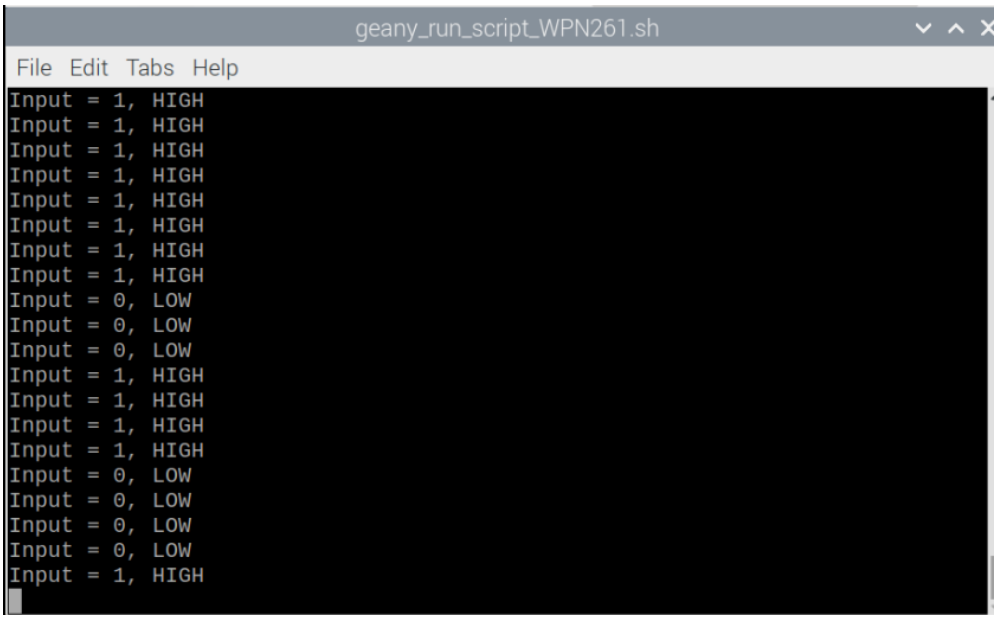
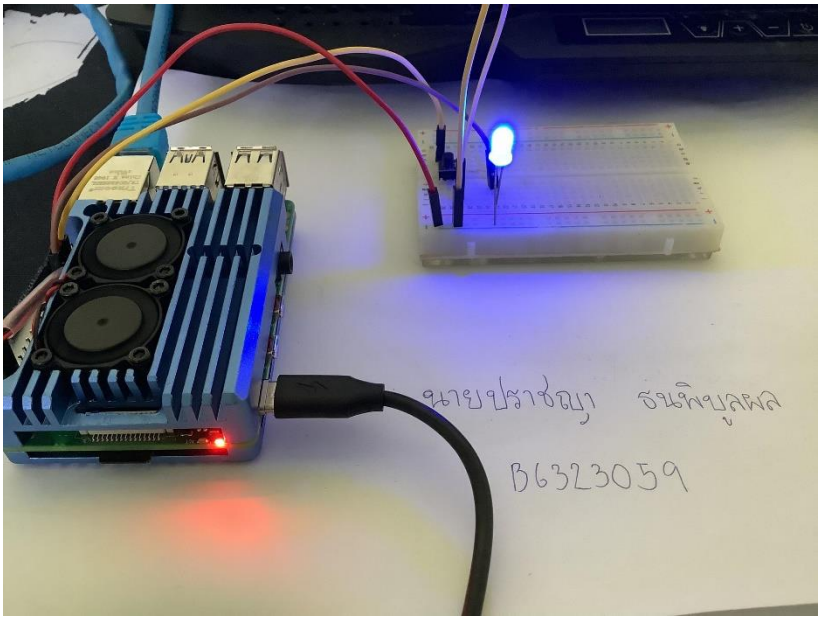
การสร้าง **MQTT Server** บน **Raspberry Pi** เพื่อใช้งาน **Chatbot LINE** ในฟาร์มอัจฉริยะ **Chatbot LINE from Raspberry Pi MQTT Server for Smart Farming**
ชื่อ-สกุล : นายปราชญา ธนพิบูลผล **รหัสนักศึกษา : B6323059**
6/6 – คำถามท้ายบทเพื่อทดสอบความเข้าใจ

