Assignment 4 - Prescriptive Analysis

Part 1: Predictive Analysis

1.a

The provided regression equation is:

Profitability = 42 + 4(State Population per Inn) + 6*(Price of the Inn) - 3*(Square Root of the Median Income of the Area) + 2*(College Students in the Area)*

According to this equation, these are the variables that affect profitability positively:

- **State Population per Inn:** This makes sense as higher the population of a state with respect to the number of inns, more likely it is to result in more demand for particular inns.
- **Price of the Inn:** It makes sense that a hotel with more price would have better facilities and would be situated in a better neighbourhood resulting in it being more attractive to the customers hence increasing profictability.
- **College Students in the Area:** A higher number of college students in the area might increase profitability as college students are less likely to own houses, and might end up renting hotels on a more frequent basis rather than permanent home owners, moreover high number of college students suggest that the area might be developed and a hub for city activities.

These are the variables that affect profitability negatively:

- **Square Root of the Median Income of the Area:** A higher average income for an area suggests that people there would likely be home owners in that neighbourhood and would likely not rent hotels that frequently meaning the only people who would use those hotels would be tourists. A higher average income might also mean a highly developed area resulting in more competition from other hotels.

1.b

The given regression equation is:

Profitability = 42 + 4(State Population per Inn) + 6*(Price of the Inn) - 3*(Square Root of the Median Income of the Area) + 2*(College Students in the Area)*

So,
Profitability of Hotel2 = 42 + 4*(−0.47) + 6*(1.70) − 3*(−0.41) + 2*(0.31) = 52.15

1.c

Hotel	Location	Price	Price (normalized)	Square Root of Median Income (normalized)	College Students in Area (normalized)	State Population Per Inn (normalized)	Predicted Profitability
1	Eureka, California	$2,925,000.00	-0.30	-0.81	-0.54	-1.00	37.5706259
2	Fresno, California	$10,000,000.00	1.70	-0.41	0.31	-0.47	52.1452738
3	Fresno, California	$3,750,000.00	-0.07	-0.41	0.31	-0.47	41.5397993
4	Fresno, California	$3,500,000.00	-0.14	-0.41	0.31	-0.47	41.1155804
5	Fresno, California	$325,000.00	-1.04	-0.41	0.31	-0.47	35.7279993
6	Long Beach, California	$8,950,000.00	1.40	0.66	0.48	-0.56	47.1775124
7	Los Angeles, California	$1,950,000.00	-0.58	0.17	3.11	3.11	56.6700963
8	Los Angeles, California	$1,750,000.00	-0.63	0.17	3.11	3.11	56.3307211
9	Los Angeles, California	$4,900,000.00	0.26	0.17	3.11	3.11	61.6758802
10	South Lake Tahoe, California	$1,650,000.00	-0.66	-0.79	-0.59	-0.43	37.5013472
11	South Lake Tahoe, California	$1,125,000.00	-0.81	-0.79	-0.59	-0.43	36.6104874
12	South Lake Tahoe, California	$2,500,000.00	-0.42	-0.79	-0.59	-0.43	38.9436918
13	South Lake Tahoe, California	$1,975,000.00	-0.57	-0.79	-0.59	-0.43	38.0528319
14	South Lake Tahoe, California	$3,750,000.00	-0.07	-0.79	-0.59	-0.43	41.0647866
15	South Lake Tahoe, California	$1,475,000.00	-0.71	-0.79	-0.59	-0.43	37.2043939
16	South Lake Tahoe, California	$750,000.00	-0.92	-0.79	-0.59	-0.43	35.9741589

1.d

The hotel with the highest profitability was Hotel 9 in Los Angeles, California with profitability of 61.68, while Hotel 5 in Fresno, California had the worst profitability with 35.73