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

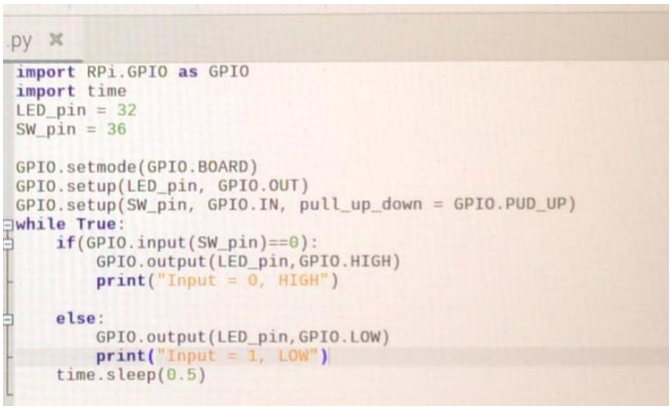
ชื่อ-สกุล : นางสาวณัฐชยา ผ่องกุศล B6226718

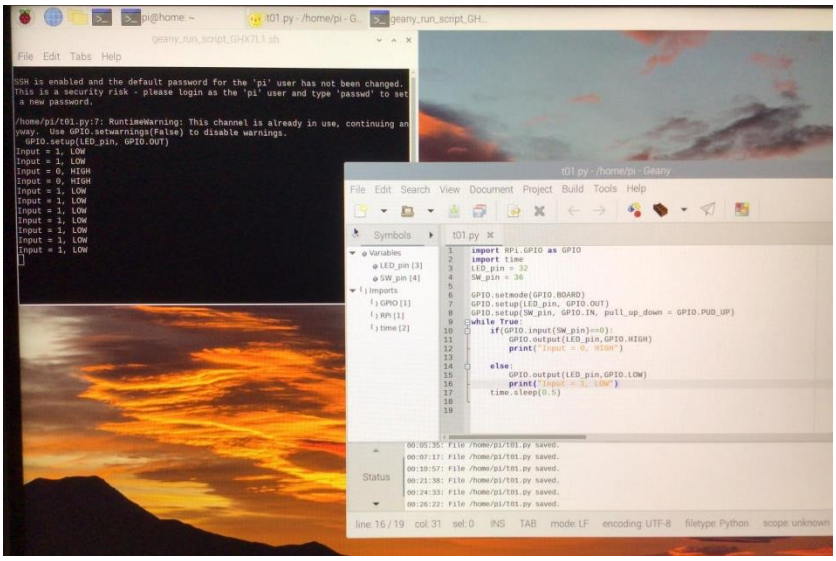
6/6 – คำถามท้ายบทเพื่อทดสอบความเข้าใจ

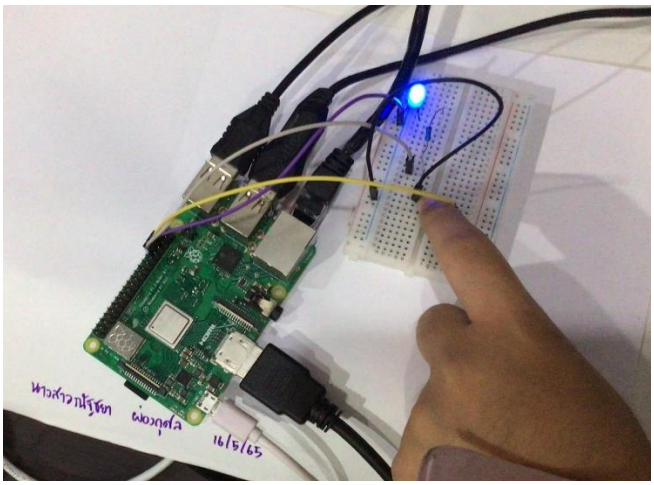
Quiz_101 – ทดสอบ RPi4 GPIO with Python

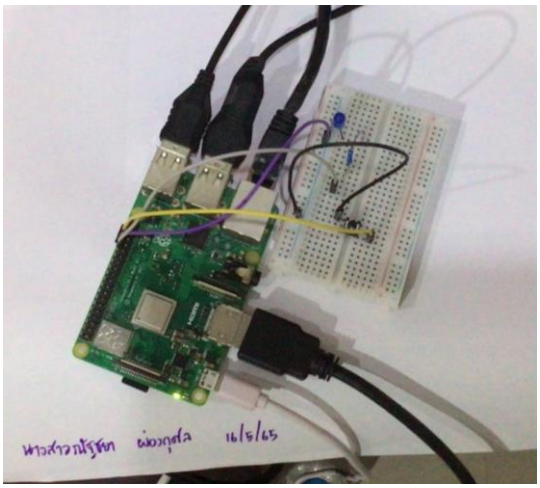
Python.1 - Python Switch control LED >> กดติด ปล่อยดับ

```
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)
```




