

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

ชื่อ-สกุล : นายอดิชาติ ภูนิเทศ

6/6 – คำถามท้ายบทเพื่อทดสอบความเข้าใจ

Quiz_101 – ทดสอบ RPi4 GPIO with Python

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

โปรแกรมที่ใช้ทดสอบ

```
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)==1): # Read Botton pin
```

```
        GPIO.output(LED_pin,GPIO.LOW) # Set LED pin to LOW
```

```
        print("Input = 0, LOW")
```

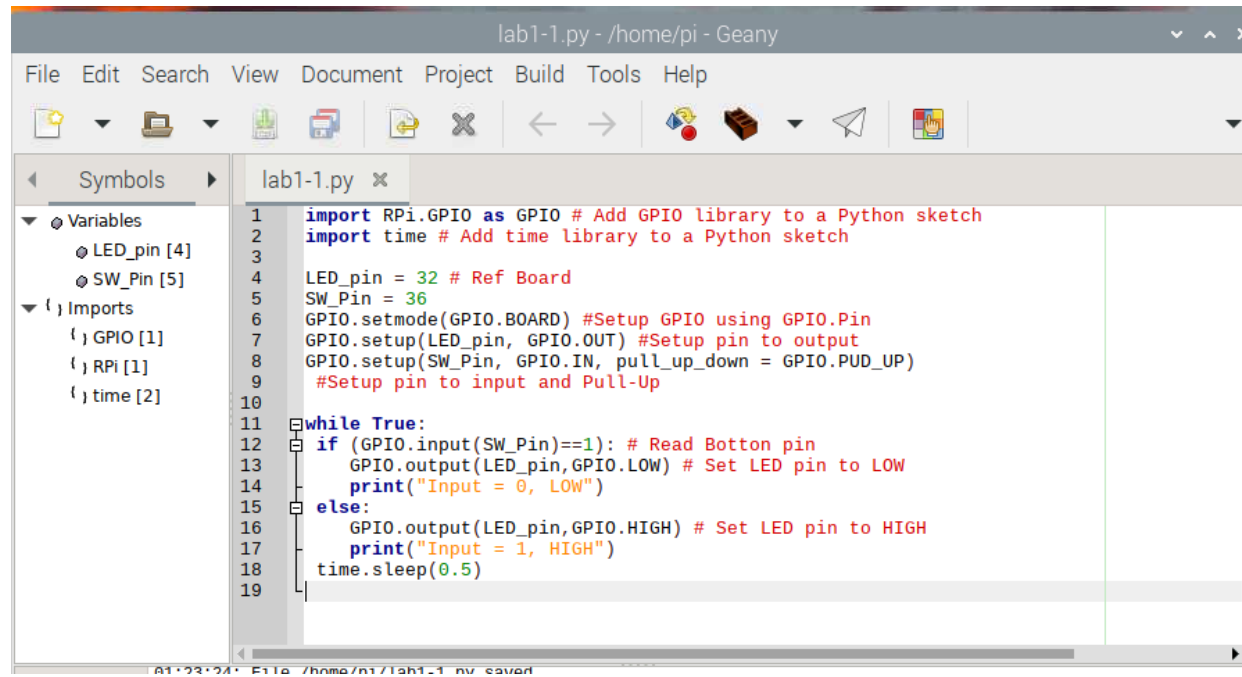
```
    else:
```

```
        GPIO.output(LED_pin,GPIO.HIGH) # Set LED pin to HIGH
```

```
        print("Input = 1, HIGH")
```

```
        time.sleep(0.5)
```

รูป Code Capture



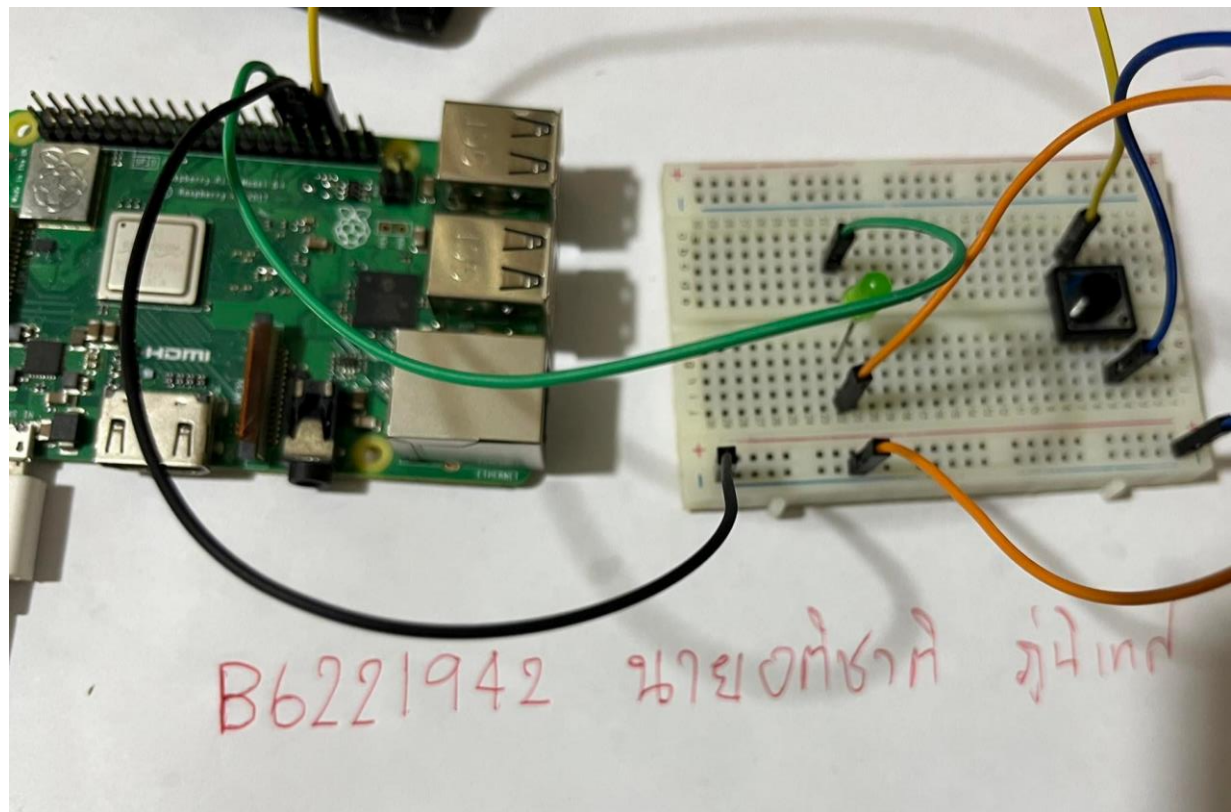
The screenshot shows a code editor window titled 'lab1-1.py - /home/pi - Geany'. The code is a Python script for controlling an LED and a button using the Raspberry Pi GPIO. The script includes imports for RPi.GPIO and time, sets up the LED pin (32) and SW pin (36), and uses a while loop to read the button state and control the LED output. The code is as follows:

```

1 import RPi.GPIO as GPIO # Add GPIO library to a Python sketch
2 import time # Add time library to a Python sketch
3
4 LED_pin = 32 # Ref Board
5 SW_Pin = 36
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
11 while True:
12     if (GPIO.input(SW_Pin)==1): # Read Button pin
13         GPIO.output(LED_pin,GPIO.LOW) # Set LED pin to LOW
14         print("Input = 0, LOW")
15     else:
16         GPIO.output(LED_pin,GPIO.HIGH) # Set LED pin to HIGH
17         print("Input = 1, HIGH")
18         time.sleep(0.5)
19

