

การสร้าง MQTT Server บน Raspberry Pi เพื่อใช้งาน Chatbot LINE ในฟาร์มอัจฉริยะ
Chatbot LINE from Raspberry Pi MQTT Server for Smart Farming

ชื่อ-สกุล : วราสิริ ลิ้มประเสริฐ B6214005

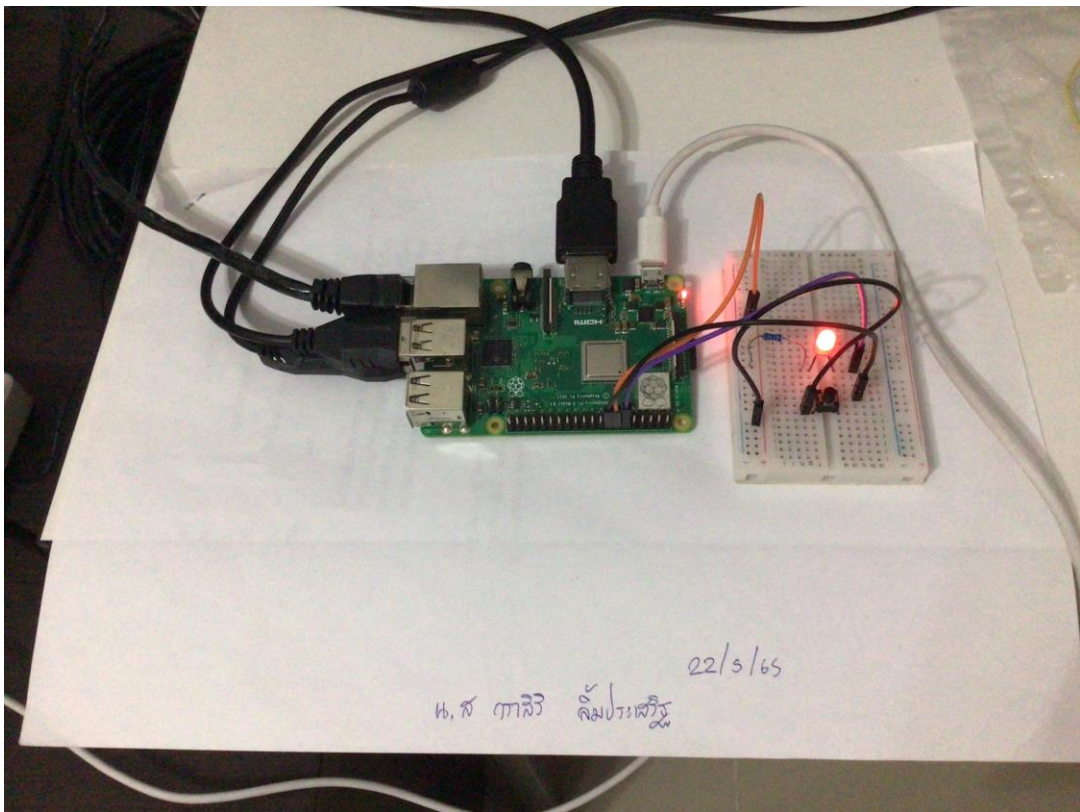
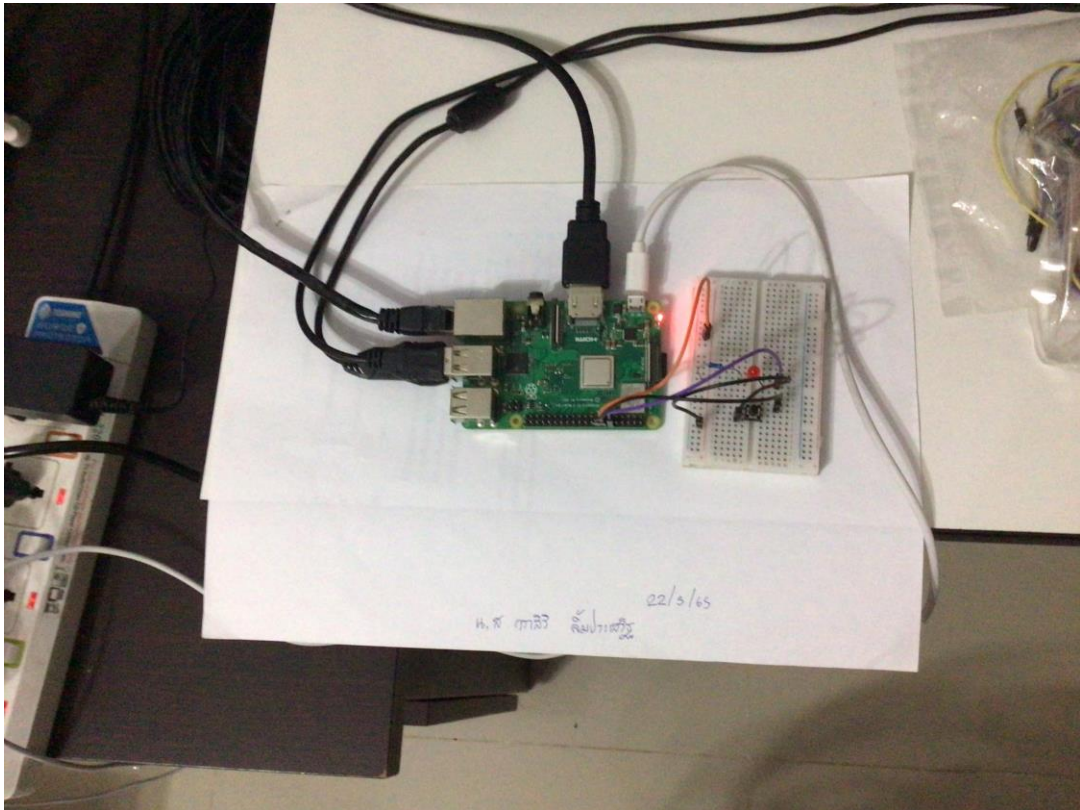
6/6 – คำถามท้ายบทเพื่อทดสอบความเข้าใจ

