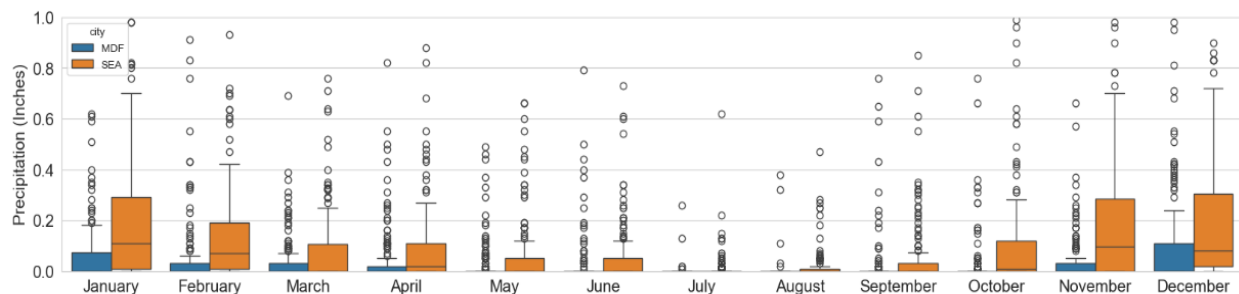


On a road trip from Phoenix, AZ to Spanaway, WA, I drove past a city in Oregon. This city, with luscious green grass, immediately caught my eye. After spending a decade in the Pacific Northwest, I wondered how it was possible for the city to be so green. In this report, I explored precipitation data from Seattle and Medford to determine which city receives more rainfall.

While it may seem intuitive, determining which city receives more precipitation could be a complex question to answer. With the dataset collected from the NOAA Global Historical Climatology Network (GHCND), I created several graphs to help visualize the data. The time frame for the precipitation observations studied would be from January 1<sup>st</sup>, 2018, to December 31<sup>st</sup>, 2022. Disclaimer: while the data was collected daily, Seattle's data frame had some missing values. For days with missing precipitation data, the mean for same days within the time frame was used to replace the empty values.

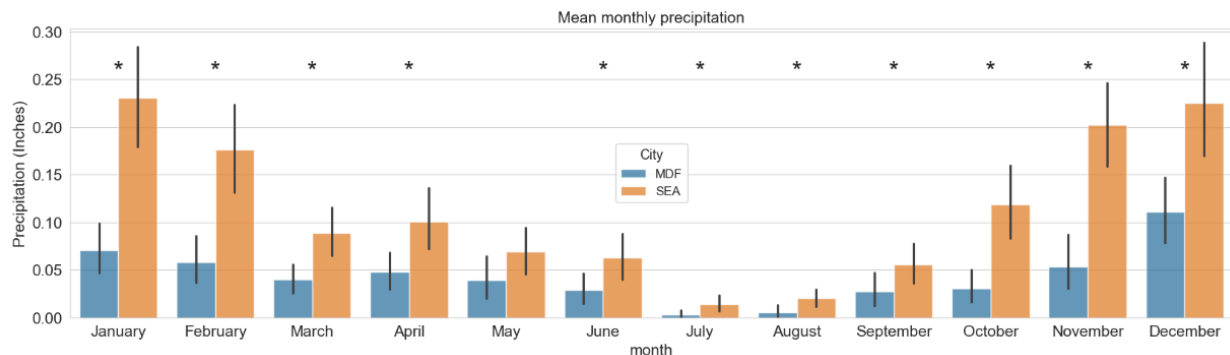
Below we will observe the graphs created to help answer the question. The first illustration is a box plot. The graph illustrates the precipitation for each city, grouped by month, throughout the 5-year period. Note that a box plot shows the distribution by showing the five number summary, consisting of the minimum, first quartile, median, third quartile and maximum values.



From the plot above, we can observe that Seattle's rainfall tends to be more variable than that of

Medford's. This is indicated by the taller boxes and longer whiskers, showing that rainfall amounts fluctuate more in Seattle.

To dive deeper into the data, a bar plot was created to illustrate the mean monthly precipitation for the two cities. The plot is shown below:



The asterisks above the bars indicate months where the mean precipitation between the two cities is statistically significant based on the t-test.

Observations from both graphs indicate that, on average, Seattle receives more rainfall each month than Medford does. For both Medford and Seattle, fluctuations in the precipitation can be explained from seasonal changes. Higher precipitation values during winter and lower during summers are indicators of wet and dry seasons. Lastly, the largest differences appear in January, February, November, and December.

In conclusion, although both cities are located in the Pacific Northwest, the precipitation data, shows that Seattle has a higher likelihood of rain. This begs the question, what leads to the luscious green grass observed when passing through Medford? Perhaps the city takes watering the grass seriously. However, based on the data, it is as clear as day that significantly more rain (measure in inches) falls in Seattle than Medford.