

# IEEE IoT with ML Internship Project

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**Topic:** Home automation using BLYNK APP and Raspberry Pi.

**Aim:** To simulate automation of home applications like fan and light using temperature and Ldr sensors using raspberry pi and blynk app. Also update the data in thingspeak cloud and get mobile notification using IFTTT.

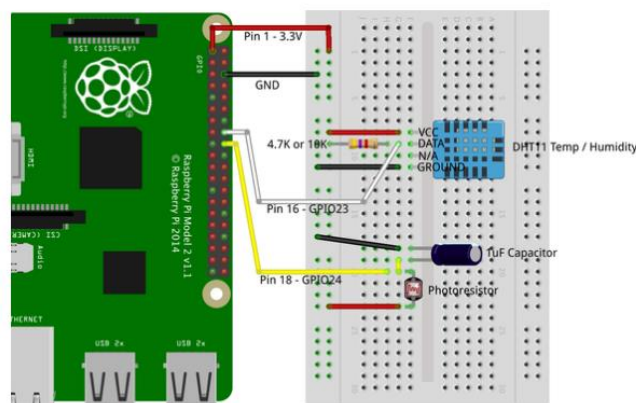
## **Hardware Components required:**

- Raspberry PI 3B+
- DHT11(Temperature and humidity sensor)
- LDR sensor
- Active buzzer
- DC motor
- Motor driver(I298)
- Led
- Jumper wires (M to M, M to F)
- Breadboard
- 12 V Battery