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 Board numbering
GPIO.setup(LED_pin, GPIO.OUT) #Setup pin to output
GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)
while True:
        if (GPIO.input(SW_Pin)==1):
                GPIO.output(LED_pin,GPIO.HIGH) #Set LED pin to HIGH
                print("Input = 1, HIGH")
        else:
                GPIO.output(LED_pin,GPIO.LOW) #Set LED pin to LOW
                print("Input = 0, LOW")
        time.sleep(0.5)
```


geany_run_script_WPN261.sh
File Edit Tabs Help
Input = 1, HIGH
Input = 1, HIGH
Input = 1, HIGH
Input = 1, HIGH
Input = 1, HIGH
Input = 1, HIGH
Input = 1, HIGH
Input = 1, HIGH
Input = 0, LOW
Input = 0, LOW
Input = 0, LOW
Input = 1, HIGH
Input = 1, HIGH
Input = 1, HIGH
Input = 1, HIGH
Input = 0, LOW
Input = 0, LOW
Input = 0, LOW
Input = 0, LOW
Input = 1, HIGH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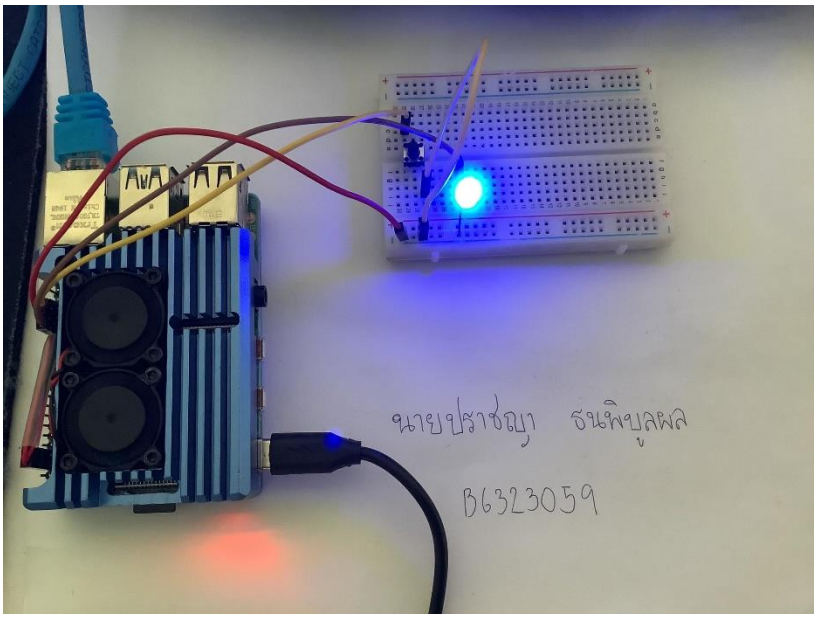
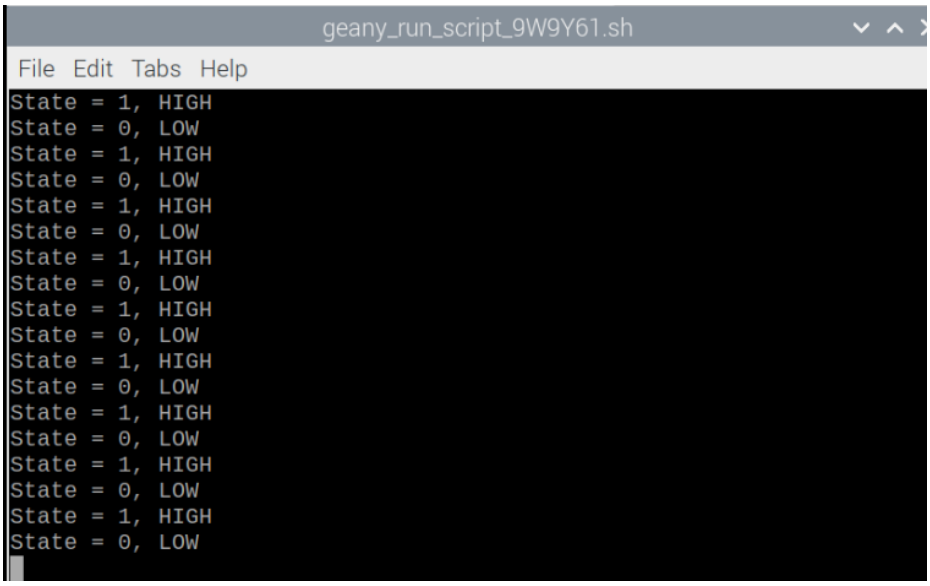
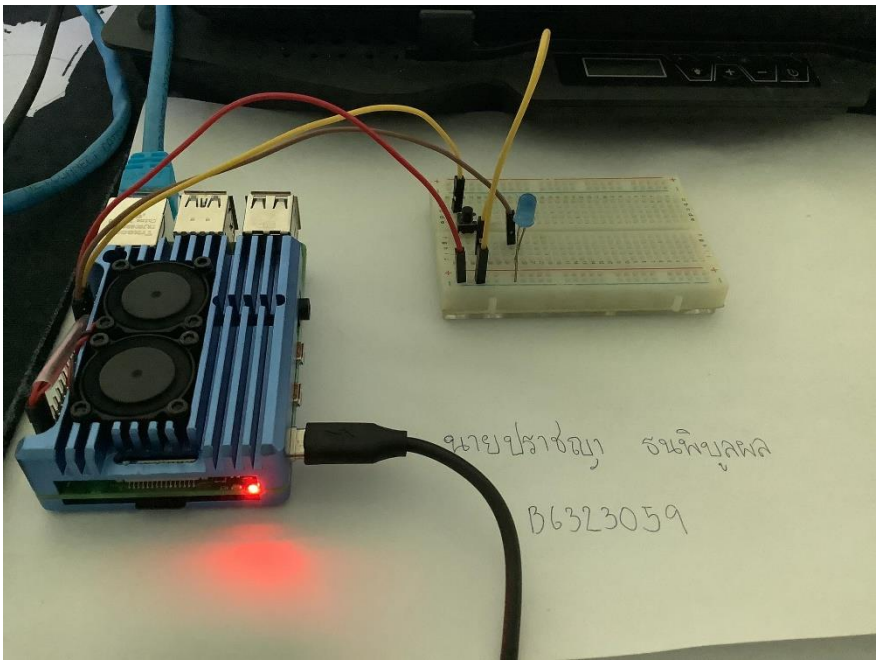


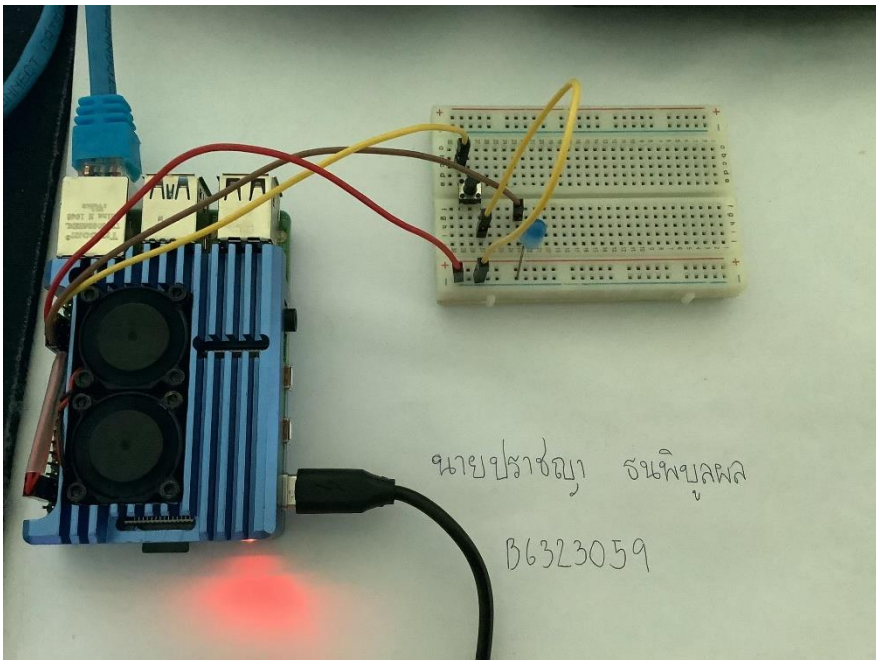
Python.2 - Python Switch control LED >> กดติด กดดับ