File Edit Tabs Help
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:7: RuntimeWarning: This channel is already in use, continuing anyway. Use GPIO.setwarnings(False) to disable warnings.
GPIO.setup(LED_pin, GPIO.OUT)
Input = 1, LOW
Input = 1, LOW
Input = 0, HIGH
Input = 0, HIGH
Input = 1, LOW
Input = 1, LOW
Input = 1, LOW
Input = 1, LOW
Input = 1, LOW
Input = 1, LOW
t01.py - /home/pi - Geany
File Edit Search View Document Project Build Tools Help
Symbols
t01.py
import RPi.GPIO as GPIO
import time
LED_pin = 32
SW_pin = 36
GPIO.setmode(GPIO.BOARD)
GPIO.setup(LED_pin, GPIO.OUT)
GPIO.setup(SW_pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)
while True:
if(GPIO.input(SW_pin)==0):
GPIO.output(LED_pin,GPIO.HIGH)
print("Input = 0, HIGH")
else:
GPIO.output(LED_pin,GPIO.LOW)
print("Input = 1, LOW")
time.sleep(0.5)
Status
00:05:35: File /home/pi/t01.py saved.
00:07:17: File /home/pi/t01.py saved.
00:10:57: File /home/pi/t01.py saved.
00:21:36: File /home/pi/t01.py saved.
00:24:33: File /home/pi/t01.py saved.
00:26:22: File /home/pi/t01.py saved.
line: 16 / 19 col: 31 sel: 0 INS TAB mode: LF encoding: UTF-8 filetype: Python scope: unknown