Quiz_101 – ทดสอบ RPi4 GPIO with Python

Python.1 - Python Switch control LED >> กดติด ปล่อยดับ

```
import RPi.GPIO as GPIO # Add GPIO library to a Python sketch
import time # Add time library to a Python sketch
LED_pin = 32 # Ref Board
SW_Pin = 36
GPIO.setmode(GPIO.BOARD) #Setup GPIO using GPIO.Pin
GPIO.setup(LED_pin, GPIO.OUT) #Setup pin to output
GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP) #Setup pin to input and Pull-Up
while True:
    if (GPIO.input(SW_Pin)==0): # Read Botton pin
        GPIO.output(LED_pin,GPIO.HIGH) # Set LED pin to HIGH
        print("Input = 0, HIGH")
    else: GPIO.output(LED_pin,GPIO.LOW) # Set LED pin to LOW
        print("Input = 1, LOW")
time.sleep(0.5)
```

```
itled> * x
1 import RPi.GPIO as GPIO # Add GPIO library to a Python sketch
2 import time # Add time library to a Python sketch
3 LED_pin = 32 # Ref Board
4 SW_Pin = 36
5 GPIO.setmode(GPIO.BOARD) #Setup GPIO using GPIO.Pin
6 GPIO.setup(LED_pin, GPIO.OUT) #Setup pin to output
7 GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP) #Setup pin to input and Pull-Up
8 while True:
9     if (GPIO.input(SW_Pin)==0): # Read Botton pin
10         GPIO.output(LED_pin,GPIO.HIGH) # Set LED pin to HIGH
11         print("Input = 0, HIGH")
12     else: GPIO.output(LED_pin,GPIO.LOW) # Set LED pin to LOW
13         print("Input = 1, LOW")
14     time.sleep(0.5)
15
```



Python.2 - Python Switch control LED >> กดติด กดดับ

```

import RPi.GPIO as GPIO # Add GPIO library to a Python sketch
import time # Add time library to a Python sketch
LED_pin = 32 # Ref Board
SW_Pin = 36
num = 0
GPIO.setmode(GPIO.BOARD) #Setup GPIO using GPIO.Pin
GPIO.setup(LED_pin, GPIO.OUT) #Setup pin to output
GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)
#Setup pin to input and Pull-Up
while True:
    if (GPIO.input(SW_Pin)==0): # Read Botton pin
        num += 1
        if(num % 2 != 0):
            GPIO.output(LED_pin,GPIO.HIGH) # Set LED pin to HIGH
            print("HIGH")
        else:
            GPIO.output(LED_pin,GPIO.LOW) # Set LED pin to LOW
            print("LOW")
        time.sleep(0.5)

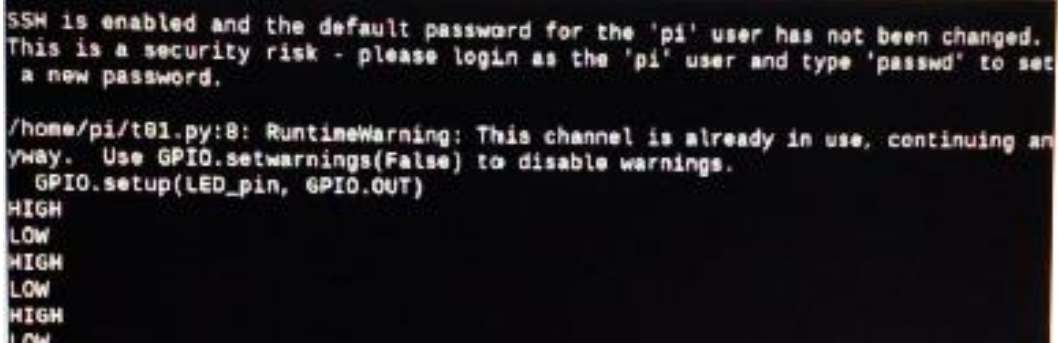
```

```

1 import RPi.GPIO as GPIO # Add GPIO library to a Python sketch
2 import time # Add time library to a Python sketch
3 LED_pin = 32 # Ref Board
4 SW_Pin = 36
5 num = 0
6 GPIO.setmode(GPIO.BOARD) #Setup GPIO using GPIO.Pin
7 GPIO.setup(LED_pin, GPIO.OUT) #Setup pin to output
8 GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)
9 #Setup pin to input and Pull-Up
10 while True:
11     if (GPIO.input(SW_Pin)==0): # Read Botton pin
12         num += 1
13         if(num % 2 != 0):
14             GPIO.output(LED_pin,GPIO.HIGH) # Set LED pin to HIGH
15             print("HIGH")
16         else:
17             GPIO.output(LED_pin,GPIO.LOW) # Set LED pin to LOW
18             print("LOW")
19         time.sleep(0.5)
20

