

At this preliminary step, we did two layers of analysis, on the state level and then down to the resort specific level.

## 1. State Level

On the state level, we applied principal component analysis (PCA) on state summary statistics, including 7 summaries on features and 2 calculated state resort density measures, as listed in Table 1. It was found that there is no clear pattern in the distribution of ticket prices across states. That is, ticket prices in States with similar features can range quite bit. This finding offers justification for building a pricing model that leaves out state as a predictor.

**Table 1. State level Analysis**

Type	variable	
Categorical	Name of the state	
Numeric	Original	Numbers of resorts per state
		Total # of days of all resorts open last year
		Total skiable area in a state
		Number of terrain parks in a state
		Total night skiing area in a state
		State total population
		State total area
	calculated	the ratio of state total # of resorts per 100k people
		the ratio of state total # of resorts pe 100k square miles

## 2. Resort Level

### 2.1 Resort Features

We then dived into resort specific data, and examined the binary correlation between adult weekend ticket price and various resort specific features. We found that there's a strong positive correlation of a resort's adult weekend ticket price with the resort features such as 1) vertical drop from summit to base, 2) the total area covered snow making machines, 3) the number of fast four person chairlifts and the total number all chairlifts, 4) the number of runs.

### 2.2 Resort-to-state Shares

For features such as resort skiable area, days of resort open in last year, the number of terrain parks at the resort, and the resort night skiing area, we also examined whether their resort-to-state shares matters the resort's ticket price. The measures we used for analysis are ratios of the resort specific values to the state summaries (total value). Among the ratios, the one ratio of a resort night skiing area to its state total stands out and appeared to be most corelated with a resort's ticket price.

### 2.3 Resort Chairlifts Resource

A resort's chairlift resource availability was measured by four ratios and their correlation with the ticket price was examined. The four ratios are the ratio of total number of chairs to runs, the ratio of total number of chairs to skiable area, the ratio of total number of fast four person chairlifts to runs and the ratio of total number of chairs to skiable area. Among the four, the first two actually showed negative correlation with a resort's ticket price. The less available our chairlifts is, the less people are

willing to pay? It seems odd? To further investigate, we would need data on the number of visitors at the resort in last year.

**Table 2. Resort Specific Analysis**

Type	Variables		
Categorical	Name, Region, State		
Numeric	Original	summit_elev, vertical_drop, base_elev, trams, fastSixes, fastQuads, quad, triple, double, surface, total_chairs, Runs, TerrainParks, LongestRun_mi, SkiableTerrain_ac, Snow Making_ac, daysOpenLastYear, yearsOpen, averageSnowfall, AdultWeekend, projectedDaysOpen, NightSkiing_ac	
	Calculated	Resort to State Share	Ratio of resort skiable area to state total, Ratio of resort days of resort open in last year to state total, Ratio of resort number of terrain parks to state total, Ratio of resort night skiing area to state total
		Resort Chairlift availability	the ratio of total number of chairs to runs the ratio of total number of chairs to skiable area the ratio of total number of fast four person chairlifts to runs the ratio of total number of chairs to skiable area.