```
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

SW_State = 0

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

GPIO.setwarnings(False)

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 (SW_State==0):

                SW_State = 1
```

```
            GPIO.output(LED_pin,GPIO.HIGH) # Set LED pin to HIGH
            print("State = 1, HIGH")
        else:
            SW_State = 0
            GPIO.output(LED_pin,GPIO.LOW) # Set LED pin to LOW
            print("State = 0, LOW")
        time.sleep(0.5)
```



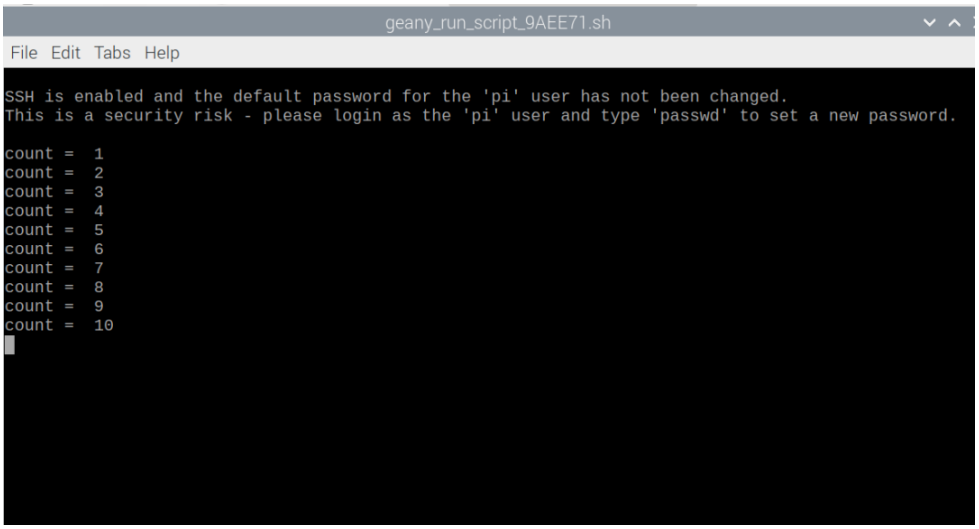


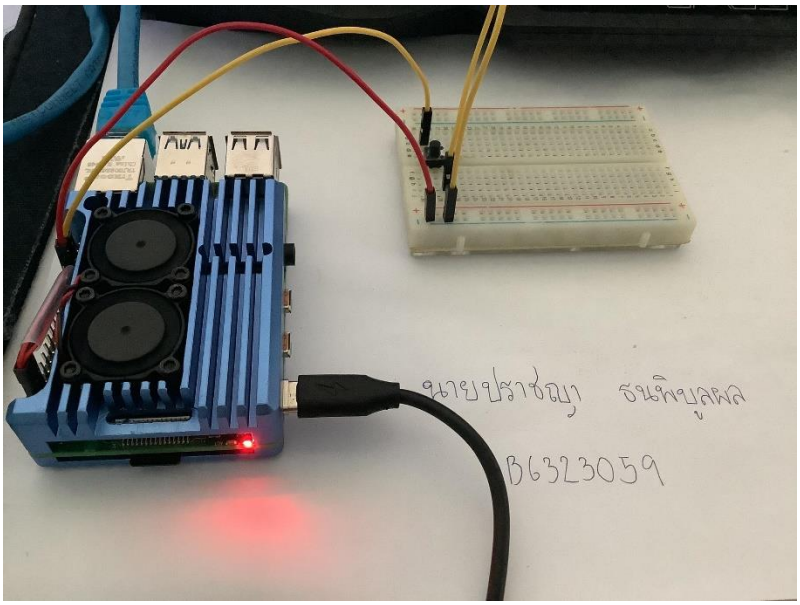


POython.3 - Python Switch >> Switch Counter

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

import time      # Add time library to a Python sketch

SW_Pin = 36    # Ref Board
```

```
count = 0

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

GPIO.setwarnings(False)

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

  count += 1

  print("count = ", count)

 time.sleep(0.5)
```

