Springboard Data Science Career Track Guided Capstone
Project Report:
Akbanu Tleubayeva
February, 2021.

Introduction

Big Mountain Resort is a ski resort located in Montana. It 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. It can accommodate skiers and riders of all levels and abilities. These are serviced by 11 lifts, 2 T-bars, and 1 magic carpet for novice skiers. The longest run is named Hellfire and is 3.3 miles in length. The base elevation is 4,464 ft, and the summit is 6,817 ft with a vertical drop of 2,353 ft. Big Mountain Resort has recently installed an additional chair lift to help increase the distribution of visitors across the mountain. This additional chair increases their operating costs by $1,540,000 this season. The resort's pricing strategy has been to charge a premium above the average price of resorts in its market segment. They know there are limitations to this approach. There's a suspicion that Big Mountain is not capitalizing on its facilities as much as it could. Basing their pricing on just the market average does not provide the business with a good sense of how important some facilities are compared to others. This hampers investment strategy. The business wants some guidance on how to select a better value for their ticket price. They are also considering a number of changes that they hope will either cut costs without undermining the ticket price or will support an even higher ticket price. The primary task is to predict the Ticket Price Big Mountain Resort can charge its customers considering the features it offers and its market segment. Present ticket price is $81.00.

Data Source

A single CSV file was provided which gave information about features and pricing for Big Mountain and its competitors.

Column	Description
Name	The name of the ski resort.
Region	The region within the United States where the resort is located.
state	The state name where the resort is located.
summit_elev	Elevation in feet of the summit mountain at the resort.
vertical_drop	Vertical change in elevation from the summit to the base in feet.
base_elev	Elevation in feet at the base of the resort.
trams	The number of trams.
fastEight	The number of fast eight person chairs.
fastSixes	The number of fast six person chairs.
fastQuads	The number of fast four person chairs.
quad	Count of regular speed four person chairlifts.
triple	Count of regular speed three person chairlifts.
double	Count of regular speed two person chairlifts.
surface	Count of regular speed single person chairlifts.
total_chairs	Sum of all the chairlifts at the resort.
Runs	Count of the number of runs on the resort.
TerrainParks	Count of the number of terrain parks at the resort.
LongestRun_mi	Length of the longest run in the resort in miles.
SkiableTerrain_ac	Total skiable area in square acres.
Snow Making_ac	Total area covered by snow making machines in acres.
daysOpenLastYear	Total number of days open last year.
yearsOpen	Total number of years the resort has been open.
averageSnowfall	Average annual snowfall at the resort in inches.
AdultWeekday	Cost of an adult weekday chairlift ticket.
AdultWeekend	Cost of an adult weekend chairlift ticket.
projectedDaysOpen	Projected days open in the upcoming season.
NightSkiing_ac	Total skiable area covered in lights for night skiing.

Modelling

Following features came up as important in our analysis:

vertical_drop

Snow Making_ac

total_chairs

fastQuads

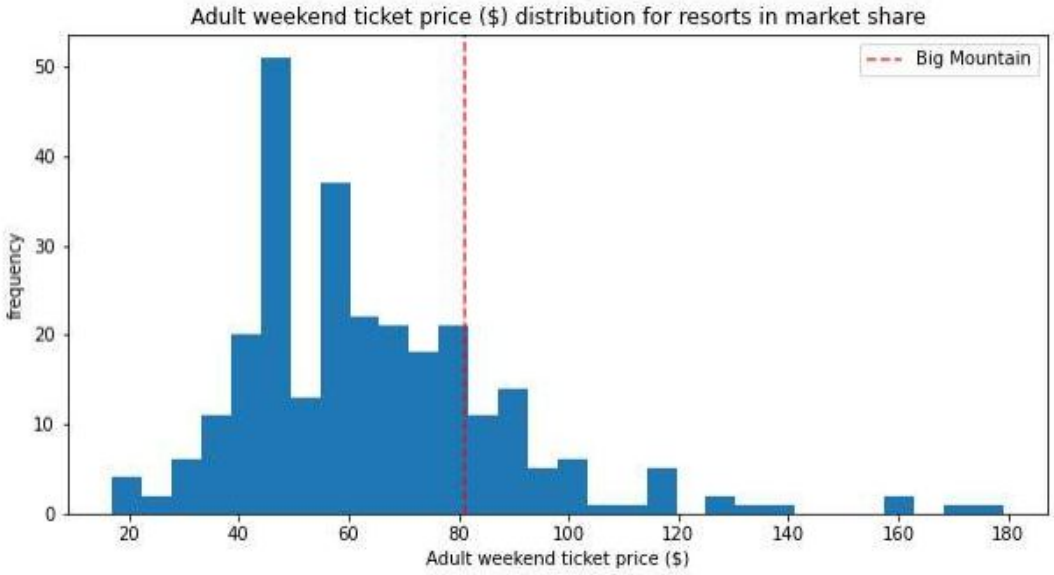
Runs

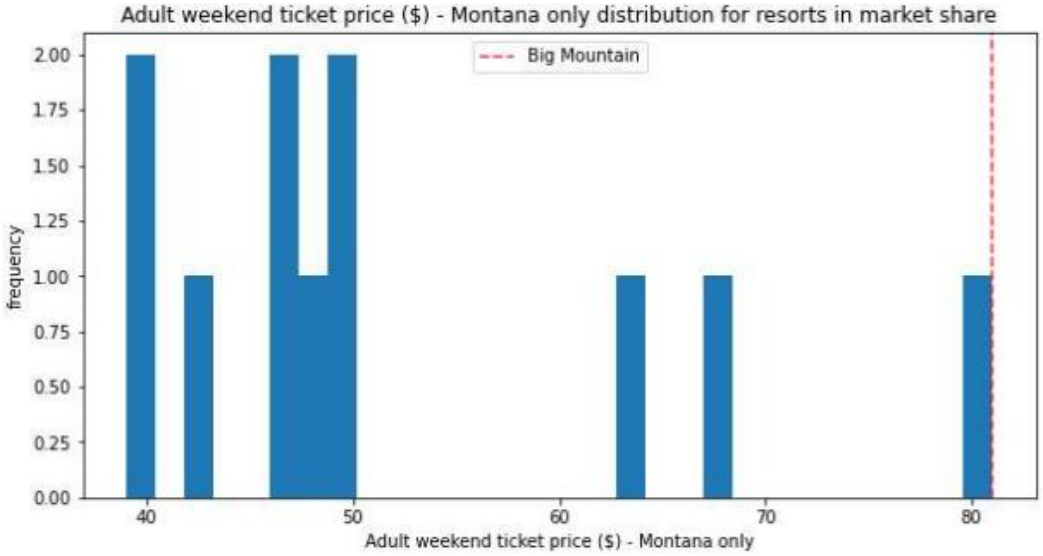
LongestRun_mi

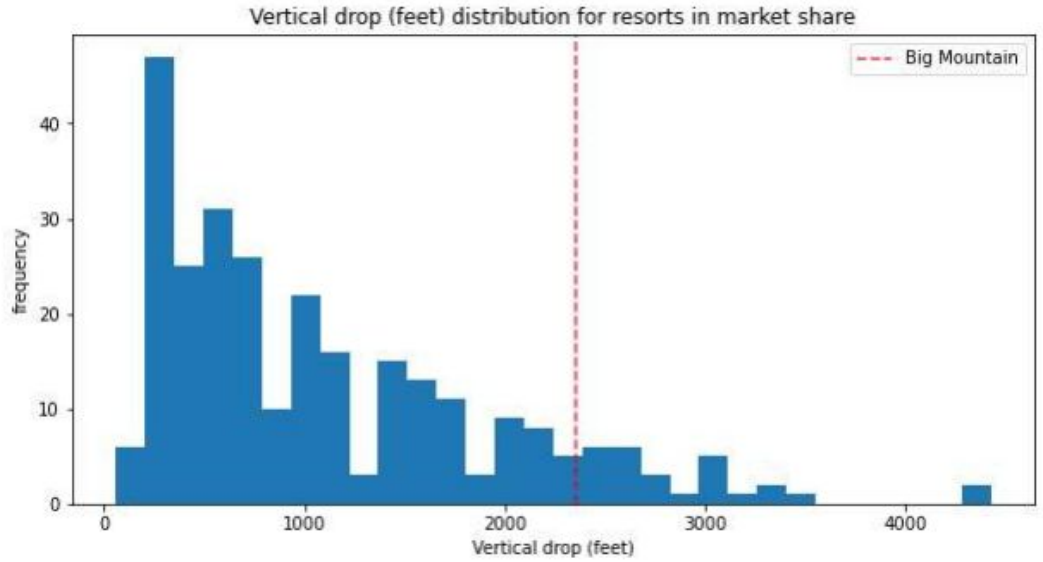
trams

