

Ex.No:12 Write a program on Raspberry Pi to retrieve temperature and humidity data from cloud.

Program: *dhtsample.py*

```
import Adafruit_DHT

while True:

    humidity, temperature = Adafruit_DHT.read_retry(11, 27) # GPIO27 (BCM notation)

    print ("Humidity = { } %; Temperature = { } C".format(humidity, temperature))
```

Program: *dhtdata.py*

```
import httpplib, urllib

import time

import Adafruit_DHT

sleep = 30 # how many seconds to sleep between posts to the channel

key = '*****' # Write API key

humidity, temperature = Adafruit_DHT.read_retry(11, 27) # GPIO27 (BCM notation)

#Report Raspberry Pi internal temperature to Thingspeak Channel

def thermometer():

    while True:

        headers = {"Content-type": "application/x-www-form-urlencoded", "Accept":
                    "text/plain"}

        conn = httpplib.HTTPConnection("api.thingspeak.com:80")

        try:

            params = urllib.urlencode({'field1': temperature, 'key':key }) # channel name is field1
                                or field 2

            conn.request("POST", "/update", params, headers)

            response = conn.getresponse()

            print humidity

            print temperature
```

```

        #print response.status, response.reason

        data = response.read()

        conn.close()

    except:

        print "connection failed"

    break

#sleep for desired amount of time

if __name__ == "__main__":

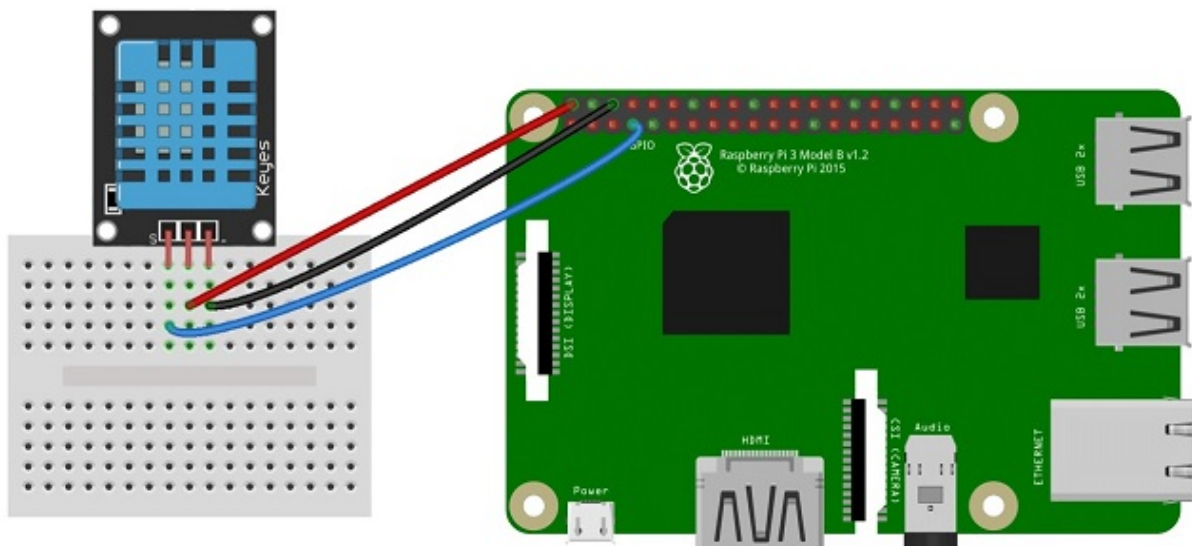
    while True:

        thermometer()

        time.sleep(sleep)

```

Circuit Diagram:



Set up the DHT11 humidity sensor on the Raspberry Pi.

GPIO pin is 27.