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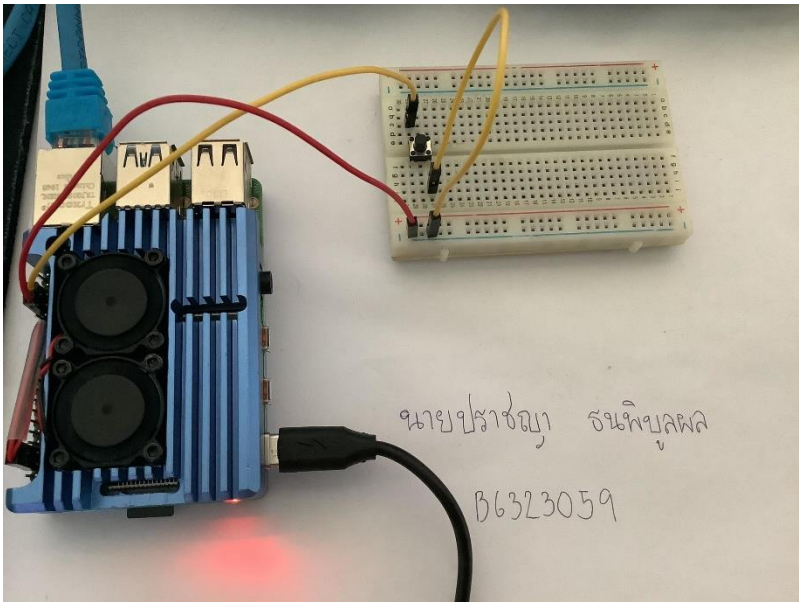
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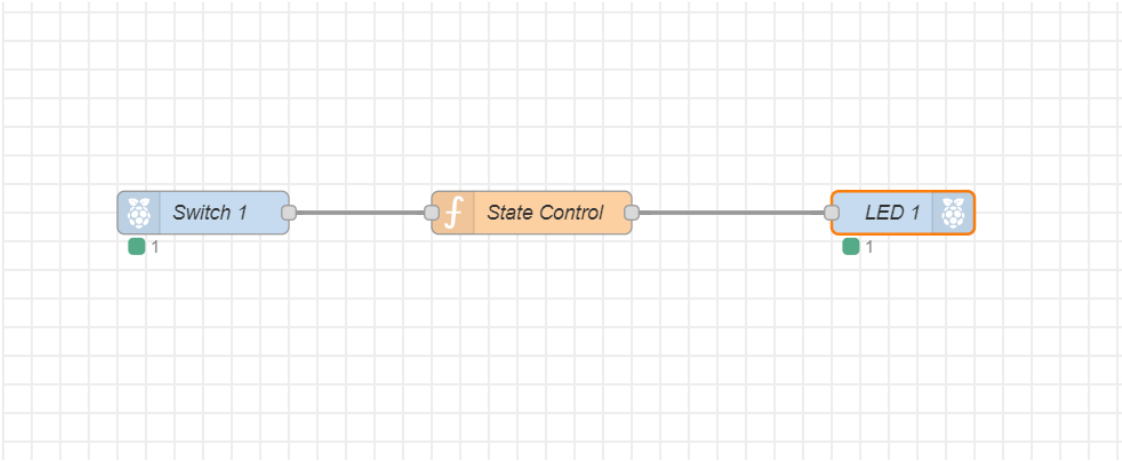
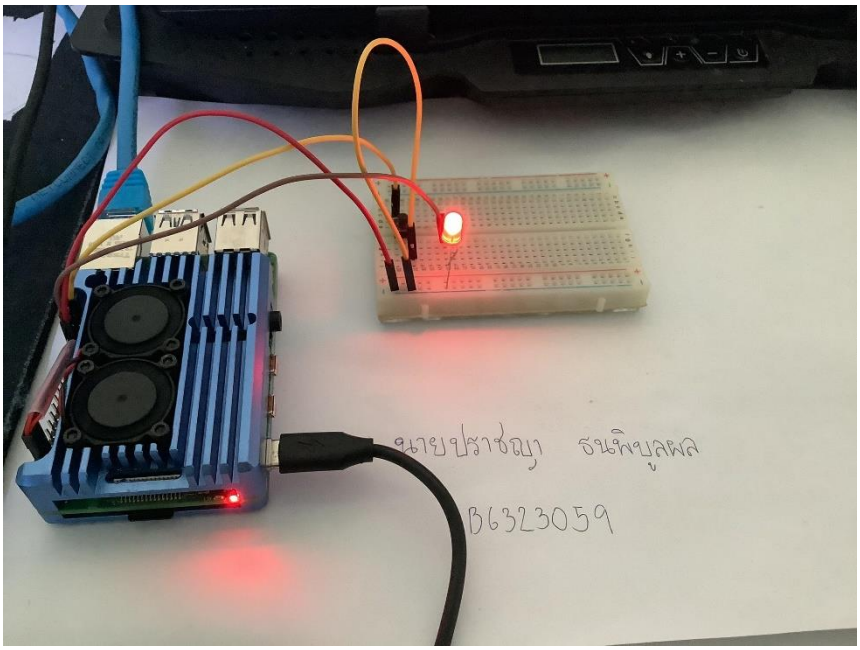
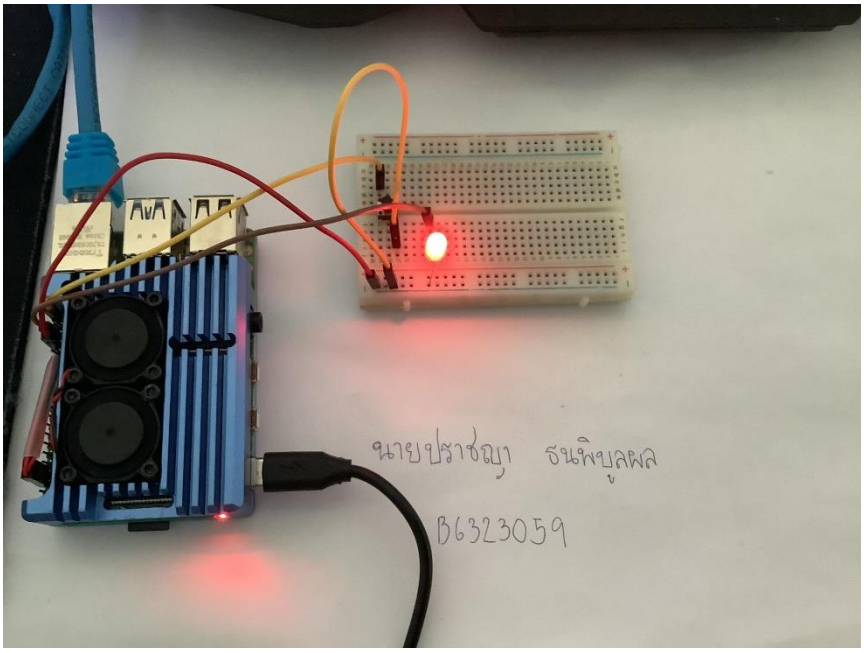
Quiz_102 – ทดสอบ RPi4 GPIO with Node-RED

