Sherman Project

Summary

The purpose is to display the weather station data. The weather station data is captured every 15 minutes and can be pulled from a publicly accessible website. The data is to be polled from the website every 15 minutes and inserted into the database on a raspberry pi. A display program will project the data in a configurable fashion onto the attached display.

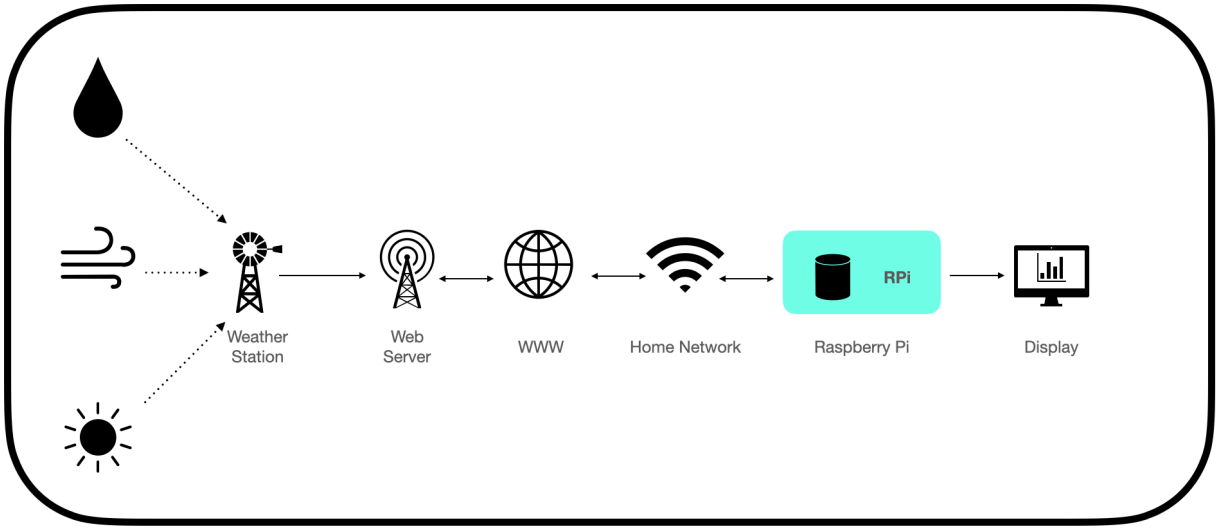
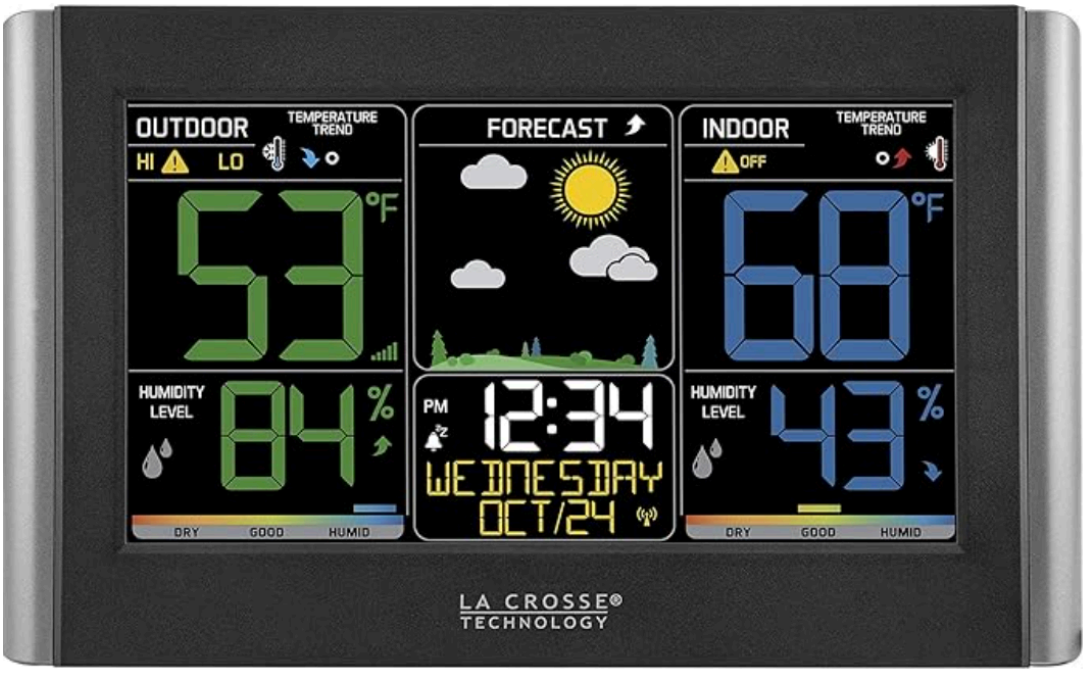