```

hell >

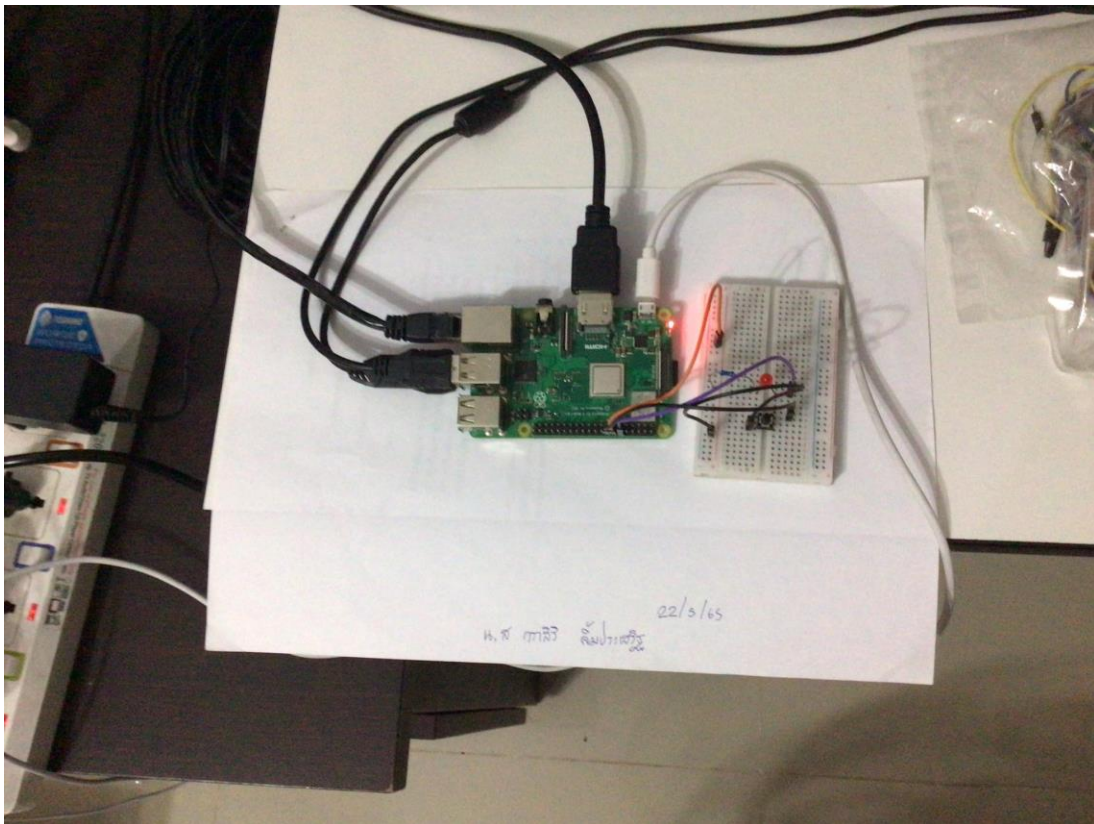
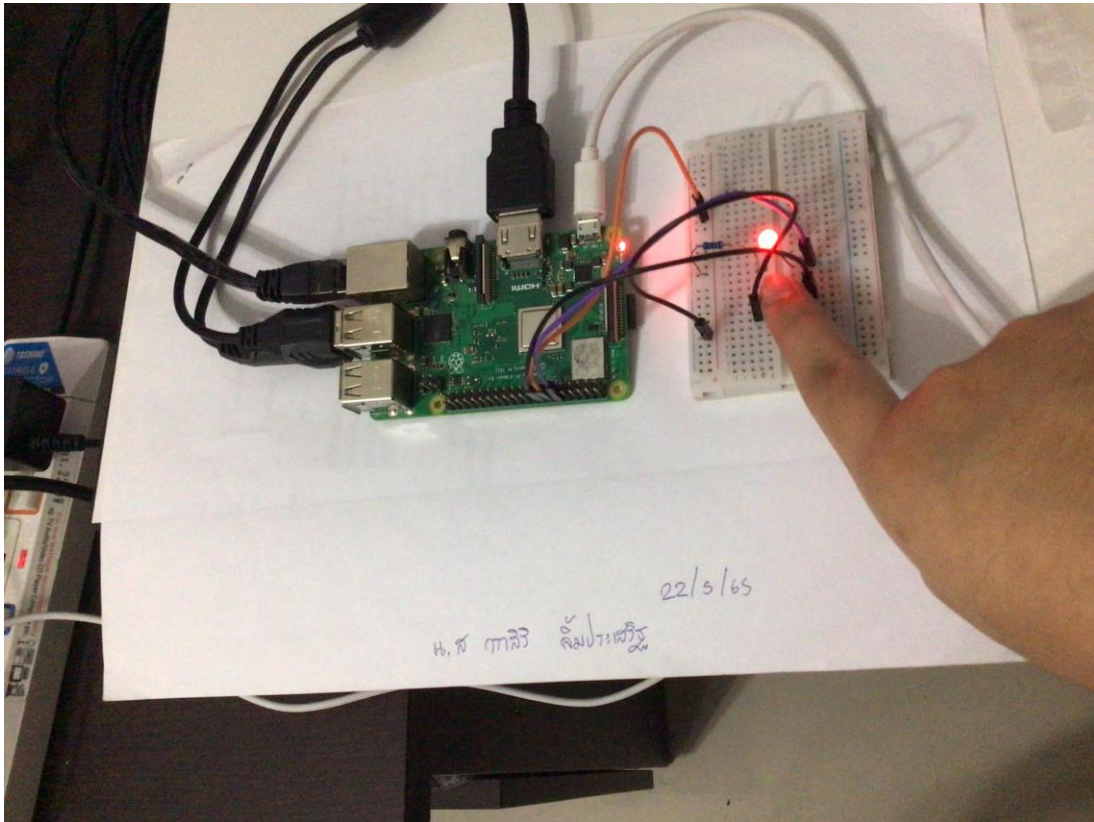


```

SSH is enabled and the default password for the 'pi' user has not been changed.
This is a security risk - please login as the 'pi' user and type 'passwd' to set
a new password.

/home/pi/tb1.py:8: RuntimeWarning: This channel is already in use, continuing an
yway. Use GPIO.setwarnings(False) to disable warnings.
  GPIO.setup(LED_pin, GPIO.OUT)
HIGH
LOW
HIGH
LOW
HIGH
LOW

```

POython.3 - Python Switch >> Switch Counter

```

import RPi.GPIO as GPIO # Add GPIO library to a Python sketch
import time # Add time library to a Python sketch
LED_pin = 32 # Ref Board
SW_Pin = 36
num = 0
GPIO.setmode(GPIO.BOARD) #Setup GPIO using GPIO.Pin
GPIO.setup(LED_pin, GPIO.OUT) #Setup pin to output
GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)

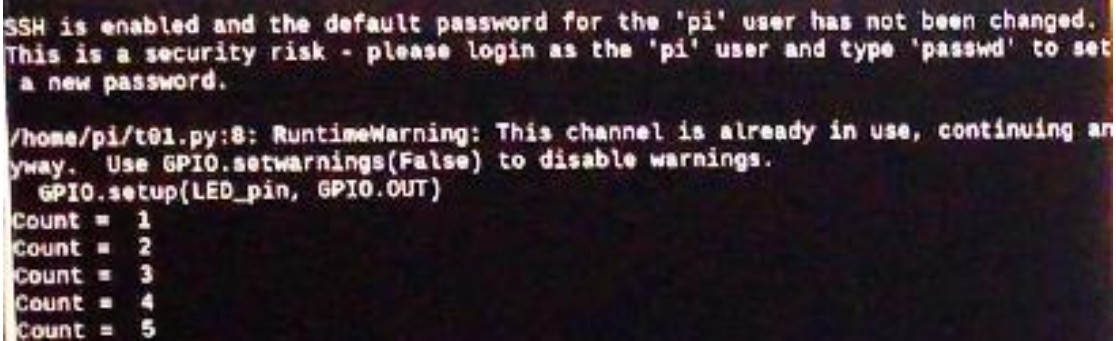
#Setup pin to input and Pull-Up
while True:
    if (GPIO.input(SW_Pin)==0): # Read Botton pin
        num += 1
        print("Count = ",num)
        time.sleep(0.5)