```

รูปการทดสอบ 1



รูปการทดสอบ 2



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

โปรแกรมที่ใช้ทดสอบ

```
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
```

```
State = 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
```

```
        state = 1 - state
```

```
        GPIO.output(LED_pin,GPIO.HIGH) # Set LED pin
```

```
print("State: %d", state)
time.sleep(0.5)
```

รูป Code Capture

The screenshot shows the Geany IDE with a file named 'lab1-1.py' open. The script is a Python program that controls an LED and reads a button state using the RPi.GPIO library. The code is as follows:

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

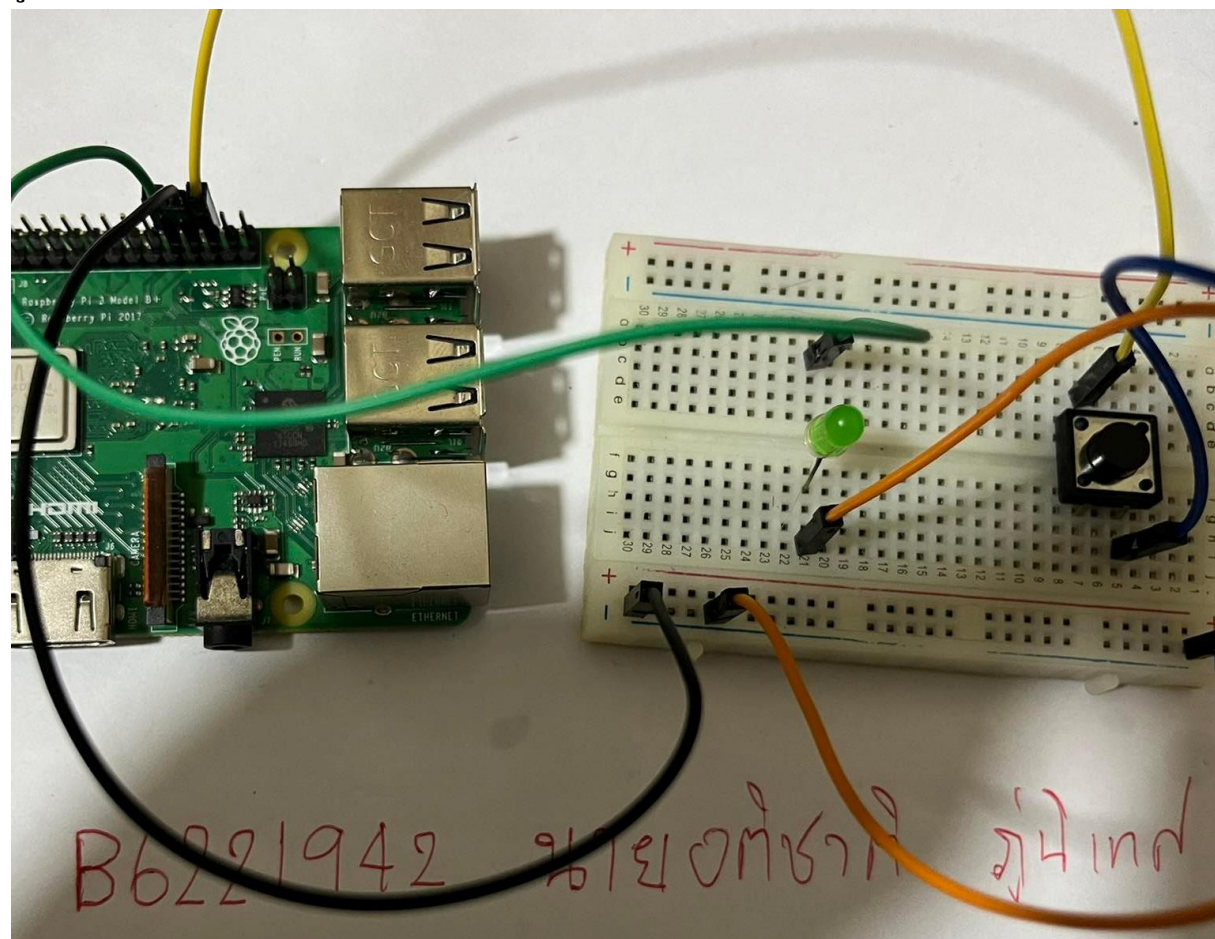
On the left, the 'Symbols' pane shows the variables and imports used in the script:

- Variables:
 - LED_pin [4]
 - SW_Pin [5]
 - state [6]
 - state [14]
- Imports:
 - GPIO [1]
 - RPI [1]
 - time [2]

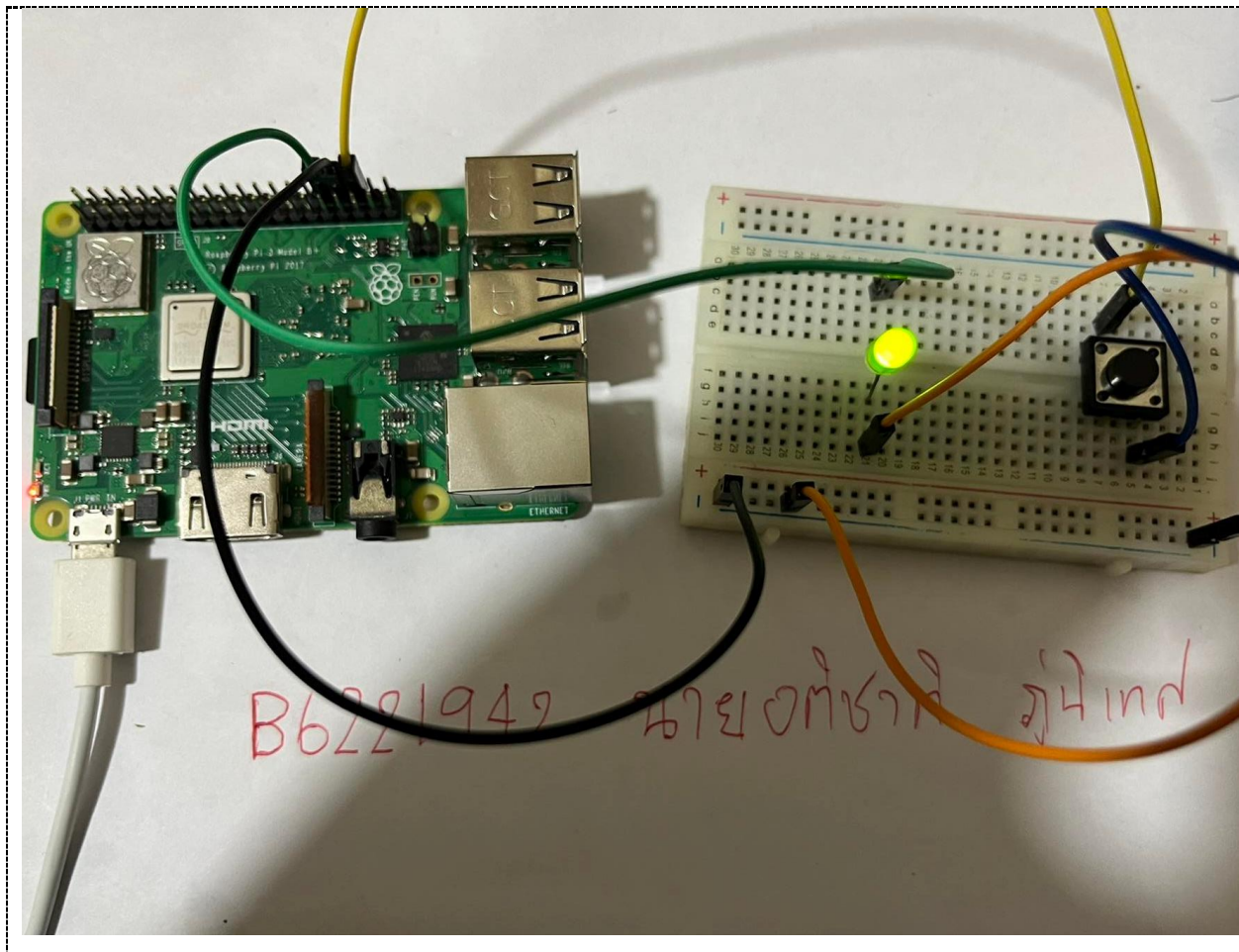
On the right, a terminal window shows the output of the script, which prints the state of the LED pin (0 or 1) repeatedly:

```
/home/pi/lab1-1.py:8: Run
anyway. Use GPIO.setwar
GPIO.setup(LED_pin, GPI
State: %d 1
State: %d 0
State: %d 1
State: %d 0
State: %d 1
State: %d 0
State: %d 1
State: %d 0
State: %d 1
State: %d 0
```

รูปการทดสอบ 1



รูปการทดสอบ 2



Python.3 - Python Switch >> Switch Counter

โปรแกรมที่ใช้ทดสอบ

```
import RPi.GPIO as GPIO # Add GPIO library to a Python sketch
```

```
import time # Add time library to a Python sketch
```

```
SW_Pin = 36
```

```
Count = 0
```

```
GPIO.setmode(GPIO.BOARD) #Setup GPIO using GPIO.Pin
```

```
GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)
```

```
#Setup pin to input and Pull-Up
```

```
while True:
```