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


```
[{"id":"51676f5ae1675c99","type":"tab","label":"D16_4","disabled":false,"info":"","env":[]},{"id":"eec1119ce2081360","type":"rpi-gpio in","z":"51676f5ae1675c99","name":"Switch 1","pin":"21","intype":"up","debounce":"25","read":false,"bcm":true,"x":220,"y":300,"wires":[["016c3e9be89901e3"]]},{"id":"06cb6823737d2dfc","type":"rpi-gpio out","z":"51676f5ae1675c99","name":"LED 1","pin":"16","set":"","level":"0","freq":"","out":"out","bcm":true,"x":710,"y":300,"wires":[]},{"id":"016c3e9be89901e3","type":"function","z":"51676f5ae1675c99","name":"State Control","func":"context.state = context.state | false;\ncontext.state = !context.state\n\nvar myContext = context.state;\nvar count = context.get(\"count\")||0;\ncount += 1;\ncontext.set(\"count\",count);\nmsg.count = count;\n\nfunction isOdd(num) { \n    return num % 2;\n}\n\nif(myContext === true && isOdd((count+1)/2) ===1){\n    msg.payload = 1;\n    return msg;\n} else if (myContext === true && isOdd((count+1)/2) ===0){\n    msg.payload = 0;\n    return msg;\n}","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":450,"y":300,"wires":[["06cb6823737d2dfc"]]}]
```

