Big Mountain Resort

Introduction:

- Ski resort located in Montana
- 350,000 people visit each year
- Annual revenue: 141.75 million dollars with ticket price of $81
- Recent installation of chair lift that costs $1,540,000 (1.09%) per season

Problem:

- No sense of correlation between ticket price and facilities
- Suspects not collecting enough revenue

Objective: Increase revenue

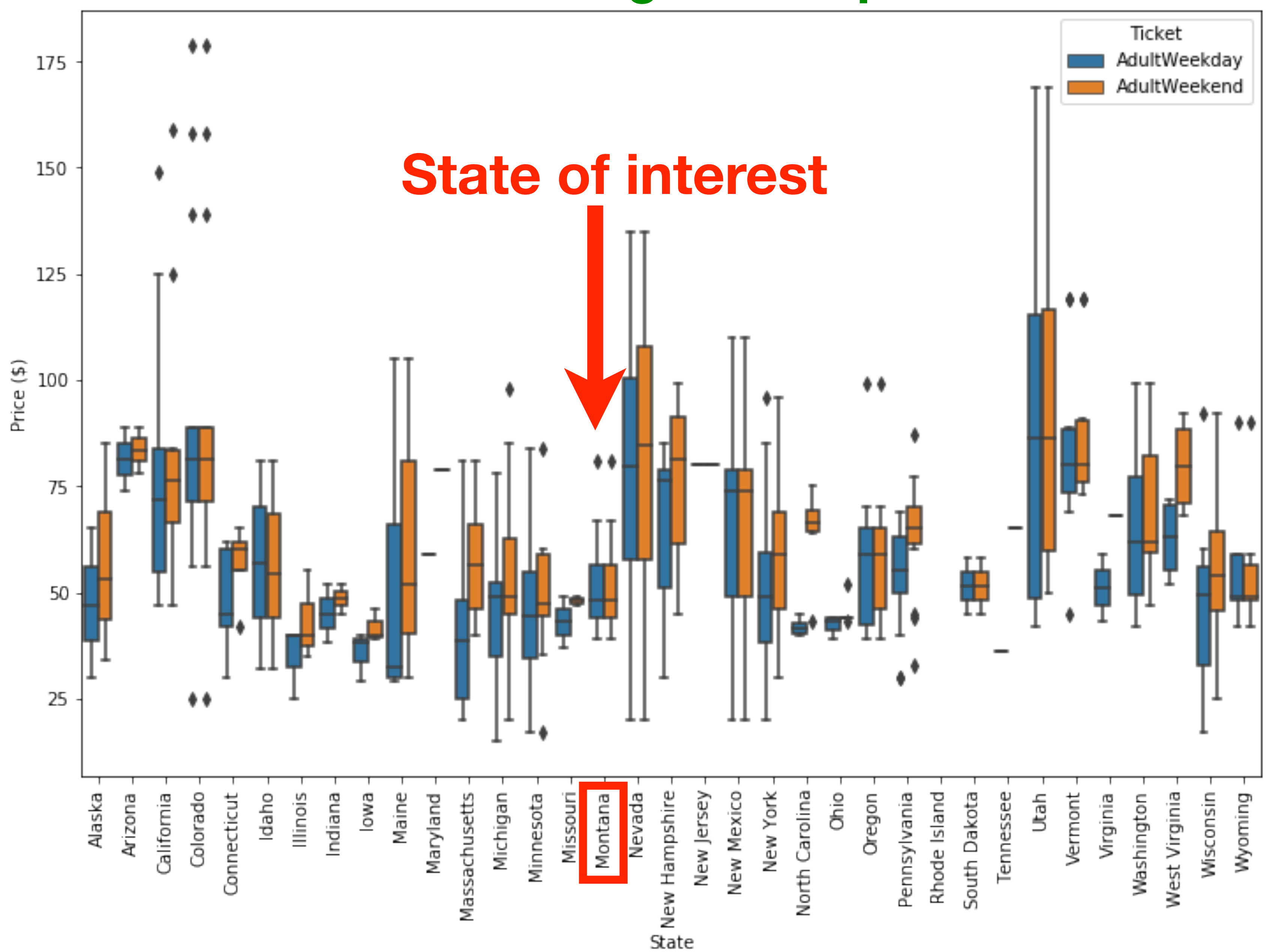
- ◉ Set competitive ticket price based on market position
- ◉ Reduce operational cost

