

A
CAPSTONE PROJECT
IN
DATA SCIENCE

BIG MOUNTAIN RESORT TICKET PRICE PREDICTION

By:
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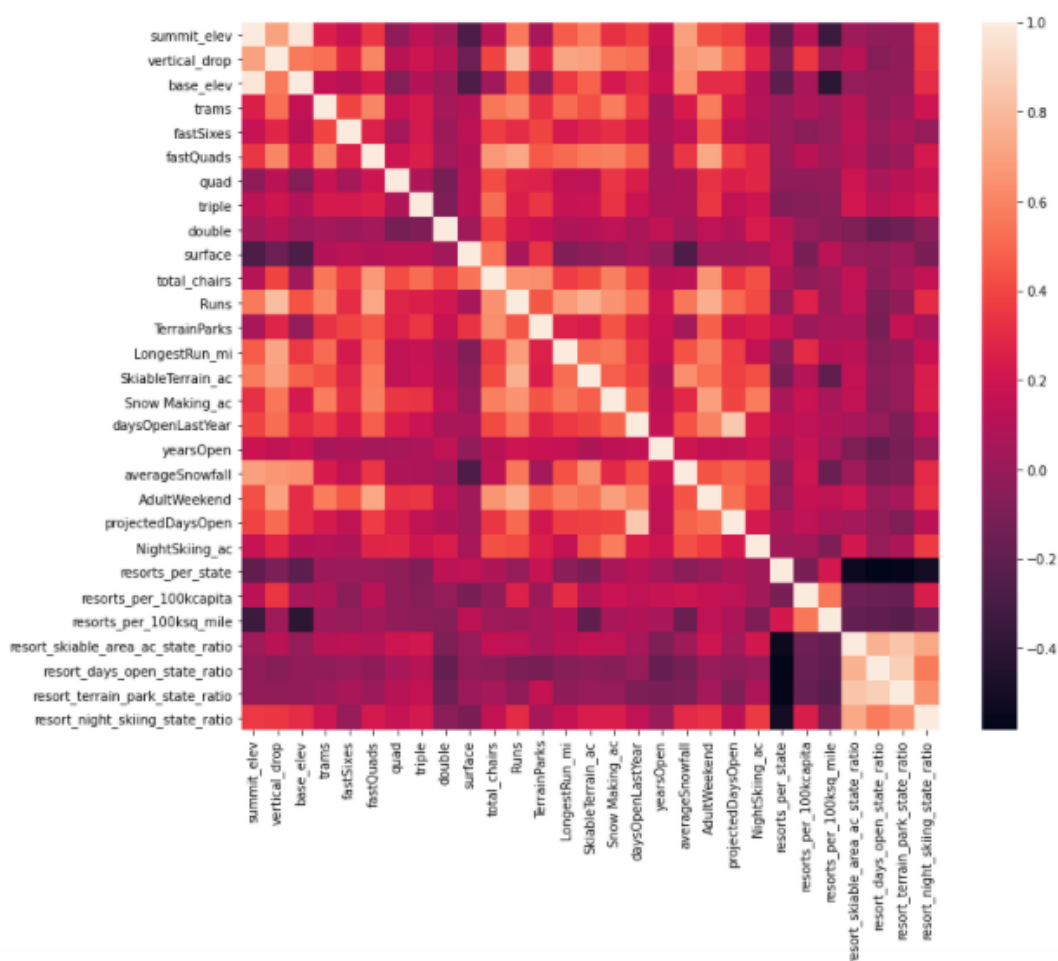
JANUARY 2021

1. Problem and its Background:

Big Mountain Resort is a ski resort located in Montana which offers spectacular views of Glacier National Park and Flathead National Forest with access to 105 trails. Every year about 350,000 people ski or snowboard at Big Mountain. The Resort has been charged a premium above the average price of resorts in its market segment. Now, the resort is considering a number of changes on its facilities that will either cut costs without undermining the ticket price or will support an even higher ticket price. The resort wants some guidance on how to select a better value for their ticket price based on its facilities so that the resort can increase its revenue. Using the data of 330 resorts in the market, we should model a price for tickets based on facilities and suggest the resort for the suitable ticket price.