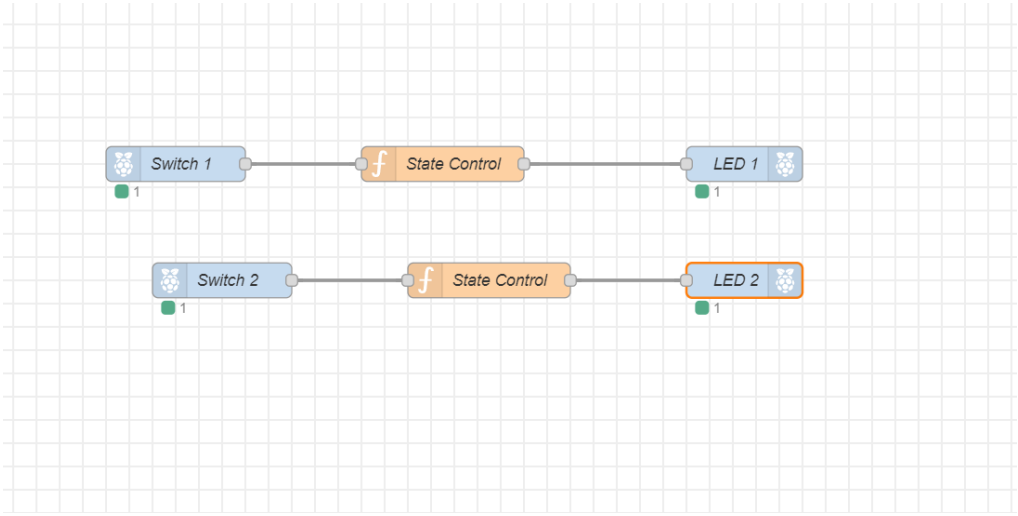


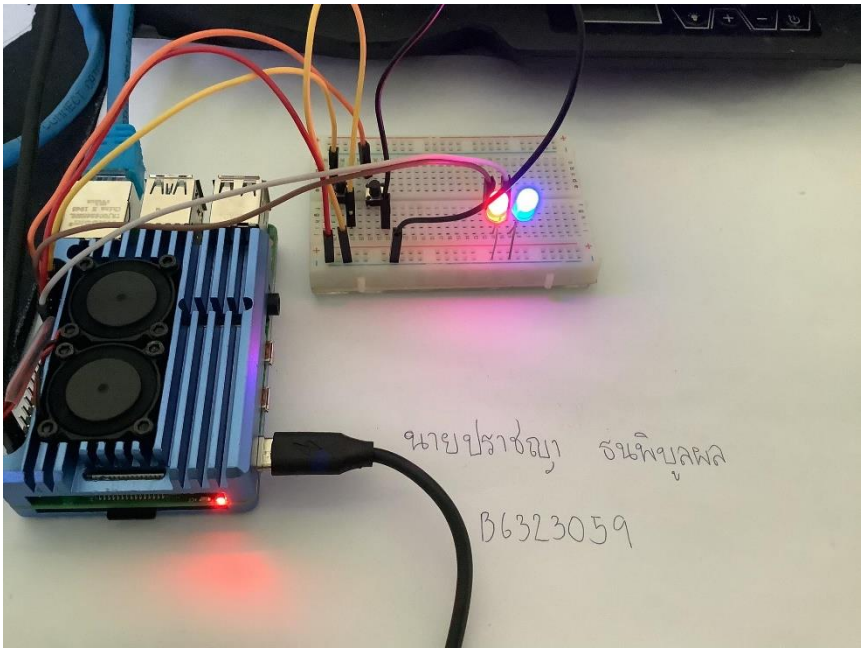


Node-RED.2 - Node-RED เพื่อควบคุมสวิตซ์กดแบบ กดติด กดดับ 2 คู่

[{"id":"3bc7f3a61e01033d","type":"tab","label":"D16_5","disabled":false,"info":"","env":[]},{"id":"f8194
9968688a337","type":"rpi-gpio in","z":"3bc7f3a61e01033d","name":"Switch
1","pin":"21","intype":"up","debounce":"25","read":false,"bcm":true,"x":220,"y":300,"wires":[["273d71
41a471f508"]]},{"id":"1b8f9a2505dfa6b9","type":"rpi-gpio

out","z":"3bc7f3a61e01033d","name":"LED
1","pin":"16","set":"","level":"0","freq":"","out":"out","bcm":true,"x":710,"y":300,"wires":[]},{"id":"273d7
141a471f508","type":"function","z":"3bc7f3a61e01033d","name":"State
Control","func":"context.state = context.state | false;\ncontext.state = !context.state\n\nvar
myContext = context.state;\nvar count = context.get(\"count\")||0;\ncount +=
1;\ncontext.set(\"count\",count);\nmsg.count = count;\n\nfunction isOdd(num) { \n return num %
2;\n}\n\nif(myContext === true && isOdd((count+1)/2) ===1){\n msg.payload = 1;\n return
msg;\n} else if (myContext === true && isOdd((count+1)/2) ===0){\n msg.payload = 0;\n
return
msg;\n}","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":450,"y":300,"wires":[["1b8f9a2505
dfa6b9"]]},{"id":"d30c4918a71a98c3","type":"rpi-gpio out","z":"3bc7f3a61e01033d","name":"LED
2","pin":"12","set":"","level":"0","freq":"","out":"out","bcm":true,"x":710,"y":400,"wires":[]},{"id":"836c8
124b9ef3817","type":"rpi-gpio in","z":"3bc7f3a61e01033d","name":"Switch
2","pin":"20","intype":"up","debounce":"25","read":false,"bcm":true,"x":260,"y":400,"wires":[["ad45a8
47409e7858"]]},{"id":"ad45a847409e7858","type":"function","z":"3bc7f3a61e01033d","name":"State
Control","func":"context.state = context.state | false;\ncontext.state = !context.state\nvar
myContext = context.state;\nvar count = context.get(\"count\")||0;\ncount +=
1;\ncontext.set(\"count\",count);\nmsg.count = count;\nfunction isOdd(num) { return num %
2;}\n\nif(myContext === true && isOdd((count+1)/2) ===1){\n msg.payload = 1;\n return
msg;\n} else if (myContext === true && isOdd((count+1)/2) ===0){\n msg.payload = 0;\n
return
msg;\n}","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":490,"y":400,"wires":[["d30c4918a
71a98c3"]]}]


