Big Mountain Resort Project

Data Science Method Analysis

Problem Identification:

Due to an increase of $1,540,000 in operating costs, how can Big Mountain Resort capitalize on their facilities so a higher ticket price could be supported?

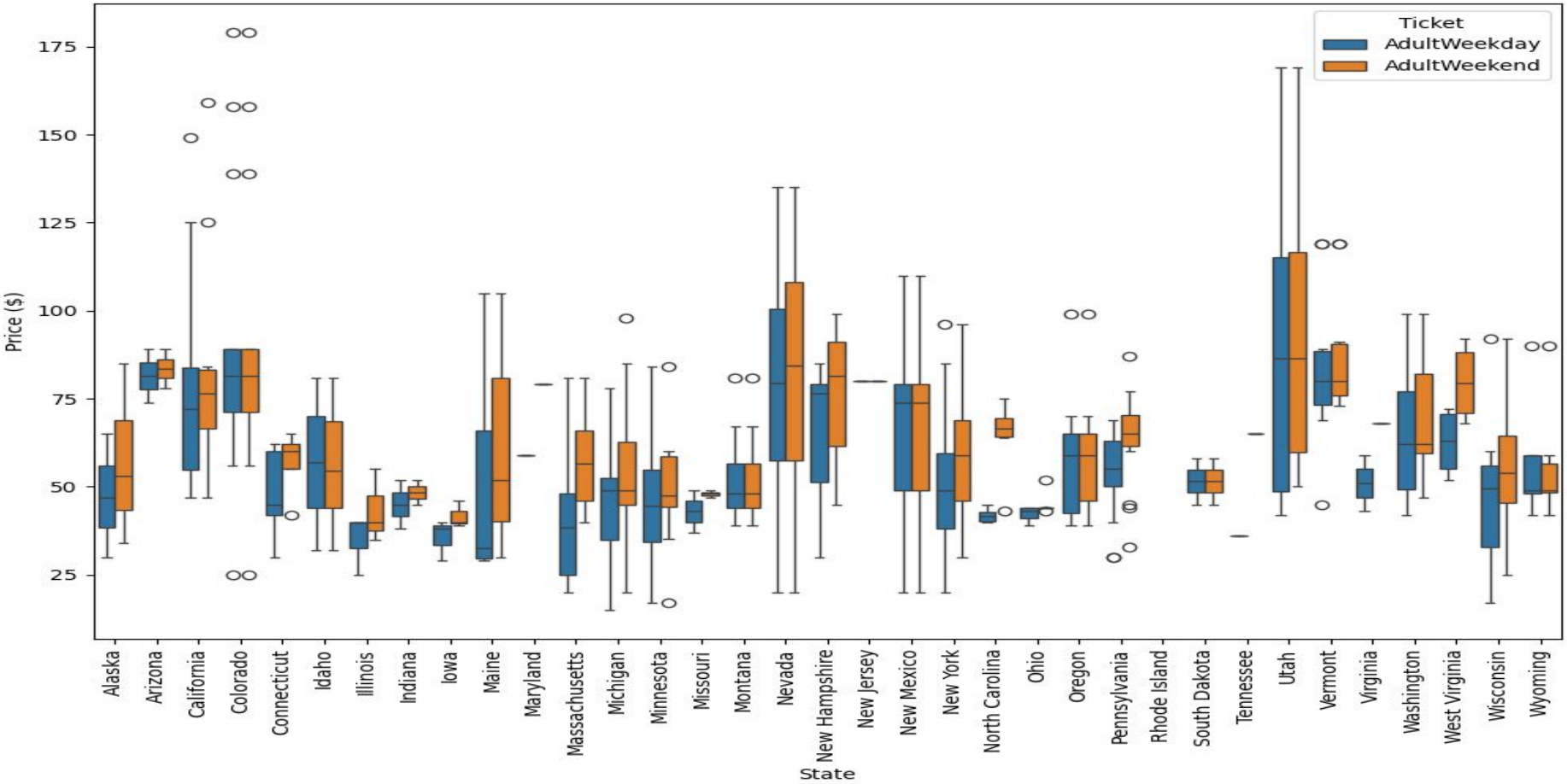
Resort:

- Accommodates around 350,000 visitors per year.
- Introduced an additional chair lift to increase distribution of visitors across the mountain.
- Surrounded by Glacial National Park and Flathead National Forest with access to 105 trails.

Recommendation and Key Findings:

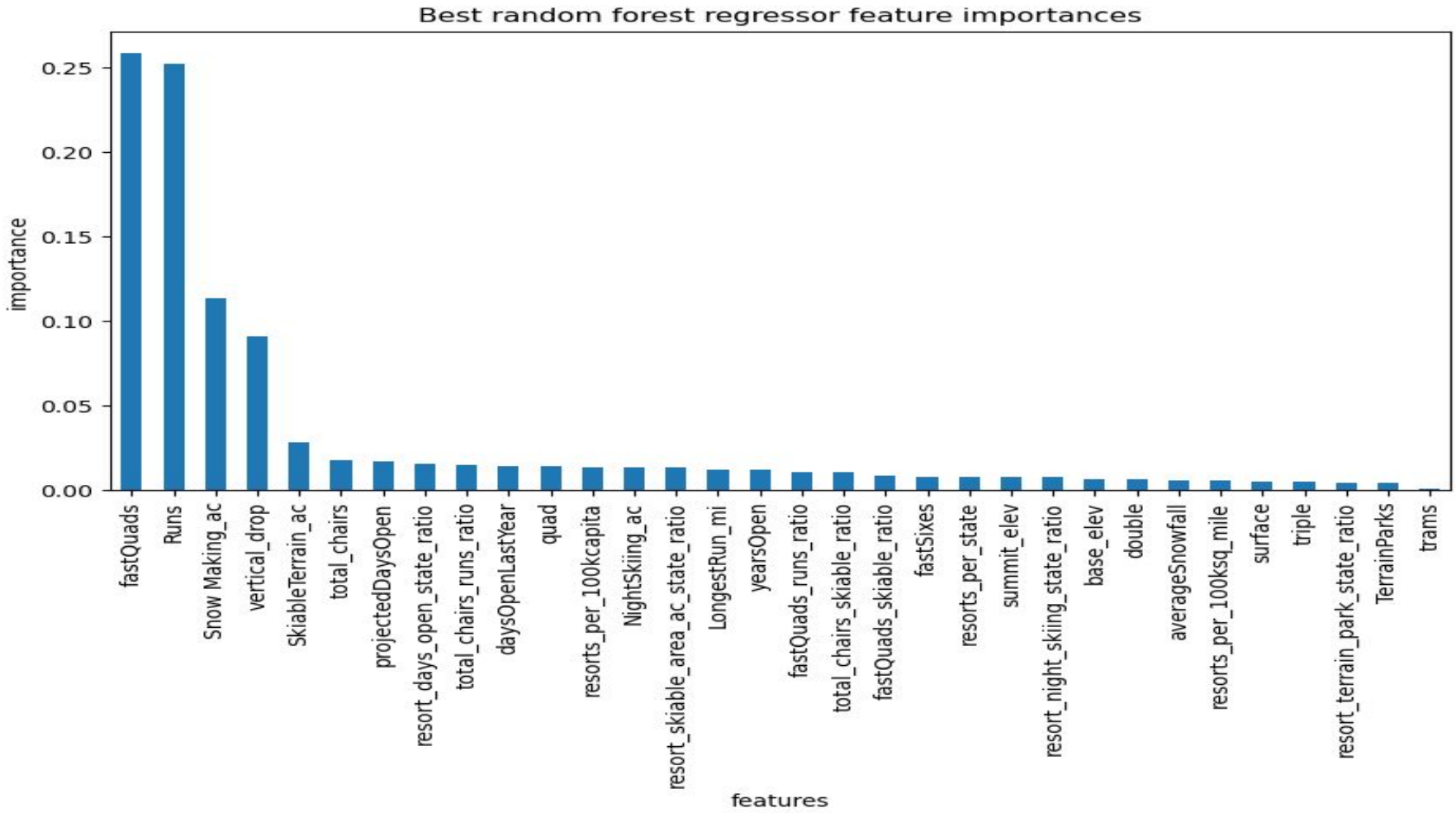
- Big Mountain Resort - 3rd largest state area and 4th for skiable terrain
- Features affecting ticket price - vertical drop, snow making, total chairs, fast quads
- Currently, ticket prices - $81 for Weekday and Weekend
- Project focus on Weekend price - data supports an increase in ticket prices.

Ticket Price Distribution for Each State



Data and Model Overview

- Dataset used: Big Mountain Resort data and State/Regional data with variables such as ticket prices, summit elevation, vertical drop, base elevation, trams, etc.
- Metrics used: R-squared, Mean Absolute Error(MAE), Mean Squared Error(MSE)
- Best model: Random Forest Model
    - Dominant features - Fast Quads, Runs, Snow Making, Vertical Drop and Skiable Terrain
    - Big Mountain Resort scored high in all features with room for improvement in Vertical Drop.


Best random forest regressor feature importances
importance
0.25
0.20
0.15
0.10
0.05
0.00
fastQuads
Runs
Snow Making_ac
vertical_drop
SkiableTerrain_ac
total_chairs
projectedDaysOpen
resort_days_open_state_ratio
total_chairs_runs_ratio
daysOpenLastYear
quad
resorts_per_100kcapita
NightSkiing_ac
resort_skiable_area_ac_state_ratio
LongestRun_mi
yearsOpen
fastQuads_runs_ratio
total_chairs_skiable_ratio
fastQuads_skiable_ratio
fastSixes
resorts_per_state
summit_elev
resort_night_skiing_state_ratio
base_elev
double
averageSnowfall
resorts_per_100ksq_mile
surface
triple
resort_terrain_park_state_ratio
TerrainParks
trams
features

Data and Model Overview cont'd

- **Best modeling scenario:**
  - **Scenario 1:** Close up to 10 of the least used runs.
    - Close 1 run makes no difference, 2 or 3 runs decreases support of increase ticket price, 4 or 5 runs does not make a difference, and 6 or more sharply decreases the support.
  - **Scenario 2:** Add a run, inc. the vertical drop by 150 ft, install additional chair lift.
    - Supports an increase of ticket price by $1.99. Over the season, the expected amount would be $3474368.
  - **Scenario 3:** Repeat scenario 2 and add 2 acres of snow making.
    - No difference with the addition.
  - **Scenario 4:** Inc. longest run by .2 miles and add 4 acres of snow making.
    - No difference in support of increase ticket price.

Summary and Conclusion:

- Goal is to maximize resorts' returns
  - Scenario 2 - WINNER!
  - 350,000 visitors per season with visitors skiing for 5 days on average.
  - Increase of ticket price by $1.99 - would cover the additional operational costs.
- Further exploration:
  - Scenario 4 - increase longest run. It showed a positive results with the Linear Regression model, but not show enough importance on Random Tree model.
  - Train business staff on model to try other parameters, such as Night Skiing.
  - Increasing Weekday price