**Seattle – New York Precipitation ANalysis**

1. **Introduction**

This document reports a data analysis that investigates whether it rains more in Seattle or in New York. By analyzing precipitation data from 2020 to 2024, a nuanced conclusion is derived with some precipitation metrics favoring Seattle, and others favoring New York.

1. **Data and Adjustments**

Data is sourced from the National Oceanic and Atmospheric Administration (NOAA) and is filtered to include data from select stations in the Seattle and New York areas from 01/01/2020 to 01/01/2024.

Seattle data: <https://github.com/joeyuy/Seattle-Weather/blob/def98215246c1d0546b333c2e7d61dcb9d7345c0/seattle_rain.csv>

New York data: <https://github.com/joeyuy/Seattle-Weather/blob/def98215246c1d0546b333c2e7d61dcb9d7345c0/ny_rain.csv>

The above data sets were used to produce a cleaned data set used for analysis. This data set was derived by aggregating the source data precipitation values by date and city. Missing precipitation values were filled by taking the average precipitation of surrounding dates. Month and season variables were created based on the date, and a rain class variable was made based on the precipitation amount.

The cleaned data frame used for analysis has 6 columns and 2922 rows and can be viewed here: <https://github.com/joeyuy/Seattle-Weather/blob/main/cleaned_sea_ny_rain.csv>.

1. **Analysis Methodology**

The metrics used to determine how much rain a city receives are precipitation amounts and rain class frequencies. For viewing precipitation amounts, a line graph that averages precipitation by month and a heatmap that averages precipitation by season, rain class, and city are created. To view rain class frequency distributions, a bar graph and a group of pie charts based on city and season are constructed.

1. **Results**
2. Precipitation Amounts

A comparison of different colors of the same color

Description automatically generated

This summary reveals that precipitation amounts on average do not differ much from between cities based on rain class and season pairings. Hence, residents from either city can experience the same range of weathers for the most part. The exceptions to this are how New York has more extreme spring, summer, and fall storms, while Seattle has worse precipitation in winter across almost all rain classes.

1. Rain Class Frequencies

A group of pie charts

Description automatically generated

These pie charts build off the heatmap by showing how frequently each rain class is distributed for each city and season. Seattle is shown to have much sunnier summers but much rainier winters than New York. Furthermore, the only season that does not have “no rain” as the most frequent weather is a Seattle winter. The volatility in New York fall is also highlighted with it having the city’s most sunny and very heavy rain days.

1. **Conclusion**

In general, results can be summarized into:

1. For most of the year, there is very little difference in the total precipitation experienced between Seattleites and New Yorkers.
2. New York storms reach more extreme precipitation levels than Seattle's.
3. Seattle has both the sunniest (275/368 no rain summer days) and least sunny (86/361 no rain winter days) seasons between both cities. New York's sunniest season is fall with only 205 no rain days, and its least sunny season is surprisingly summer with only 163 no rain days.

New York can be argued to be less rainy because it does not have an extended period that features day after day of rain, unlike Seattle's winters. But at the same time, New York experiences worse extreme storms than Seattle. Seattle can also be argued to be less rainy because it has the only season (summer) that comes close to a 75% no rain period. New York's best is only 56% in fall.

Overall, New York can be said to have consistently more rain and worst individual storm days, but the rainy season of Seattle is significantly worse than New York's. **As such, the answer to the question depends on if a resident values the presence of sun (Seattle is preferable) or the absence of rain (New York is preferable).**