Precipitation Across the Cities of Seattle and Springfield

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Problem

Where is it rainier? Seattle, WA or Springfield, OR? We will attempt to answer this question by comparing daily precipitation data

Method

NOAA NCEI (National Oceanic and Atmospheric Administration; National Centers for Environmental Information) data was collected at one local weather station in Seattle, WA, and at 68 local stations in Springfield, OR over the dates of 01-01-2018 to 12-31-2022. Rainfall was measured in inches.

Data sets can be independently requested here. Data wrangling was completed via python. Copies of our raw data and our code can also be located in the Github repository here.

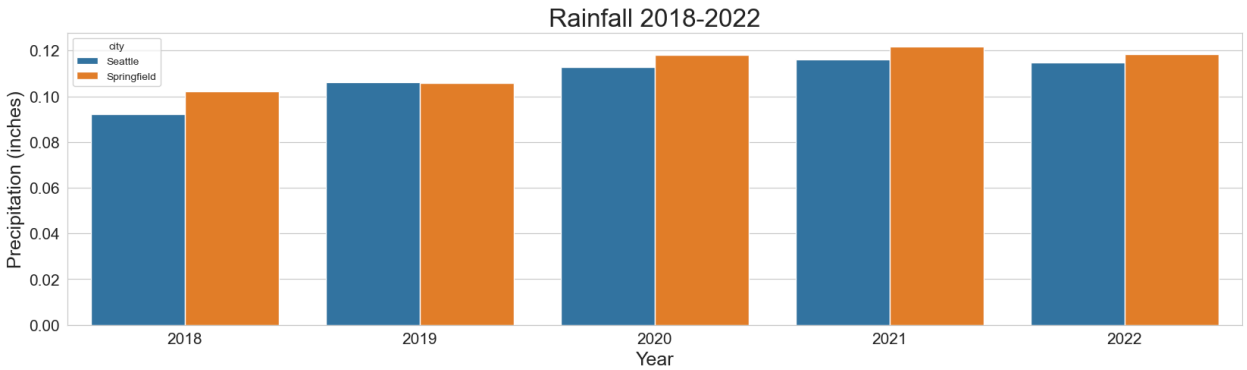
Cleaned data consists of only one station's worth of records from both cities. Precipitation values for several dates from each city over the five year period were missing; these have been supplemented by the mean average precipitation for that day of the year for that city. Both data sets were combined into one tidy final source. Several variables transforming date were introduced to better visualize trends. Line plots, bar plots, and histograms were generated for ease of visualizing findings.

Analysis

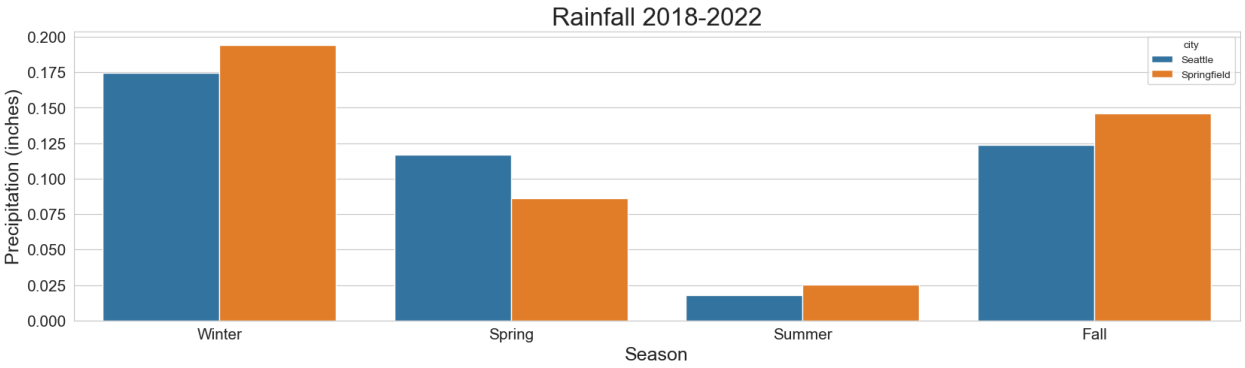
In a descriptive approach, we determine summary statistics and visual graphics for assessment. Summary stats by city for the full five years reveal Springfield to have a higher average, median, and max daily rainfall. The total rainfall for the period also surpassed Seattle.

city	count	mean	standard deviation	min	25%	50%	75%	max	sum
Seattle	1826	0.108457	0.23471	0	0	0	0.1	2.33	198.041667
Springfield	1826	0.11327	0.240516	0	0	0.01	0.12	2.6	206.831667