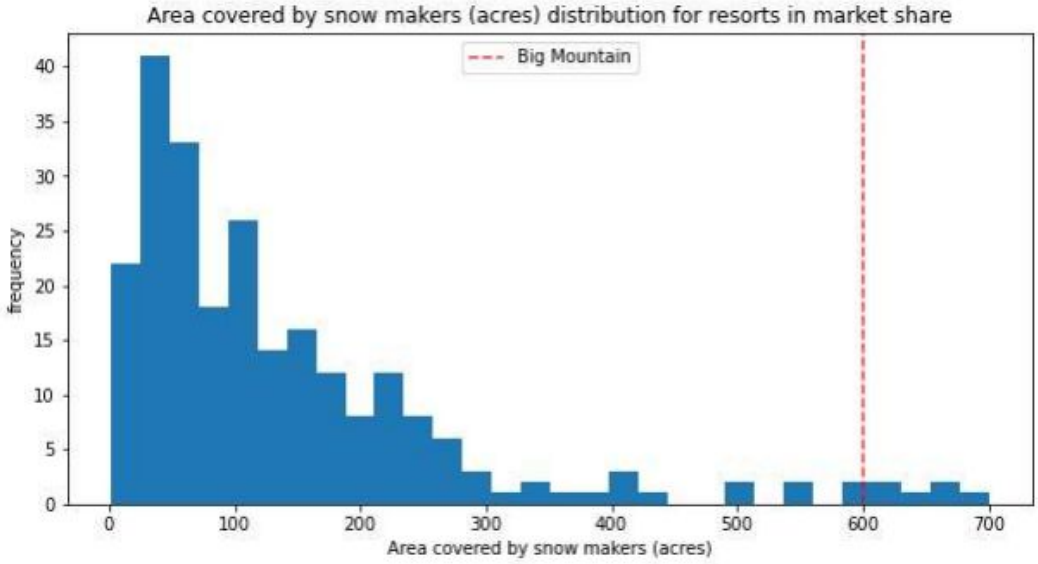
SkiableTerrain_ac

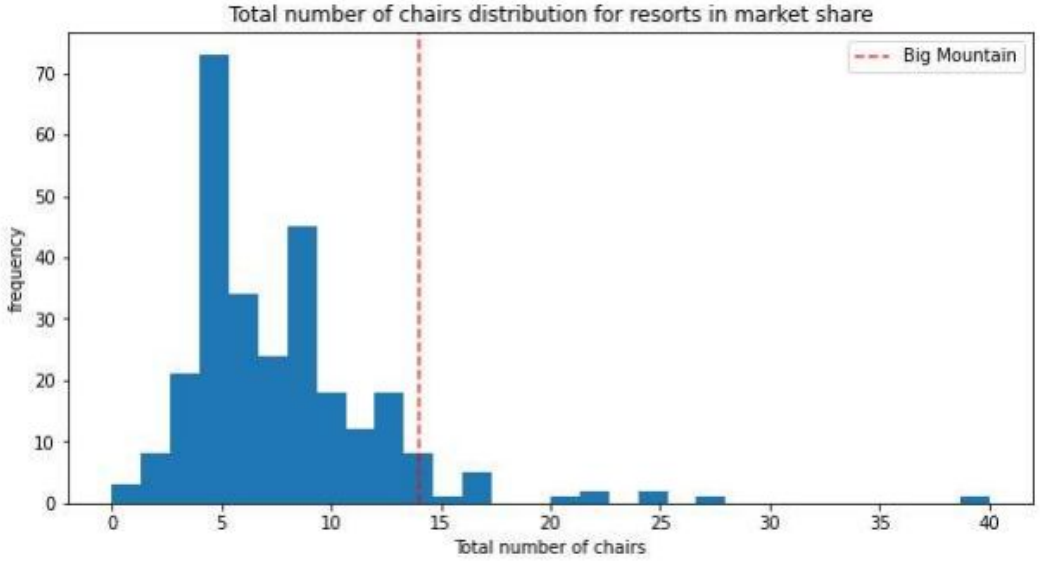
Here are some charts which represent these features and the relative position of Big Mountain Resort.