Methodology

Data analysis:

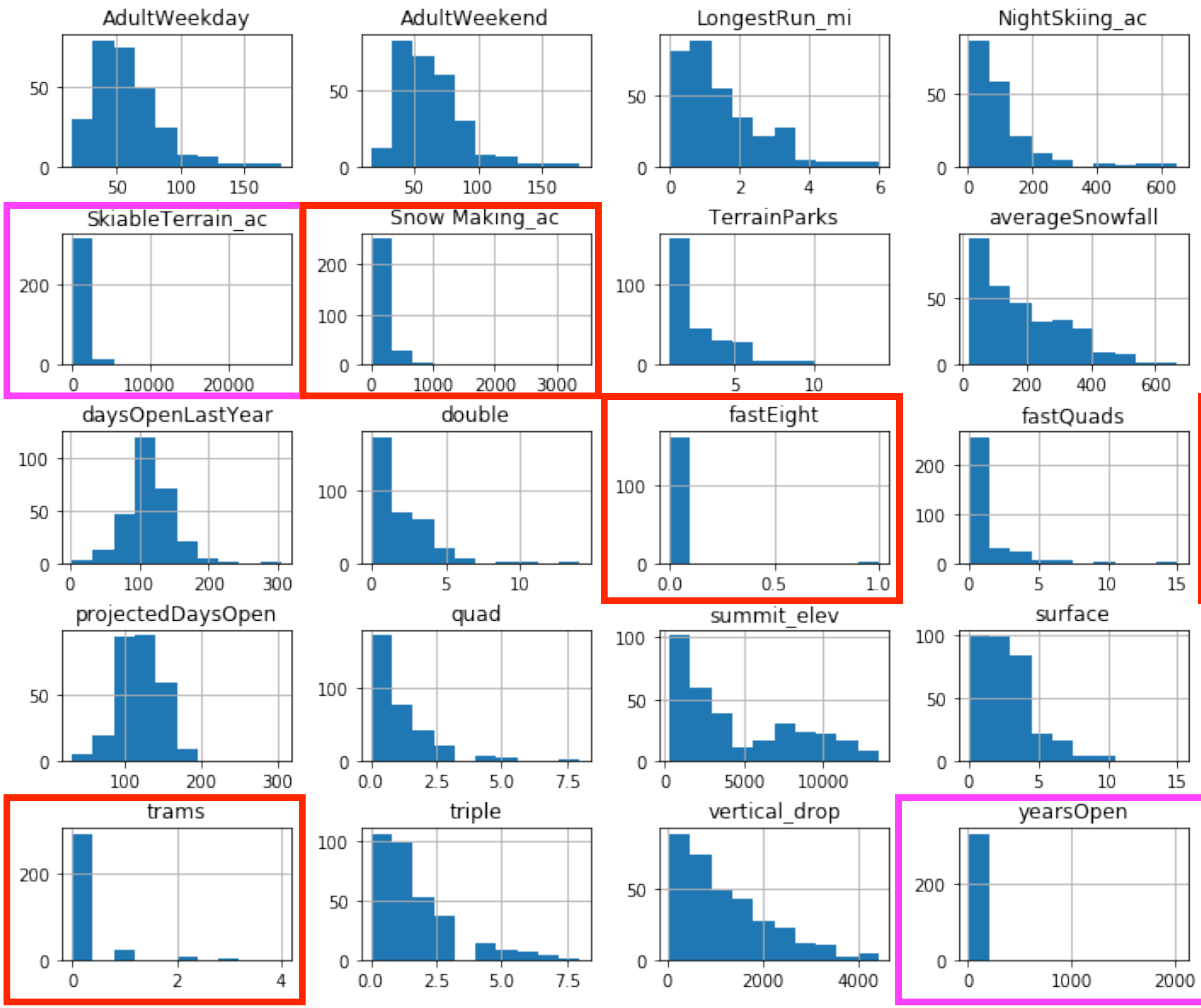
- Ski resort data containing information from 330 resorts in US
- Contains 27 features describing the resort
- Two features describing ticket prices : AdultWeekday and AdultWeekend
- Added state population and area to generate state summary statistics