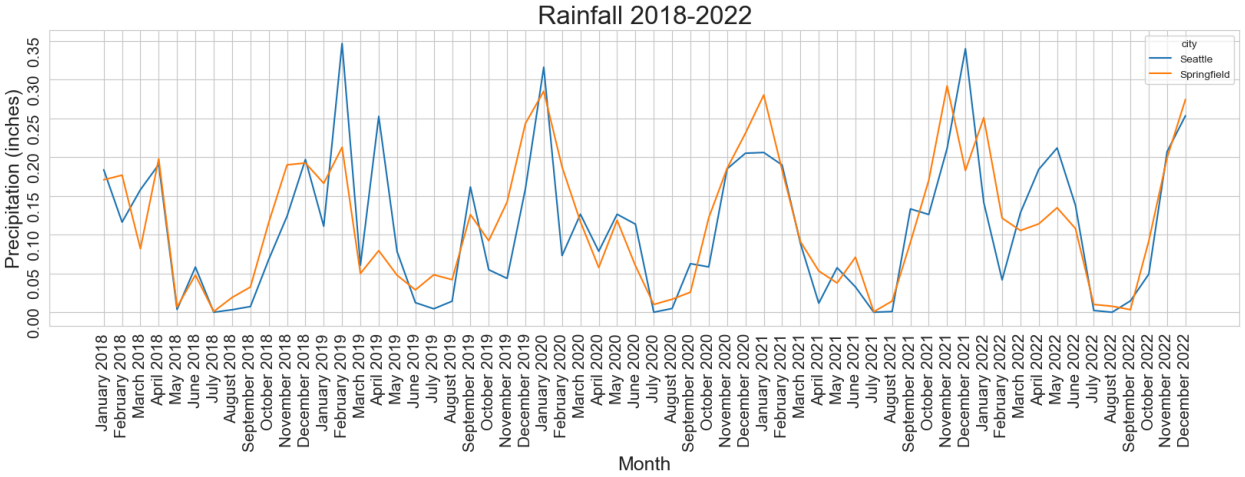
A bar plot of total rainfall in each year reveals that four of five years, Springfield outrained Seattle, saving 2019.



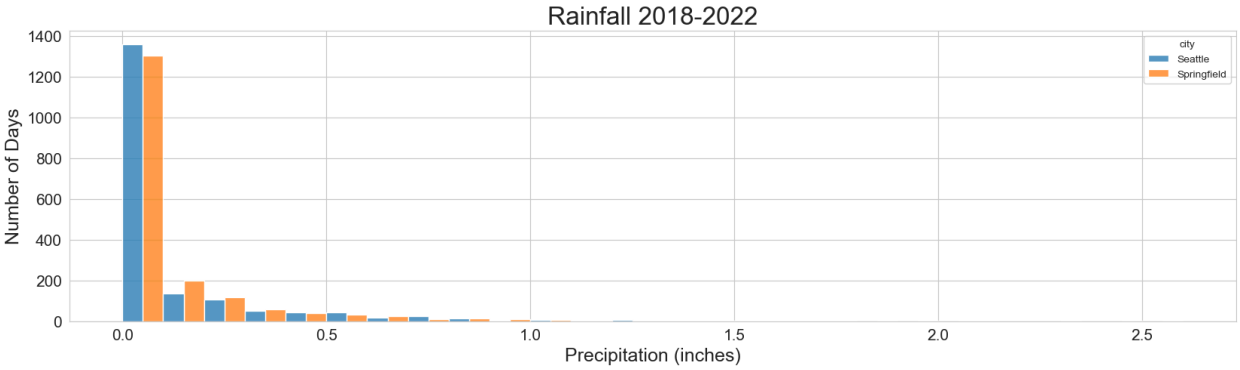
A bar plot of total rainfall by season (approximately 90 days following equinox and solstices) shows that Seattle did indeed receive more cumulative rain in spring.



With a lineplot of precipitation, we rediscover the peak Seattle rainfall which can outperform Springfield in the winter and spring months. Despite the highest monthly totals being held by Seattle, we already recognize that the max daily precipitation value belongs to Springfield. Understandably, Springfield's standard deviation (variability from average) is also greater.



A histogram shows both cities' precipitation rates skew heavily right, explained by the high number of no rain days. Seattle shows a greater number of no rain days than Springfield.



Conclusion

We assessed daily precipitation in inches over a five year period from single weather stations in both Seattle, WA and Springfield, OR. Due to its greater total rainfall, greater annual rainfall four of five years, greater seasonal rainfall summer through winter, and greater maximum rainfall skewing the distribution further right, we conclude that Springfield, OR is in fact rainier than Seattle, WA. A larger amount of data may provide options into improved tests for the significance of the differences between these statistics.