```

```

1 import RPi.GPIO as GPIO # Add GPIO library to a Python sketch
2 import time # Add time library to a Python sketch
3 LED_pin = 32 # Ref Board
4 SW_Pin = 36
5 num = 0
6 GPIO.setmode(GPIO.BOARD) #Setup GPIO using GPIO.Pin
7 GPIO.setup(LED_pin, GPIO.OUT) #Setup pin to output
8 GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)
9
10 #Setup pin to input and Pull-Up
11 while True:
12     if (GPIO.input(SW_Pin)==0): # Read Botton pin
13         num += 1
14         print("Count = ",num)
15         time.sleep(0.5)
16

```

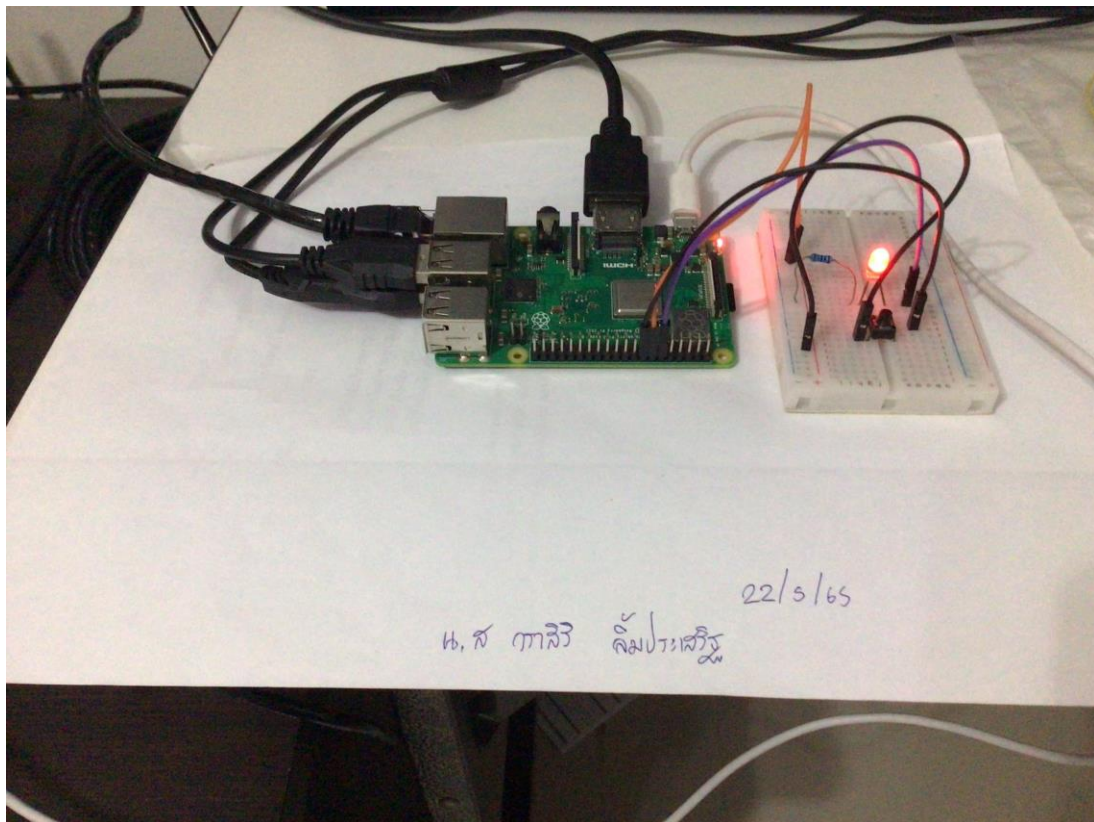
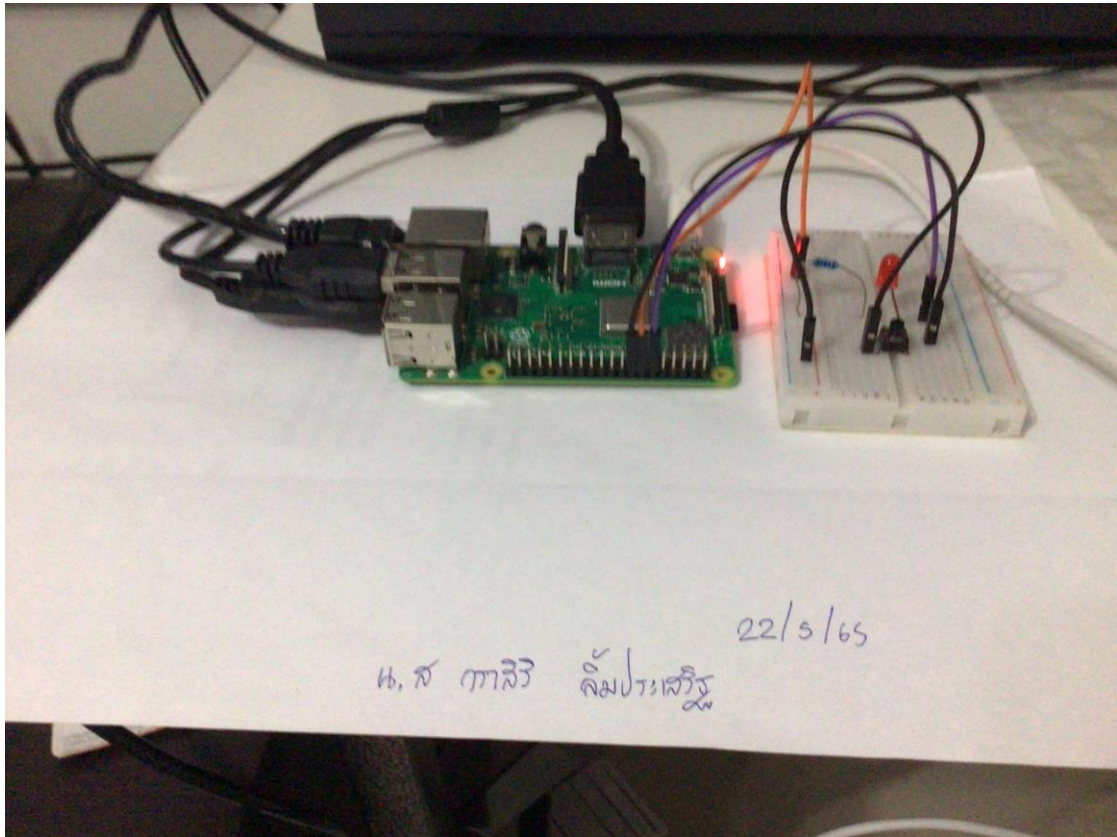


```

SSH is enabled and the default password for the 'pi' user has not been changed.
This is a security risk - please login as the 'pi' user and type 'passwd' to set
a new password.

/home/pi/t01.py:8: RuntimeWarning: This channel is already in use, continuing an
yway. Use GPIO.setwarnings(False) to disable warnings.
  GPIO.setup(LED_pin, GPIO.OUT)
Count = 1
Count = 2
Count = 3
Count = 4
Count = 5

