Project: Weather Forecaster

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OVERVIEW

In the project, Weather Forecaster, the main idea is to get inputs from many sensors and give the user a proper, understandable result of a prediction of rain or if not. This project can help give an accurate result in the moment it is called upon. Offering many ways to express if it would rain or not, our project can be called upon to give a quick result to the user, and data that the user might find useful.

Step-By-Step Understanding

Why Use Sensors? 3/4/2024 - 3/6/2024 Using BMP 280, DHT 11, Photo-Resistor

We use sensors to help Arduino sense the surrounding things in its environment.

BMP 280 Pressure Sensor

The BMP 280 is a sensor that can provide accurate measures of the barometric pressure in the air, hence around the user.
We can use the BMP 280 to help recognize the sudden drops/increases of pressure to check if rain is going to be present.

DHT 11 Temp, Humidity Sensor

The DHT11 is a sensor that can be used to determine the humidity and the temperature of an area.

Photo Resistor

We can connect one leg to the power to 5V and the other to an Analog input, it measures the light intensity too.

How to Solve

For this project, we can use the sensors told above to get an analog input which we can change into a more precise unit of measure such as converting the thermistor's Analog input into C or F. In this scenario, on the breadboard we had DHT11, BMP280, Photo resistor. Using the DHT11 Library(https://github.com/adafruit/DHT-sensor-library/tree/master) we can use the functions:

```
DHT.readTemperature();
```

This function returns a value directly in the measurement of Celsius (No extra calculations needed)

To read the Humidity with the same library, the function required is:
DHT.readHumidity();

The function above returns a value which is the humidity percentage which we can directly tell the Arduino.

Using the BMP 280:

```
bmp.readPressure() / 100.0; // This number is given in hPa
```

This Function can be used to tell the user the pressure at the current time.

Refresh rate:
10,000 or 96,000

Measuring the Light Intensity:
Using the Photoresistor we connect one end to Power and the other to another Analog Input, then based on many trials and conditions we find the Lowest and the Highest and find a third Point to finally determine the curve.

The highest value is 1023, representing the 5V.
Finally, after being able to obtain numbers for/from the different variables/inputs. We broadcast this information to be fully understandable by the user through the LCD.

The relationship between the Resistance and Light intensity is that they are Inversely Proportional

So as an example:
As the resistance increases, we can say that the light intensity is low.