16/5/65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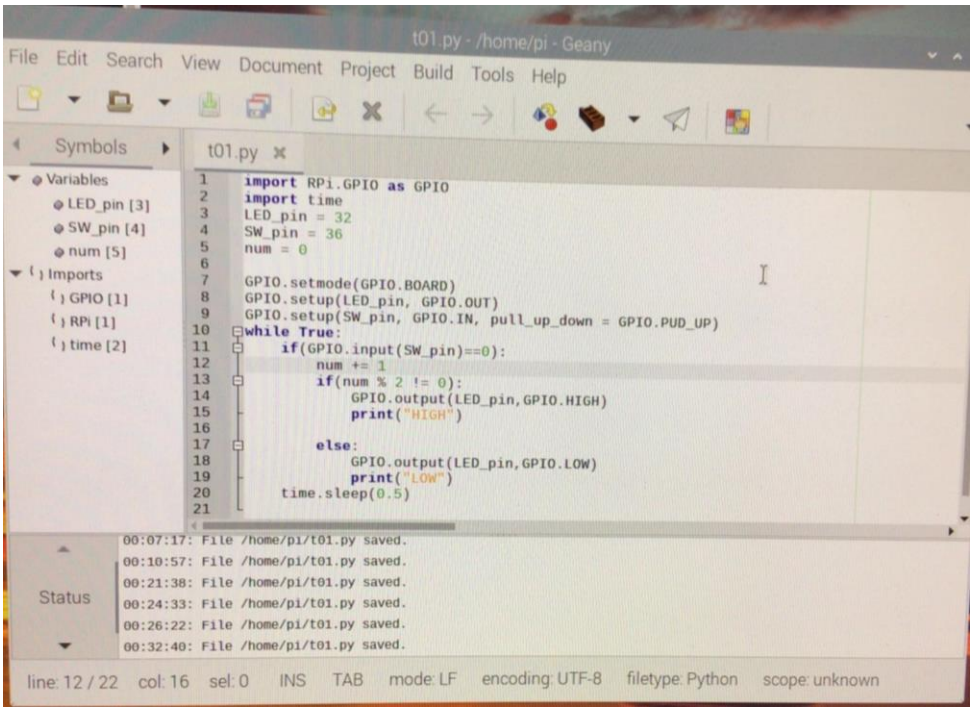
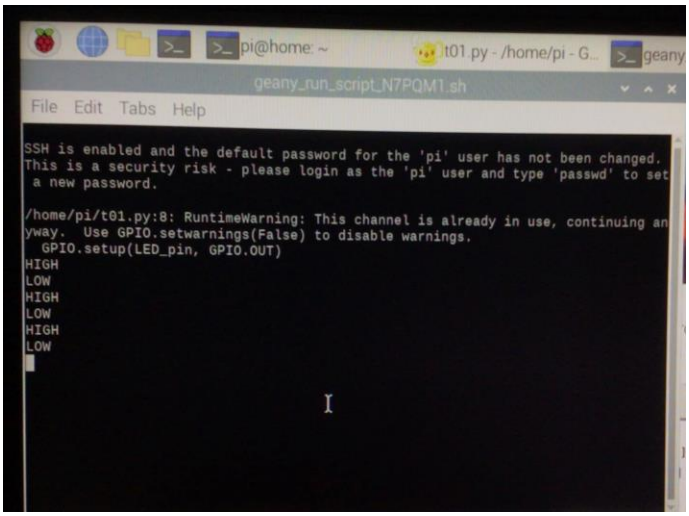
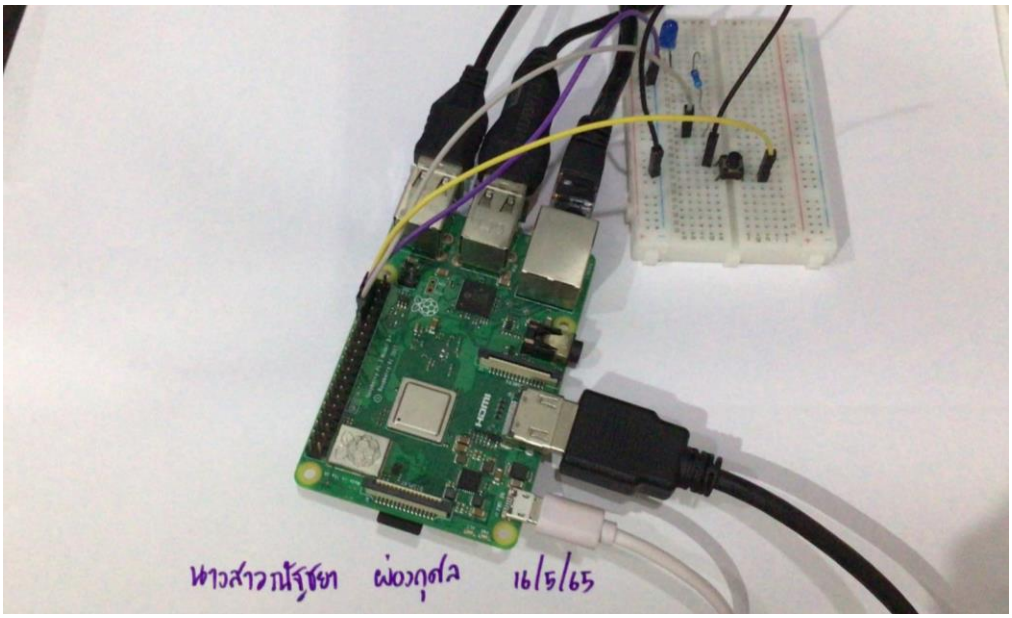
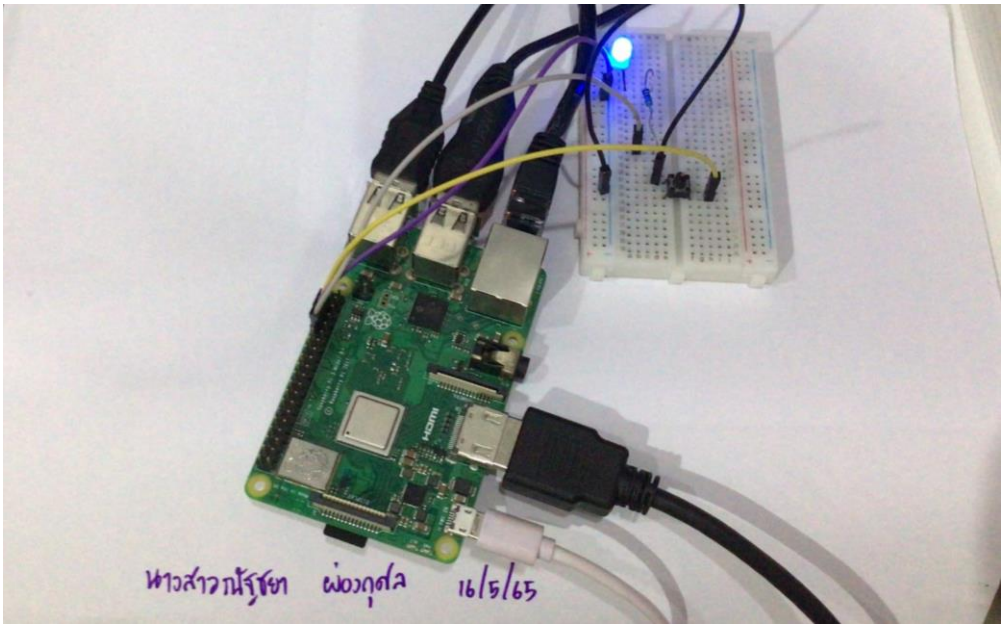
Python.2 - Python Switch control LED >> กดติด กดดับ

```
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
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)
```


