

Raspberry Pi 3 Tutorial 12 – GPIO DHT11 Digital Temperature + Humidity Sensor

 invent.module143.com/daskal_tutorial/raspberry-pi-3-gpio-dht11-digital-temperature-humidity-sensor/

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Difficulty level: Beginner

Approx reading time:

Components Required:

1. Raspberry Pi 3 model B
2. MicroSD card 8 or 16 GB (Class 4 and above) with Raspbian
3. Windows PC / Linux PC (Tested on Windows 10, Ubuntu 14.04 LTS)
4. Ethernet cable (Category 5 – also called Cat 5)
5. Micro USB cable
6. Breadboard
7. DHT11 Sensor
8. Jumper Wires (Male to Female, Male to Male)

Way to go ->

1. Login to your Pi using PuTTY or your Ubuntu terminal.
2. Login to your Pi GUI using VNC server (Linux / Windows).
3. In **Python 3 (IDLE)**, create a new file.
4. The name could be: **DHT11Read.py**.
5. In the file **DHT11Read.py**, write the following code with comments (line starting with “#”) for clear understanding and save (press **Ctrl + S** on your PC keyboard) the file.

```
import Adafruit_DHT
```

```
while True:
```

```
    humidity, temperature = Adafruit_DHT.read_retry(11, 27) # GPIO27 (BCM notation)
    print ("Humidity = {} %; Temperature = {} C".format(humidity, temperature))
```

Before running the python script do the following:

6. In the terminal type:

```
sudo apt-get install git-core
```

7. Download the Adafruit DHT11 library. In the terminal type:

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

8. Navigate to to Adafruit_Python_DHT directory (folder), in the terminal type:

```
cd Adafruit_Python_DHT
```

9. Run the following commands in the terminal.

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

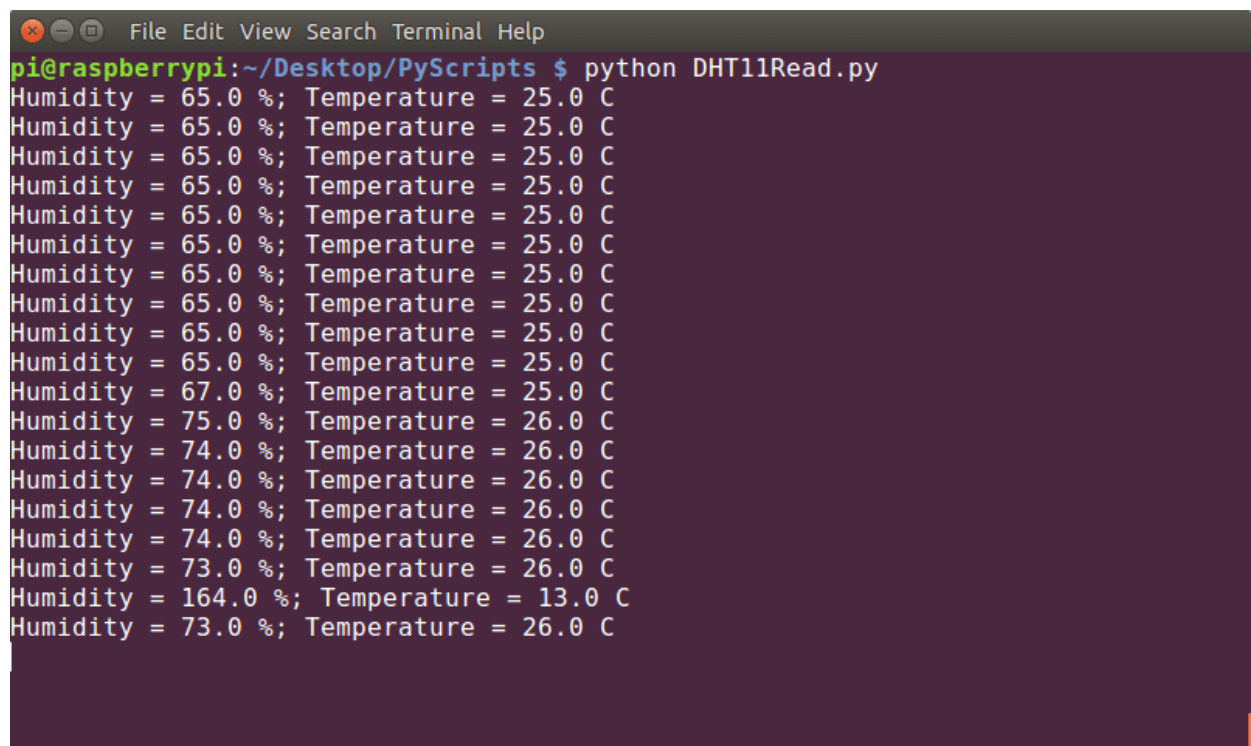
```
sudo apt-get install build-essential python3-dev # python3
```

