Assignment-5

Data Aquisition using Raspberry Pi Report

For the project we have used DHT11 sensor(digital sensor) used for capturing temperature and humidity. It uses a thermistor (for temp) and humidity sensor (for humidity) to measure the surrounding air and then it sends out a digital signal on to the data pin.

For the Raspberry Pi, it has about 40 pin GPIO header and this header provides 2 of 5V, 2 of 3.3V, 8 ground pins and a lot of GPIO pins. At the 40 pins GPIO header we can connect an extension cable and a breadboard where we can put our final sensor.

Then we connected this DHT11 sensor with our Raspberry Pi for capturing the temperature and humidity of our room (use case). The sensor basically has 3 pins. VCC pin is for power supply which ranges from 3.5V to 5.5V, Data pin outputs both temperature and humidity through serial data and the last one is connected to ground of the circuit.

Operating Voltage: 3.5V to 5.5V

Temperature: 0 to 50 Celsius

Humidity: 20 to 80%

Output: Digital signal

In the code we used the adafruit library and the time library. Installing the required libraries is the first step for data aquisition. Install adafruit module using the command **sudo pip3 install Adafruit_DHT.**

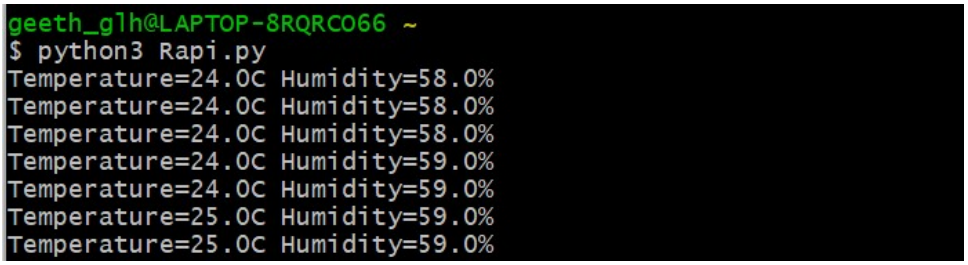
```
geeth_glh@LAPTOP-8RQRCO66 ~
$ pip3 install Adafruit_DHT
Defaulting to user installation because normal site-packages is not writeable
Collecting Adafruit_DHT
  Using cached Adafruit_DHT-1.4.0.tar.gz (15 kB)
  Preparing metadata (setup.py) ... done
Using legacy 'setup.py install' for Adafruit-DHT, since package 'wheel' is not i
nstalled.
Installing collected packages: Adafruit-DHT
```

We should connect the sensor's ground pin to the ground of the raspi, , connect the positive terminal of the sensor to the 5v of the raspi and connect the sensor's signal pin GPIO pin 4. After all this is done we'll see a red LED on the DHT11 sensor. Now we are ready to record the data.

We then establish the sensor and pins in the code. Then we capture the humidity and temperature into variables with same name as temperature and humidity. And then we must print these recoreded values on to our screen. We used an if and else loop for this. As the DHT11 can only be checked for once in a time of one second, so we used sleep function to pause around 3 seconds between the checks.

Then we ran our code using the function **python3 Rapi.py** in the terminal.

Our code successfully ran and we captured the humidity and temperature of the room in the span of every 3 seconds in the terminal window. The following are the results obtained:



The results have been verified with the online temperature and humidity calculator. The results are same as the online ones.

In our assignment we used Raspberry Pi for measuring the temperature and humidity of the place but there are many more uses of it. Some of them include agriculture usage, data logging, home automation(monitoring the environmental conditions in our home and we can use it as our personal weather station for our daily uses.

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