t01.py - /home/pi - Geany
File Edit Search View Document Project Build Tools Help
Symbols
t01.py
Variables
LED_pin [3]
SW_pin [4]
num [5]
Imports
GPIO [1]
RPi [1]
time [2]
1 import RPi.GPIO as GPIO
2 import time
3 LED_pin = 32
4 SW_pin = 36
5 num = 0
6
7 GPIO.setmode(GPIO.BOARD)
8 GPIO.setup(LED_pin, GPIO.OUT)
9 GPIO.setup(SW_pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)
10 while True:
11 if(GPIO.input(SW_pin)==0):
12 num += 1
13 if(num % 2 != 0):
14 GPIO.output(LED_pin,GPIO.HIGH)
15 print("HIGH")
16
17 else:
18 GPIO.output(LED_pin,GPIO.LOW)
19 print("LOW")
20 time.sleep(0.5)
21
Status
00:07:17: File /home/pi/t01.py saved.
00:10:57: File /home/pi/t01.py saved.
00:21:38: File /home/pi/t01.py saved.
00:24:33: File /home/pi/t01.py saved.
00:26:22: File /home/pi/t01.py saved.
00:32:40: File /home/pi/t01.py saved.
line: 12 / 22 col: 16 sel: 0 INS TAB mode: LF encoding: UTF-8 filetype: Python scope: unknown


pi@home: ~
t01.py - /home/pi - G...
geany
geany_run_script_N7PQM1.sh
File Edit Tabs Help
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)
HIGH
LOW
HIGH
LOW
HIGH
LOW

