

ASSIGNMENT 1: SUNSHINE HOURS ANALYSIS

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1 Introduction

In this report, we analyze the variations in sunshine hours across different U.S. cities using a dataset of average monthly sunshine hours. Two primary questions are explored: (1) How do sunshine hours vary across months in each city? (2) Is there a correlation between latitude, longitude, and sunshine hours? The answers to these questions are visualized through heatmaps and correlation matrices.

2 Sunshine Hours Across Cities

The first visualization addresses the question of how sunshine hours vary across different months in each city. The heatmap presents the monthly sunshine hours for six major U.S. cities: Chicago, Houston, Miami, New York, San Francisco, and Seattle.

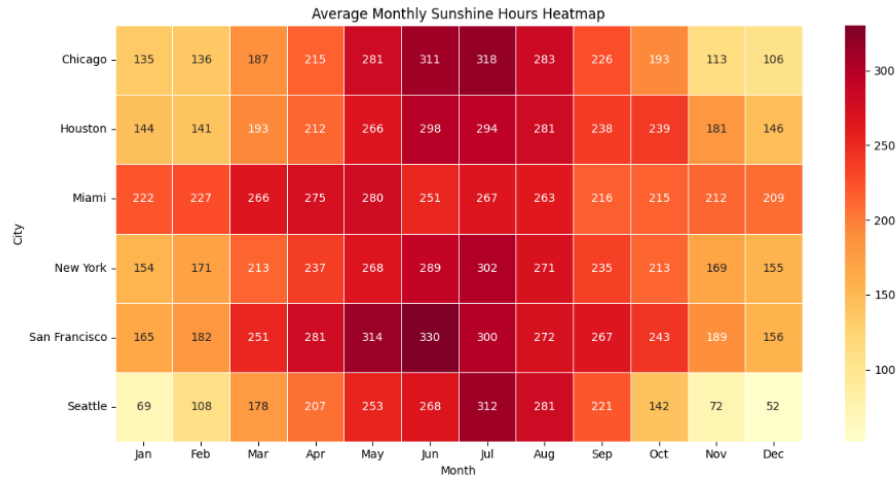


Figure 1: Average monthly sunshine hours heatmap for six U.S. cities.

As shown in Figure 1, there is considerable variation in sunshine hours across cities. Miami, being closer to the equator, receives consistently higher sunshine hours throughout the year, whereas cities like Seattle experience fewer hours, especially during the winter months.

3 Correlation Between Latitude, Longitude, and Sunshine Hours

The second part of the analysis investigates the correlation between geographical coordinates (latitude and longitude) and sunshine hours. A correlation matrix was computed to visualize these relationships.

In Figure 2, we observe a negative correlation between latitude and sunshine hours (-0.24), indicating that as we move further from the equator, sunshine hours tend to decrease. On the other hand, longitude shows a weak correlation with sunshine hours, suggesting minimal impact.

4 Conclusion

This analysis effectively demonstrates the relationship between geographic location and sunshine hours. Cities closer to the equator, such as Miami, experience more consistent sunshine throughout the year, while cities at higher latitudes,

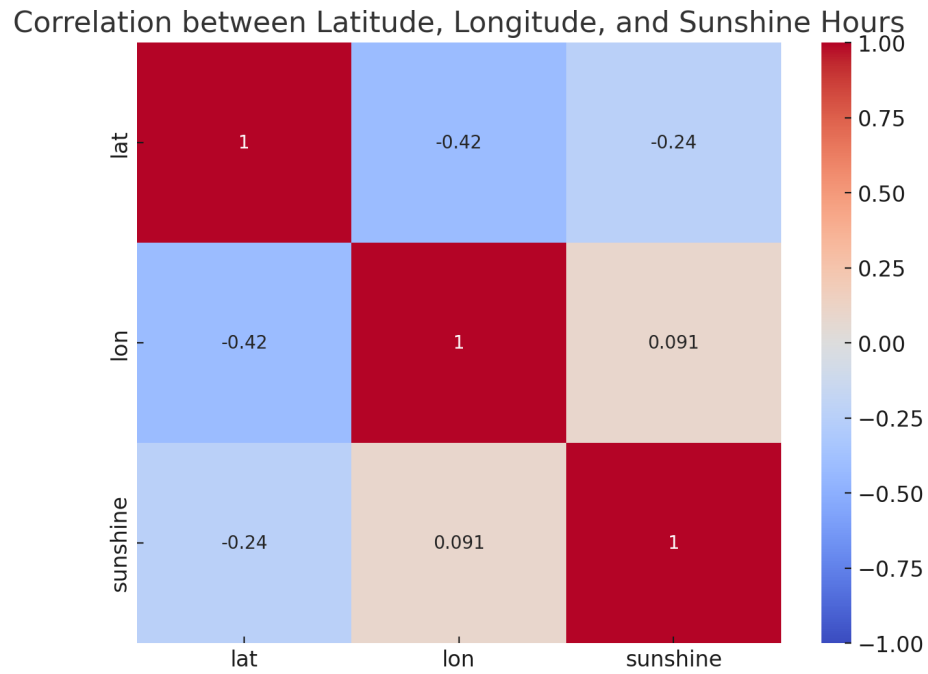


Figure 2: Correlation matrix between latitude, longitude, and sunshine hours.

like Seattle, face significant seasonal variations. The negative correlation between latitude and sunshine hours supports the understanding that geographical location is a key determinant of sunshine exposure.