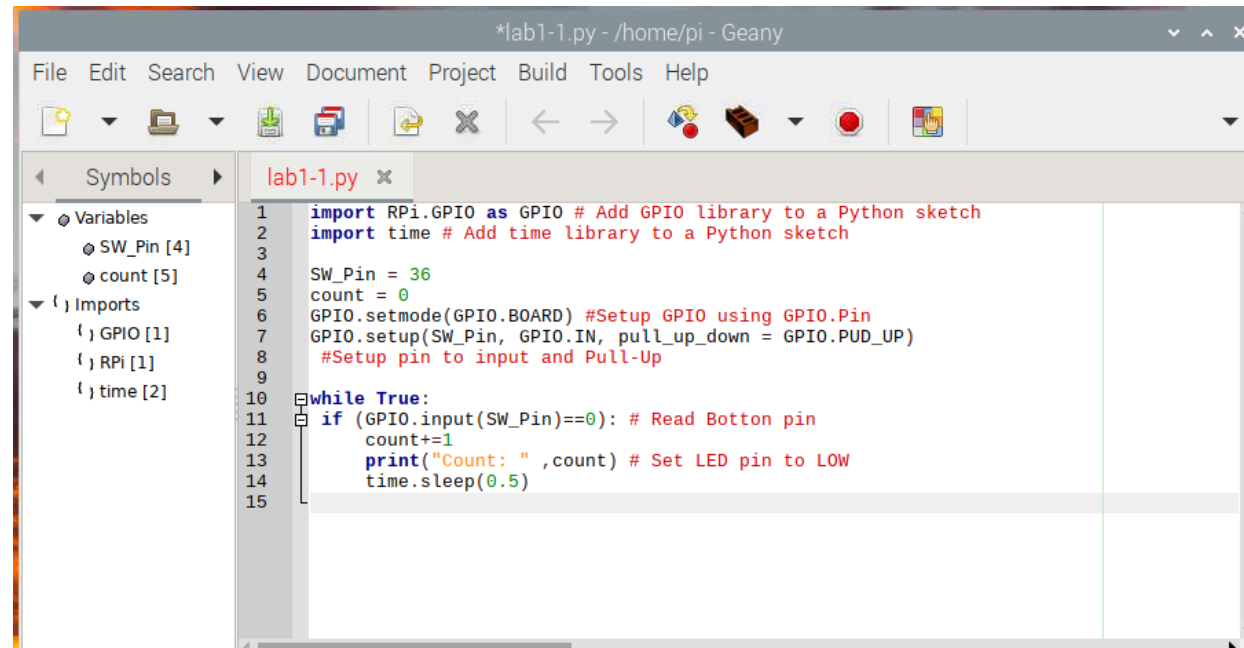
```
    if (GPIO.input(SW_Pin)==1): # Read Button pin
```

```

Count+=1
print("Count: ",Count)
time.sleep(0.5)

```

รูป Code Capture

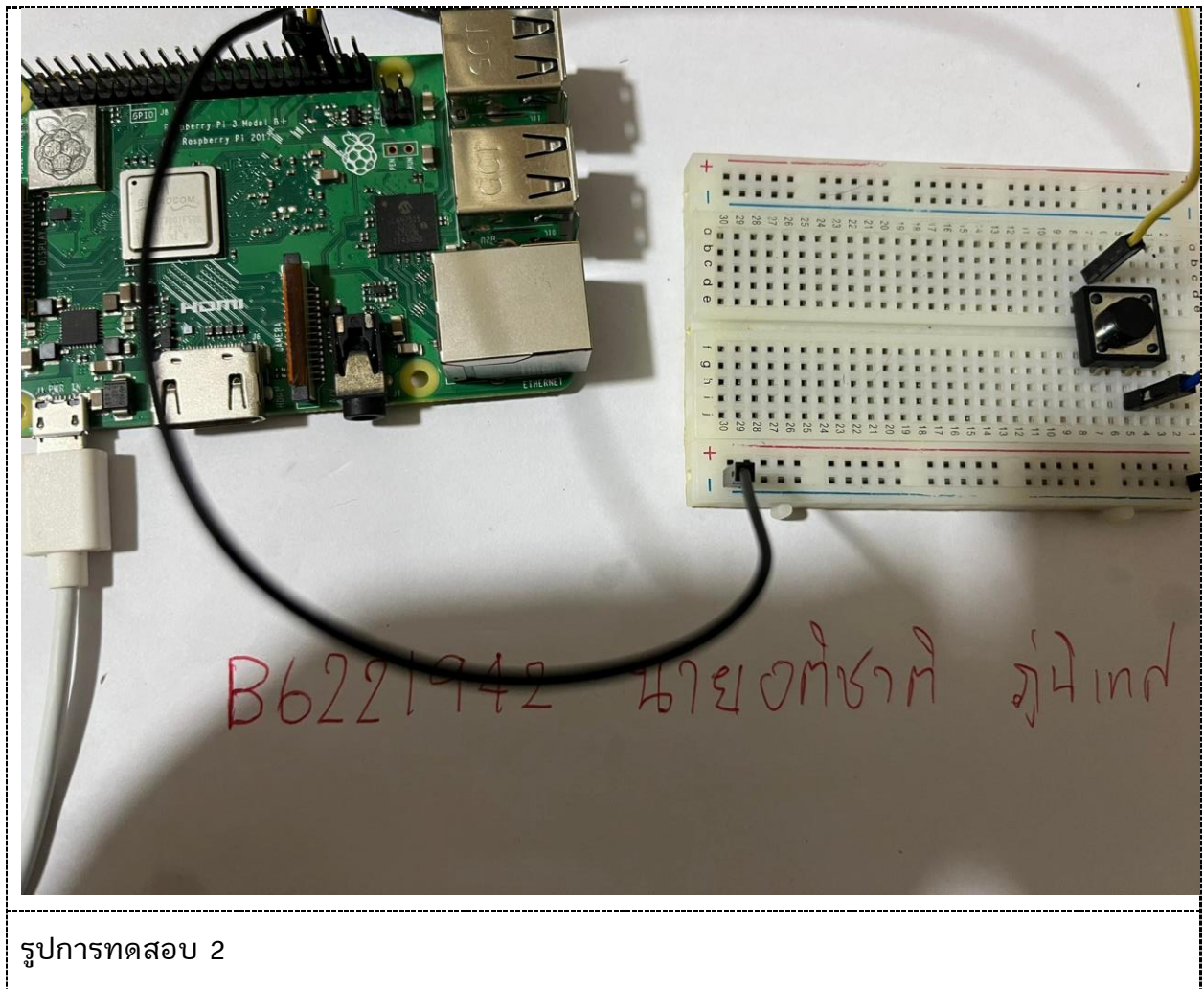


```

*lab1-1.py - /home/pi - Geany
File Edit Search View Document Project Build Tools Help
lab1-1.py x
Symbols
Variables
  SW_Pin [4]
  count [5]
Imports
  GPIO [1]
  RPi [1]
  time [2]
1 import RPi.GPIO as GPIO # Add GPIO library to a Python sketch
2 import time # Add time library to a Python sketch
3
4 SW_Pin = 36
5 count = 0
6 GPIO.setmode(GPIO.BOARD) #Setup GPIO using GPIO.Pin
7 GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)
8 #Setup pin to input and Pull-Up
9
10 while True:
11     if (GPIO.input(SW_Pin)==0): # Read Botton pin
12         count+=1
13         print("Count: " ,count) # Set LED pin to LOW
14         time.sleep(0.5)
15

