

# **Big Mountain Price Ticket Optimization**

**Guided Capstone—Slide Deck for the Executive Team**

**Elinor Velasquez, 30 November, 2020**

# Big Mountain Ticket Price Optimization

## Big Mountain Resort, Montana

- Current price of Adult Weekend Daily Ticket: \$81
- Vertical Drop: 2353 Feet
- 14 Chairs
- 105 Runs
- Skiable Terrain: 3000 acres
- Snow Making: 600 acres
- Average Snow Fall: 333 inches

# Big Mountain Resort Ticket Price Optimization

- Average Ticket Price for U.S. resorts: \$64
- Number of Resorts in Montana: 12
- Average Ticket Price of Montana Resorts: \$52

# Recommendation and Key Findings

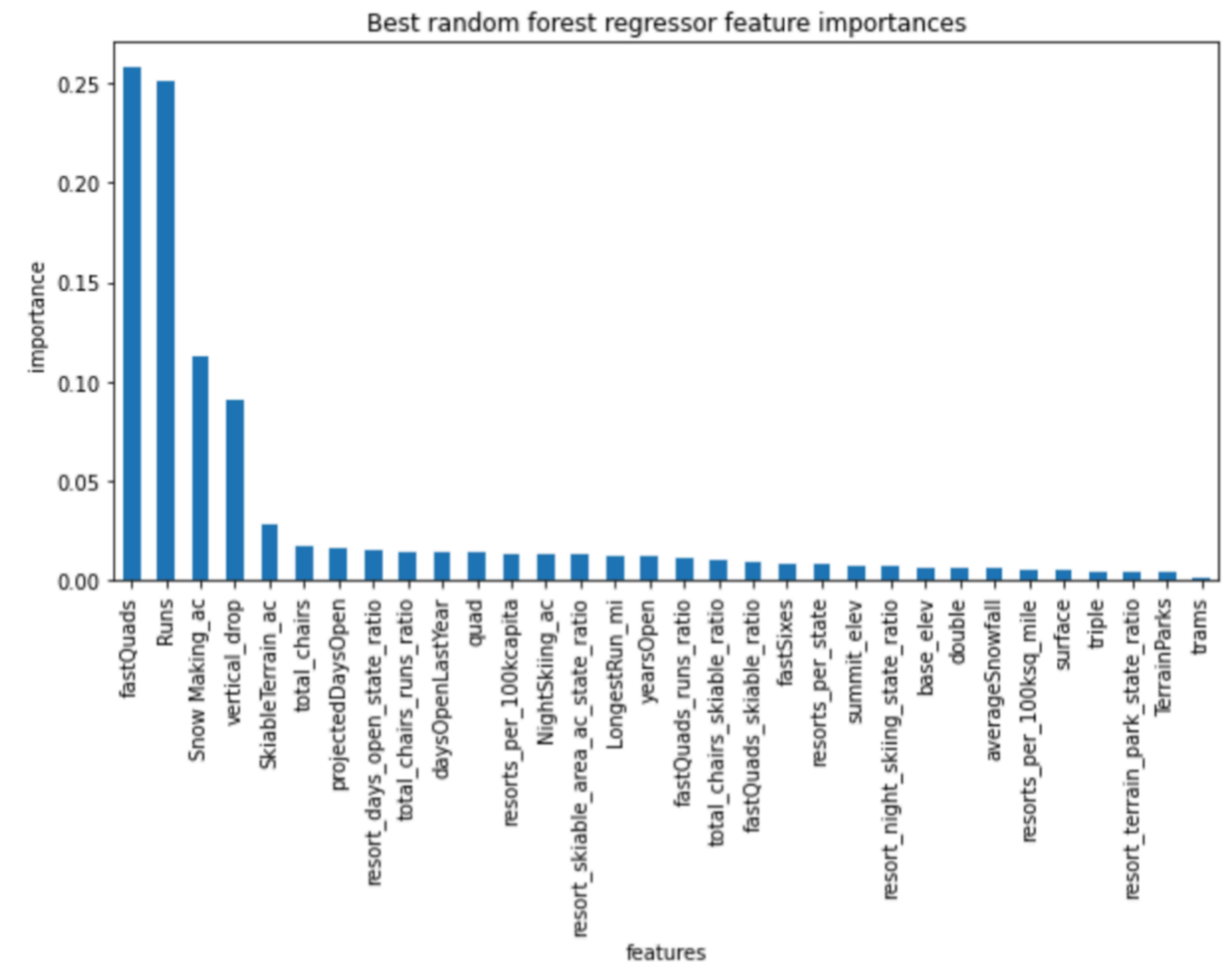
**Recommended Big Mountain Resort Ticket Price: \$95.87**

- Scenario:
- Add 1 run
- Increase vertical drop by 150 feet
- Add 1 chair lift
- Increase snow making
- Increase ticket price by \$9.90 to \$90.90 for adult weekend daily ticket