Figure 1 - High Level Flow

The goal is to make it look similar to the following:



Details

There will be two main programs running on the Raspberry PI: Data_Gather.py and Display.py.

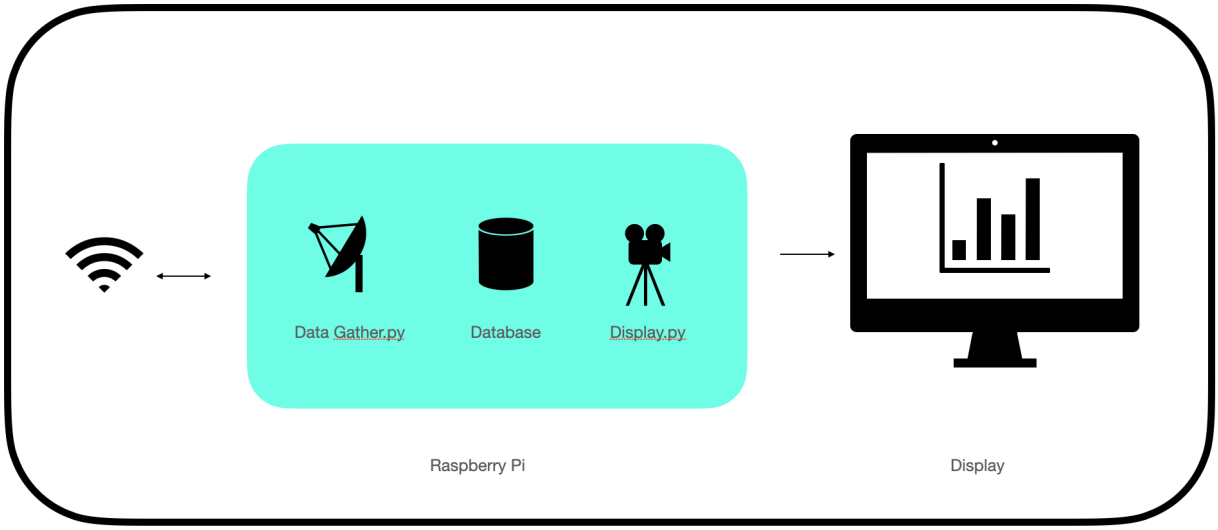


Figure 2 - Lower Level Flow

Data_Gather.py

Data_Gather.py program will pull data from the following website every 15 minutes:

https://ucce-slo.westernweathergroup.com/reports/view?reportType=Tabular&stations=SLO-11&groups=&interval=15&fields=&dateType=12&deltas=#

This report has all the data being reported by the weather station. The data should be pulled and inserted into a database on the raspberry pi.

Display.py

Display.py will pull data from the database and put it on the attached display. The goal is to make it configurable so that one can select what values can be shown. My guess the easiest would be to create a web page that displays everything. The entire screen would be the web page (without the menu or address bar - basically what is called Kiosk view). The webpage could either reload every 15 minutes (with new data) or javascript could be embedded to load the data directly from the database. The display itself is a touchscreen so it can be used to select options with ones finger.