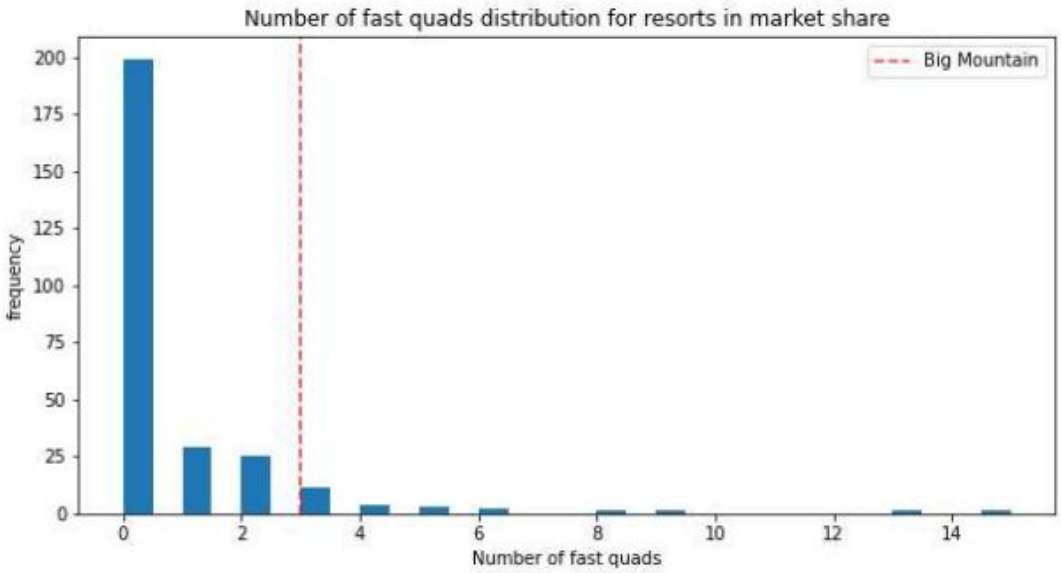


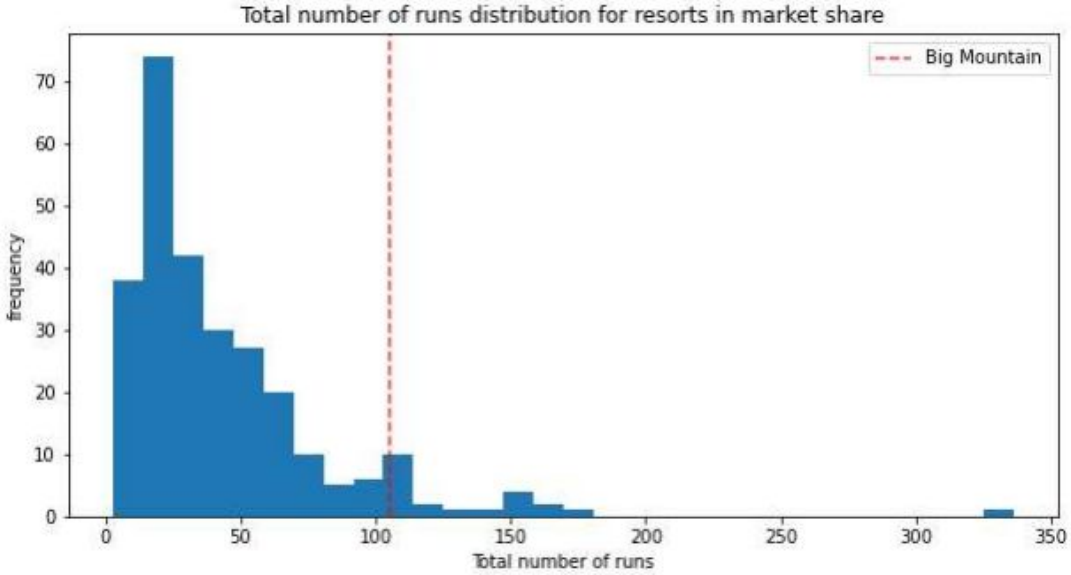

Adult weekend ticket price ($) - Montana only distribution for resorts in market share
Big Mountain
frequency
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
40
50
60
70
80
Adult weekend ticket price ($) - Montana only