Distribution of average ticket price vs state



Distribution of all features in the ski resort data

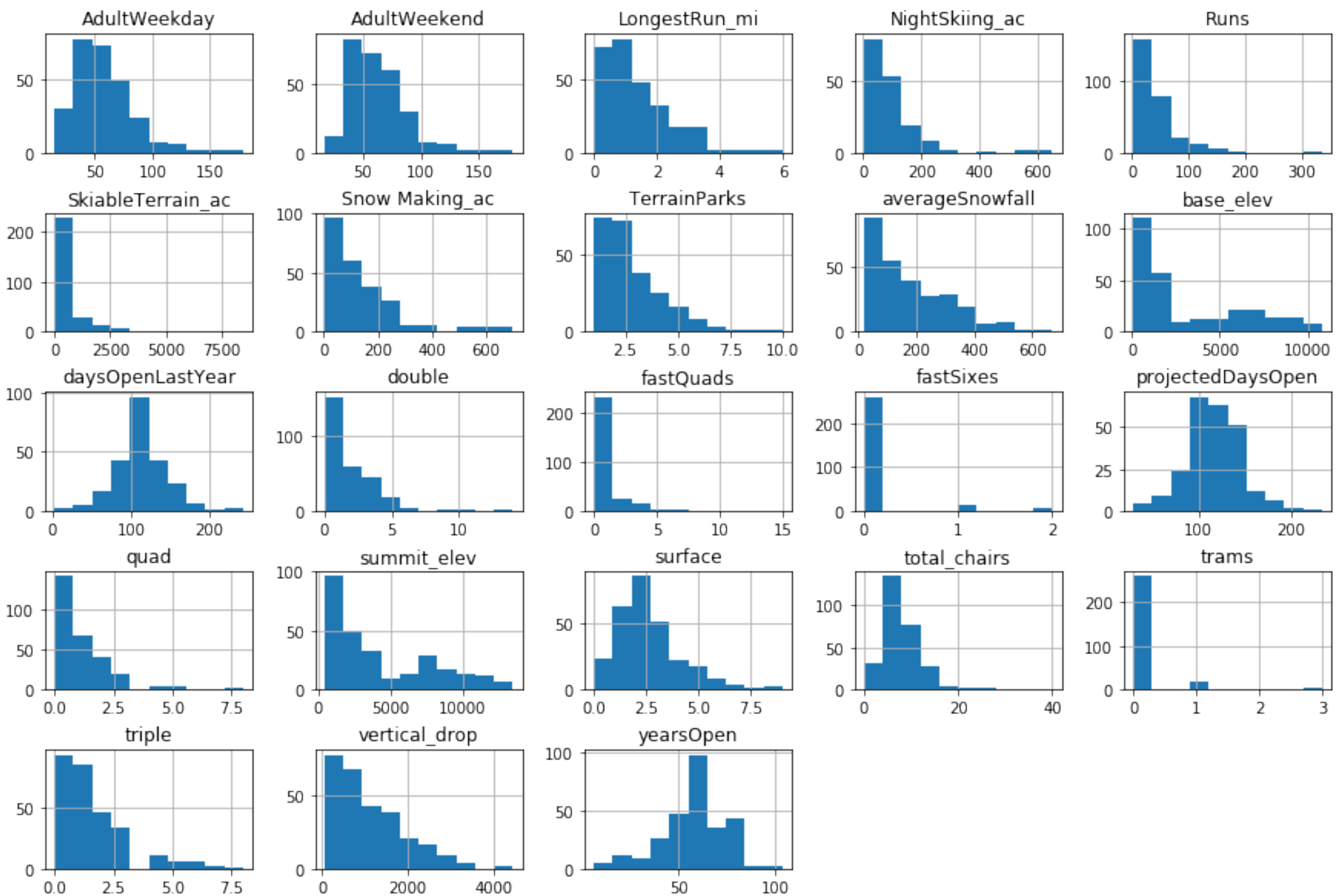
Histogram plot of all features



Data suspicious in highlighted histograms