```

รูปการทดสอบ 1





The image shows a terminal window with a title bar that reads "geany_run_script_NZZ7L1.sh". The window has a menu bar with "File", "Edit", "Tabs", and "Help". The terminal output consists of 20 lines, each starting with "Count:" followed by a number from 1 to 20. A cursor is visible on the line following "Count: 20".

```
Count: 1
Count: 2
Count: 3
Count: 4
Count: 5
Count: 6
Count: 7
Count: 8
Count: 9
Count: 10
Count: 11
Count: 12
Count: 13
Count: 14
Count: 15
Count: 16
Count: 17
Count: 18
Count: 19
Count: 20

```

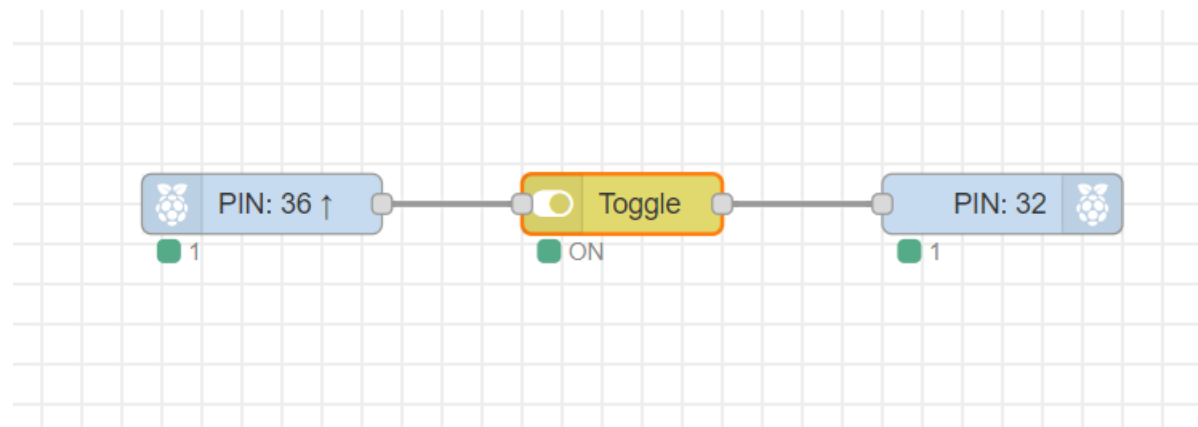
Quiz_102 – ทดสอบ RPi4 GPIO with Node-RED

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

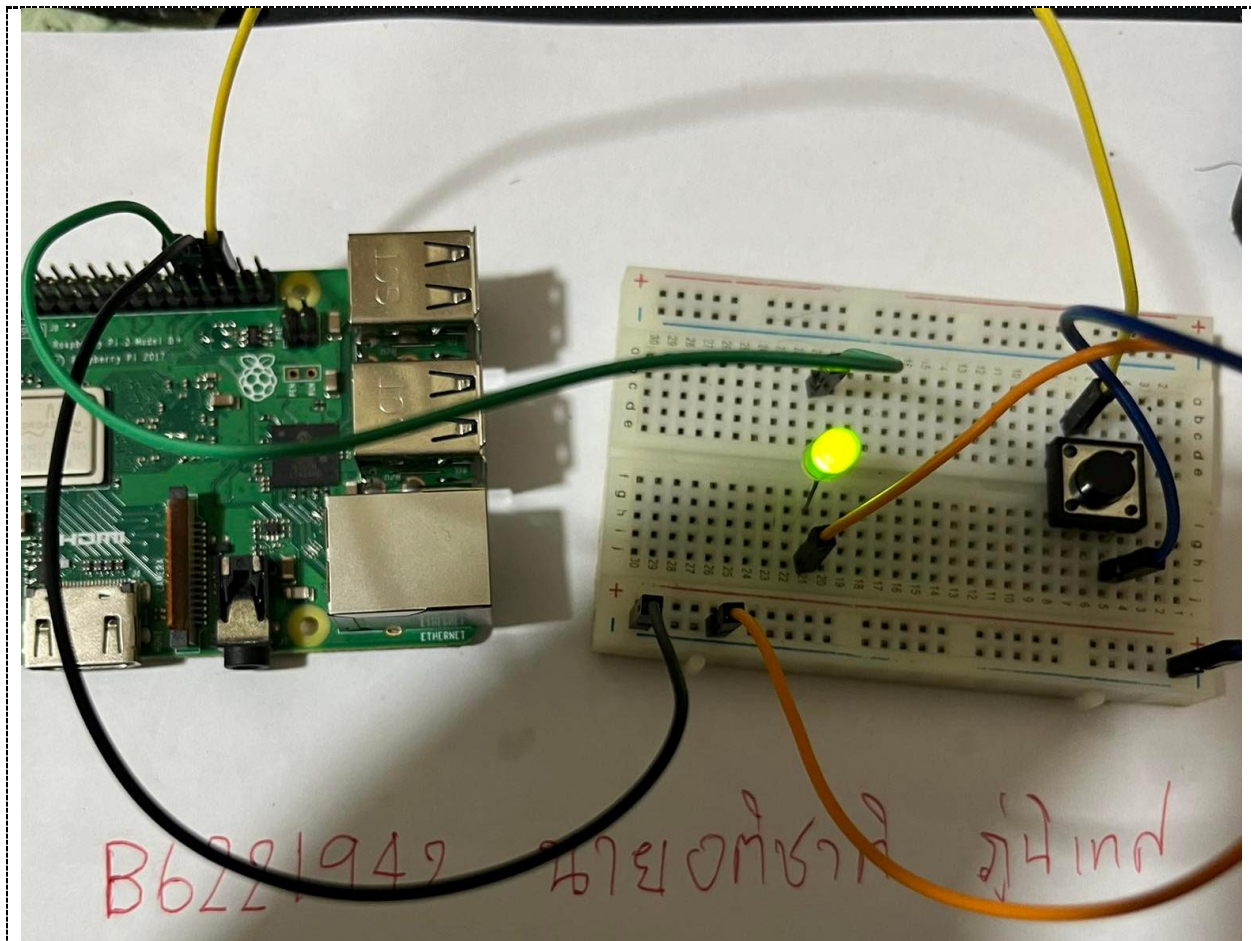
โปรแกรมที่ใช้ทดสอบ

```
[{"id":"2ea6c3a668637a03","type":"tab","label":"Flow 2","disabled":false,"info":"","env":[]},{
  "id":"e7624f12eddd0ecd","type":"rpi-gpio in",
  "z":"2ea6c3a668637a03","name":"","pin":"16","intype":"tri","debounce":"25","read":false,"bcm":true,
  "x":230,"y":240,"wires":[["cc37ede6ca4beeed"]]},
  {"id":"1c153335fa5c851d","type":"rpi-gpio out",
  "z":"2ea6c3a668637a03","name":"","pin":"12","set":"","level":"0","freq":"","out":"out","bcm":true,
  "x":660,"y":240,"wires":[]},
  {"id":"cc37ede6ca4beeed","type":"toggle",
  "z":"2ea6c3a668637a03","name":"","onOffTopic":"gpio/36","onValue":"1","onType":"str","offValue":"0","offType":"str",
  "toggleTopic":"","toggleValue":"0","toggleType":"str","passOnOff":"","x":440,"y":240,"wires":[["1c153335fa5c851d"]]}]
```

