Weather Results

My friend who lives up in Queens, NYC came to Seattle to visit me. Despite me telling him that late fall and winter are arguably the worst times to visit, he visited in November. When he arrived, he complained about the amount of rain and how it was “too much” even compared to NYC. The purpose of this project is to hopefully prove to my friend that Seattle is not as “rainy” as popularly believed and that it is comparable to NYC, perhaps even raining less than the Big Apple.

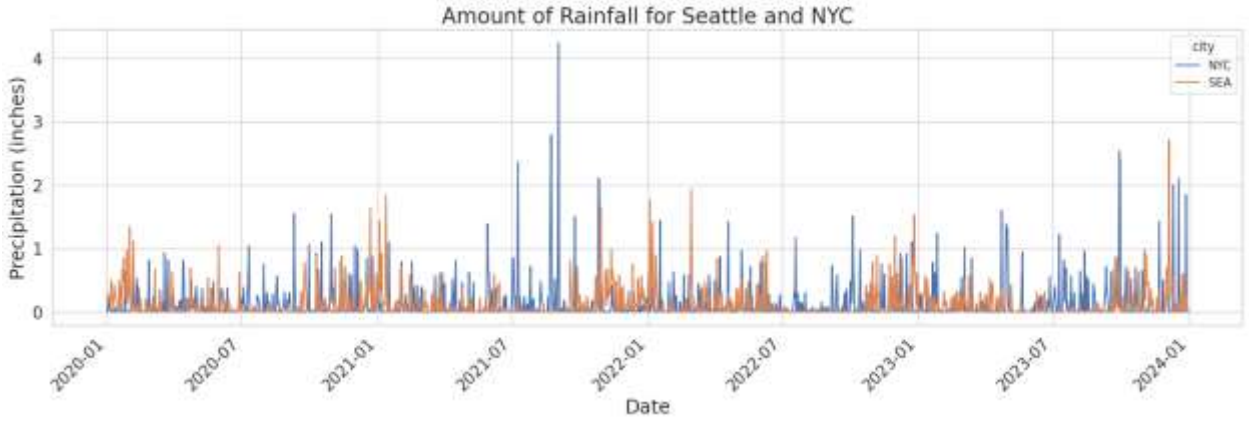
The data we will use is the daily precipitation measured in Seattle and New York from January 1, 2020 through December 31, 2023. The data sets were downloaded from the National Centers for Environmental Information Online search tool: https://www.ncei.noaa.gov/cdo-web/search?datasetid=GHCND. The data sets “seattle_rain.csv” and “ny_rain.csv” can be accessed from the weather folder Links in the DATA 3320 Github repository: https://github.com/galenegan/DATA-3320/tree/main/weather. You can also consult the data documentation: https://www.ncei.noaa.gov/pub/data/cdo/documentation/GHCND_documentation.pdf.

"Rainy" can be defined in many ways. Here, we will be looking at the total amount, frequency, and intensity. We reconfigured the data to give us one average precipitation value per day per city, and from the 5 number summary, we found that the mean for NYC (~0.134 in.) is about 0.018 inches more than Seattle (~0.116 in.), so on average, NYC received more inches of rainfall than Seattle during that timeframe. However, we also found that Seattle's median (~0.016 in.) and 75th percentile (~0.131 in) of rainfall are higher NYC’s (~0.012 in. and ~0.122 in. respectively), which tells us that perhaps it rains harder here than it does in NYC.

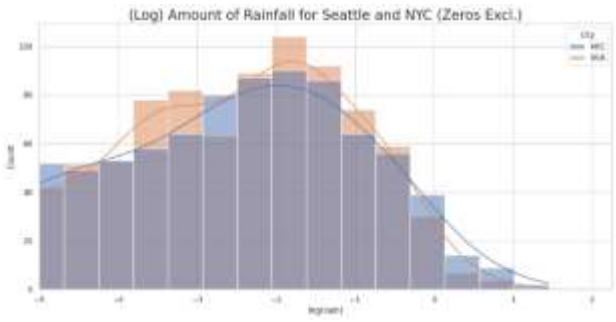
With more detailed analysis, we can see that Seattle received 548 days of no rain; 94 days more than NYC's 454 days. We went even further with the number of days exceeding 0.5 inches of rain, 1 inch of rain, and between 0.01 and 0.25 inches of rain.

For days exceeding 0.5 inches of rain, NYC had 114 days; 20 days more than Seattle's 94 days. For days exceeding 1 inch of rain, NYC had 33 days; 19 days more than Seattle's 14 days. However, in the range between (and including) 0.01 inches to 0.25 inches, Seattle has 574 days; 56 days more than NYC's 518 days.

Visually, we can see that NYC has more total inches of rainfall in the first graph. For the most part, both cities hover around 0.5 to 1 inch(es), but we can clearly see NYC has more peaks above 2 inches, as well as fairly consistent rain during Seattle's dry season.



Our log graphs below show us that NYC has more intense rains compared to Seattle by taking the natural log of each precipitation value and counting the frequency, giving us an easy-to-read histogram. The graph on the left, which ignores zero-values, shows us that while Seattle has more days with rain above zero but below 1 inch, NYC has more days of rain closer to, and especially beyond, 1 inch of rain (recall that *ln(1) = 0*). The graph on the right, which includes zero-values (by converting each zero-value into a negligibly small, positive value), shows us that Seattle has more days of no rain and accurately represents the claims we made above.



So, while Seattle has more misty days than NYC, when it comes to the total number of rainy days per year, intensity of rain, and overall inches of rainfall, NYC is rainier than Seattle.