Step 1: Business and Data Understanding

*Provide an explanation of the key decisions that need to be made. (250 word limit)*

Key Decisions:

*Answer these questions*

1. What decisions needs to be made?

We need to decide in which city to build a new store.

1. What data is needed to inform those decisions?

We will need city-by-city historical sales data of pet stores and pawdacity stores, as well as population and demographics data of cities.

Step 2: Building the Training Set

*Build your training set given the data provided to you. Your column sums of your dataset should match the sums in the table below.*

*In addition provide the averages on your data set here to help reviewers check your work. You should round up to two decimal places, ex: 1.24*

|  |  |  |
| --- | --- | --- |
| **Column** | **Sum** | **Average** |
| *Census Population* | *213,862* | 19442 |
| *Total Pawdacity Sales* | *3,773,304* | 343027.64 |
| *Households with Under 18* | *34,064* | 3096.72 |
| *Land Area* | *33,071* | 3006.49 |
| *Population Density* | *63* | 5.71 |
| *Total Families* | *62,653* | 5695.71 |

Step 3: Dealing with Outliers

*Answer these questions*

Are there any outliers in the training set? Which outlier have you chosen to remove or impute? Because this dataset is a small data set (11 cities), **you should only remove or impute one outlier**. Please explain your reasoning.

I calculated the interquartile range (IQR, 75th percentile – 25th percentile) and looked for anything that was above 75th pct + 1.5\*IQR or below 25th pct - 1.5 \* IQR. Cheyenne was an outlier in a few categories: total sales, census population, population density, total families, and under 18 households. A few other cities were an outlier in one category, but Cheyenne is the outlier I would remove.

Outlier analysis:

Casper

Households with Under 18 above 1.5\*IQR: 6747.0 value: 7788

Cheyenne

Total Pawdacity Sales above 1.5\*IQR: 399816.0 value: 917892

Cheyenne

2010 Census above 1.5\*IQR: 44206.0 value: 59466

Cheyenne

Population Density above 1.5\*IQR: 13.06 value: 20.34

Cheyenne

Total Families above 1.5\*IQR: 11838.2 value: 14612.64

Cheyenne

Households with Under 18 above 1.5\*IQR: 6747.0 value: 7158

Gillette

Total Pawdacity Sales above 1.5\*IQR: 399816.0 value: 543132

Rock Springs

Land Area above 1.5\*IQR: 5148.095526 value: 6620.201916