Seattle vs. Portland: Which City Gets More Rain?

Project Title: Analyzing Precipitation Patterns in Seattle and Portland (2018-2022)

Anushka Naidu Maddisetty

DATA 5100 – Foundations of Data Science

Date: October 8, 2025

Introduction

Our discussion today focuses on a simple but often-debated question: Which city gets more rain, Seattle or Portland?

These cities are known for their gloomy skies and rainy days, and it's hard to conclude where it rains more just by general observation. If we were comparing Seattle and San Francisco, we would not have to think twice before picking Seattle. But when it comes to Seattle and Portland, which are quite similar and located close to each other, people often get into debates, each claiming they know the right answer.

Well, today we are here to settle that question using the data science methodology. By applying real weather data and structured analysis to move past opinions and find a clear, data-driven answer to the question: **Does it rain more in Seattle, Washington, or in Portland, Oregon?**

Method

To find out which city gets more rain, the project followed a simple data science process of collecting, cleaning, combining, and analyzing real rainfall data.

Data Source: Daily rainfall data (in inches) from January 1, 2018, to December 31, 2022 was taken from the National Oceanic and Atmospheric Administration (NOAA). The data includes both Seattle and Portland.
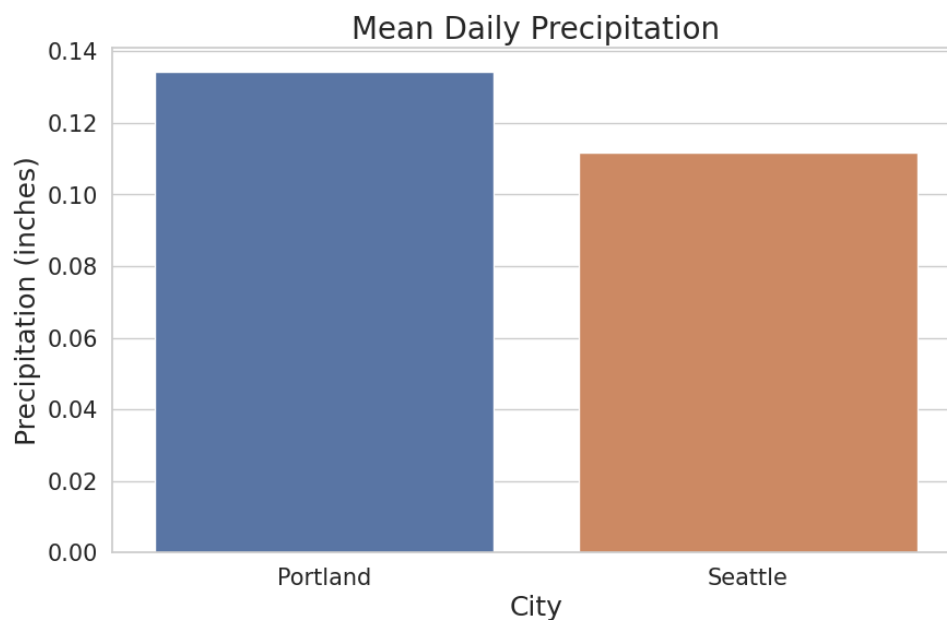
Steps: All analysis was done in Google Colab using Python with the libraries pandas, numpy, matplotlib, and seaborn.

The analysis began by importing Python libraries used for data handling and visualization. pandas and numpy were used for working with and cleaning the data, while matplotlib and seaborn helped create charts and graphs to visualize rainfall patterns. The rainfall data for Seattle and Portland was loaded from the respective files.