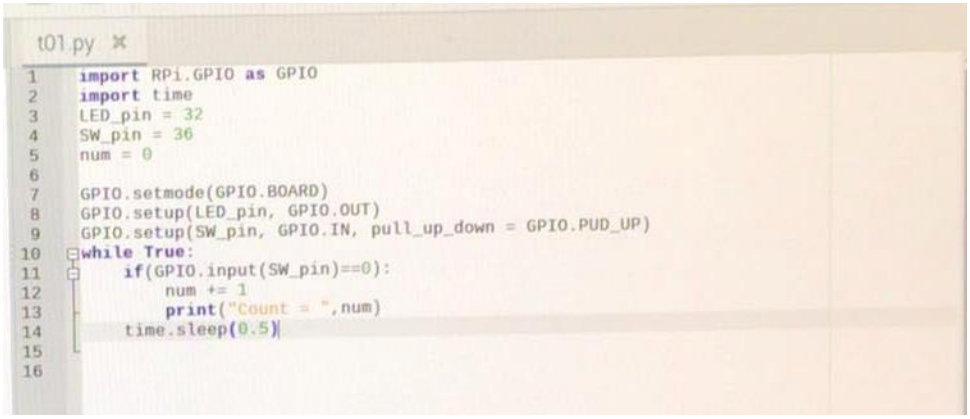


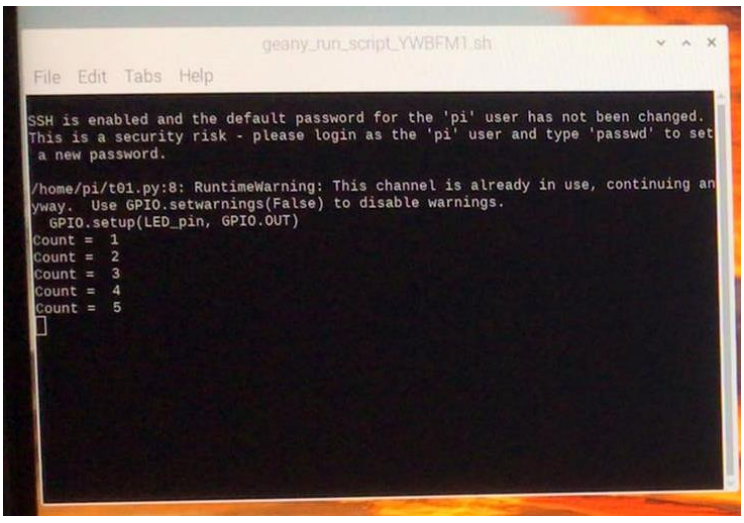


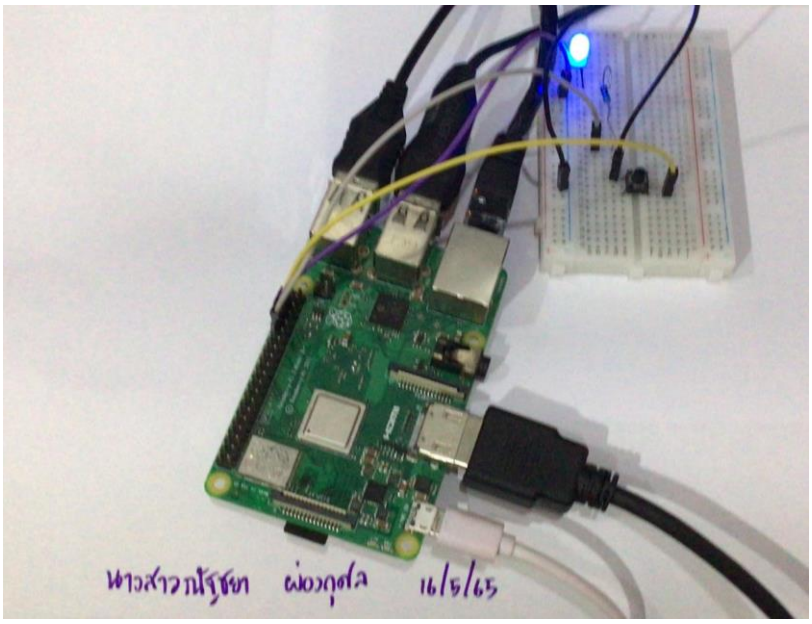
POython.3 - Python Switch >> Switch Counter

```
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
```

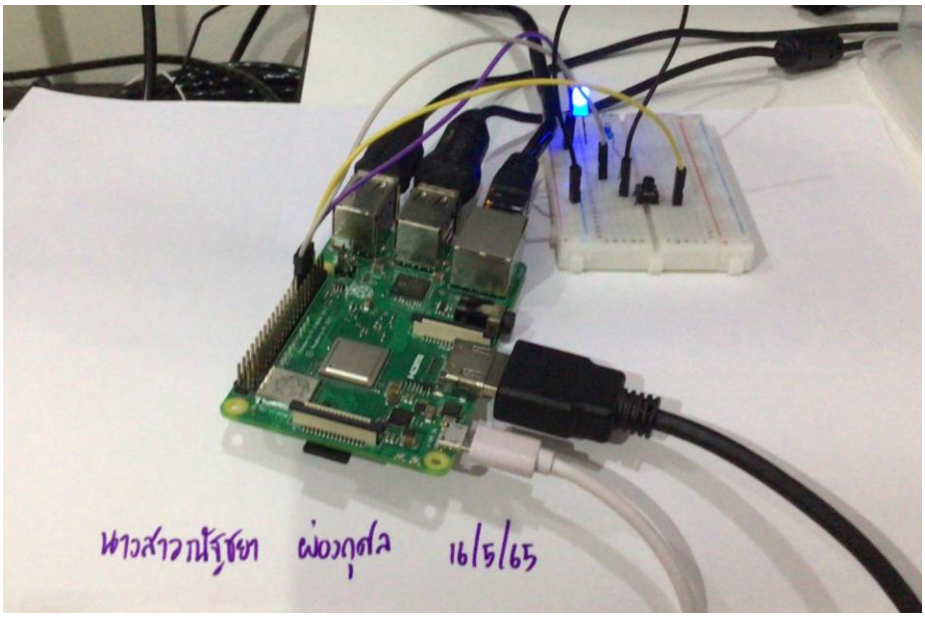
```
GPIO.setmode(GPIO.BOARD) #Setup GPIO using GPIO.Pin
GPIO.setup(LED_pin, GPIO.OUT) #Setup pin to output
GPIO.setup(SW_Pin, GPIO.IN, pull_up_down = GPIO.PUD_UP)
 #Setup pin to input and Pull-Up
while True:
 if (GPIO.input(SW_Pin)==0): # Read Botton pin
     num += 1
     print("Count = ",num)
 time.sleep(0.5)
```