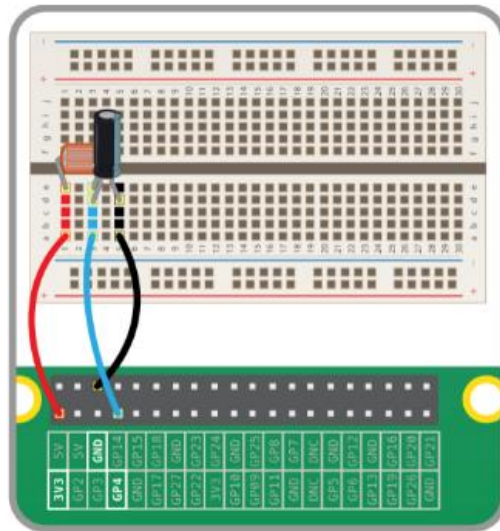
## **Software required:**

- Python IDLE
- Blynk App
- Thingspeak cloud
- IFTTT app

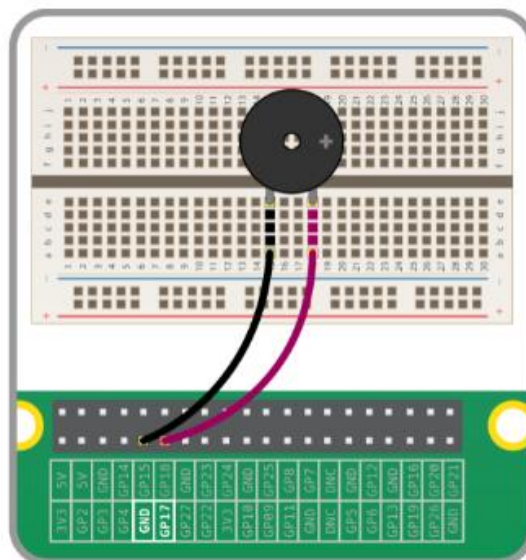
## **Circuit diagram:**



**Fig 1:** Circuit for DHT11 sensor

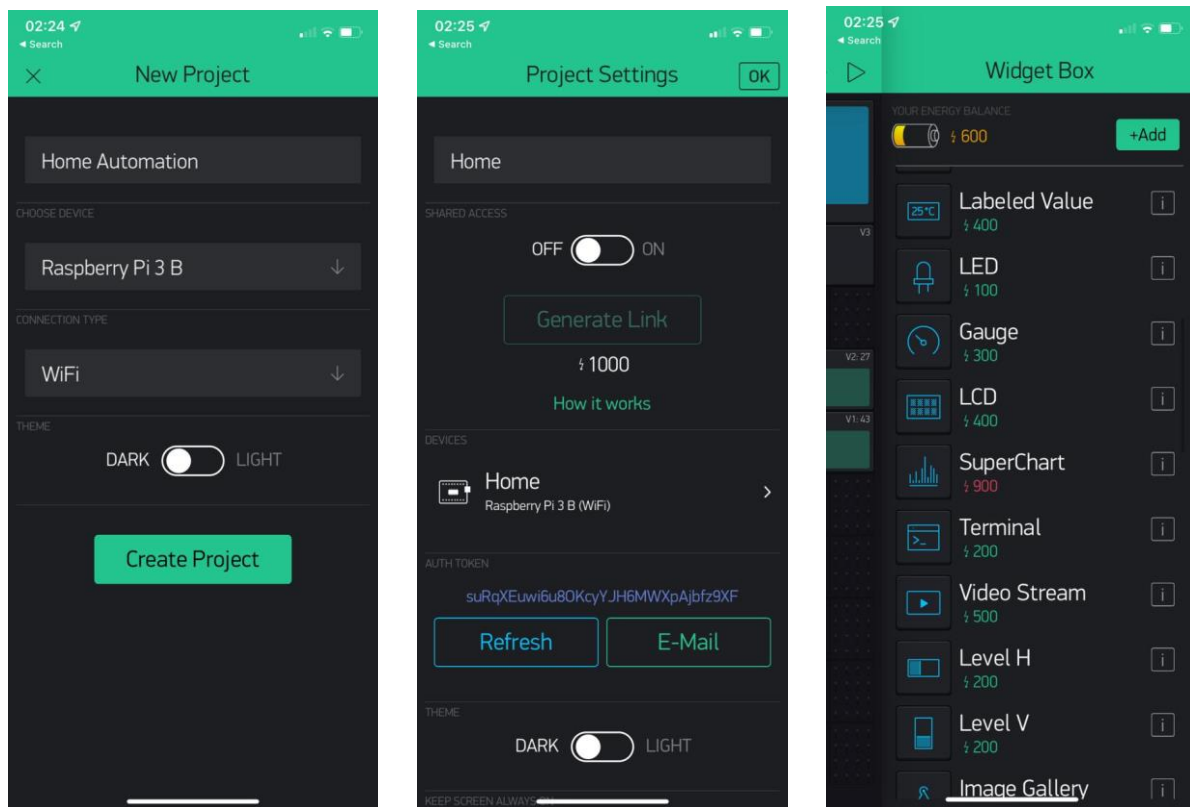


**Fig 2:** Circuit for LDR sensor



**Fig 3:** Circuit for Buzzer

### Blynk App setup:



First create a new project with the given specifications. Next you will receive an auth token which will be used to link up with your python code. Then you need to create your own layout with given parameters.