Switch 1
State Control
LED 1
Switch 2
State Control
LED 2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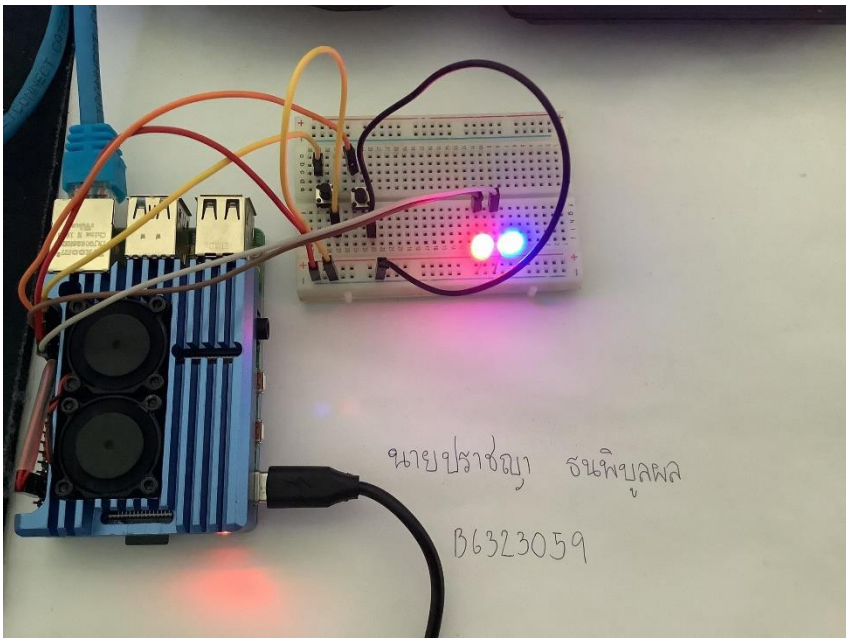
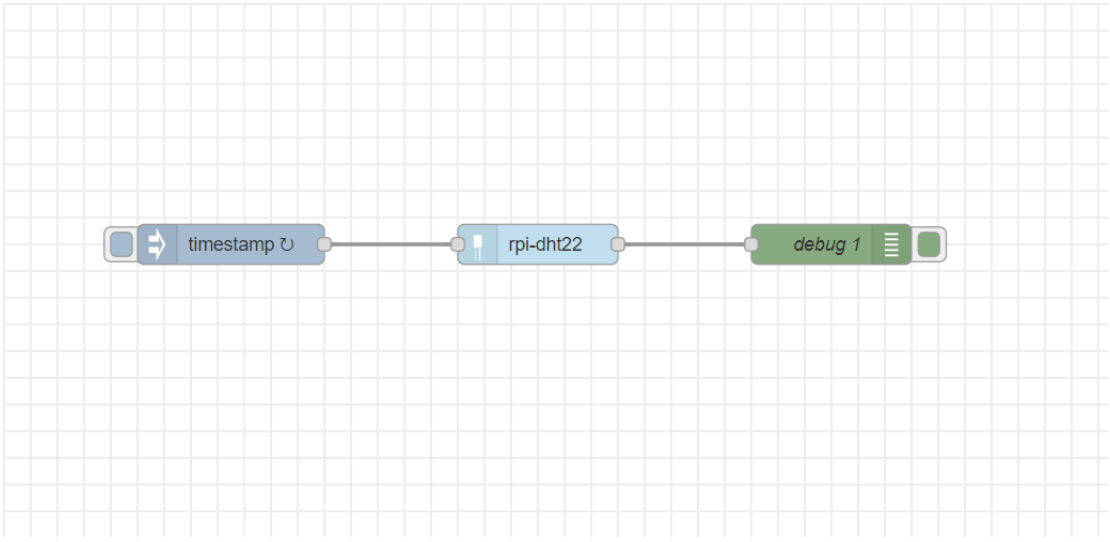
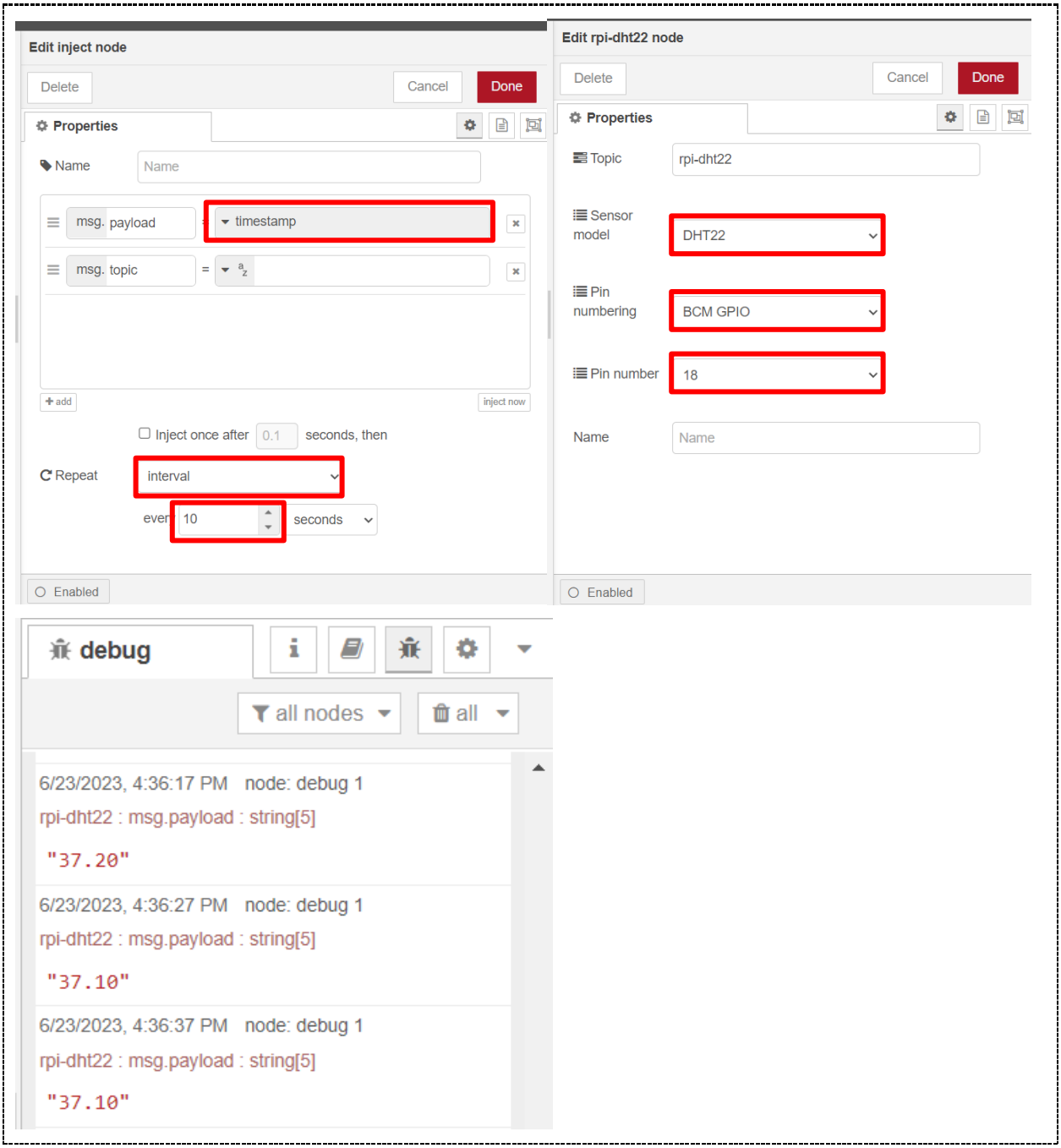
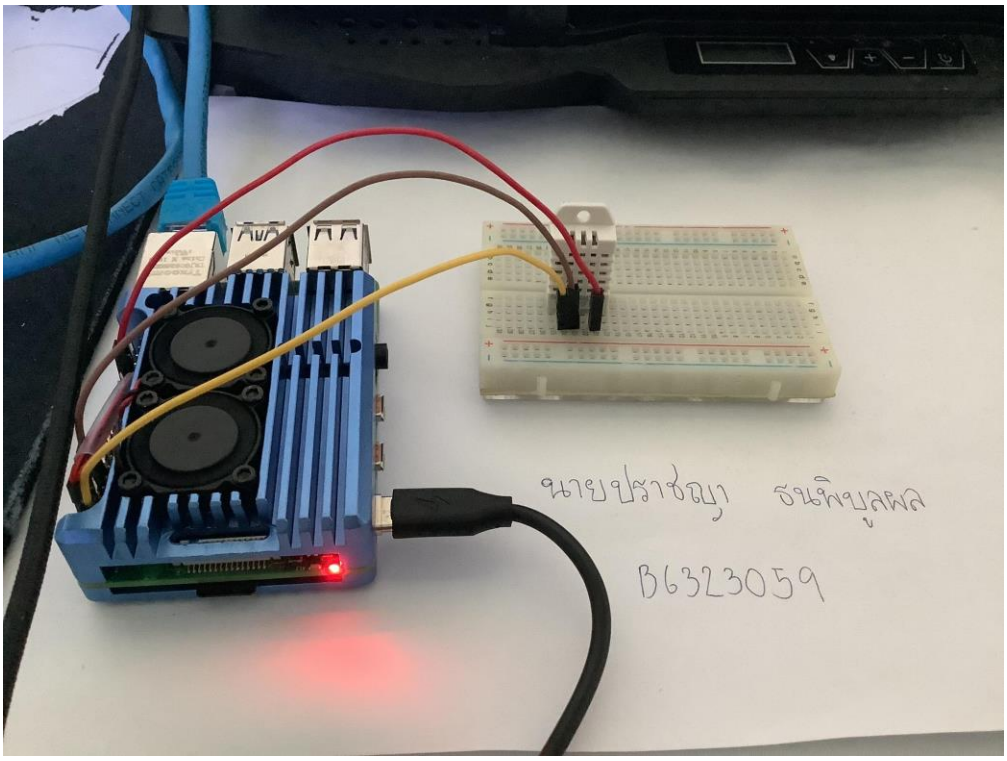