# Modeling Results and Analysis

## Random Forest Regressor

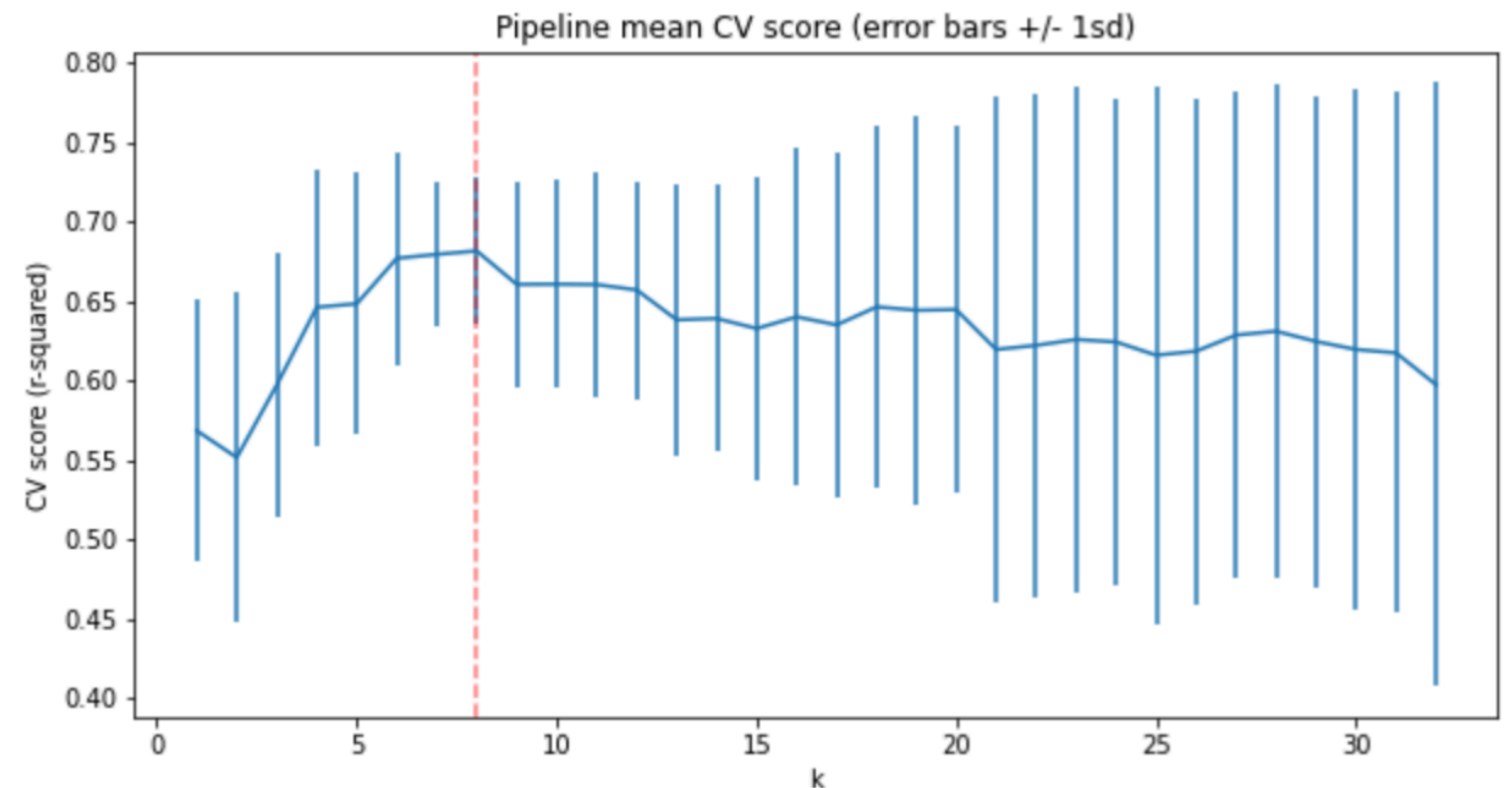
- Eight best features for RF model:
- Simplest model: The mean, \$64.00
- Error of the mean model: \$19.00
- Random Forest regression: \$95.87
- $R^2$  error of RF regression test data: 0.70
- $R^2$  error of the mean test data: -0.003
- Recall  $R^2$  optimized error = [0,1]



# Modeling Results and Analysis

## Random Forest Regressor

- Cross Validation showed  $k=8$  for best features for RF regression model
- Missing values were swapped with median of each feature