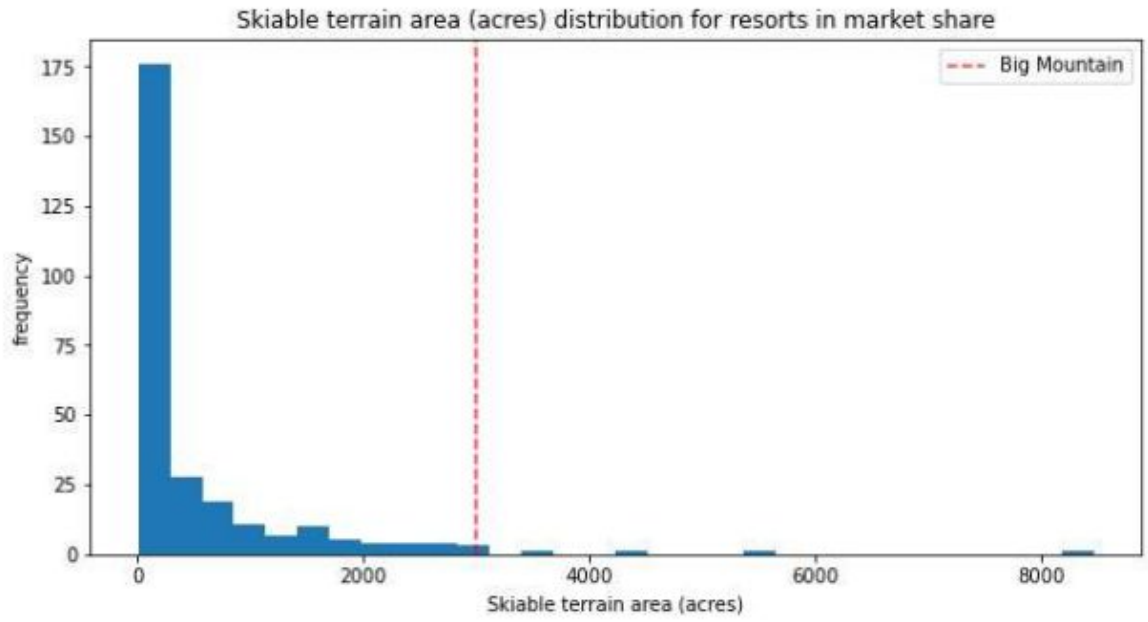

Vertical drop (feet) distribution for resorts in market share
Big Mountain
frequency
40
30
20
10
0
0
1000
2000
3000
4000
Vertical drop (feet)


Area covered by snow makers (acres) distribution for resorts in market share
Big Mountain
frequency
Area covered by snow makers (acres)
0
5
10
15
20
25
30
35
40
0
100
200
300
400
500
600
700


Total number of chairs distribution for resorts in market share
Big Mountain
frequency
Total number of chairs
0
10
20
30
40
50
60
70
0
5
10
15
20
25
30
35
40


Number of fast quads distribution for resorts in market share
Big Mountain
frequency
Number of fast quads
0
2
4
6
8
10
12
14
0
25
50
75
100
125
150
175
200


Total number of runs distribution for resorts in market share
Big Mountain
frequency
Total number of runs
0
50
100
150
200
250
300
350
0
10
20
30
40
50
60
70



Summary

Other Analysis

We also investigated various proposals to increase revenue (ticket price).

1. Closing top 10 unused runs. 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.

2. Increase vertical drop by 150 feet and install an additional chair lift. In this scenario, 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 and over the season this could be expected to amount to $3474638.

3. Increase vertical drop by 150 feet and install an additional chair lift and add 2 acres of snow making capability. This scenario increases support for ticket price by $1.99 and over the season this could be expected to amount to $3474638. This is similar to scenario 2 so there is no effect of adding extra 2 acres of snow making capability.

4. Increasing the longest run by 0.2 miles and guaranteeing its snow coverage by adding 4 acres of snow making capability. This scenario does not support any increase in ticket price.

Summary

Big Mountain exceeds in most features in its market segment. Based on this our model predicts that Big Mountain can increase price up to $95.87. The Mean absolute error is $10.39, which suggests there is room for an increase.

Notes

Additional data like the number of visitors in a season and the costs associated with each feature would have increased the accuracy of our model.