Summary

Montana’s Big Mountain Resort has engaged us to review and propose a pricing strategy, and to assess the value impact of operational cost cutting measures being considered. Our first task was to obtain, review, and prepare the provided data for an exploratory data analysis. This summarizes our data preparation exercise.

The raw data was loaded and found to have 330 observations and 27 columns. The distribution of data types among the features was:

|  |  |
| --- | --- |
| Data Type | # Features |
| Categorical | 3 |
| Integer | 11 |
| Float | 13 |
| Total | 27 |

The dataset contained \_\_ types of features:

* Geographic – e.g. region and state
* Geological – e.g. elevation, drop and base level
* Transportation – Number and types of trams and lifts
* Ski Area – Number of runs, length of longest run, skiable terrain
* Snow – Average snowfall, and snowmaking statistics
* Open – Past and projected days open as well as the number of years open
* Availability of night sking
* Price – weekday and weekend pricing

**Key observations**

* Big Mountain Resort has the highest average ticket price of the resorts in Montana.
* Montana ticket prices rank 23rd of the 35 states in the data set.

# Categorical Features

We evaluated the following categorical features included:

* Name
* Region
* State

Here are the key observations

1. For the most part (90% of samples) Region and state are the same, with some exceptions, e.g. California, Nevada, Oregan, and Utah. The exceptions make up 10% of the data. There were 38 regions and 35 states
2. We evaluated the number of resorts by state. Montana ranked 10th by region and 12th by state.
3. We computed the average ticket price by state. Key observations include:
4. Montana has the 23rd highest average ticket price out of 35 states.

* Weekend and weekday ticket prices followed nearly identical distributions

# Numerical Features

First, we determined the missing target values (weekday and weekend prices) and found that approximately 14% of the resorts had no price data, and another 3% were missing either weekday or weekend pricing.

Our examination of the remaining numerical features illuminated several features of concern:

* SkiableTerrain\_ac because values are clustered down the low end,
* Snow Making\_ac for the same reason,
* fastEight because all but one value is 0 so it has very little variance, and half the values are missing,
* fastSixes raises an amber flag; it has more variability, but still mostly 0,
* trams also may get an amber flag for the same reason,
* yearsOpen because most values are low but it has a maximum of 2019, which strongly suggests someone recorded calendar year rather than number of years.

The following changes were made:

* Skiable terrain for Silverton Mountain was changed from 26819 to 1819 based upon the Silverton Mountain website.
* Heavenly Mountain Resort had no ticket pricing, so it was dropped.
* Pine Knob Ski Resort in Michigan was dropped because of an invalid number of years open (2019). This value could mean the year that the resort will open. Since we couldn’t make a determination, it was dropped.
* The fourteen percent of rows with no pricing data were dropped.

# Population Area Data by State

Descriptive statistics were obtained at the state level. Population and area data were extracted from Wikipedia and added to the summary. The summary for Montana is as follows:

|  |  |
| --- | --- |
| **state** | Montana |
| **resorts\_per\_state** | 12 |
| **state\_total\_skiable\_area\_ac** | 21410 |
| **state\_total\_days\_open** | 951 |
| **state\_total\_terrain\_parks** | 27 |
| **state\_total\_nightskiing\_ac** | 710 |
| **state\_population\_x** | 1068778 |
| **state\_area\_sq\_miles\_x** | 147040 |
| **state\_population\_y** | 1068778 |
| **state\_area\_sq\_miles\_y** | 147040 |
| **state\_population** | 1068778 |
| **state\_area\_sq\_miles** | 147040 |

# Target Feature

We examined the relationship between weekday and weekend pricing and had the following observations:

* There was a strong positive linear correlation between the two prices.
* At the $100 and below level, weekend prices were slightly higher than weekday prices.
* The weekend and weekday prices in Montana were:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** |  | **AdultWeekend** | **AdultWeekday** | **Average Price** |
| **151** | Big Mountain Resort | 81 | 81 | 81 |
| **148** | Red Lodge Mountain | 67 | 67 | 67 |
| **142** | Bridger Bowl | 63 | 63 | 63 |
| **147** | Montana Snowbowl | 50 | 50 | 50 |
| **143** | Discovery Ski Area | 49 | 49 | 49 |
| **144** | Great Divide | 48 | 48 | 48 |
| **149** | Showdown Montana | 47 | 47 | 47 |
| **145** | Lost Trail - Powder Mtn | 46 | 46 | 46 |
| **141** | Blacktail Mountain Ski Area | 42 | 42 | 42 |
| **146** | Maverick Mountain | 39 | 39 | 39 |
| **150** | Teton Pass Ski Resort | 39 | 39 | 39 |

* **Note that Big Mountain Resort has the highest average price of the resorts in Montana.**