### Code:

```
import BlynkLib
import RPi.GPIO as GPIO
import time
import Adafruit_DHT
from time import sleep
try:
    import urllib.request as urllib2
except ImportError:
    import urllib2
```

```
baseURL1 = 'http://api.thingspeak.com/update?api_key=Y8C2YRBY4RMT2JJ1&field1='
baseURL2 = 'http://api.thingspeak.com/update?api_key=Y8C2YRBY4RMT2JJ1&field2='
baseURL3 = 'http://api.thingspeak.com/update?api_key=Y8C2YRBY4RMT2JJ1&field3='
```

```
sensor=Adafruit_DHT.DHT11
gpio=17
GPIO.setmode(GPIO.BCM)
GPIO.setwarnings(False)
GPIO.setup(21,GPIO.OUT)
```

```

blynk = BlynkLib.Blynk('suRqXEuwi6u8OKcyYJH6MWXpAjbFz9XF')
delayt = .1
value = 0
ldr = 7
buzzer=23
GPIO.setup(buzzer,GPIO.OUT)
GPIO.setup(11,GPIO.OUT)

def rc_time (ldr):
    count = 0

    #Output on the pin for ldr
    GPIO.setup(ldr, GPIO.OUT)
    GPIO.output(ldr, False)
    time.sleep(delayt)

    #Change the pin back to input
    GPIO.setup(ldr, GPIO.IN)

    #Count until the pin goes high
    while (GPIO.input(ldr) == 0):
        count += 1

    return count

@blynk.VIRTUAL_WRITE(0)
def my_write_handler(value):
    print('Current V0 value: {}'.format(value))
    if value==['1']:
        GPIO.output(21,True)
        print('on')
    else:
        GPIO.output(21,False)
        print('off')
@blynk.VIRTUAL_READ(2)
def my_read_handler():
    blynk.virtual_write(2,temperature)
    blynk.virtual_write(1,humidity)
