

Rainbows and Pouring Rain: Adventures in Weather Prediction



Imagine this: you've planned a day out with your friends, full of fun, outdoor festivities on a bright & sunny day. You and your friends plan on visiting a farmer's market, followed by a picnic on the lawn, sunset hike up humpback rock, and ending the day with grilling s'mores, and stargazing at the rotunda. Sounds fun, right? Except you step out the front door and all you see for the next 8 miles is pouring rain. Precipitation- the greatest villain in ruining your summer plans. If only there was a way to predict bad weather better than the app on your iphone, maybe you could prevent this from happening to anyone...

Weather is an unpredictable phenomenon whose patterns hold heavy importance for the common man due to their wide-ranging implications on daily life and decision-making. Weather forecasts help individuals plan their activities, whether it's as simple as scheduling outdoor events and commuting to work, or as vital as preparing for storms and heatwaves. Such predictions are extremely necessary for industries such as agriculture, transportation, energy, and tourism who rely on certain types of weather for their practices. Additionally, accurate weather forecasts can help mitigate risks associated with natural disasters, enabling timely evacuation and resource allocation. Therefore, a dependable weather model can not only enhance efficiency but also plays a crucial role in safeguarding lives and resources making it a useful tool for the average person. Aspiring to contribute to such an important field of predictive analytics, this project aims to establish a predictive model that can successfully estimate future climate measures for certain times of the year.

Your Task:

1. Merge the five given climate datasets from the NOAA (in the .csv file format) to create one base dataset. Split this data into training and test sets in order to prepare for model building and validation where the training set contains data from 1895-2023, and the test set contains 2024 data.
2. Find a type of predictive model you would like to try and build (Technical articles regarding different options will be provided). Build the model using training data.
3. Test your model's performance by predicting 2024 climate parameters and evaluate its accuracy using the test data to see the actual climate in 2024.

Your Deliverables:

1. Multipage PDF document explaining your findings and the process used to obtain them, including a hypothesis, data cleaning procedures, analysis plan, conclusions, and next steps.
2. Online github repository including all resources, figures, and used code.