Big Mountain Resort Project Report

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Overview

- Big Mountain Resort bases their pricing just on the market average but that price does not reflect the value of the facilities they offer.

- They also have an increase of 1.54 million dollars in operating costs.

- We want to figure out what facilities we can cut down on while still maintaining their ticket value. Is it feasible?

- Our project is trying to build a predictive model for ticket prices based on a number of facilities or properties at the resorts.
    - We can then use this model for Big Mountain's pricing and future plans.

# Statistical Summary of the Numerical Columns

|	count	mean	std	min	25%	50%	75%	max
summit_elev	330.0	4591.818182	3735.535934	315.0	1403.75	3127.5	7806.00	13487.0
vertical_drop	330.0	1215.427273	947.864557	60.0	461.25	964.5	1800.00	4425.0
base_elev	330.0	3374.000000	3117.121621	70.0	869.00	1561.5	6325.25	10800.0
trams	330.0	0.172727	0.559946	0.0	0.00	0.0	0.00	4.0
fastEight	164.0	0.006098	0.078087	0.0	0.00	0.0	0.00	1.0
fastSixes	330.0	0.184848	0.651685	0.0	0.00	0.0	0.00	6.0
fastQuads	330.0	1.018182	2.198294	0.0	0.00	0.0	1.00	15.0
quad	330.0	0.933333	1.312245	0.0	0.00	0.0	1.00	8.0
triple	330.0	1.500000	1.619130	0.0	0.00	1.0	2.00	8.0
double	330.0	1.833333	1.815028	0.0	1.00	1.0	3.00	14.0
surface	330.0	2.621212	2.059636	0.0	1.00	2.0	3.00	15.0
total_chairs	330.0	8.266667	5.798683	0.0	5.00	7.0	10.00	41.0
Runs	326.0	48.214724	46.364077	3.0	19.00	33.0	60.00	341.0
TerrainParks	279.0	2.820789	2.008113	1.0	1.00	2.0	4.00	14.0
LongestRun_mi	325.0	1.433231	1.156171	0.0	0.50	1.0	2.00	6.0
SkiableTerrain_ac	327.0	739.801223	1816.167441	8.0	85.00	200.0	690.00	26819.0
Snow Making_ac	284.0	174.873239	261.336125	2.0	50.00	100.0	200.50	3379.0
daysOpenLastYear	279.0	115.103943	35.063251	3.0	97.00	114.0	135.00	305.0
yearsOpen	329.0	63.656535	109.429928	6.0	50.00	58.0	69.00	2019.0
averageSnowfall	316.0	185.316456	136.356842	18.0	69.00	150.0	300.00	669.0
AdultWeekday	276.0	57.916957	26.140126	15.0	40.00	50.0	71.00	179.0
AdultWeekend	279.0	64.166810	24.554584	17.0	47.00	60.0	77.50	179.0
projectedDaysOpen	283.0	120.053004	31.045963	30.0	100.00	120.0	139.50	305.0
NightSkiing_ac	187.0	100.395722	105.169620	2.0	40.00	72.0	114.00	650.0

Feature Engineering

- Target column is 'AdultWeekday' which is 'Price'

- Features engineered: TerrainParks, SkiableTerrain_ac, daysOpenLastYear and NightSkiing_ac and they were added as new columns.
  - used a heatmap to look at the correlation between our variables