10. To install the library, in the terminal type:

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

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

11. Finally, run the script by clicking on **Run -> Run Module** in the menu bar or by pressing **F5** on your PC keyboard.



```
pi@raspberrypi:~/Desktop/PyScripts $ python DHT11Read.py
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 65.0 %; Temperature = 25.0 C
Humidity = 67.0 %; Temperature = 25.0 C
Humidity = 75.0 %; Temperature = 26.0 C
Humidity = 74.0 %; Temperature = 26.0 C
Humidity = 74.0 %; Temperature = 26.0 C
Humidity = 74.0 %; Temperature = 26.0 C
Humidity = 73.0 %; Temperature = 26.0 C
Humidity = 164.0 %; Temperature = 13.0 C
Humidity = 73.0 %; Temperature = 26.0 C
```

Hardware Connections ->

1. Raspberry Pi 3 GPIO Header.

Raspberry Pi 3 GPIO Header

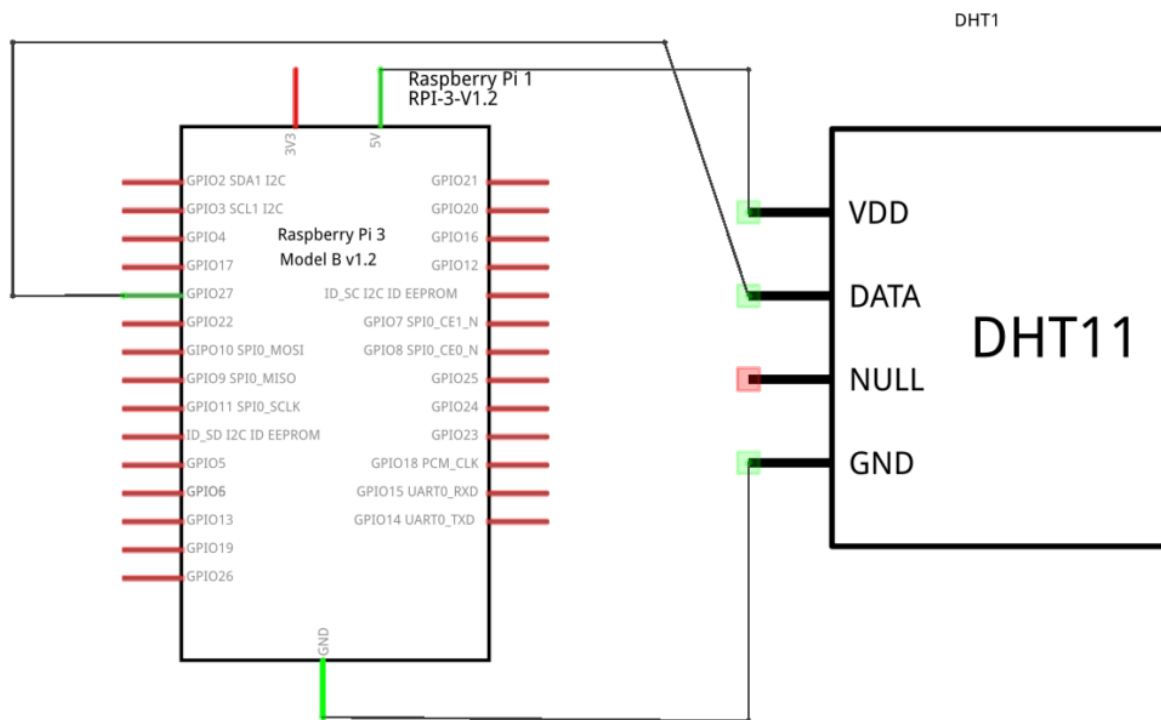
Pin#	NAME		NAME	Pin#
01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I ² C)		DC Power 5v	04
05	GPIO03 (SCL1 , I ² C)		Ground	06
07	GPIO04 (GPIO_GCLK)		(TXD0) GPIO14	08
09	Ground		(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I ² C ID EEPROM)		(I ² C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40