```

Quiz_102 – ทดสอบ RPi4 GPIO with Node-RED

Node-RED.1 – Node-RED เพื่อควบคุมสวิตช์กดแบบ กดติด กดดับ {Switch-LED 1 คู่}

```
>>> Import
```

```
{["id":"6ba26f4f.16d16","type":"tab","label":"Flow
2","disabled":false,"info":"","{"id":"740a99d2.b07d1","type":"function","z":"6ba26f4f.16d16","name":"startBlink","func":"var BLINKDELAY = 250;\n\nvar light = true;\n\nvar blinker = setInterval(blink,
BLINKDELAY);\n\nglobal.set(\\"blinker\\", blinker);\n\nfunction blink () {\n  \n  if (light) {\n    msg.payload = 1;\n\n    light = false;\n  }\n  \n  else {\n    msg.payload = 0;\n    light = true;\n  }\n  \n  node.send(msg);\n}\n\n\nreturn;","outputs":1,"noerr":0,"x":360,"y":140,"wires":[["41b167bc.bbfc"]]},{"id":"73f5f278.0231bc","type":"inject","z":"6ba26f4f.16d16","name":"","repeat":"","crontab":"","once":false,"topic":"","payload":"","payloadType":"date","x":204,"y":140,"wires":[["740a99d2.b07d1"]]},{"id":"41b167bc.bbfc","type":"rpi-gpio
out","z":"6ba26f4f.16d16","name":"","pin":"32","set":"","level":"0","freq":"","out":"out","x":549,"y":140,"wires":[]},{"id":"cc1b11b1.bebb28","type":"function","z":"6ba26f4f.16d16","name":"stop
Blink","func":"clearInterval(global.get(\\"blinker\\"));\n\nmsg.payload = 0;\n\nreturn
msg;","outputs":1,"noerr":0,"x":366,"y":212,"wires":[["41b167bc.bbfc"]]},{"id":"5db82a6c.1b547c","type":"inject","z":"6ba26f4f.16d16","name":"","repeat":"","crontab":"","once":false,"topic":"","payload":"","payloadType":"date","x":201,"y":213,"wires":[["cc1b11b1.bebb28"]]}]
```

Import nodes

Clipboard

Paste flow json or select a file to import

Local

Examples

```
[{"id": "6ba26f4f.16d16", "type": "tab", "label": "Flow 2", "disabled": false, "info": ""}, {"id": "740a99d2.b07d1", "type": "function", "z": "6ba26f4f.16d16", "name": "startBlink", "func": "var BLINKDELAY = 250;\n\nvar light = true;\n\nvar blinker = setInterval(blink, BLINKDELAY);\n\nnglobal.set(\"blinker\", blinker);\n\nfunction blink () {\n  if (light) {\n    msg.payload = 1;\n    light = false;\n  } else {\n    msg.payload = 0;\n    light = true;\n  }\n\n  node.send(msg);\n  return;\n}, \"outputs\": 1, \"noerr\": 0, \"x\": 360, \"y\": 140, \"wires\": [[\"41b167bc.bbf fc\"]]}, {"id": "73f5f278.0231bc", "type": "inject", "z": "6ba26f4f.16d16", "name": "", "repeat": "", "crontab": "", "once": false, "topic": "", "payload": "", "payloadType": "date", "x": 204, "y": 140, "wires": [[\"740a99 d2.b07d1\"]]}, {"id": "41b167bc.bbfcc", "type": "rpi-gpio out", "z": "6ba26f4f.16d16", "name": "", "pin": "32", "set": "", "level": "0", "freq": "", "out": "out", "x": 549, "y": 140, "wires": []}, {"id": "cc1b11b1.bebb28", "type": "function", "z": "6ba26f4f.16d16", "name": ""}]
```

>>>startBlink

```
var BLINKDELAY = 250;
var light = true;
var blinker = setInterval(blink, BLINKDELAY);
global.set("blinker", blinker);
function blink () {
  if (light) {
    msg.payload = 1;
    light = false;
  }
  else {
    msg.payload = 0;
    light = true;
  }
  node.send(msg);
}
return;
```

Delete

Cancel

Done

⚙ Properties



📌 Name

startBlink



⚙ Setup

On Start

On Message

On Stop

```
1 var BLINKDELAY = 250;
2 var light = true;
3 var blinker = setInterval(blink, BLINKDELAY);
4 global.set("blinker", blinker);
5 function blink () {
6   if (light) {
7     msg.payload = 1;
8     light = false;
9   }
10  else {
11    msg.payload = 0;
12    light = true;
13  }
14  node.send(msg);
15 }
16 return;
```