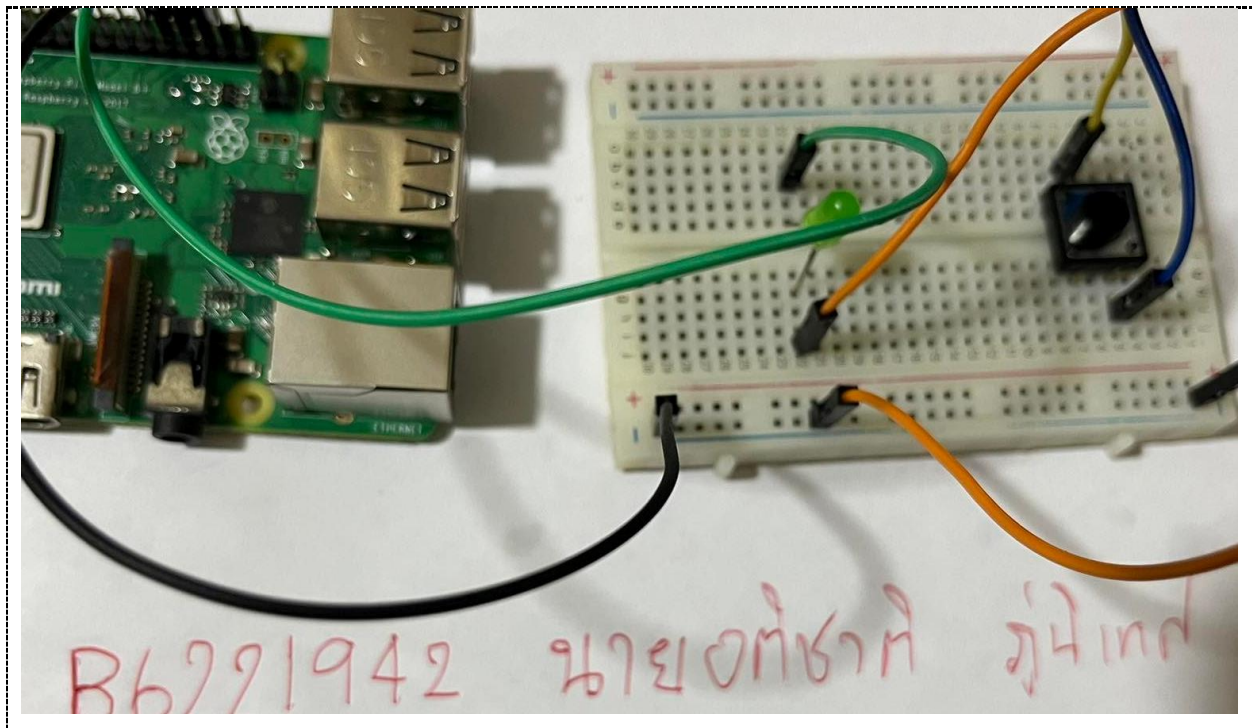
รูป Code Capture



รูปการทดสอบ 1



รูปการทดสอบ 2

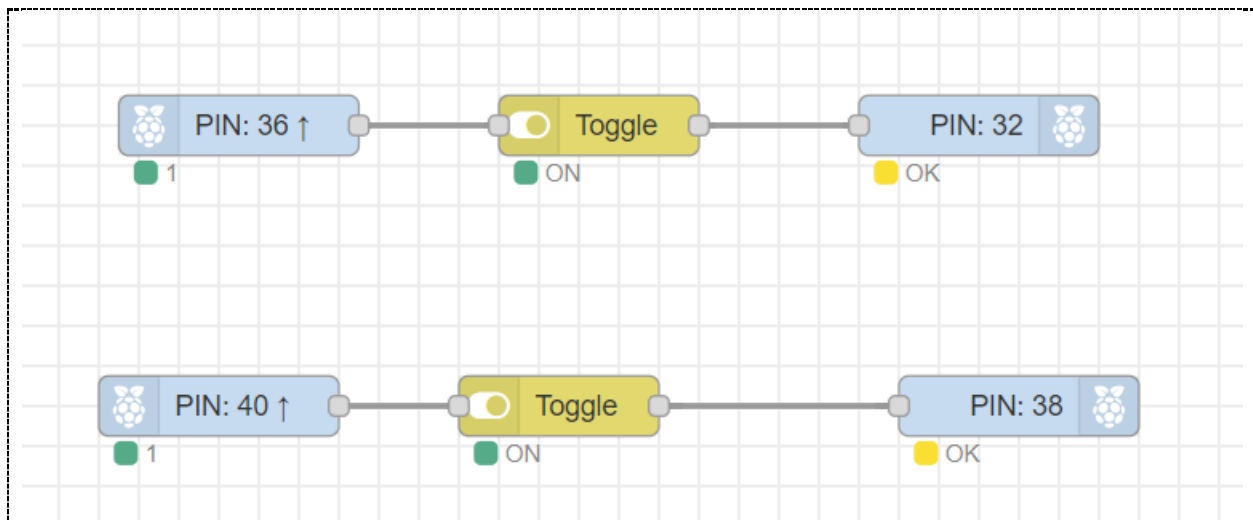


Node-RED.2 - Node-RED เพื่อควบคุมสวิตช์กดแบบ กดติด กดดับ 2 คู่

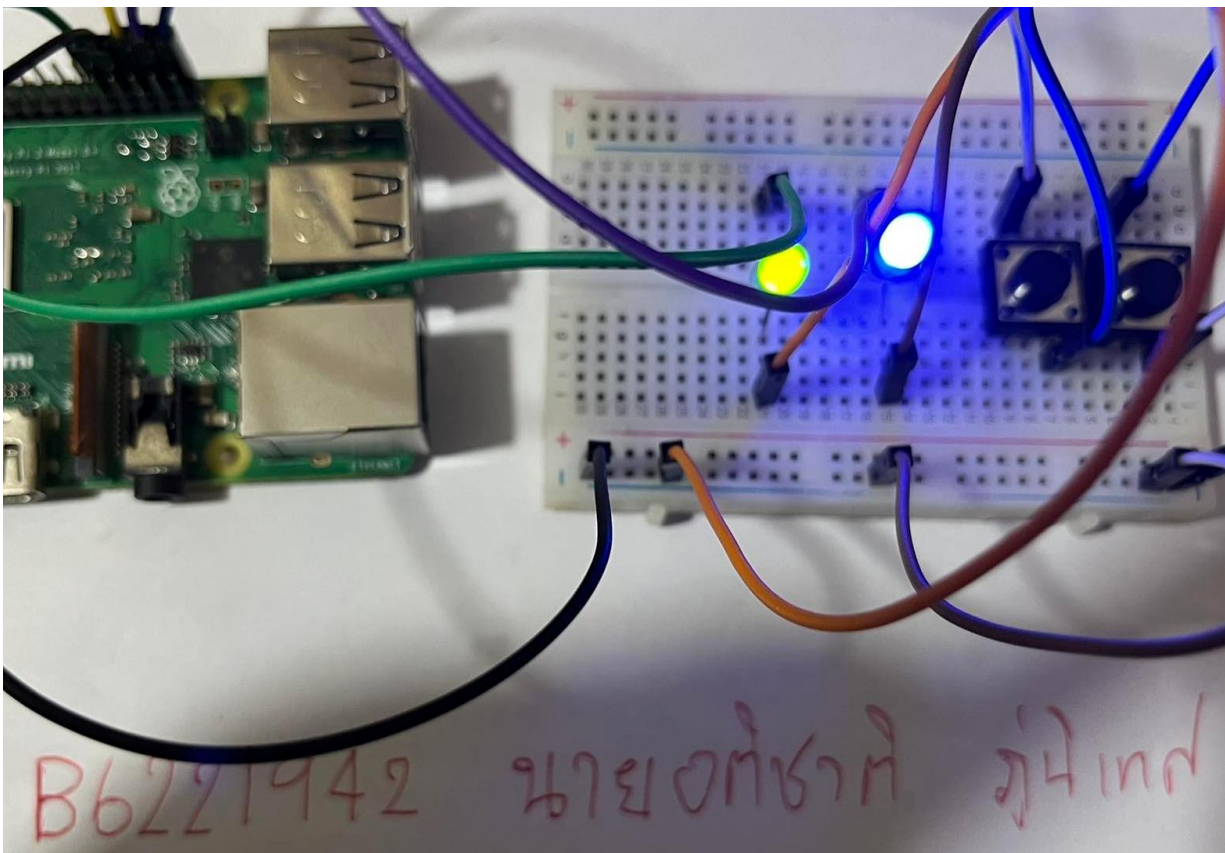
โปรแกรมที่ใช้ทดสอบ

```
[{"id":"c0e4aacac2c1e182","type":"tab","label":"Flow
5","disabled":false,"info":"","env":[]},{id:"7dd583e01e8ffce8","type":"rpi-gpio
in","z":"c0e4aacac2c1e182","name":"","pin":"16","intype":"up","debounce":"25","read":false,"bcm"
:true,"x":330,"y":200,"wires":[["79a050ff564ec93b"]]},{"id":"3536a7e662fa4cb3","type":"rpi-gpio
out","z":"c0e4aacac2c1e182","name":"","pin":"12","set":"","level":"0","freq":"","out":"out","bcm":t
rue,"x":700,"y":200,"wires":[]},{id:"79a050ff564ec93b","type":"toggle","z":"c0e4aacac2c1e182","
name":"Toggle","onOffTopic":"gpio/36","onValue":"1","onType":"num","offValue":"0","offType":"nu
m","toggleTopic":"","toggleValue":"0","toggleType":"num","passOnOff":"","x":510,"y":200,"wires":[
["3536a7e662fa4cb3"]]},{"id":"17f2c69da7f82b3f","type":"rpi-gpio
in","z":"c0e4aacac2c1e182","name":"","pin":"21","intype":"up","debounce":"25","read":false,"bcm"
:true,"x":320,"y":340,"wires":[["24123b43dc7e93cf"]]},{"id":"326027dd62db1aae","type":"rpi-gpio
out","z":"c0e4aacac2c1e182","name":"","pin":"20","set":"","level":"0","freq":"","out":"out","bcm":t
rue,"x":720,"y":340,"wires":[]},{id:"24123b43dc7e93cf","type":"toggle","z":"c0e4aacac2c1e182","
name":"","onOffTopic":"gpio/40","onValue":"1","onType":"str","offValue":"0","offType":"str","toggle
Topic":"","toggleValue":"0","toggleType":"str","passOnOff":"","x":490,"y":340,"wires":[["326027dd6
2db1aae"]]}]
```