Installation Procedure

Download the Adafruit DHT11 library. In the terminal, type the following command.

```
git clone https://github.com/adafruit/Adafruit_Python_DHT.git
```

Navigate to Adafruit_Python_DHT directory (folder).

```
cd Adafruit_Python_DHT
```

Run the following commands in the terminal.

```
sudo apt-get install build-essential python-dev # python2
```

```
sudo apt-get install build-essential python3-dev # python3
```

To install the library, in the terminal, type the following.

```
sudo python setup.py install # python2
```

```
sudo python3 setup.py install # python3
```

Navigate to the example folder.

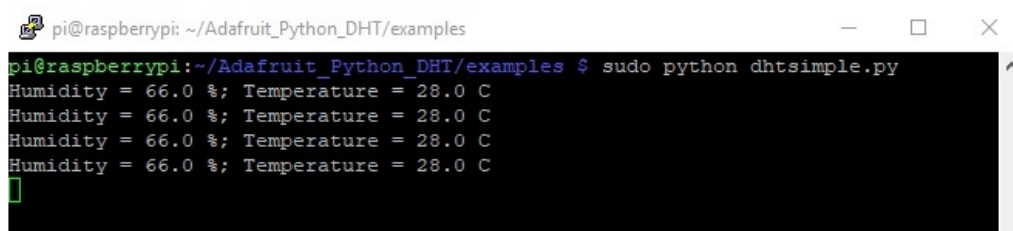
```
cd examples
```

```
sudo nano dhtsample.py
```

Run the program.

```
sudo python dhtsimple.py
```

Output

A terminal window on a Raspberry Pi showing the execution of the dhtsimple.py script. The window title is 'pi@raspberrypi: ~/Adafruit_Python_DHT/examples'. The command 'sudo python dhtsimple.py' has been executed, resulting in four lines of output: 'Humidity = 66.0 %; Temperature = 28.0 C'.

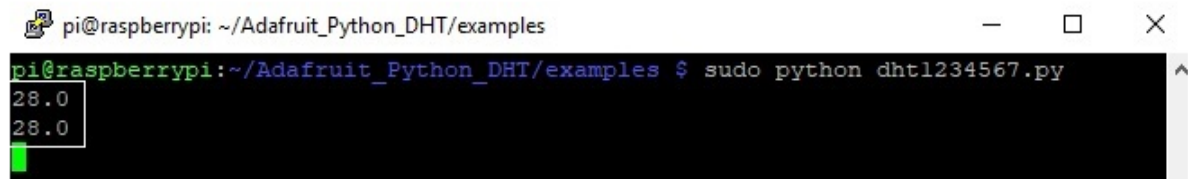
```
pi@raspberrypi: ~/Adafruit_Python_DHT/examples
pi@raspberrypi:~/Adafruit_Python_DHT/examples $ sudo python dhtsimple.py
Humidity = 66.0 %; Temperature = 28.0 C
Humidity = 66.0 %; Temperature = 28.0 C
Humidity = 66.0 %; Temperature = 28.0 C
Humidity = 66.0 %; Temperature = 28.0 C
```

Thingspeak:

ThingSpeak allows you to aggregate, visualize, and analyze live data streams in the cloud. It provides instant visualizations of data posted by your devices or equipment. It accelerates the development of proof-of-concept IoT systems, especially those that require analytics. Build IoT systems without setting up servers or developing web software.

- Open Thingspeak (<https://thingspeak.com>).
- Create a new channel and select fields 1 and 2.

- Select new channel and API Keys.
- Get the Write API Key or generate the new Write API Key.
- Open the new Python file and name it as dhtdata.py
sudo nano dhtdata.py
- Run the program.
sudo python dhtdata.py



```
pi@raspberrypi: ~/Adafruit_Python_DHT/examples
pi@raspberrypi:~/Adafruit_Python_DHT/examples $ sudo python dht1234567.py
28.0
28.0
```

The image shows a terminal window on a Raspberry Pi. The window title is "pi@raspberrypi: ~/Adafruit_Python_DHT/examples". The prompt is "pi@raspberrypi:~/Adafruit_Python_DHT/examples \$". The command "sudo python dht1234567.py" has been executed, resulting in two lines of output: "28.0" and "28.0". A green cursor is visible at the end of the second line of output.