**Weather Station Using Raspberry Pi**

**Abstract**

Weather station by using raspberry pi, in this project we have used some weather related sensor that measure weather atmosphere and write some code for displaying the weather situation on screen. We can access our data and show our data from anywhere of the world because of using IOT.

**Introduction**

Weather is the state of the atmosphere describing for example the degree to which it’s hot or cold ,wet or dry, clear or cloudy.in this research using raspberry pi and some sensor which is related to measure weather atmosphere we make weather station. Rain sensor,DHT22 sensor,MQ135 are some sensor that have been used in this project. That works right way and we measure the atmosphere. The DHT22 sensor is great way to get temp and humidity reading in our project. Air sensor is one switching device which is use to detect the rainfall.MQ135 sensor are used in air quality control equipment’s and are suitable for the detecting and measuring of poison gas.

**Working principle**

For measuring humidity and temperature required connection are:

1. DHT22 sensor VCC to raspberry pi 5v
2. DHT22 GND to raspberry pi GND
3. 10k ohm resistor between DHT22 pin1 and pin2

DHT22 sensor consists of two components for measuring; Humidity sensing component and the NTC temperature sensor (or a thermistor). There is an IC on the back side which makes the readings to be able to read by the Raspberry pi. While measuring the humidity, the humidity sensor comes into play. The humidity sensor consists of two electrodes with moisture holding substrate between them. So when the humidity changes, the conductivity of substrate changes or you can say that the resistance between the electrodes changes. This change in resistance is then given to IC which makes it to read by the Raspberry pi.

to detect rainfall the required connection are:

* YL38 sensor VCC to raspberry pi 3.3v
* YL38 sensor GND to raspberry pi GND
* YL38 sensor DO to raspberry pi 12(GPIO18)

when no rain drop are on the sensor the sensor controller DO pin is high (3.3 in our case).when rain drops are detect this changes to low(0v).By connecting DO to a GPIO port on the pi (GPIO18) we can read the status rain is detect.

Finding the air quality the require connections are:

* MQ-135 sensor VCC to raspberry pi 5v
* MQ-135 sensor GND to raspberry pi GND
* MQ-135 sensor to raspberry pi 38(GPIO 20)
* 10k ohm resistor

The air quality sensor has a small potentiometer that permits the adjustment of the load resistance of the sensor circuit. The 5V power supply is used for air quality sensor. The air quality sensor is a signal output indicator instruction. It has two outputs: analog output and TTL output. The TTL output is low signal light which can be accessed through the IO ports on the Microcontroller. The analog output is an concentration, i.e. increasing voltage is directly proportional to increasing concentration. This sensor has a long life and reliable stability as well.

**Result**

In our project all sensor worked properly and we got our desire output . As we are running codes we got temperature and humidity, when sensor detect rain we got the output as is raining and when sensor detecting gas we got output as gas detect. For using IOT we are using firebase server. Our project is better than other due to the use of firebase server as we are getting real time live date .

**conclusion**

In the ending we can say that our project can be consider as a ideal project to find out the temperature and humidity, detecting gas and rain.