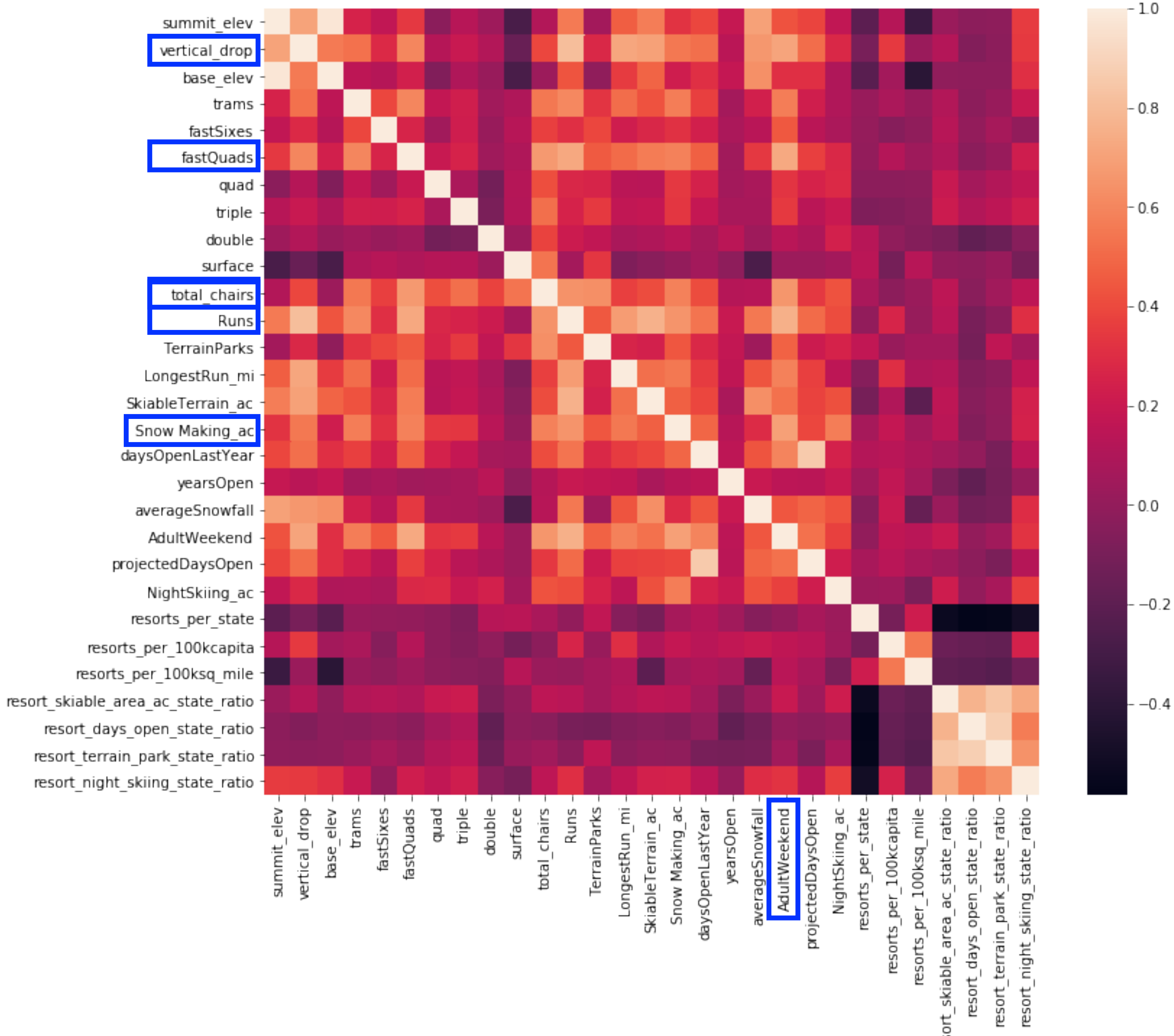
Refine distribution of ski resort data

- **Replaced unusual data, features missing more than 50% of data, and row missing both ticket prices**



