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DATA 3320
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This project analyzes the Seattle and St. Louis rain data from 2017 to 2022 to determine whether Seattle receives more rain than St. Louis. The data was acquired from the NOAA Climate website of the National Centers for Environmental Information and cleaned in preparation for the study. To answer the main question, the project posts three sub-questions such as how many days a year it rains, the frequency distribution of daily precipitation, and how the average monthly rainfall in both cities has changed.

The data is loaded from the CSV files using the Pandas library. Data cleaning techniques, such as joining datasets, are used to identify and remove missing values. I impute missing data using an algorithm that calculates the average precipitation for each month of the year. The cleaned data is then put into a tidy format to enhance readability. Finally, the data is analyzed to generate visualizations using the matplotlib library. The visualizations include histograms, line charts, and bar charts.

After analyzing the data, I found that Seattle receives more rain than St. Louis. The graph displays the average annual number of days with precipitation in Seattle and St. Louis. We can observe from the chart that Seattle has more mean annual precipitation days than St. Louis does. This shows Seattle experiences more rain than St. Louis (Figure 1).

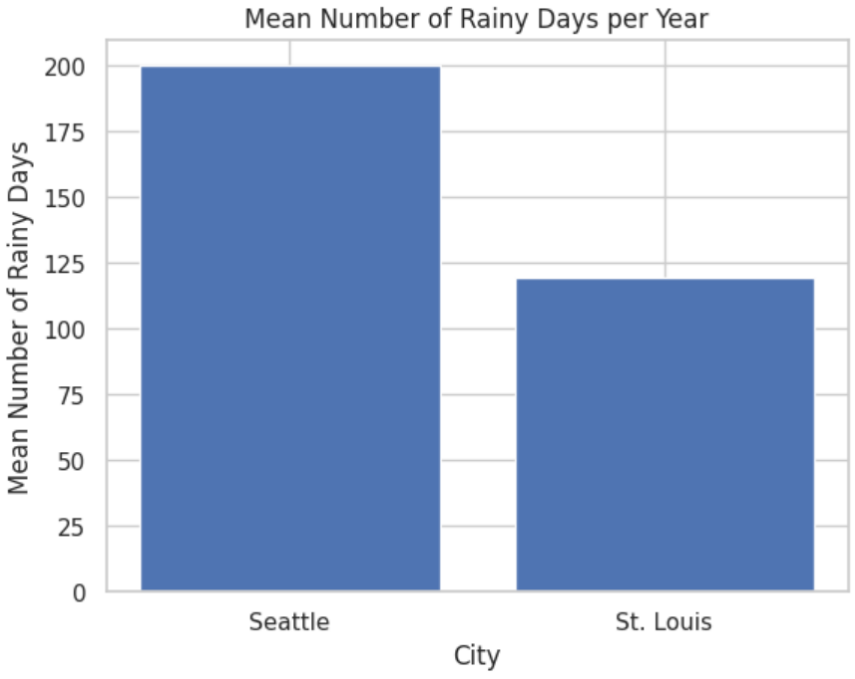

Figure 1

Furthermore, I examine the frequency distribution of daily precipitation. Seattle is highly skewed towards the lower end, with most days receiving less than 0.25 inches of rain. In contrast, the distribution in St. Louis is more evenly distributed, with a proportion of days receiving between 0.25 and 1.5 inches of rain (Figure 2). According to this histogram, Seattle

typically experiences more days with light rain (less than 0.25 inches) and fewer days with heavy rain (more than 0.5 inches) than St. Louis. Conversely, there are often more days with light rain and no rain in St. Louis. (between 0.2 and 0.5 inches).