Node-RED.3 - Node-RED เพื่ออ่าน DHT-22 Sensor




Edit inject node
Delete
Cancel
Done
Properties
Name
Name
msg. payload
timestamp
msg. topic
add
inject now
Inject once after
0.1
seconds, then
Repeat
interval
every
10
seconds
Enabled
Edit rpi-dht22 node
Delete
Cancel
Done
Properties
Topic
rpi-dht22
Sensor model
DHT22
Pin numbering
BCM GPIO
Pin number
18
Name
Name
Enabled
debug
all nodes
all
6/23/2023, 4:36:17 PM node: debug 1
rpi-dht22 : msg.payload : string[5]
"37.20"
6/23/2023, 4:36:27 PM node: debug 1
rpi-dht22 : msg.payload : string[5]
"37.10"
6/23/2023, 4:36:37 PM node: debug 1
rpi-dht22 : msg.payload : string[5]
"37.10"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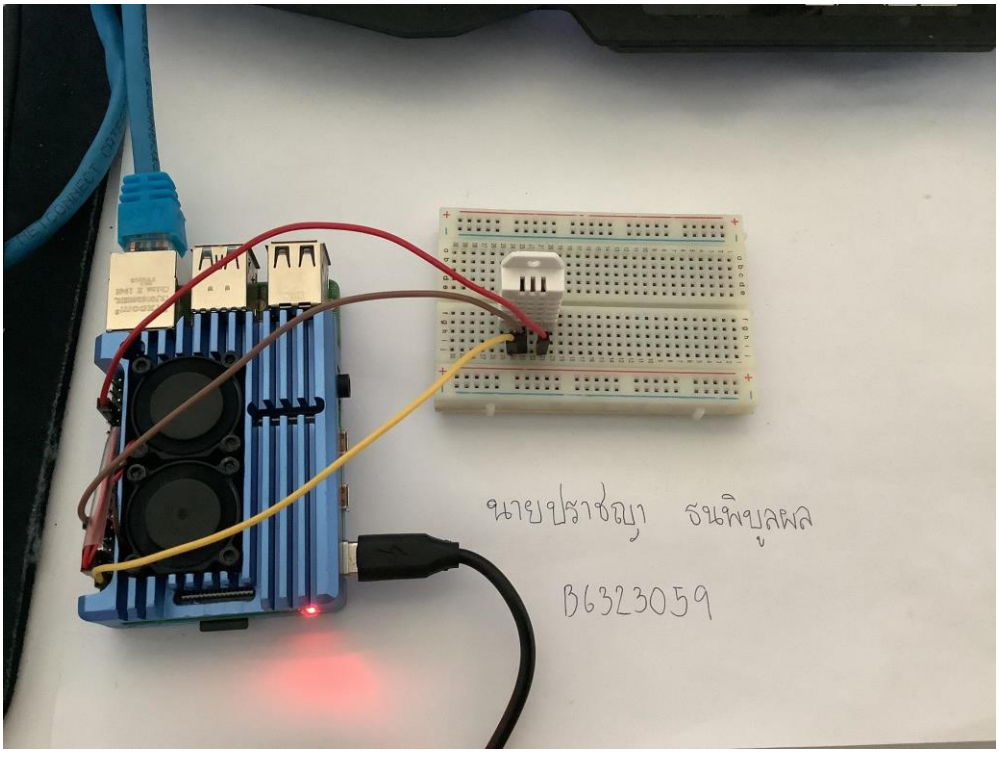
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