Feature correlation heatmap

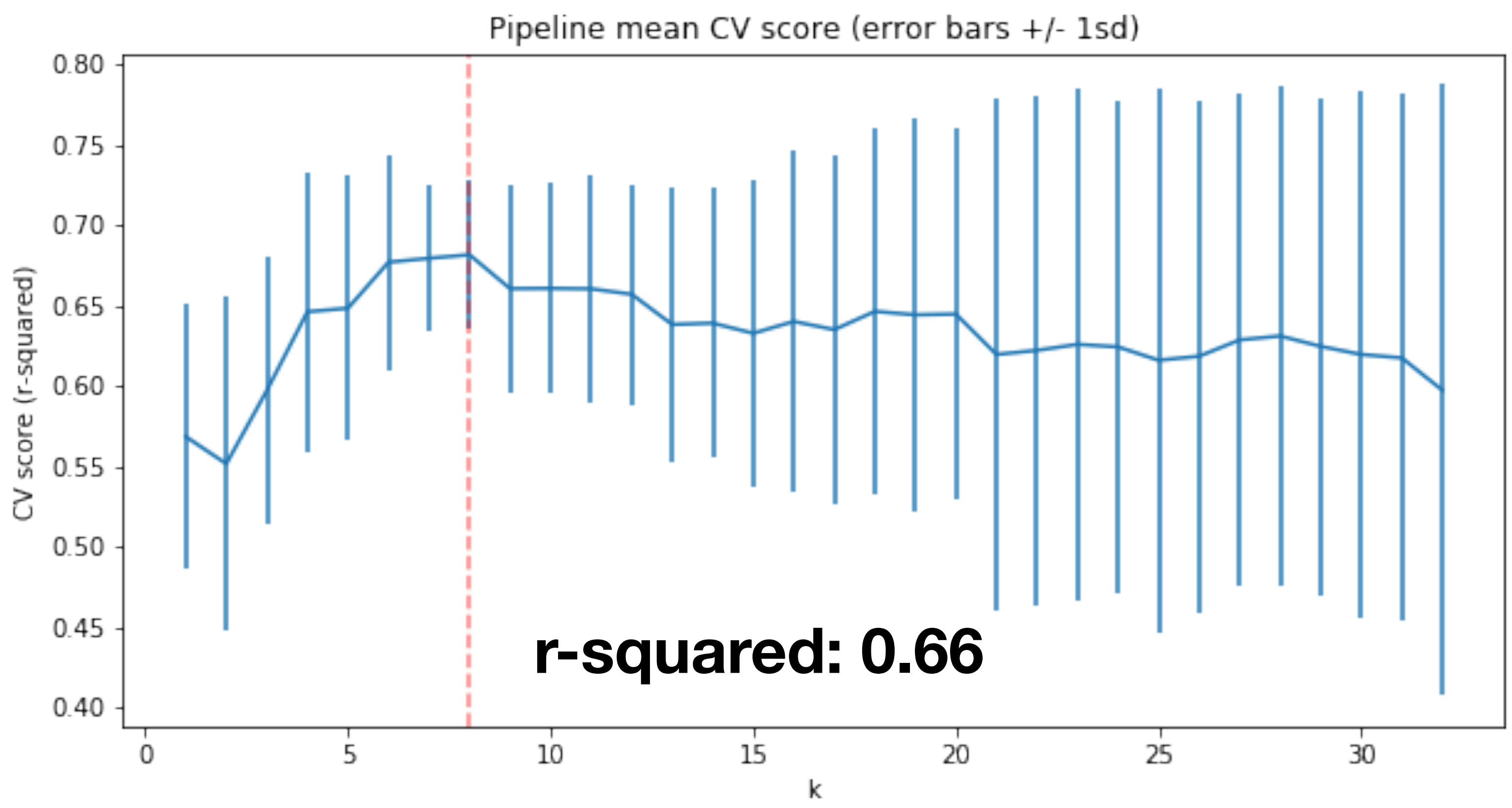
- **Features showing high correlation with ticket price are highlighted in blue boxes**



Data Modeling

- Partitioning of data into training and test sets with ratio 7/3
- Training data with a pipeline using
  - Imputing strategy: mean and median separately
  - Models:
    - Linear regression and random forest regression
  - Seleting k best features
  - Five-fold cross validation