จริงๆถอดหลอดไฟออกได้ แต่แถมให้ค่ะ



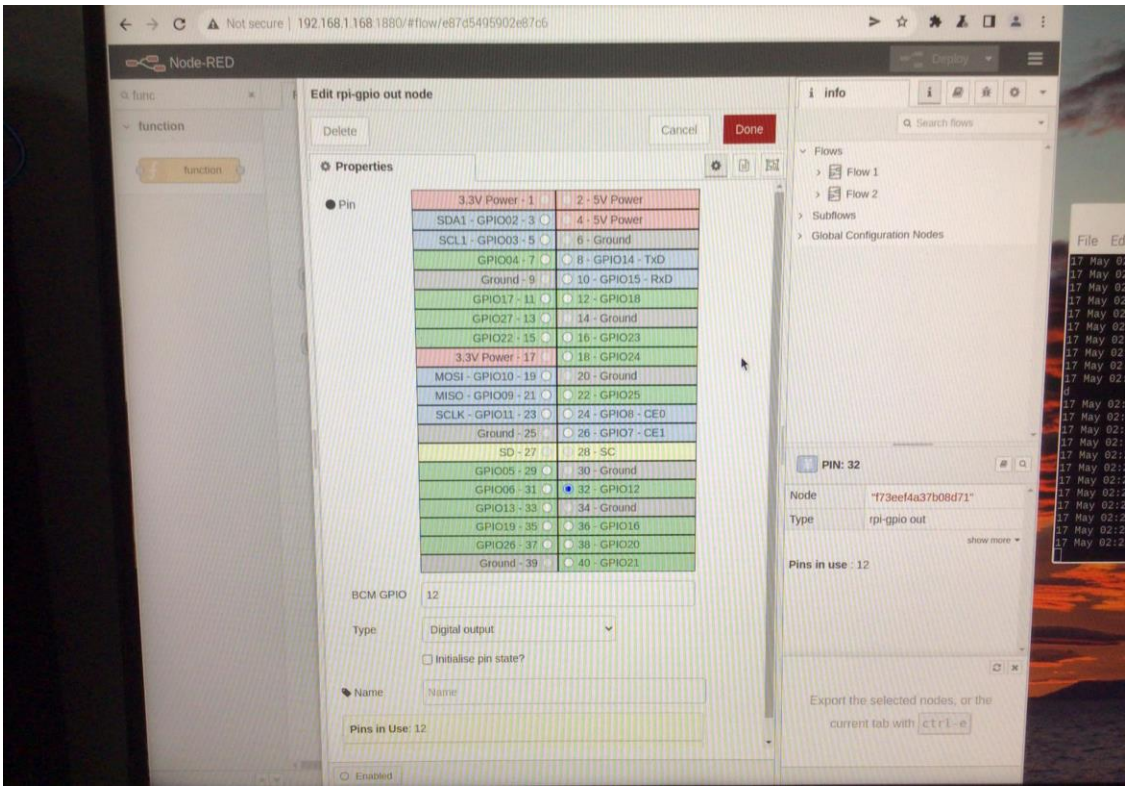
Quiz_102 – ทดสอบ RPi4 GPIO with Node-RED