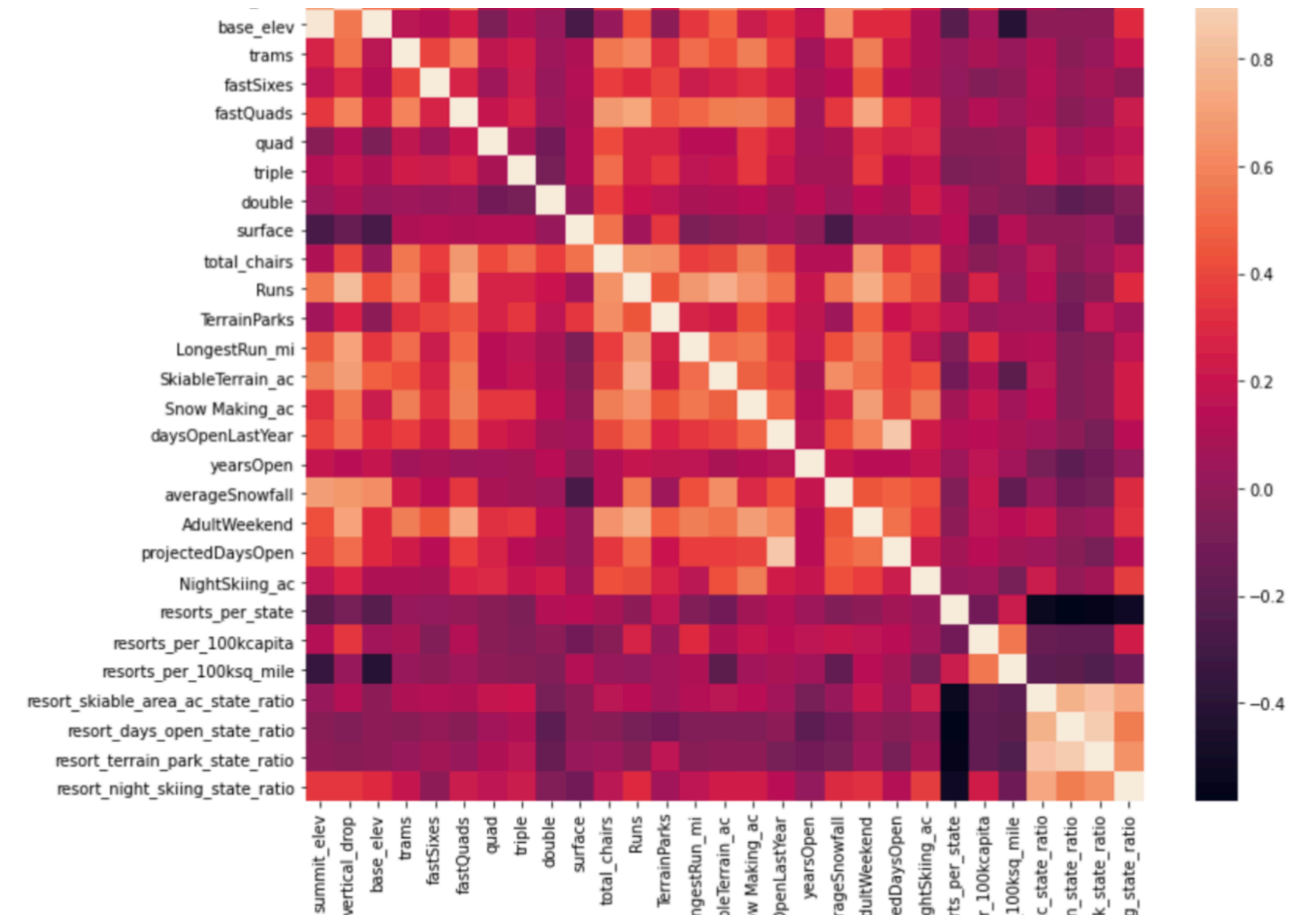


# Modeling Results and Analysis

## Random Forest Regressor

- Eight best features for RF Regression model:
- Fast Quads
- Runs
- Snow Making
- Vertical Drop
- Total Chairs
- Projected Days Open
- Resort Days Open Per State (Ratio)
- Skiable Terrain

Compare with Pearson correlation:



## HeatMap shows Pearson Correlation

# Modeling Results and Analysis

## Random Forest Regressor Pipeline

- Error of the mean model (mean absolute error): \$19.00
- Error of the RF model (mean absolute error): \$9.54
- Pipeline to train the data: 70/30 train/test split:
- 1) Simple Imputer (substitute missing values as median)
- 2) Standard Scaler (normalize data (mean = 0, std = 1)) was not used in RF model
- 3) Random Forest Regression
- 4) GridSearchCV (Use 5 fold cross-validation and grid to find k=8 best features)



# Summary and Conclusion

## Big Mountain Resort Price Ticket Optimization

The current price for Big Mountain is \$81.00 for Adult Weekend Daily Ticket.

The recommended price for Big Mountain is \$95.87.

The top four features:

Fast Quads

Runs

Snow Making

Vertical Drop



This graph shows that no further data collection is needed.