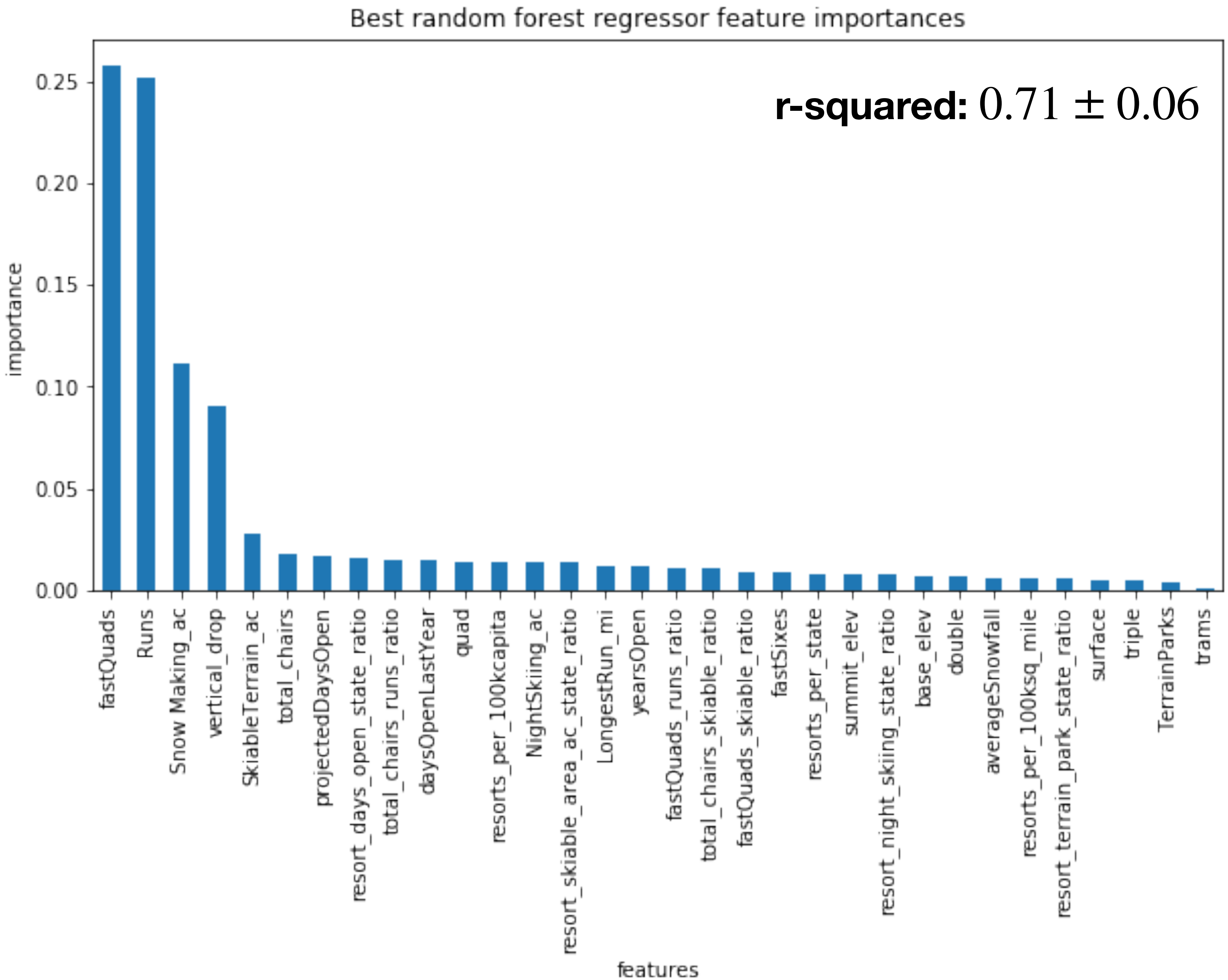
Linear regression model:



- Predicted 8 best features with vertical drop as the significant feature

Data Modeling

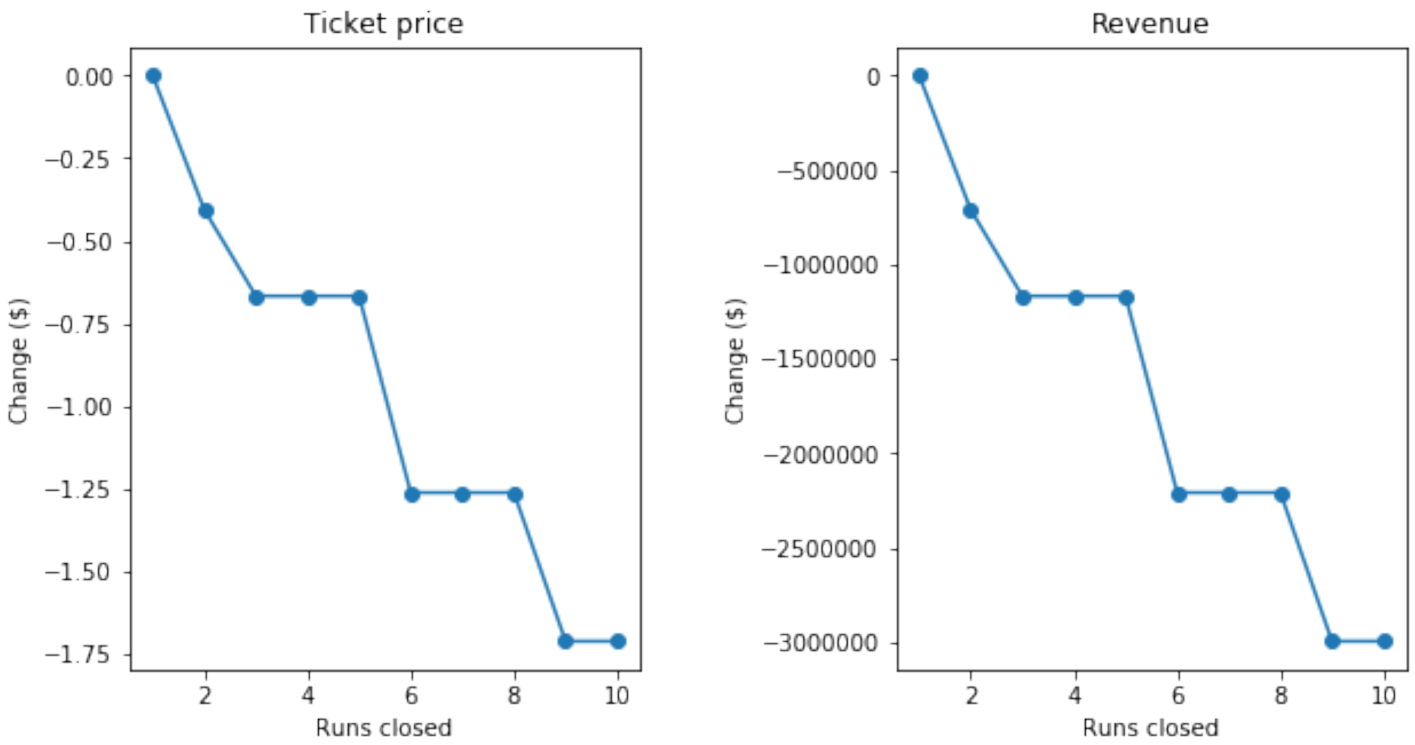
Random forest regression model better than linear regression model



Data Modeling and prediction

- Training ski resort data excluding Big Mountain resort
- Build algorithm to predict weekend ticket price using all remaining other features
- Used this model to predict the ticket price of Big Mountain resort
- The modeled price is $\$94.22 \pm 10.39$ whereas the current price is of $81
- Revenue with $83.83 and $94.22 ticket prices:-
  - five ticket purchase: $146,702,500 and $164,885,000

Scenario 1: Close the number of runs



Modeling predictions

- ◉ Scenario 2: Addition of 1 run, 1 chair and 150 feet vertical drop
  - Increase in the ticket price by $1.99
  - Revenue increase by 2.45% ($3,482,500)
  - Total revenue overcomes operational cost by a factor of 2
- ◉ Scenario 3: Addition of 2 acres of snow making capability in scenario 2
  - No change in the ticket price; unfavorable
- ◉ Scenario 4: Addition of 0.2 miles of longest run and 4 acres of snow making capability
  - No change in the ticket price; unfavorable

Conclusions

- Current ticket price (\$81) is lower than model prediction (\$$94.22 \pm 10.39$)
- 10% increase in the revenue with the ticket price of \$89.40
- 1 run can be closed without affecting the revenue
- Revenue can be increased by adding 1 run, 1 chair and 150 feet vertical drop. The increased revenue overcomes operational cost by a factor of 2.
- Addition of 0.2 miles of longest run and 4 acres of snow is unfavorable in increasing ticket price and revenue collection