>>>stopBlink

#Stop Blink function

```
msg.payload = 0;
```

```
return msg;
```

Edit function node

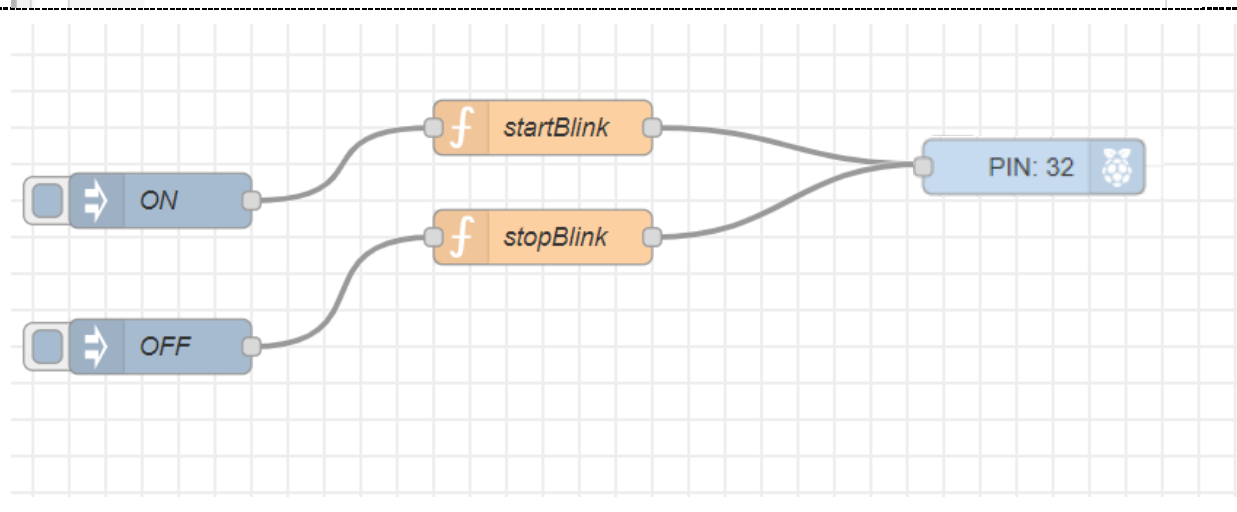
Delete Cancel Done

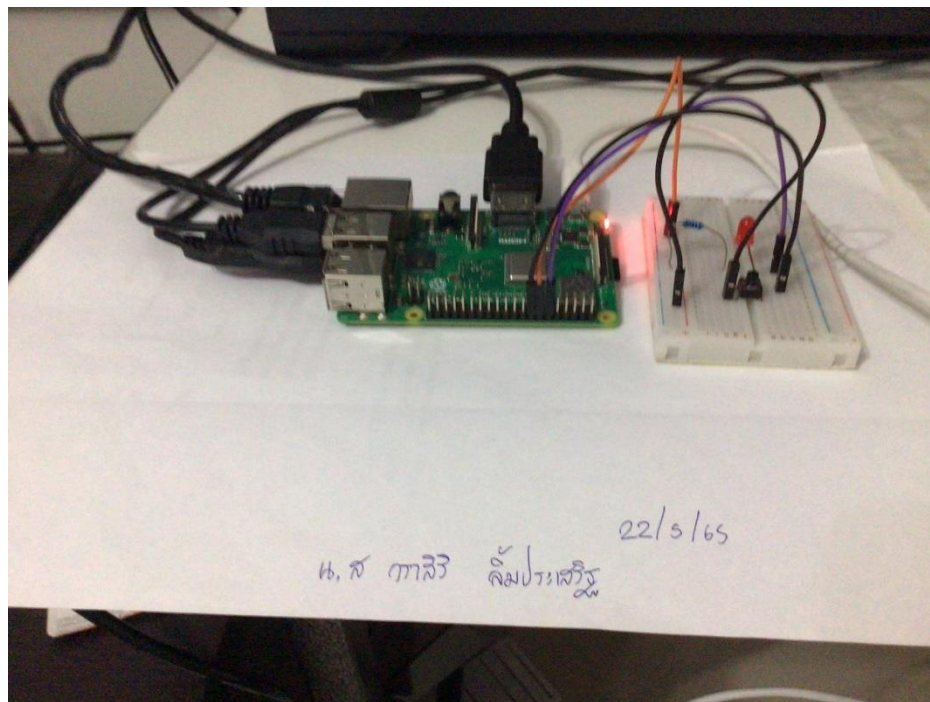
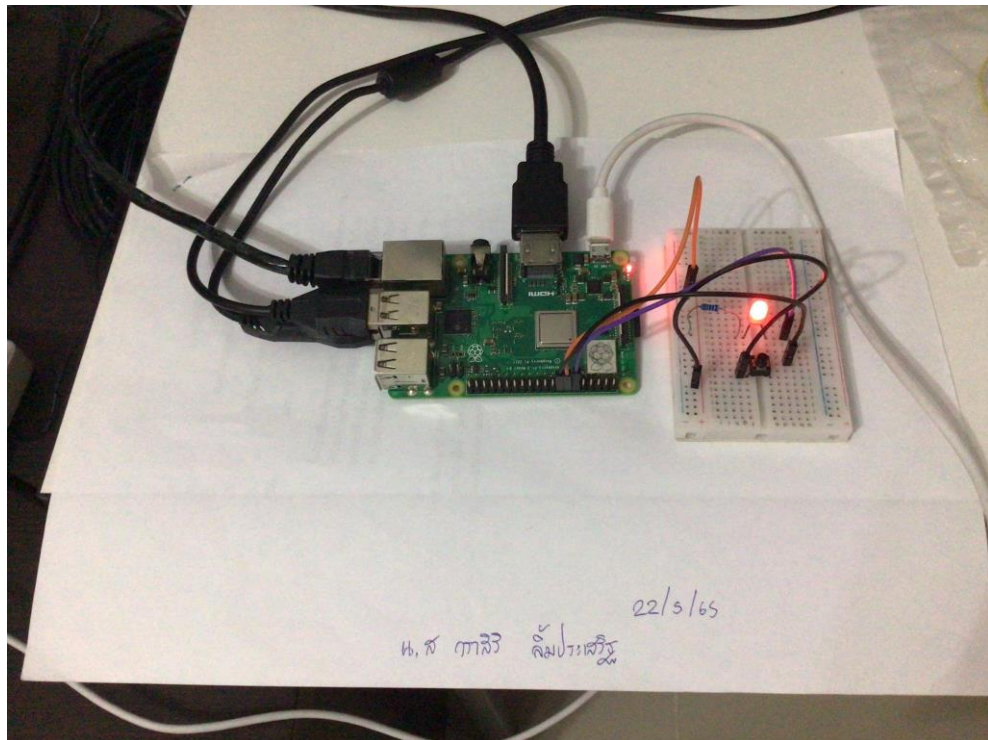
⚙️ **Properties** ⚙️ 📄 🖨️

🔖 Name stopBlink 📄 ▼

⚙️ Setup On Start **On Message** On Stop

```
1 msg.payload = 0;
2 return msg;
3
```