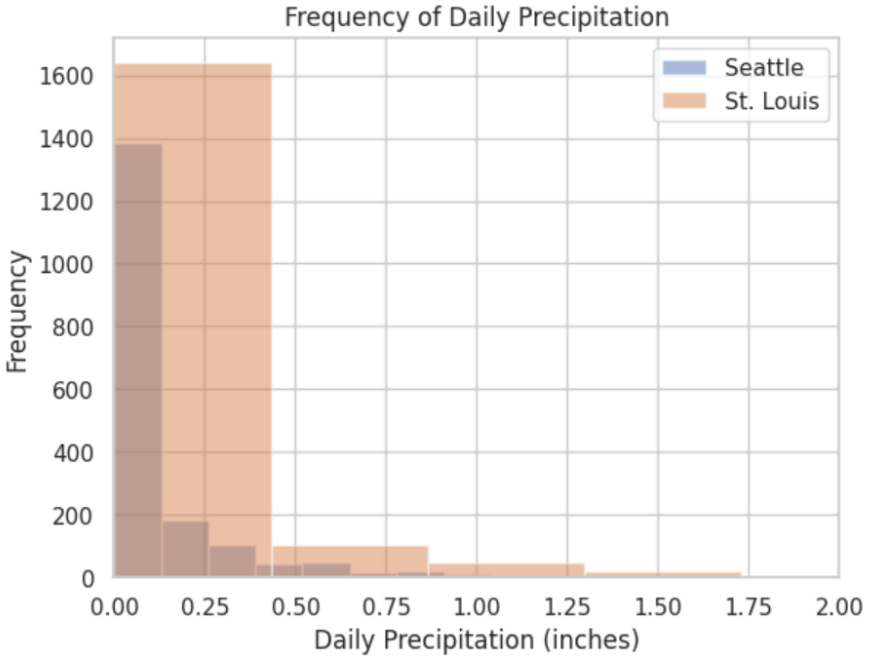

Figure 2

I investigate the average monthly precipitation in Seattle and St. Louis (Figure 3). I conclude from the graph that Seattle typically has higher annual precipitation levels than St. Louis. While precipitation is more evenly distributed throughout the year in St. Louis, there is a distinct seasonal pattern in Seattle, with more precipitation in the fall and winter months.

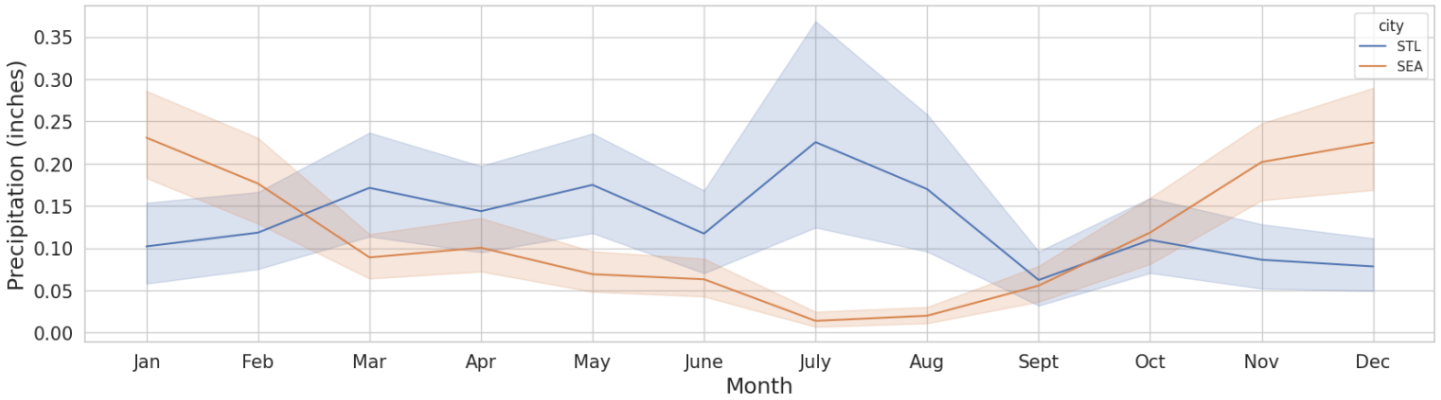

Figure 3

In conclusion, comparing the rainfall statistics for Seattle and St. Louis reveals that Seattle receives more precipitation than St. Louis. Seattle sees a seasonal trend where it rains more in the fall and winter months. In contrast, St. Louis has more evenly distributed rain throughout the year. Additionally, St. Louis experiences more dry days than Seattle.