- Calculate the following ratios as well: Total_chairs_runs_ratio, Total_chairs_skibale_ratio, fastQuads_runs_ration, fastQuads_skiable_ration
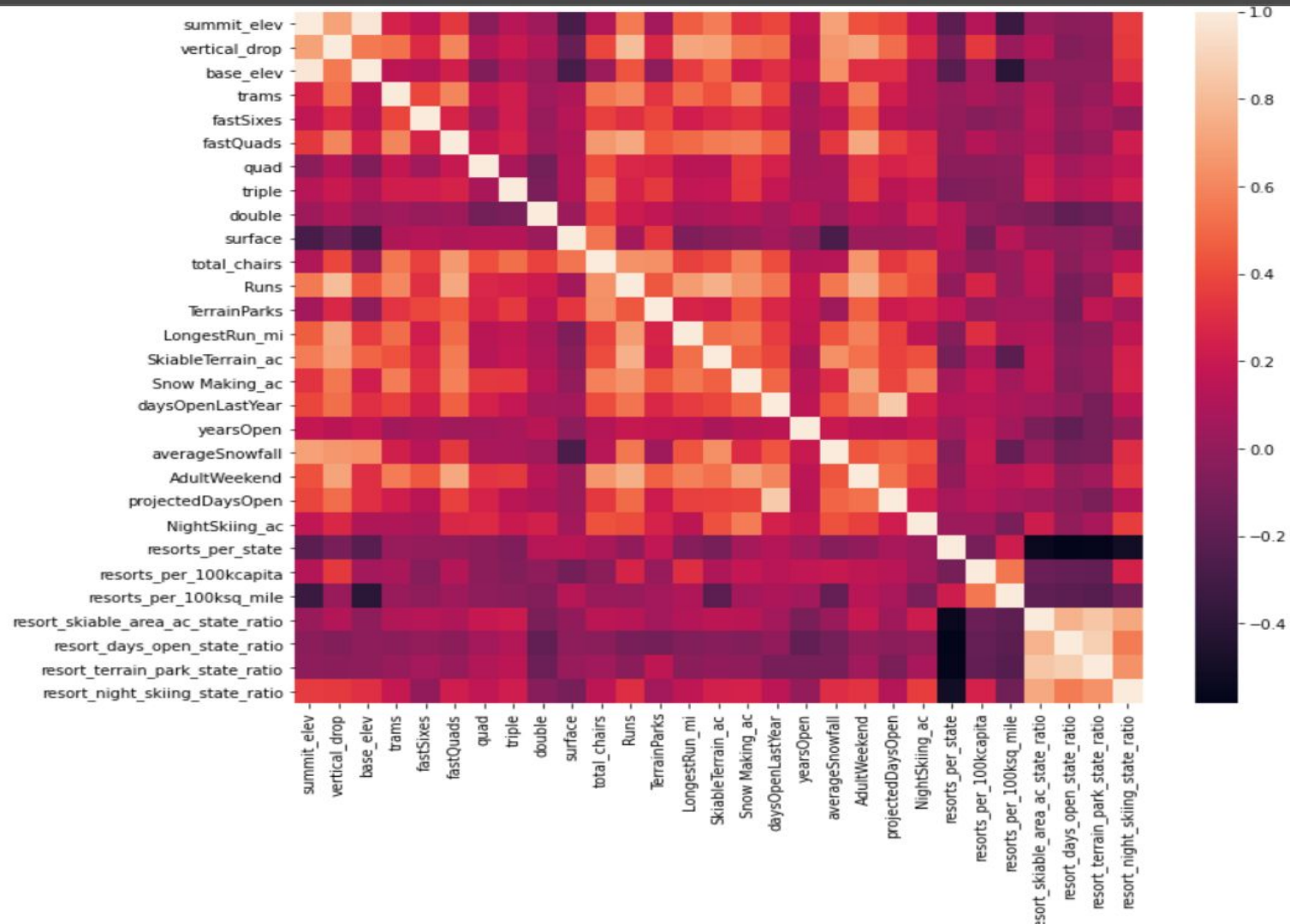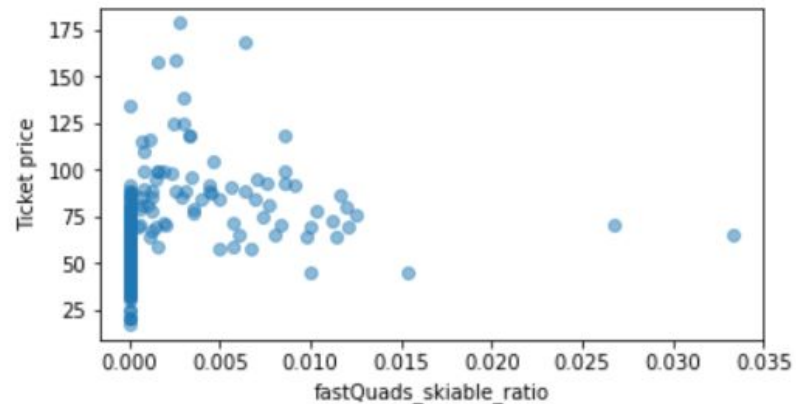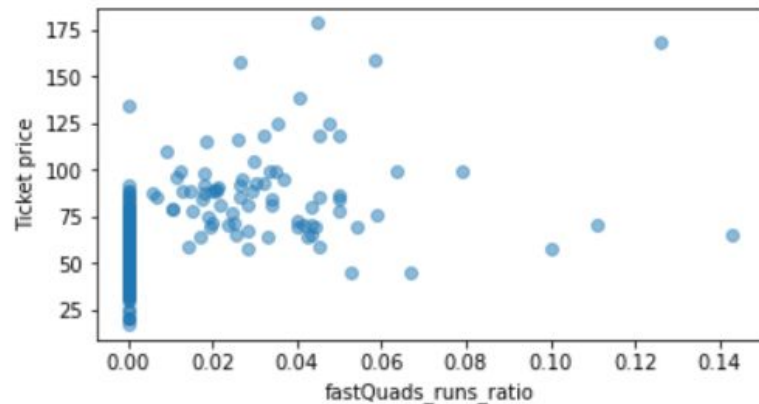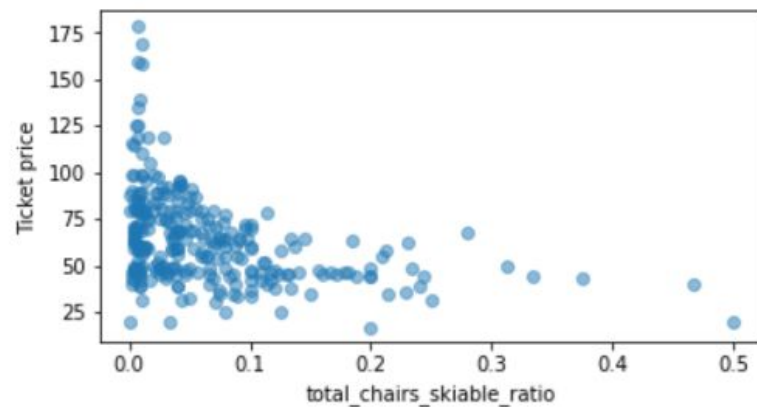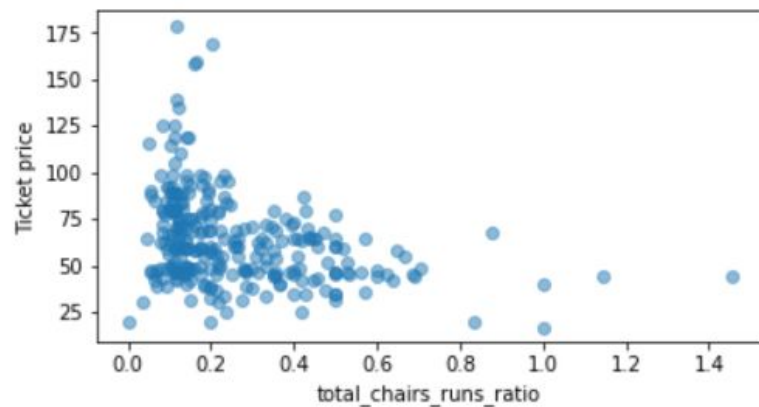
Predicting

