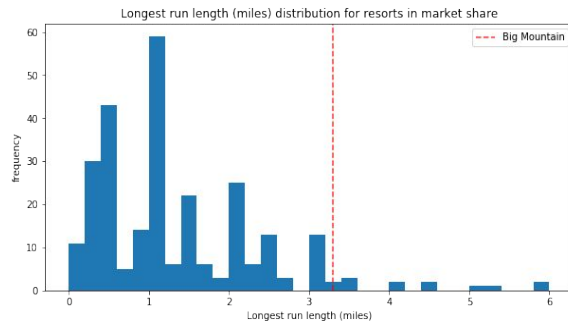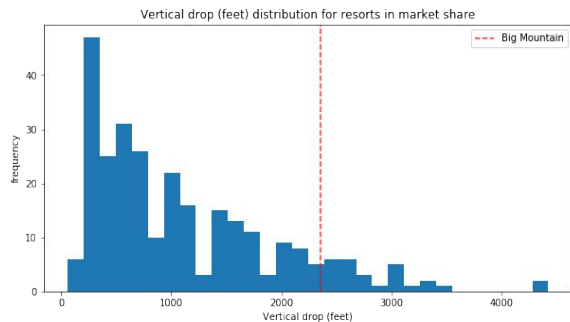
*Big Mountain is among the top resorts in its market segment

Modeling Results & Analysis (Pt.3)

Adult weekend ticket price ($) distribution for resorts in market share

Adult weekend ticket price ($) - Montana only distribution for resorts in market share

Summary

- Big Mountain is among the top resorts in its market segment
- Modeled price is $95.86 vs. actual price of $81
  - MAE = ~$10, suggesting room for increase
- Pricing Assumptions:
  - Other resorts set their prices according to market
- 4 Proposed Scenarios:
  - Close of least used runs
  - Increase Vertical Drop (with or without snow-making)
  - Increase longest run with snow making
- Recommendation: **Increasing the vertical drop** with or without added snow making provides opportunity to **increase revenues by $3.5 million**.
  - However the effect on costs must be considered
  - Current model is lacking operating costs, next step would be to incorporate that into dataset