The rainfall data for both cities was cleaned by converting the DATE column into the correct date format and keeping only the important columns which are DATE and PRCP (precipitation in inches). Missing rainfall values were filled with each city's average/mean to keep the dataset complete. After cleaning, the two datasets were merged by date using an outer join so that all days from 2018 to 2022 were included, even if one city had no record for a particular day. Finally, the combined dataset was reshaped into a long format, which made it easier to compare and visualize rainfall patterns for Seattle and Portland side by side.
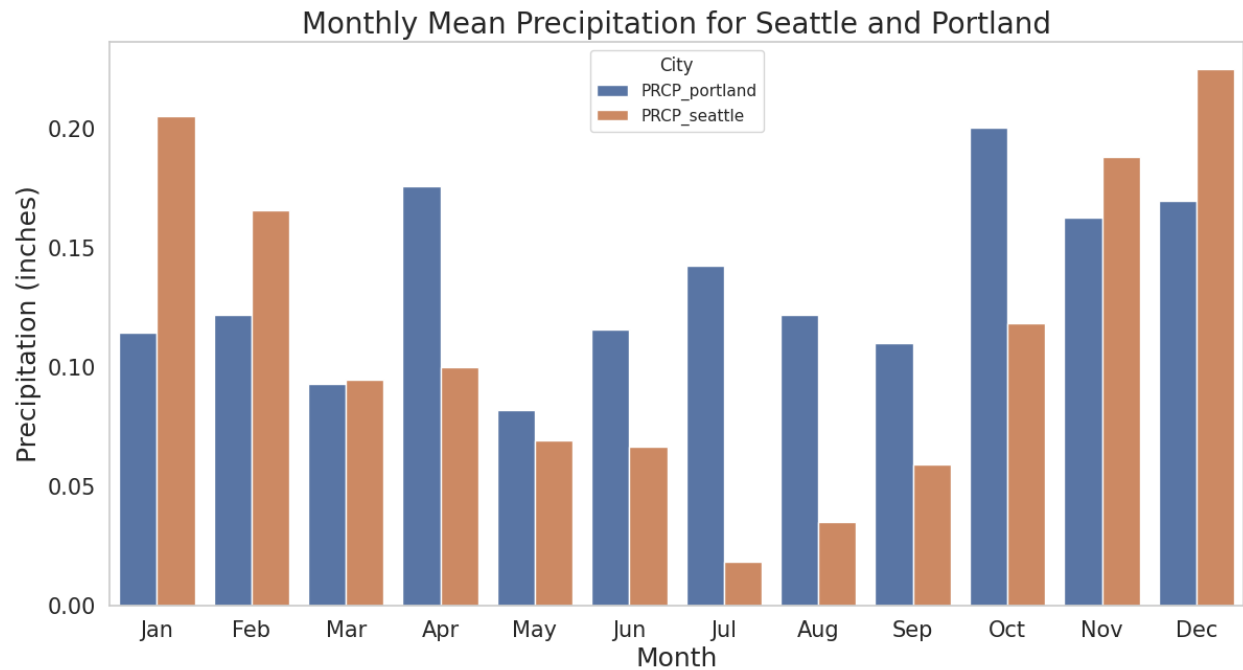
Lastly, graphs were created to explore and compare rainfall patterns. These included charts showing average daily rainfall, monthly averages, the proportion of rainy days, and seasonal rainfall trends across the five-year period.
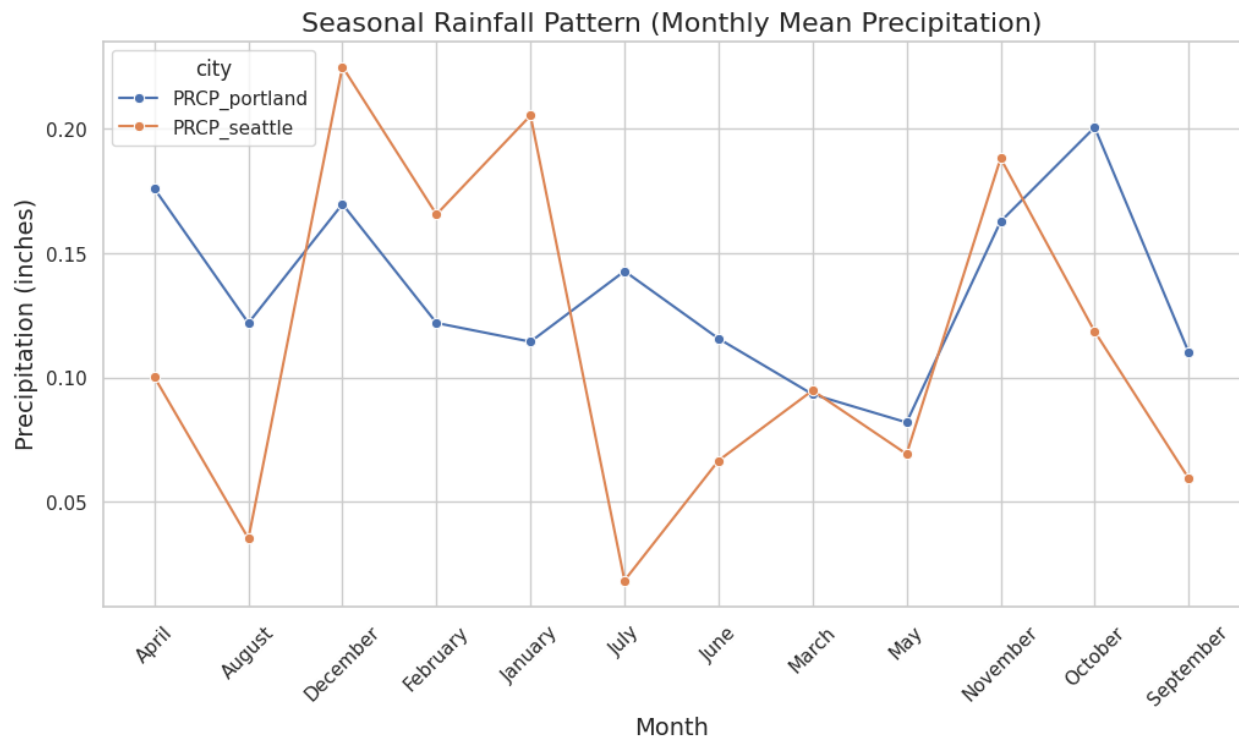
Results