    blynk.virtual_write(3,value)

GPIO.output(buzzer,GPIO.LOW)

while True:

    humidity, temperature = Adafruit_DHT.read_retry(sensor, gpio)
    print('LDR Value:')
    value = rc_time(ldr)

```

```

print(value)
if humidity is not None and temperature is not None:
    print('Temp={0:0.1f}*C Humidity={1:0.1f}%'.format(temperature, humidity))

if temperature>32 or humidity>50:
    GPIO.output(buzzer,GPIO.HIGH)
    print ("Beep")
    sleep(0.5) # Delay in seconds
    GPIO.output(buzzer,GPIO.LOW)
    #Switch on Fan
    #GPIO.output(11,GPIO.HIGH)
else:
    print('Failed to get reading. Try again!')

f1 = urllib2.urlopen(baseUrl1 +str(temperature))
f1.read()
f1.close()
f2 = urllib2.urlopen(baseUrl2 +str(humidity))
f2.read()
f2.close()
f3 = urllib2.urlopen(baseUrl3 +str(value))
f3.read()
f3.close()

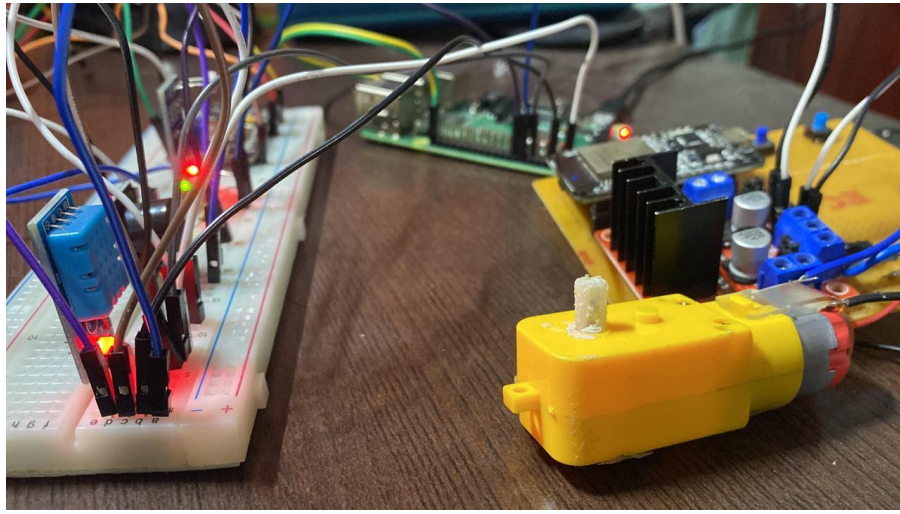
blynk.run()
try:

    while True:
        print("Ldr Value:")
        value = rc_time(ldr)
        print(value)
        if ( value <= 10000 ):
            print("Lights are ON")
            GPIO.output(21,GPIO.HIGH)
            time.sleep(2)
        if (value > 10000):
            print("Lights are OFF")
            GPIO.output(21,GPIO.LOW)
            time.sleep(2)
    except KeyboardInterrupt:
        pass
    finally:
        GPIO.cleanup()

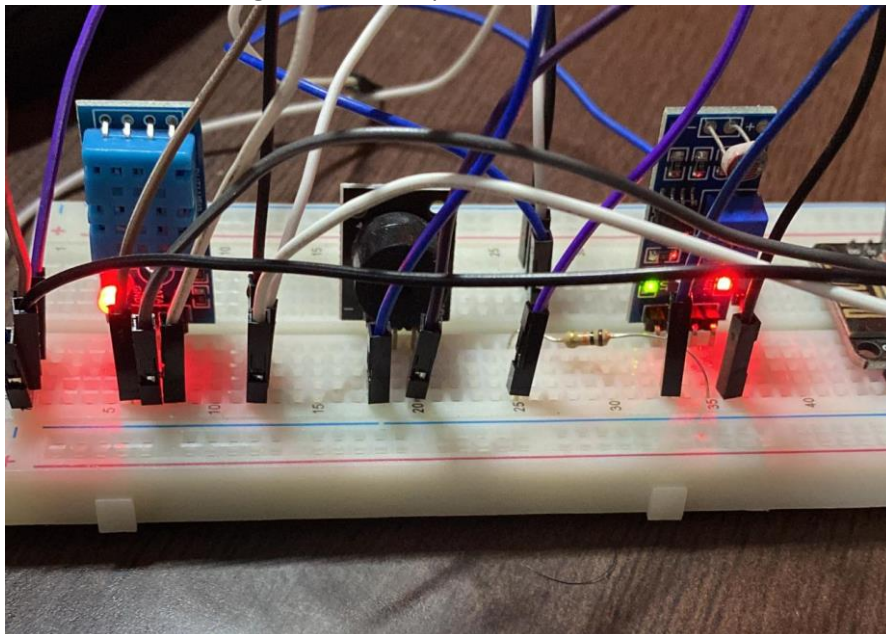
blynk.run()