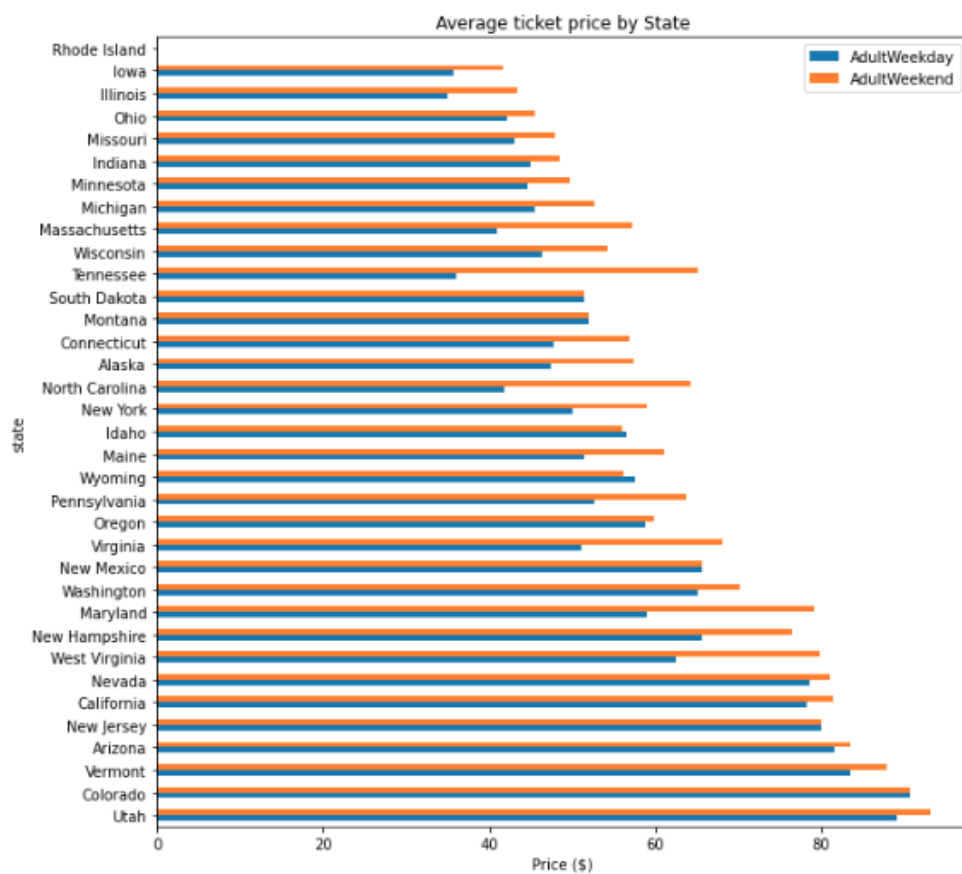
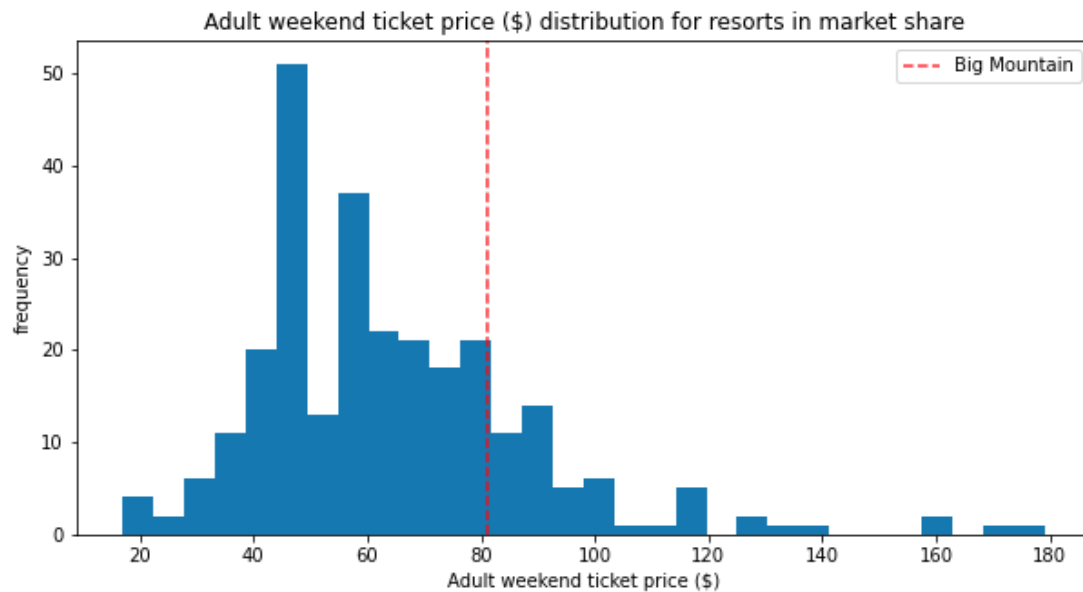
2. About the Data:

The original data, provided by Database Manager - Alesha Eisen, contains data related to the 330 resorts in the market. After cleaning the data, it is of shape (277, 25) and our target variable is 'AdultWeekend' which is the price of ticket in weekend. The following heat-map shows the relationship between the variables.



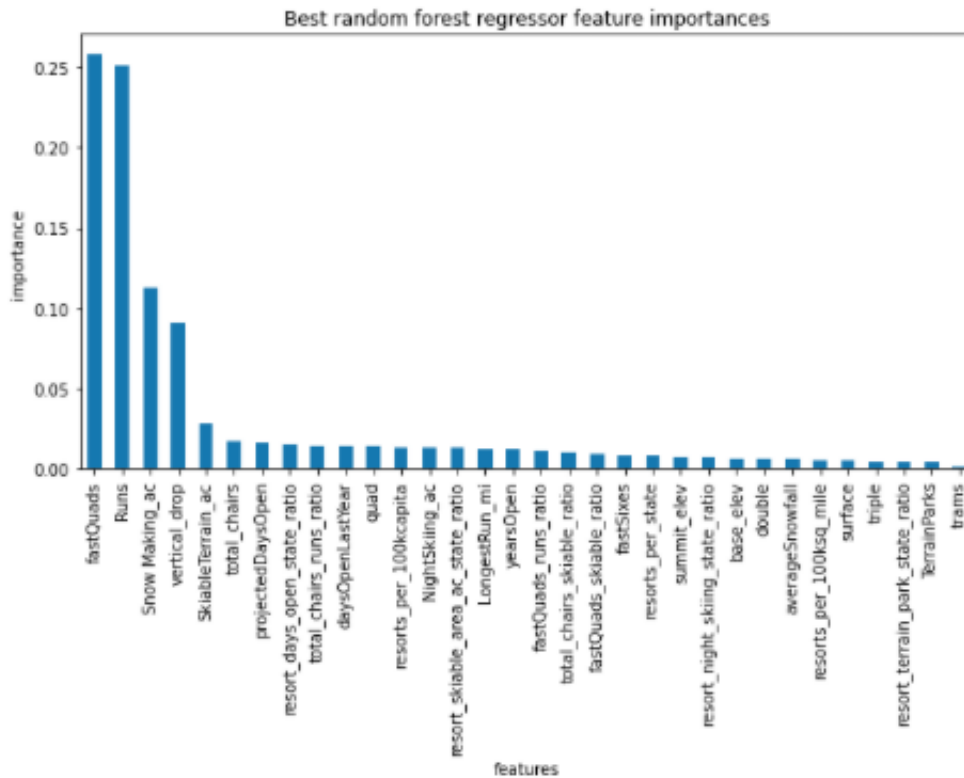
3. Current Situation:

The Big Mountain Resort is currently charging \$ 81 per ticket. It is very high compared with whole United states average price of \$ 64 and Montana State average price of \$ 52.