1.Interpretation of the plot above:
The bar graph compares the average daily precipitation (in inches) between Portland and Seattle. The results show that Portland records higher mean daily precipitation (0.13–0.14 inches) compared to Seattle (0.11 inches). This indicates that Portland experiences slightly heavier rainfall on average, while Seattle's precipitation is more evenly distributed throughout the year.

Monthly Mean Precipitation for Seattle and Portland

2. Interpretation of the plot above:

From the chart, it is evident that Portland receives more rainfall on average each month compared to Seattle. The difference is most noticeable during the winter months, when Portland's precipitation levels rise sharply. Seattle shows smaller fluctuations, indicating a more stable rainfall pattern throughout the year. Overall, Portland's climate is wetter and more variable, while Seattle experiences moderate but consistent precipitation.

Seasonal Rainfall Pattern (Monthly Mean Precipitation)

3. Interpretation of the plot above:
The line graph compares the monthly mean precipitation for Portland and Seattle, showing how rainfall varies seasonally across the year.
Both cities follow a similar seasonal rainfall pattern where the precipitation is highest in the winter months (November to February) and lowest in the summer months (June to August). However, Portland's line generally sits above Seattle's, meaning that Portland receives heavier average rainfall in most months.

Conclusion

Based on the analysis of precipitation data for Seattle and Portland from 2018 to 2022, we can draw the following conclusions:

- Total Rainfall: Portland received more total rainfall than Seattle during this period.
- Frequency vs. Intensity: Seattle experienced rain on more days overall, but the rainfall was usually lighter. In contrast, Portland had fewer rainy days, but when it rained, the precipitation was heavier on average.
- Seasonal Patterns: Both cities showed clear seasonal trends where it rained more during the winter months and less during the summer.
  However, Portland had higher rainfall peaks during the wet season compared to Seattle.

In summary:
Seattle tends to have rain more often but in smaller amounts, while Portland has fewer rainy days with heavier rainfall, leading to a higher total precipitation overall.

So to finally answer : Does it rain more in Seattle, Washington, or in Portland, Oregon?

The answer is Portland, Oregon.