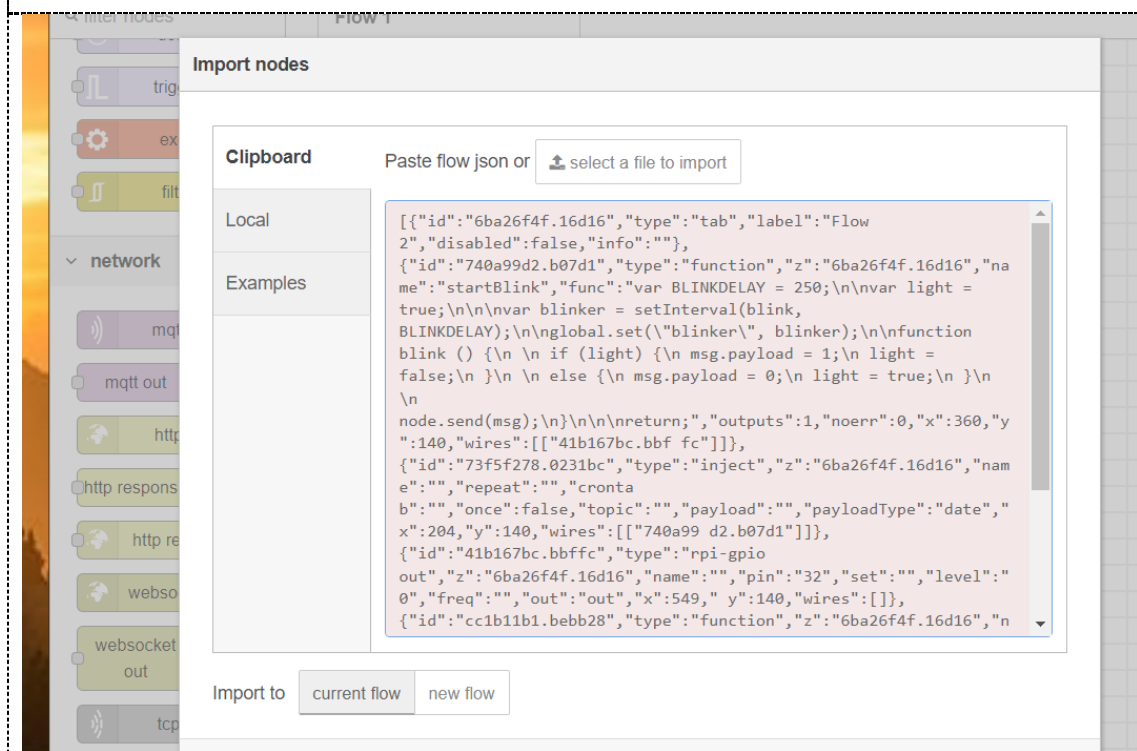




Node-RED.2 - Node-RED เพื่อควบคุมสวิตช์กดแบบ กดติด กดดับ 2 คู่

```
>>> Import
```

```
{["id":"6ba26f4f.16d16","type":"tab","label":"Flow
2","disabled":false,"info":"","["id":"740a99d2.b07d1","type":"function","z":"6ba26f4f.16d16","na
me":"startBlink","func":"var BLINKDELAY = 250;\n\nvar light = true;\n\nvar blinker = setInterval(blink,
BLINKDELAY);\n\nglobal.set(\\"blinker\\", blinker);\n\nfunction blink () {\n  \n  if (light) {\n    msg.payload = 1;\n\n    light = false;\n  }\n  \n  else {\n    msg.payload = 0;\n    light = true;\n  }\n  \n  node.send(msg);\n}\n\n\nreturn;","outputs":1,"noerr":0,"x":360,"y":140,"wires":[["41b167bc.bbfc"]]],{"id":"73f5f278.0231bc","type":"inject","z":"6ba26f4f.16d16","name":"","repeat":"","cronta
b":"","once":false,"topic":"","payload":"","payloadType":"date","x":204,"y":140,"wires":[["740a99
d2.b07d1"]]],{"id":"41b167bc.bbffc","type":"rpi-gpio
out","z":"6ba26f4f.16d16","name":"","pin":"32","set":"","level":"0","freq":"","out":"out","x":549,"
y":140,"wires":[]],{"id":"cc1b11b1.bebb28","type":"function","z":"6ba26f4f.16d16","name":"stop
Blink","func":"clearInterval(global.get(\\"blinker\\"));\n\nmsg.payload = 0;\n\nreturn
msg;","outputs":1,"noerr":0,"x":366,"y":212,"wires":[["41b167bc.bbffc"]]],{"id":"5db82a6c.1b547
c","type":"inject","z":"6ba26f4f.16d16","name":"","repeat":"","crontab":"","once":false,"topic":"","
payload":"","payloadType":"date","x":201,"y":213,"wires":[["cc1b11b1.bebb28"]]]}
```



>>> Start Blink

```
msg.payload = 1;
```

```
return;
```

The screenshot shows the 'Properties' dialog for a function node named 'startBlink'. The 'On Message' tab is selected. The code editor contains the following code:

```
1 msg.payload = 1;
2 return;
```

