**Analysis Summary of Relationships Between Weather and Latitude**

This summarizes the key findings from the analysis of the relationships between key weather factors and latitude from a sample of more than 500 randomly selected cities across the globe.

**I. Methodology**

This analysis leverages Citipy library to locate cities nearest to 500+ latitude and longitude pairs randomly generated. It then requests for the weather info for such cities from OpenWeatherMap API as of Oct 4, 2019. From such data, this analysis leverages the Pearson correlation coefficients between Latitude and 4 key weather measures: Maximum Temperature (C), Humidity (%), Cloudiness (%), and Wind Speed (kmph), together with qualitative observations of scatterplots, to identify whether weather changes as Latitude changes.

**II. Conclusion**

It is very likely that Temperature drops as it gets closer to the North or South Poles, and it goes up as it gets closer to the equator, with a strong negative correlation coefficient of -0.84 for the Northern Hemisphere, and a positive 0.74 for the Southern Hemisphere. However, none of Humidity, Cloudiness or Wind Speed shows a correlation with Latitude changes with correlation coefficient values below 0.5.



**III. Key Findings**

1. Latitude and Temperature trends have relatively strong correlations. Based on qualitative observation of the below plot, the correlation seems to be strong in the Northern Hemisphere than in the Southern Hemisphere. This might be due to reasons such as a smaller number of cities in the Southern Hemisphere in the sample, or other factors like Altitude might play a more significant role. Nevertheless, the correlation is proven by the quantitative coefficients as highlighted.

A close up of a map

Description automatically generated

2. Latitude and Humidity don’t show a clear pattern, or any correlation based on qualitative observation of the plot below. This is confirmed by the correlation coefficient values for both Northern and Southern Hemispheres. This might be because Humidity tends to have a more visible relation with distance to oceans or other large bodies of water, or other factors that are not analyzed in this study.

A close up of a map

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3. Similar to Finding #2, Latitude and Cloudiness don’t show a clear pattern indicating any correlation based on both qualitative observation and quantitative coefficients. Meanwhile, Cloudiness values of the sample tend to concentrate at levels of around 0%, 20%, 40%, 70%, and 100%. This measure might have potential relation with Temperature changes instead of Latitude.

A screenshot of a cell phone

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4. Similar to Findings #2 and #3, Latitude doesn’t show a clear impact on Wind Speed based on the qualitative observation of the plot below, confirmed by the correlation coefficient.

A screenshot of a cell phone

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