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Weather Data Retrieval
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Climate change is a major issue for our planet. This calls for researchers to investigate solutions that can create positive effects on the environment. One of the ways they can achieve this is by collecting historical weather data and making trends over time. This makes learning about the commands related to retrieving weather data appealing to me. I love research and it is great to know the ways we can contribute to the overall environment using Mathematica programming. Starting from the basic Mathematica syntax and data types such as Lists, I was able to understand the more complex commands that are related to this project. I chose to focus mostly on WeatherData, WeatherForecastData, ListPlot, DateListPlot, ListLinePlot and other helpful commands that are helpful like UnitConvert. The complexity of these commands stretched my knowledge beyond the basic Mathematica commands we have learned in class so far. The organization of my notebook is inspired by the previous tutorials seen in class. I broke everything down in sections and processes on how/when to use them. For the complex commands, I showcased different ways of using it, and the different outputs you can get. I also included some wrong syntax on purpose to use it to teach about worst case scenarios when using such commands. An example of this is the WeatherData["WindSpeed"] and WeatherForecastData["WindSpeed"]. As a beginner learning these capabilities, it might seem like both could work. It turns out that there is a slight difference in output because Mathematica reads it incorrectly and not the way you would expect. I made sure to highlight this difference and how to avoid the mistake. After using WeatherForecastData and seeing the output it returned, I knew I needed to mention a few things about data visualization. ListLinePlot, DateListPlot became really helpful in visualizing the time series that it outputted. I also wanted to include weather property commands like AirPressureData[], WindVectorData[] to show users that we don't necessarily always have to use WeatherData[] to get current specific trends. They can use those property commands instead. After completing my first draft, I received feedback from a classmate about including more related commands not just WeatherData[] and WeatherForecastData[]. In order to incorporate those changes, I reformatted the notebook in 4 major sections from my initial 2 sections: (1) Weather Data, (2) WeatherForecast Data, (3) ListPlot ListLinePlot, and (4) Weather Properties. Each of these sections allowed me to research commands that are easy to use and commands that do similar but slightly different things. An example of this is ListPlot and ListLinePlot, very similar but can be used differently. Another example of this is AirPressureData[]. If you use WeatherData[*location*, "AirPressure"] you can yield the same result. This makes my tutorial more interesting for the user. This feedback was helpful because it made the organization of the notebook better. I was able to make the sections more specific. Every command I used came from trial and error. I would use a command and realize I need another command to make it either easier to understand or to avoid errors.