```

### Hardware Implementation:

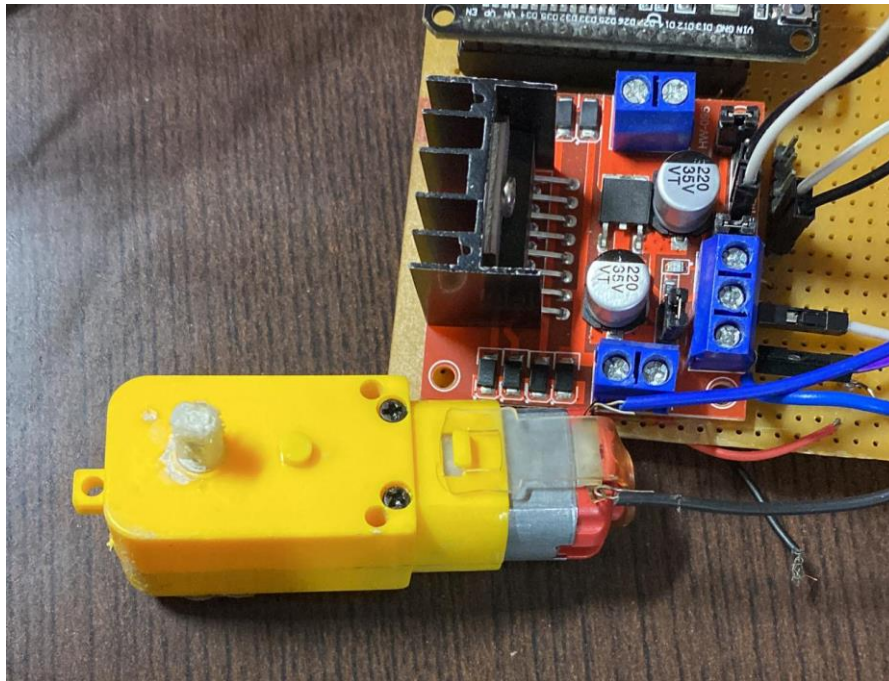


**Fig 4:** Entire components connected.

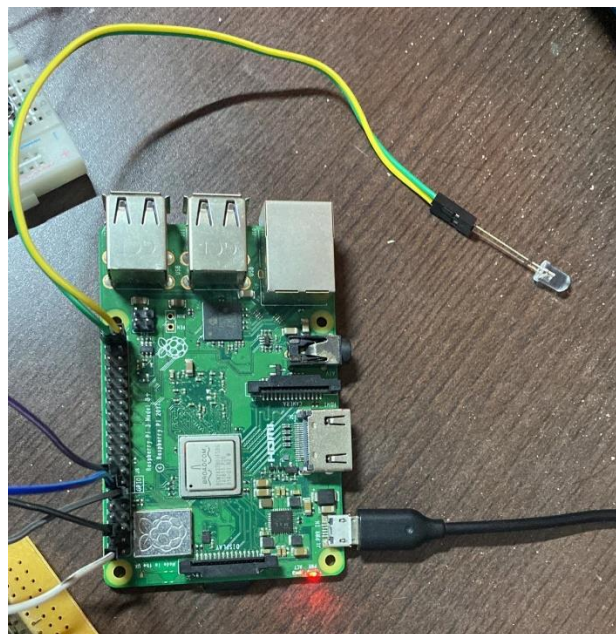


**Fig 5:** Breadboard connections of DHT11, Buzzer, Ldr sensor.





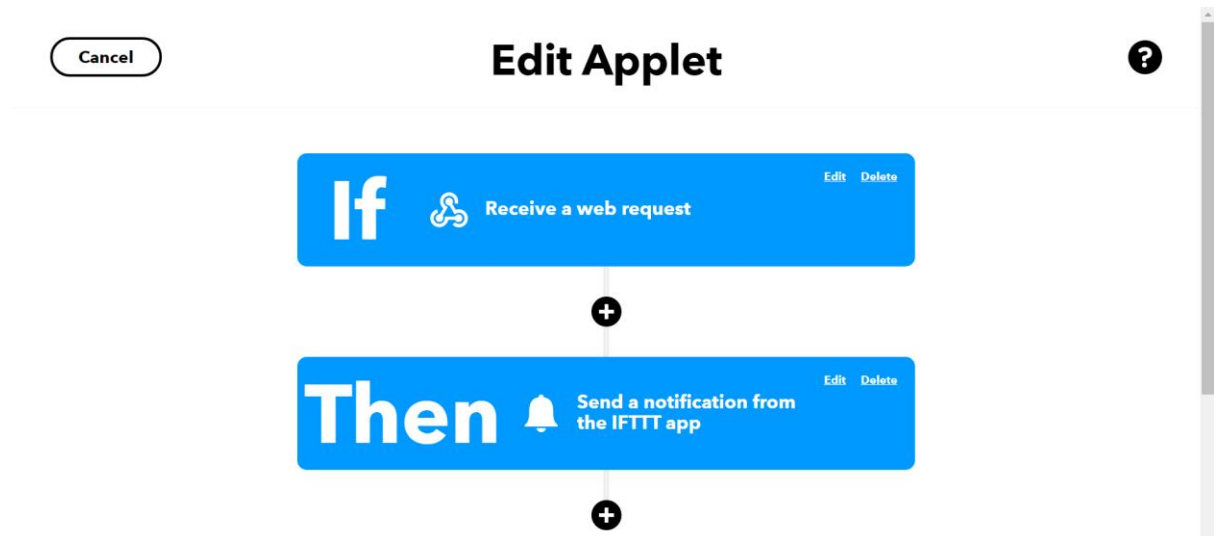
**Fig 6:** DC motor with Motor board in PCB