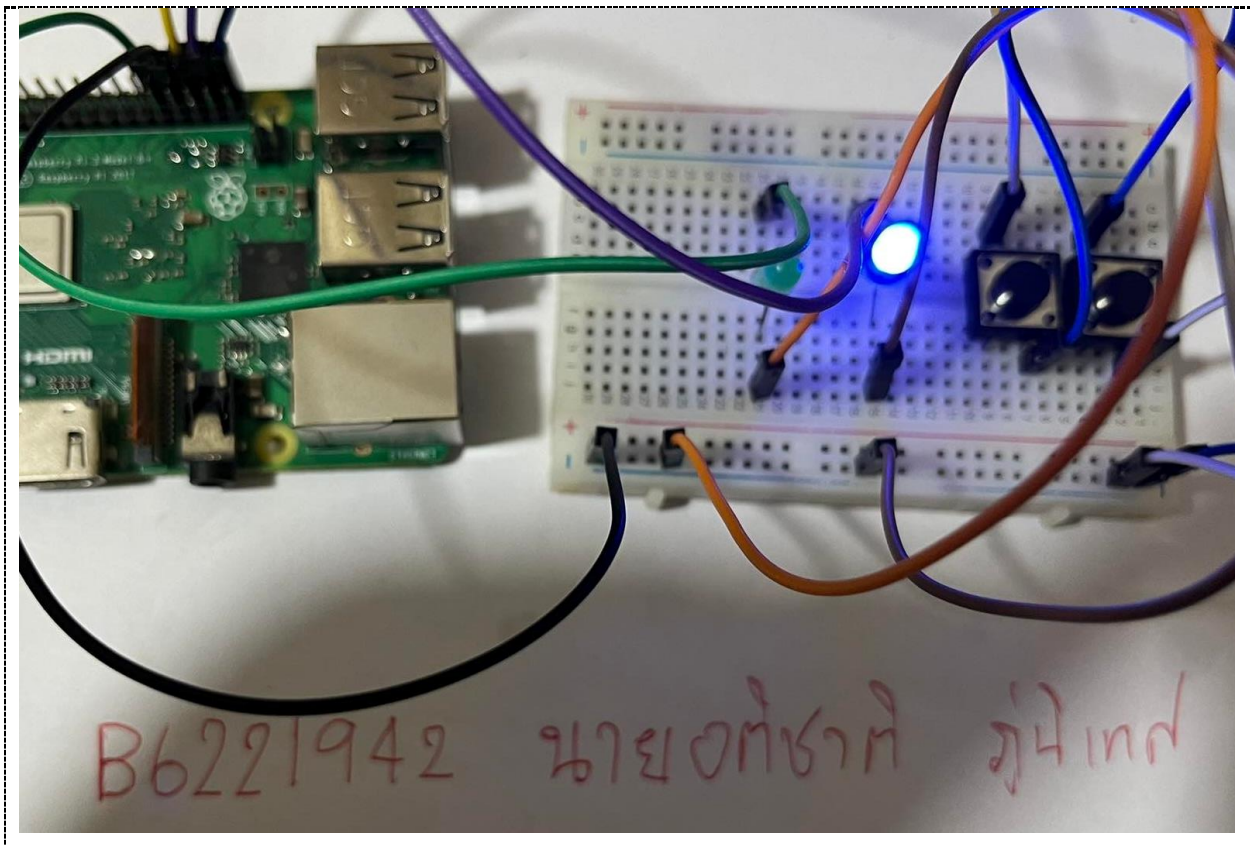
รูป Code Capture



รูปการทดสอบ 1



รูปการทดสอบ 2



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

โปรแกรมที่ใช้ทดสอบ

```
[{"id":"95e14f3908f78d10","type":"tab","label":"Flow 1","disabled":false,"info":"","env":[]},{
  "id":"49f4e98091eef55b","type":"inject","z":"95e14f3908f78d10","name":"","props":[{"p":"payload"},{"p":"topic","vt":"str"}],"repeat":"","crontab":"","once":false,"onceDelay":0.1,"topic":"","payload":"","payloadType":"date","x":200,"y":280,"wires":[["5063271611a2b9c1"]]},
  {"id":"f92f516360db9610","type":"debug","z":"95e14f3908f78d10","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"false","statusVal":"","statusType":"auto","x":650,"y":280,"wires":[]},
  {"id":"5063271611a2b9c1","type":"rpi-dht22","z":"95e14f3908f78d10","name":"","topic":"rpi-dht22","dht":22,"pintype":"3","pin":"5","x":400,"y":280,"wires":[["f92f516360db9610"]]}]
```

รูป Code Capture



รูปการทดสอบ 1

18/5/2565 03:47:27 node: f92f516360db9610

rpi-dht22 : msg.payload : string[5]

"28.90"

18/5/2565 03:47:28 node: f92f516360db9610

rpi-dht22 : msg.payload : string[5]

"28.90"

18/5/2565 03:47:29 node: f92f516360db9610

rpi-dht22 : msg.payload : string[5]

"28.90"

รูปการทดสอบ 2