- Pipes for both linear regression and random regressor and found that the random regressor performed better

- best_params was applied and it gave us only 8 features

- MAE is 9.54 and the mean is 63.81

Best random forest regressor feature importances
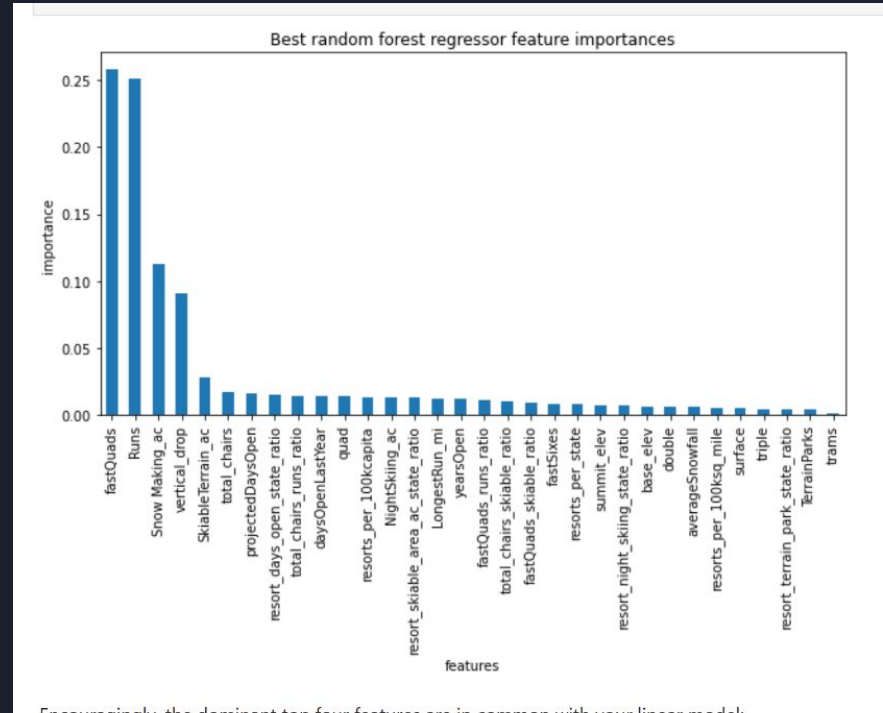
Encouragingly, the dominant top four features are in common with your linear model:

Recommendations

- Modeled price is $95.87 while our actual price is $81

- There is room to increase the ticket price by about $5
    - add a total of $7.5M to our sum

- Huge difference in price decrease when you close up to 6 of the least used runs so closing a couple is acceptable