Rev. 2
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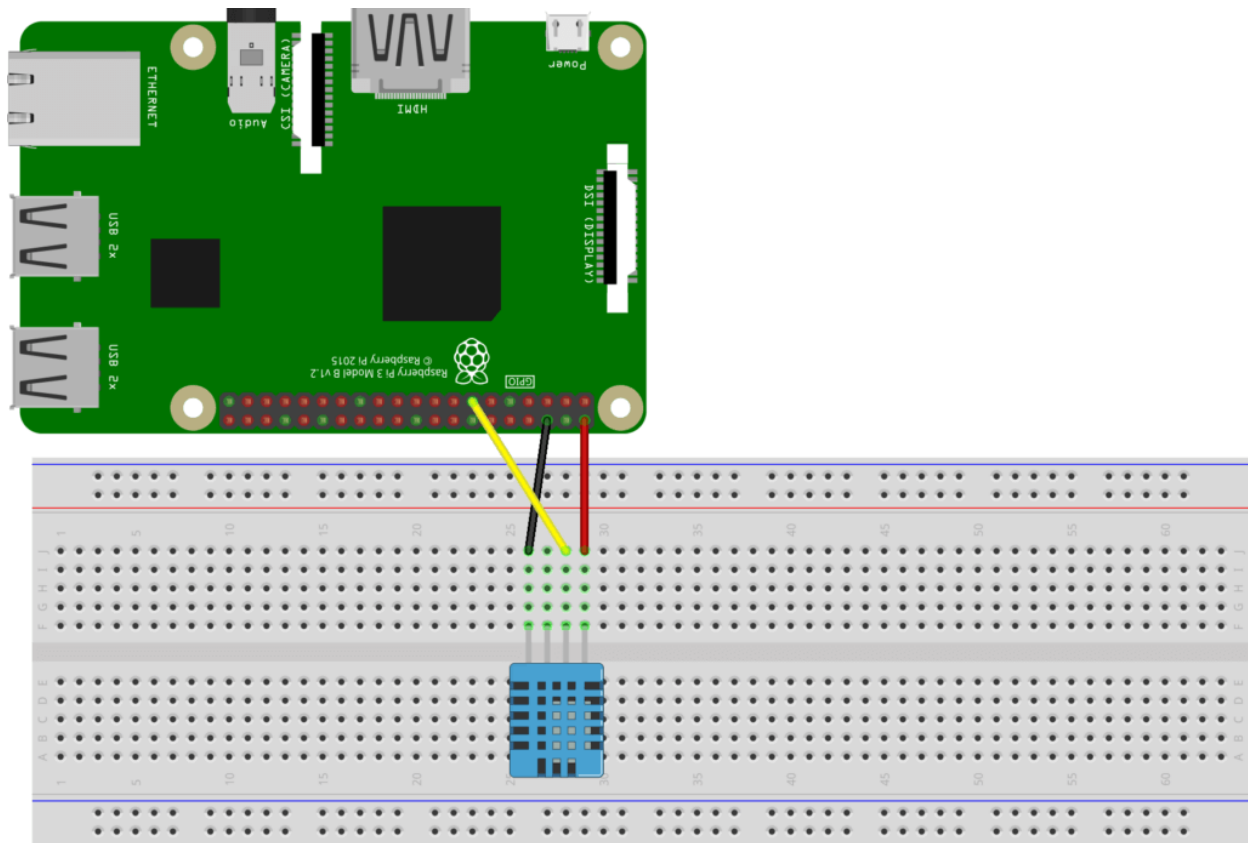
www.element14.com/RaspberryPi

2. DHT11 to Pi connections.

DHT11	Pi
Vcc	5v
Output	GPIO27 (Pin 13)
GND	Ground



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