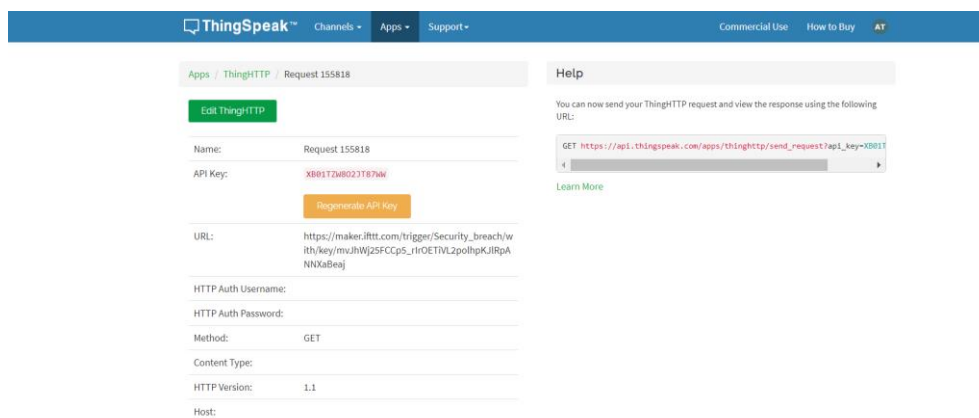
**Fig 7:** Raspberry pi with full connections with an LED

## Implementation IFTTT with Thingspeak:

- Create a Webhook Applet in IFTTT



- Create ThingHTTP in Thingspeak with IFTTT trigger url





- ThingSpeak™ChannelsAppsSupport

Commercial UseHow to BuyAT

Apps / React / TEMP REACT

Edit React

Name:	TEMP REACT
Condition Type:	Numeric
Test Frequency:	On data insertion
Last Ran:	2021-05-23 18:13
Channel:	IOT Home automation
Condition:	Field 1 (Temperataure) is greater than 32
ThingHTTP:	Request 155818
Run:	Each time the condition is met
Created:	2021-05-21 3:41 pm

Help

React works with [ThingHTTP](#) and [ThingTweet](#) to perform actions when channel data meets a certain condition. For example, you can have a mobile app report your latitude and longitude to a ThingSpeak channel. When your position is within a certain distance of your house, have ThingHTTP turn on your living room lights.  
[Learn More](#)

- Code output when run in IDLE:

[illegible]

- Thingspeak Cloud data logging:

## IOT Home automation

Channel ID: 1411335

Author: mwie0000020088956

Access: Private

Private View Public View Channel Settings Sharing API Keys Data Import / Export

Add Visualizations

Add Widgets

Export recent data

MATLAB Analysis

MATLAB Visualization

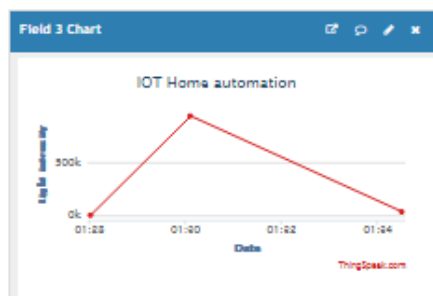
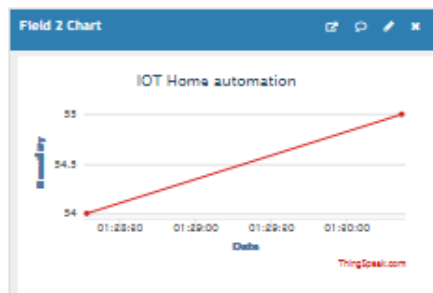
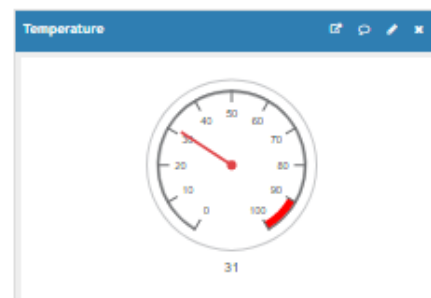
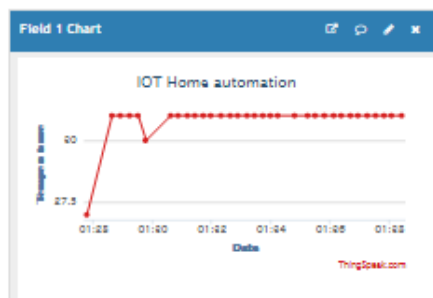
Channel 4 of 4 < >

