**Does It Rain More in Seattle or Portland? A Data-Driven Look at the Pacific Northwest’s Rainfall Patterns for its two major cities**

### **Introduction**

Seattle is famous for its rain, but many people wonder whether it really rains more there than in nearby Portland, Oregon. To answer this question, I analyzed five years of daily precipitation data (2018–2022) from both cities. The goal was to compare not just how much rain each city receives, but also how often it rains. This project follows a data science process—collecting, cleaning, and analyzing weather data.

### **Data Description**

The data used in this analysis come from official daily weather observations published by the National Oceanic and Atmospheric Administration (NOAA). The analysis focuses on the period from January 2018 through December 2022, comparing one weather station in Seattle, WA, and one in Portland, OR.

### **Methods**

To compare rainfall between the two cities, I calculated the total and average precipitation, the number of days with measurable rain, and seasonal (monthly) patterns. Two statistical tests were used: a *t-test* to compare average rainfall amounts and a *z-test* to compare the proportion of rainy days. These methods help determine whether observed differences are meaningful or due to random variation.

### **Results**

The results show that Seattle and Portland receive nearly identical total rainfall. From 2018 to 2022, Seattle averaged 41.4 inches of precipitation per year, and Portland averaged 40.4 inches. Both cities are wettest in winter (November–January) and driest in summer. The t-test results indicate that only August showed a statistically significant difference (p = 0.02), with Seattle receiving slightly more rain that month (Figure 1 – Mean Monthly Precipitation)

A graph of a number of months

Description automatically generated

In contrast, the z-test revealed that Seattle experiences rain on significantly more days during several months—especially February, July, August, and October (Figure 2 – Monthly proportion of days with precipitation). This means Seattle’s rain is spread across more days, while Portland tends to have fewer but heavier rain events.

A graph of different colored bars

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The distribution of daily rainfall (Figure 3 – distribution of daily precipitation by month) confirms that both cities share the same seasonal pattern of wet winters and dry summers, but Seattle’s rainfall is lighter and more frequent.

A graph with different colored lines

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Finally, the distribution of rainfall on rainy days (Figure 4 ) shows that most rain events in both cities are light. Seattle’s curve peaks higher near zero, indicating more drizzle-level precipitation. Portland’s distribution is slightly flatter, suggesting fewer light rain days and relatively heavier rainfall when it does occur. This pattern explains why Seattle rains more frequently overall, even though both cities receive nearly the same total rainfall.

**A graph of rain fall

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### **Conclusion**

In total, Seattle and Portland receive about the same amount of rain each year, but Seattle’s rainfall occurs more often and in smaller amounts. The data support Seattle’s reputation for frequent drizzle, but not necessarily harder or longer. Portland, by contrast, experiences similar rainfall totals condensed into fewer, heavier events.