WeatherPy Data Analysis by Diane Scherpereel 9/28/2019

The random-generated latitudes and longitudes appear to have provided a good distribution of latitudes all the way from approximately -55 degrees up to approximately 78 degrees. This website: <https://blog.batchgeo.com/cities-by-latitude-and-longitude/> shows that there are relatively few cities in the range of 75-80 degrees and no cities further south than -55 degrees, so to have a range of -55 to 78 included by the random generation demonstrates that this random sample contains a varied set of latitudes to analyze.

From the data produced by this Python code, there appears to be a relationship between a city’s maximum temperature and the latitude. Looking at the temp\_lat\_with\_curve2.png, it can be seen from the curve that the peak in temperature appears to be around a latitude of 5 degrees, and definitely in the range of 0-10 degrees. From 10 to 78 degrees and 0 to -55 degrees, the maximum temperature drops down moving away from the equator at 0 degrees.

Though a non-linear curve can be fitted to the maximum temperature vs. latitude plot (see temp\_lat\_with\_curve2.png), for the other 3 plots (humidity vs. latitude, cloudiness vs. latitude, or wind-speed vs. latitude), there is really no line or curve that would make sense to capture all of the data. We can see though, that for humidity, the majority of cities have higher vs. lower humidity, with more than half the cities in the range of 60-100% humidity, and a higher concentration yet between 80-100%. The wind-speed vs. latitude plot shows that for most cities the wind-speed is 0-15 miles per hour, with the greatest concentration of cities being between 0-10 miles per hour.

The plot of cloudiness vs. latitude contains some interesting concentrations on specific percentage lines. Researching why that might be the case led to this Wikipedia explanation for how they measure cloudiness ( <https://en.wikipedia.org/wiki/Okta> ):

In [meteorology](https://en.wikipedia.org/wiki/Meteorology), an **okta** is a [unit of measurement](https://en.wikipedia.org/wiki/Units_of_measurement) used to describe the amount of [cloud cover](https://en.wikipedia.org/wiki/Cloud_cover) at any given location such as a [weather station](https://en.wikipedia.org/wiki/Weather_station). [Sky](https://en.wikipedia.org/wiki/Sky) conditions are estimated in terms of how many eighths of the sky are covered in [cloud](https://en.wikipedia.org/wiki/Cloud), ranging from 0 oktas (completely clear sky) through to 8 oktas (completely [overcast](https://en.wikipedia.org/wiki/Overcast)).

The openweathermap.org data measures cloudiness on a scale of 0-100 vs. 0-8 oktas; however, the explanation above about the cloudiness being measured by eighths of the sky, gives perspective on why there might be horizontal lines of data on the plot. We would expect more general percentages, for example 20% cloudy or 100% cloudy, vs. 21 % cloudy, because measuring cloudiness is not that precise.

I ran the data several times as I worked on my code in order to include the information requested. You will find more than one set of png files, and I included those because they confirm the general analysis above. The specific files for this set of data, as can be seen in the code, are:

temp\_lat\_with\_curve2.png

hum\_lat2.png

cloud\_lat2.png

wind\_lat2.png