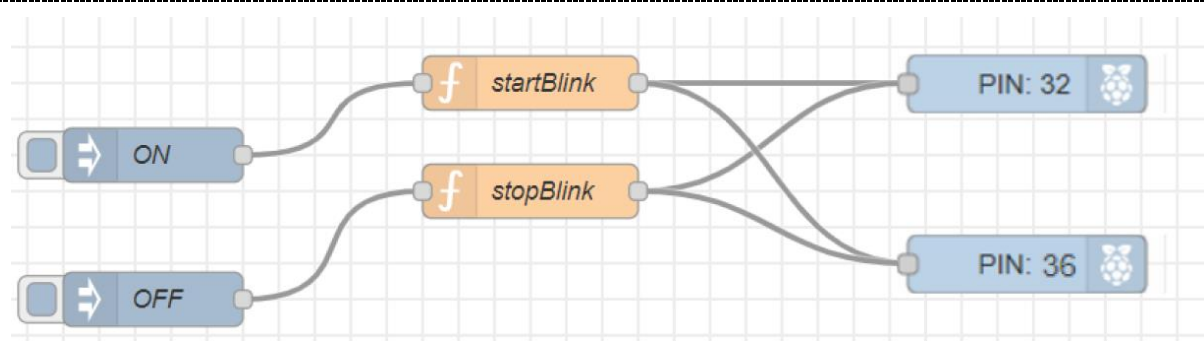
>>> Stop Blink

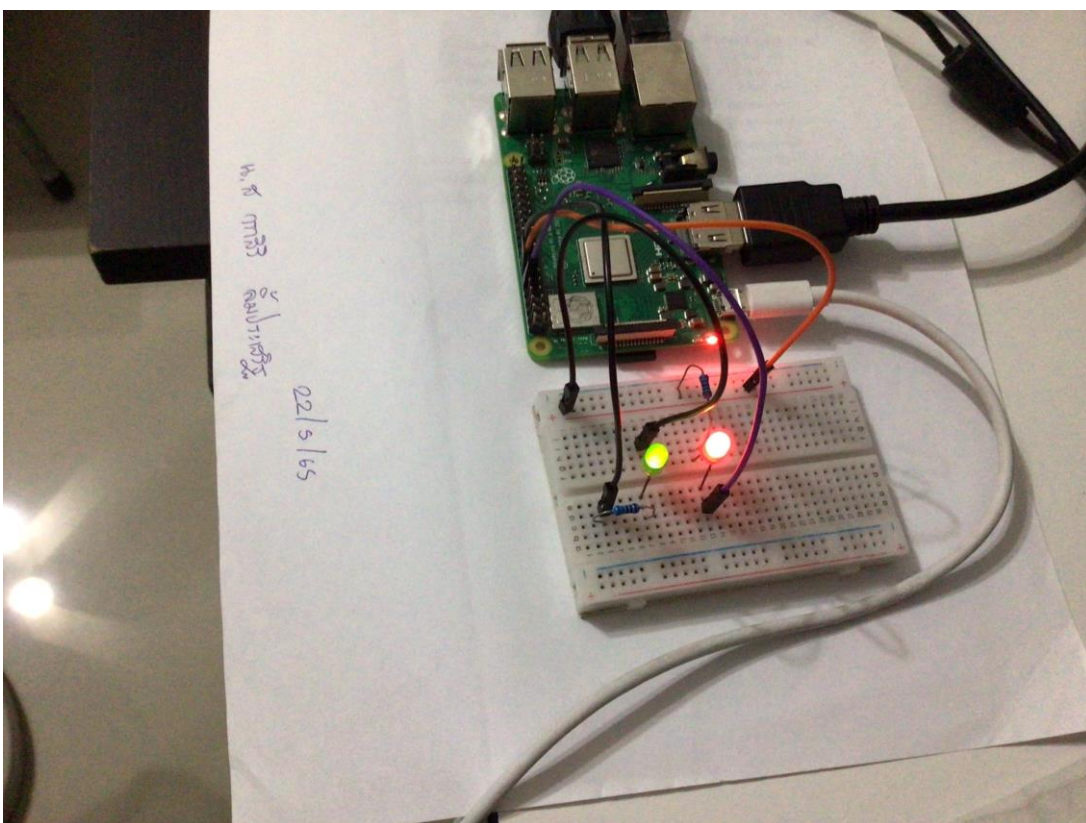
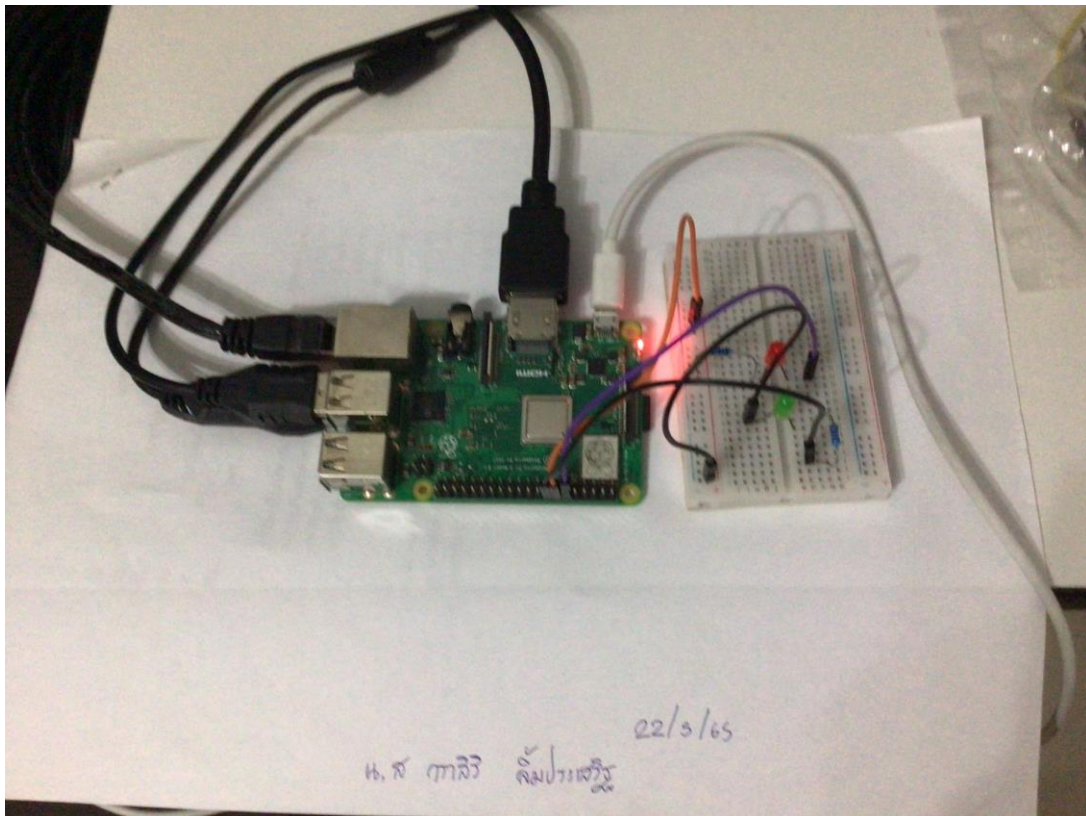
```
msg.payload = 0;
```

```
return msg;
```

The screenshot shows the 'Properties' dialog for a function node named 'stopBlink'. The 'On Message' tab is selected. The code editor contains the following code:

```
1 msg.payload = 0;
2 return msg;
```





Node-RED.3 - Node-RED เพื่ออ่าน DHT-22 Sensor

The screenshot displays the Node-RED web interface. At the top, a workflow is visible on a grid background, consisting of three nodes connected in sequence: a 'timestamp' node, an 'rpi-dht22' node, and a 'msg.payload' node.

Below the workflow, there are two configuration panels:

- Left Panel: Edit rpi-dht22 node**
 - Topic: DHT22
 - Sensor model: DHT22
 - Pin numbering: BCM GPIO
 - Pin number: 18
 - Name: (empty field)
- Right Panel: Edit inject node**
 - Properties:
 - Name: (empty field)
 - msg. payload = timestamp
 - msg. topic = a_z
 - Inject once after 0.1 seconds, then
 - Repeat: Interval every 30 seconds

At the bottom, a 'debug' console window shows the following log entries:

```

22/5/2022, 2:43:44 PM node: 7ec800daf18fd2ca
rpi-dht22 : msg.payload : string[5]
"29.00"

22/5/2022, 2:44:14 PM node: 7ec800daf18fd2ca
rpi-dht22 : msg.payload : string[5]
"29.90"
    
```