Possible values being gathered:

```
Date and Time          :    Data and time of the reading
BatVolt:(V)            :    Voltage of weather station (not needed)
DewPt:(°F)             :    Dew point
Inversion:(°F)         :    Inversion Strength
LatestRain:(In)        :    Latest Rain Amount
RH:(%)                 :    Relative Humidity
SolarRad:(W/m2)        :    Solar Radiation
Temp:(°F)              :    Temperature
Temp30ft:(°F)          :    Temperature at 30 ft
Temp5ft:(°F)           :    Temperature at 5 ft
WetBulb:(°F)           :    Wet Bulb Temperature
WindGust:(mph)         :    Wind Gust
WindSpd:(mph)          :    Average Wind Speet
DailyETo:(in)          :    Daily Reference Evapotranspiration
DailyRain:(In)         :    Daily Rainfall
MonthPrecip:(In)       :    Monthly Rainfall
SeasonPrecip:(In)      :    Season Rainfall
DailyMaxTemp:(°F)      :    Daily Max Temp
TimeofMaxTemp          :    Time of Max Temp
DailyMinTemp:(°F)      :    Daily Min Temp
TimeofMinTemp          :    Time of Min Temp
DailyMaxWind:(mph)     :    Daily Max Wind Speed
TimeofMaxWind          :    Time of Max Wind Speed
YestETo:(In)           :    Yesterday's Reference Evapotranspiration
YestPrecip:(In)        :    Yesterday's Precipitation
YestMaxT:(°F)          :    Yesterday's Max Temp
YestMinT:(°F)          :    Yesterday's Min Temp
YestMaxGst:(mph)       :    Yesterday's Max Wind Gust
```

Figure 3 below has a mock up of display. The goal would be to show the most commonly wanted items but also provide selectors (three dots in squares below) to allow selection of other items of even graphs of historical values (all stored in the database).

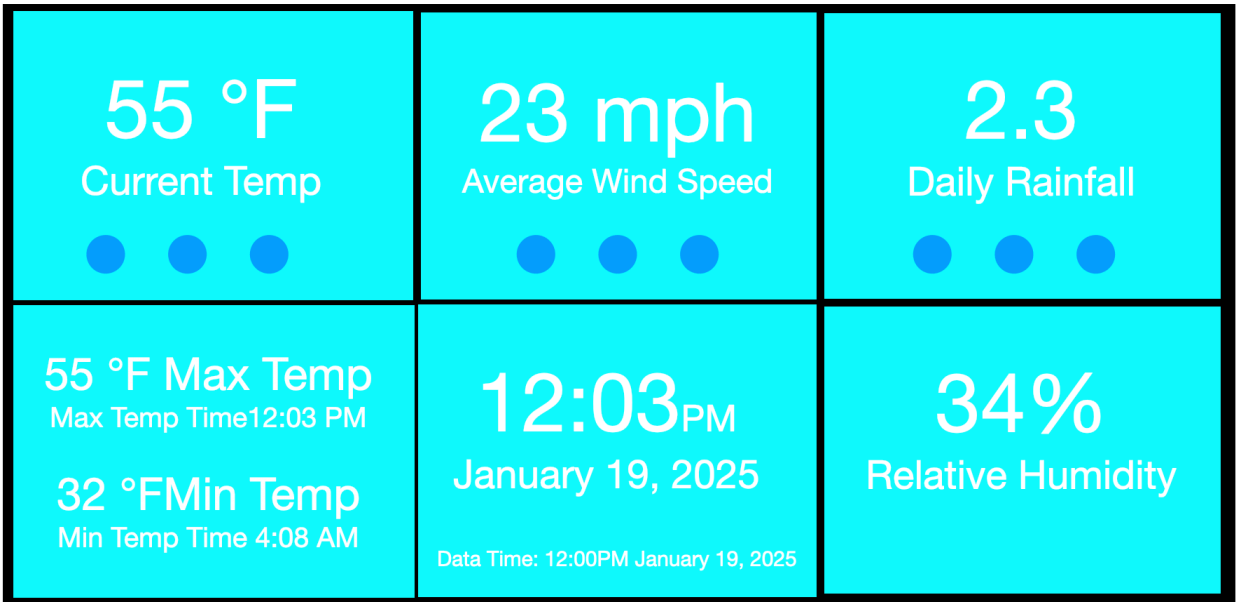


Figure 3 - Mock - up Display

High Level Activities

Below is a list of activities that would be needed to complete this project.

Raspberry Pi

Install Raspberry Pi
Download necessary libraries
Install Database
Attach Display
Figure out how to project onto display (might act as a regular display)
** Add light detector to change display to night mode when low light

** Not really needed but could be done

Programming

Data Gather.py
Display.py
Various Tools (need something to clean out database, check that programs running etc)

Frame

Need to build / print a frame to hold the display and RPI