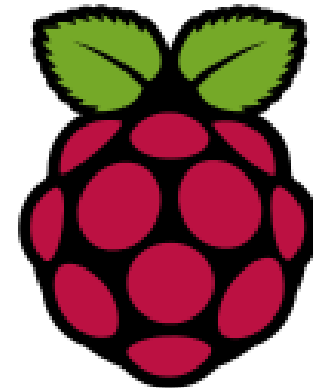


# Connecting DHT11 using RPi

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# Piezo Buzzer

- Piezo buzzer is an electronic device commonly used to produce sound. Light weight, simple construction and low price make it usable in various applications like car/truck reversing indicator, computers, call bells etc.
- Piezo buzzer is based on the inverse principle of piezo electricity discovered in 1880 by Jacques and Pierre Curie.



# Piezo Buzzer

```
1 import RPi.GPIO as GPIO
2 import time
3 GPIO.setmode(GPIO.BCM)
4 GPIO.setwarnings(False)
5 GPIO.setup(18, GPIO.OUT)
6 #Connect buzzer to GPIO18
7 while True:
8     print("BUZZER on")
9     GPIO.output(18, GPIO.HIGH)
10    time.sleep(1)
11    print("BUZZER off")
12    GPIO.output(18, GPIO.LOW)
13    time.sleep(1)
```

# Temperature Sensor – DHT11

- The DHT11 temperature and humidity sensor is a nice little module that provides digital temperature and humidity readings. It's really easy to set up, and only requires one wire for the data signal.
- These sensors are frequently used in remote weather stations, soil monitors, and home environment control systems. The programming is simple too, and many libraries and example code in both Python and C already exist.

# Temperature Sensor – DHT11

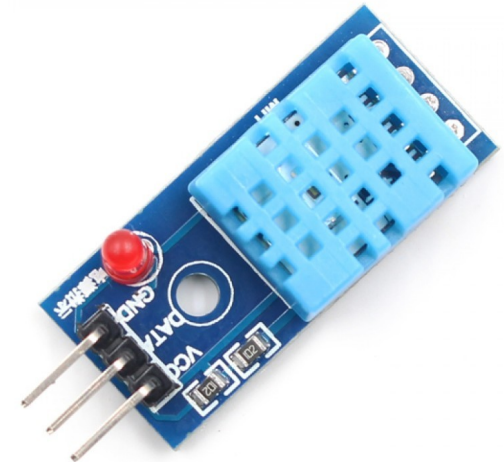
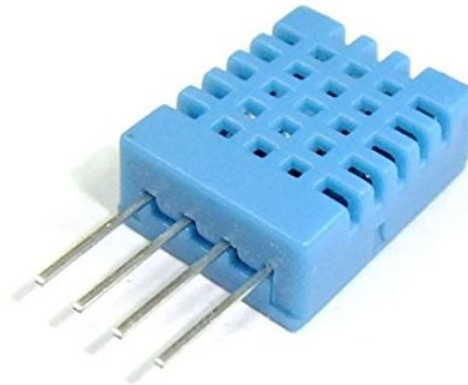
- The DHT11 contains a surface mounted NTC thermistor and a resistive humidity sensor. An IC on the back of the module converts the resistance measurements from the thermistor and humidity sensor into digital outputs of degrees Celsius and Relative Humidity.

# Fact sheet – DHT11

- Ultra low cost
- 3 to 5V power and I/O
- 2.5mA max current use during conversion (while requesting data)
- Good for 20–80% humidity readings with 5% accuracy
- Good for 0–50°C temperature readings  $\pm 2^\circ\text{C}$  accuracy
- No more than 1 Hz sampling rate (once every second)
- Body size 15.5mm x 12mm x 5.5mm
- 4 pins with 0.1" spacing

# Temperature Sensor – DHT11

- There are two variants of the DHT11 you're likely to come across. One is a four pin stand alone module, and the other is a three pin, PCB mounted module. The pinout is different for each one, so connect the DHT11 according to which one you have:

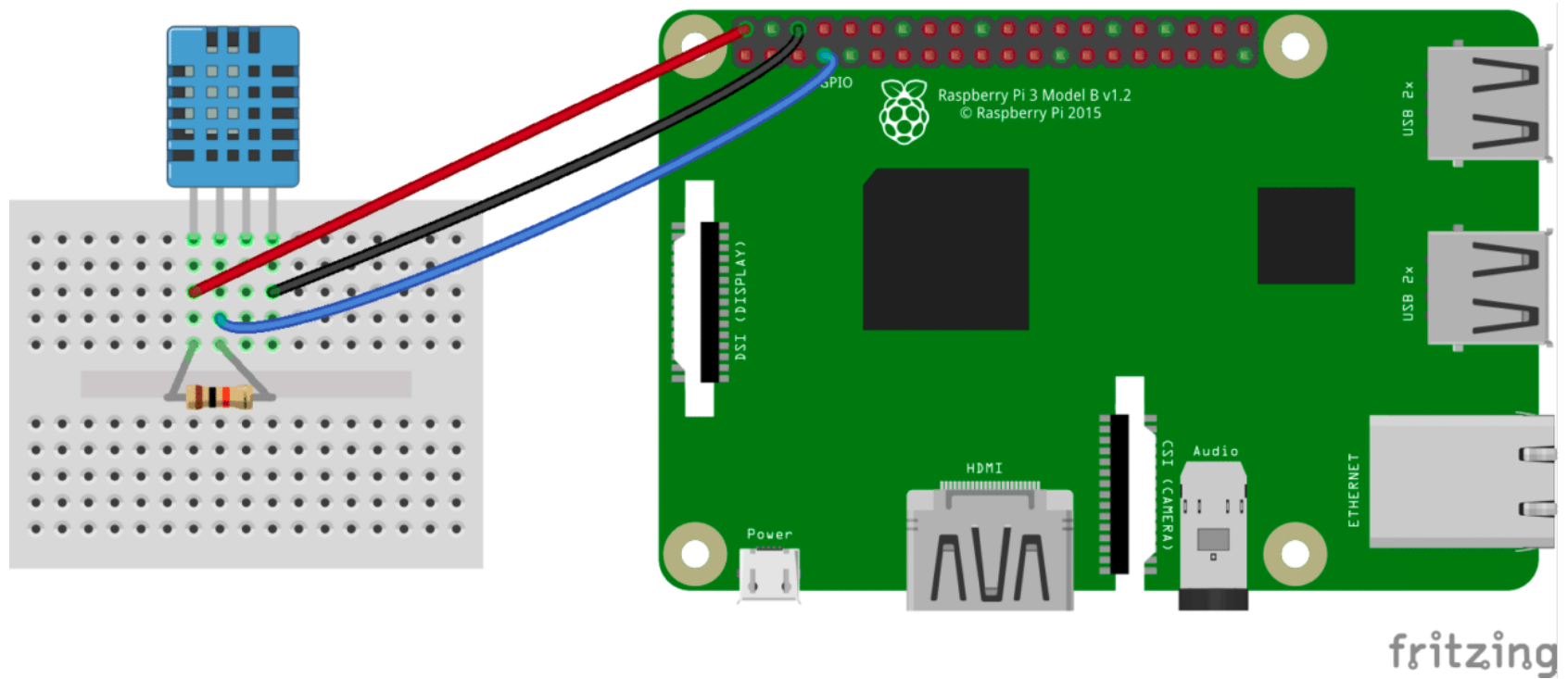


# Circuit Diagram – DHT11

- VCC of DHT11 -> 5v Pin of Raspberry Pi 3
- GND of DHT11 -> GND Pin of Raspberry Pi 3
- Signal pin of DHT11 -> GPIO 4 Pin of Raspberry Pi3



# Temperature Sensor – DHT11



# Programming the DHT11 in Python

- We will be using the Adafruit DHT11 Python library. We can download the library using Git, so if you don't have Git installed on your Pi already, enter this at the command prompt:  
**sudo apt-get install git-core**
- Note: If you get an error installing Git, run `sudo apt-get update` and try it again.

# Install the Adafruit DHT11 library

1. Enter this at the command prompt to download the library:

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

2. Change directories with:

```
cd Adafruit_Python_DHT
```

3. Enter this:

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

4. Install the library with:

```
sudo python setup.py install
```

# Program:

```
import Adafruit_DHT

while True:
    hum, temp = Adafruit_DHT.read_retry(11, 4)
    print "Temperature:", temp
    print "Humidity: ", hum
```

# Assignment

- Create a circuit using Raspberry Pi, DHT11 and Buzzer. When the temperature goes beyond 35 degrees, the buzzer will start ringing.

# Thank you

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## Web Resources

<http://mitu.co.in>

<http://tusharkute.com>

## Blogs

<http://digitallocha.blogspot.in>

<http://kyamputar.blogspot.in>

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