# Weather Prediction

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**Project Description:**

For this project, we were tasked with finding a solution for how technology can be used to improve the lives of people in New Jersey. We decided to tackle weather prediction. A lot of people can see the weather and not necessarily understand what they're seeing. Some will just see the temperature and if it's sunny and call it a day. This software will allow you to see predictions on the weather in your area based off of previous weather data, as well as show real-time weather data.

**Vision**:

This software application would utilize data from various sources, including weather forecast data. We would then take the past-recorded data and put it into a csv file. With the data that was put into the system, we would train the model based on the previous data that was recorded. Our goal from this was to see if we were able to predict the weather in the future.

**Safe Goal**:

The safe goal for this project was to build a working prototype of the software application, utilizing pre-existing weather data. We anticipated being able to accomplish this within a reasonable timeframe, factoring in both technical and time constraints.

**Stretch Goal**:

The stretch goal for this project was to incorporate real-time weather, providing users with more accurate and up-to-date alerts. We anticipated this goal would be more difficult to accomplish, as it would require access to real-time data sources and more advanced algorithms for generating personalized alerts.

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**Progress:**

In the beginning, the project we wanted to do was pothole detection. As we were doing it, we realized that it was a lot to do and understand, but also did not have enough time to do it. Our second option was to do sign language detection, but that was also too long of a process, so we decided that we finally wanted to do weather prediction. This was great because everyone needs to know what the weather is to help prepare themselves for that day.

**Final Progress**:

The final product of this project turned out very well. The project really walks the user through the process of how it actually works. First with reading the csv file of our previous weather data. Then getting rid of null values and showing different statistics like max/min temperatures and precipitation over the years. Then setting the training data set and the test data set, and finally making the predictions and showing the average amount off the prediction from the actual results. Overall, we were able to implement both our safe and stretch goals into our project and we are very happy with the results.

**Helpful/Unhelpful**:

Some things that were helpful while creating this project were having a group to communicate with and being able to refer to different sources for help with the library we used. Some of the things that were unhelpful while doing this project were the inconsistencies of previous ideas we had, such as libraries being out of date and not working correctly. Another thing that was difficult to do was to learn how to use the library ‘sklearn’ and the commands built into it. Some of the commands were unfamiliar to us, so we had to take time to learn these commands and what they are used for.

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**Lessons Learned**:

This project gave us great insight into multiple things. First it gave us a greater depth of knowledge into python libraries. We previously went into python libraries with our second project, but now we have learned another really useful library that can be used for personal projects in the future. Next we have learned more about machine learning. With this, we were able to create a software that can predict the weather based off of previous weather data, as well as incorporate real-time weather, providing users with more accurate and up-to-date alerts. Lastly, we learned how to take a problem that can affect a group of people, such as people in our state, and create software that can address this problem. We took our vision, applied our knowledge and created a final product that does what we created it for. We had adversity, and persevered through it to get to our end goal. This was a great experience and truly taught us that we have the ability to help people through creating technology.