

Guided Capstone Project Report

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Problem identification

- Big Mountain Resort charges a premium above the average price of its market segment.
- Not a good strategy !
- A new chairlift increased operating costs by \$ 1,540,000 this season.

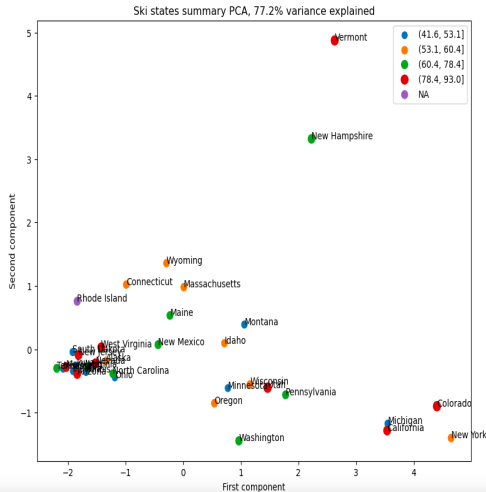
How can Big Mountain Resort improve its pricing strategy so that its revenue is increased by at least \$1,540,000 within one season, by taking into account the importance of each facility or the vertical drop of the resort ?

Recommendation and key findings

- Our model recommends that the weekend ticket price should be \$95.87, with a MAE of \$10.39.
- This represents a sharp increase from the current price of \$ 81.00.
- Among the 4 scenarios under consideration, the following ones are worth studying further:
 - Scenario 1 (closing up to 10 of the least used runs),
 - Scenario 2 (adding a run to increase the vertical drop and installing a new chairlift)

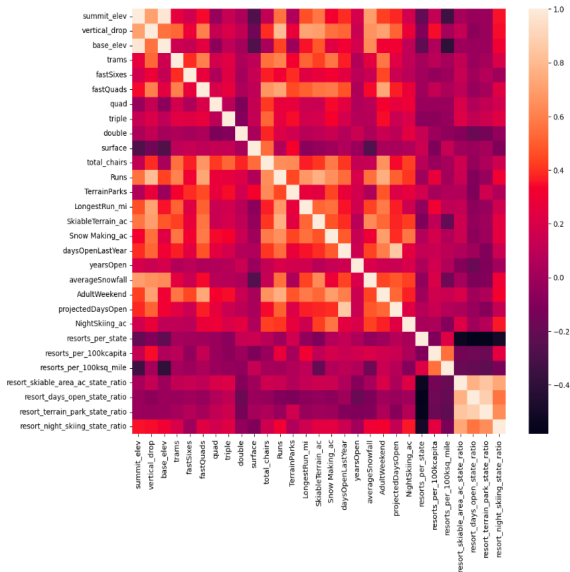
Modelling results and analysis

- **Data Wrangling:** the target feature is taken to be the weekend price and not the weekday price.
- **EDA:** Principal Component Analysis reveals that we can treat all states equally:



Modelling results and analysis (cont.)

- and correlation patterns between features:



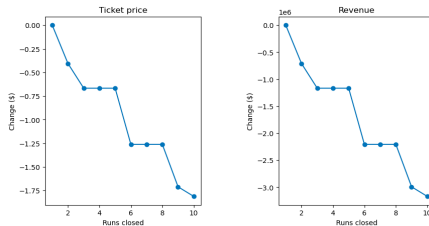
Modelling results and analysis (cont.)

- **Pre-processing and training:**

- Missing values were imputed by median or mean,
 - StandardScaler to scale data to zero mean and unit variance, or no scaling
 - Baseline model, linear regression and random forest
 - cross-validation
 - Hyperparameter search with GridSearchCV
 - Performance metrics: R-squared, MAE, MSE
- Winning model: random forest.
 - We also have a sufficient amount of data.

Modelling results and analysis (cont.)

- Modelling Scenario 1:



- For Scenario 2, our model suggests a ticket price increase of \$8.61, or an expected revenue increase of \$15065471 over the season.

Summary and conclusion

- We recommend that the weekend ticket price is increased to \$95.87.
- We also recommend further studies of Scenarios 1 and 2.
- We also suggest studying further the limitations of our model:
 - Free-market assumption,
 - Data for operating costs for all the lifts not available.