### Channel Stats

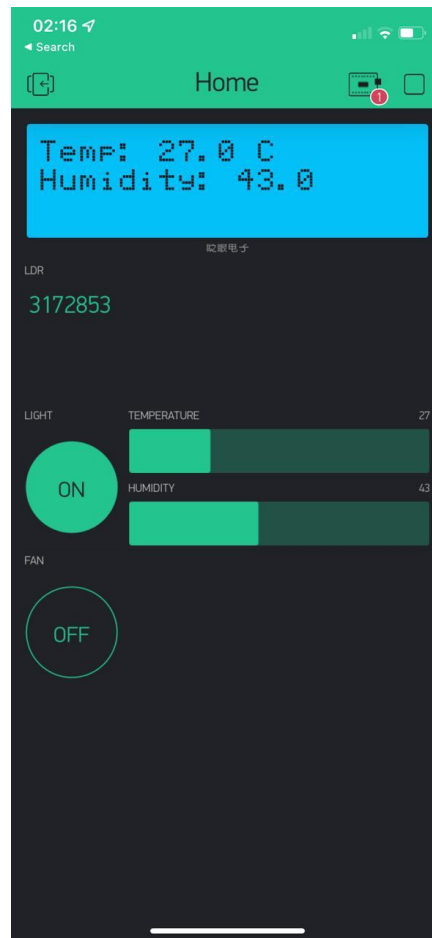
Created: ~~about an hour ago~~

Last entry: ~~42 minutes ago~~

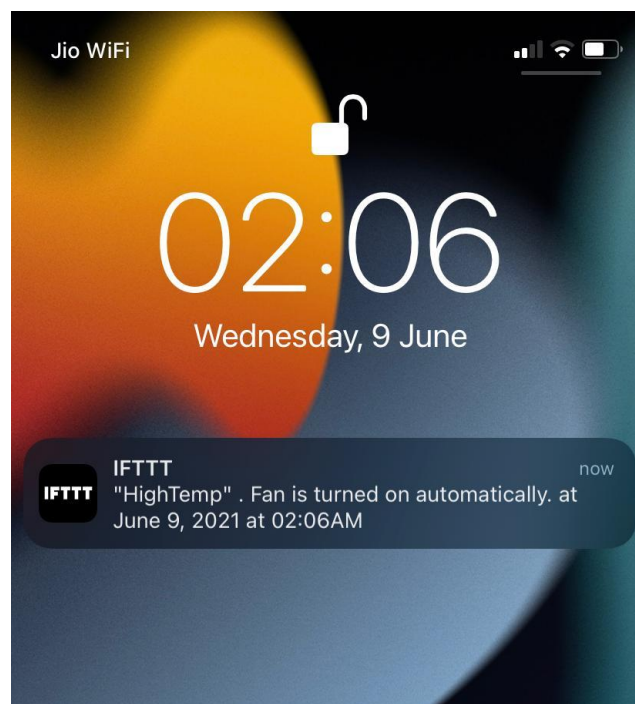
Entries: 38



- Blynk App results:



- IFTTT Notification in phone:



**Project Demo Video Link:**

<https://drive.google.com/file/d/1V22Teagx40WAB-cOchPKYDhSwvKunBv/view?usp=sharing>

**Inference:**

Hence, Home automation using Raspberry pi, Blynk app and Thingspeak was successfully created and verified.