4. Model:

I used RandomForestRegressor of sklearn inside the pipeline instead of LinearRegressor model. Also, I used cross-validation method to pick the best number k of features. I found $k = 17$ as the best number of features. This means there are 17 important features in the data that affect the ticket price.



5. Findings and Recommendations:

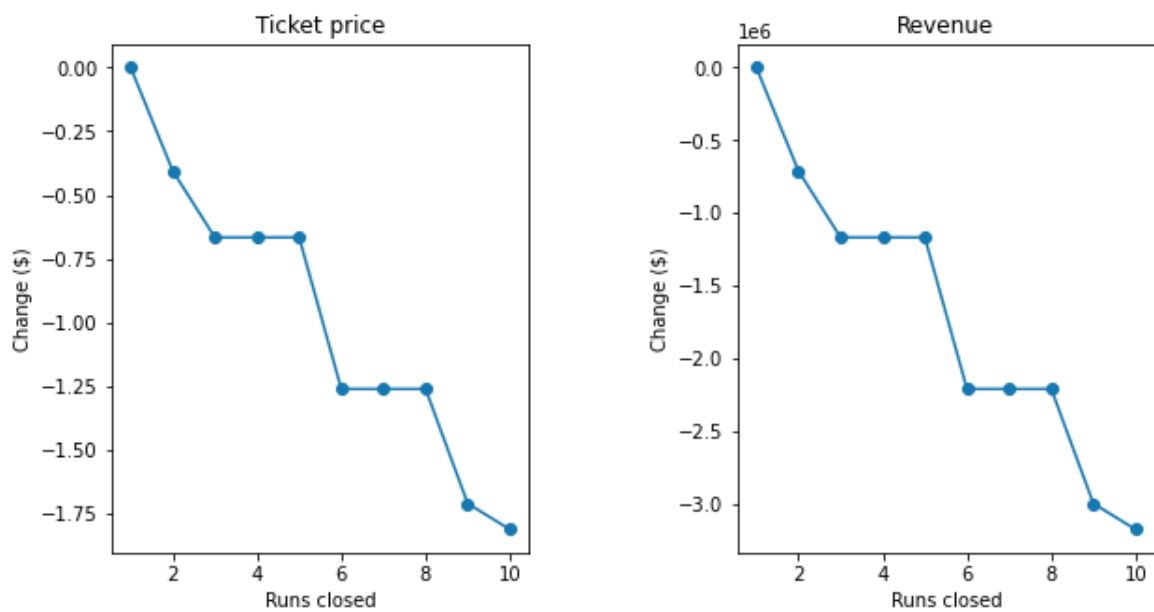
The Big Mountain Resort is currently charging \$ 81 per ticket. But according to the model, the modeled ticket price at the Big Mountain Resort should be \$ 95.87. Even with the expected mean absolute error of \$ 10.39, this suggests there is room for an increase.

I found two important scenarios which can help to increase the revenue with a remarkable amount by making small changes in facilities.

Scenario 1: In the first scenario, if Big Mountain is adding a run, increasing the vertical drop by 150 feet, and installing an additional chair lift then the revenue can be expected to increase by the amount \$ 3322464 with the increase of ticket price by \$ 1.90.

Scenario 2: in the second scenario, if Big Mountain is repeating the same previous facilities with the addition of 2 acres of snow making then the revenue can be expected to increase again by the amount \$ 3322464 with the increase of ticket price by \$ 1.90.

Also 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.



6. Acknowledgments:

I am very grateful to my mentor for his valuable suggestions while completing this project. Also I am thankful to the Big Mountain Resort authority for providing valuable information.