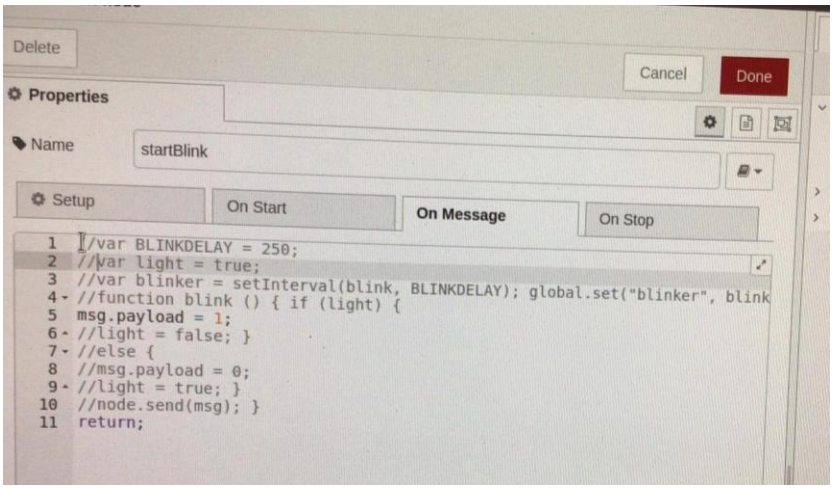
Node-RED.1 – Node-RED เพื่อควบคุมสวิตซ์กดแบบ กดติด กดดับ {Switch-LED 1 คู่}

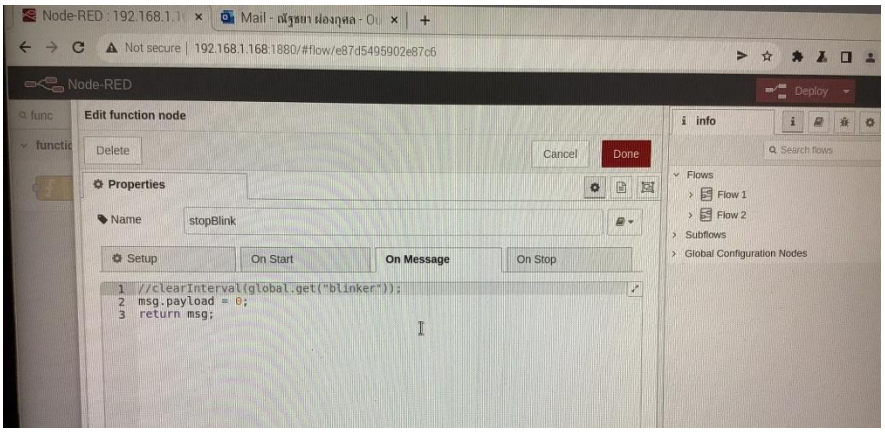
#Import

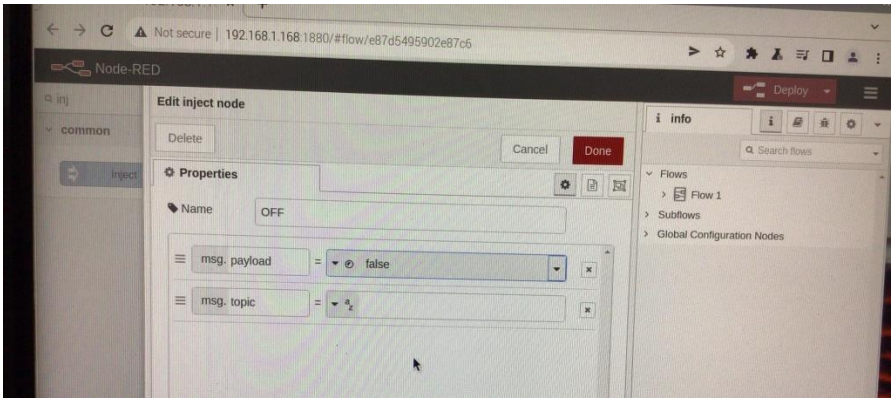
[{"id":"6ba26f4f.16d16","type":"tab","label":"Flow 2","disabled":false,"info":""},{"id":"740a99d2.b07d1","type":"function","z":"6ba26f4f.16d16","name":"startBlink","func":"var BLINKDELAY = 250;\n\nvar light = true;\n\n\nvar blinker = setInterval(blink, BLINKDELAY);\n\nglobal.set(\"blinker\", blinker);\n\nfunction blink () {\n \n if (light) {\n msg.payload = 1;\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.bbffc"]]},{"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.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.1b547c","type":"inject","z":"6ba26f4f.16d16","name":"","repeat":"","crontab":"","once":false,"topic":"","payload":"","payloadType":"date","x":201,"y":213,"wires":[["cc1b11b1.bebb28"]]}]

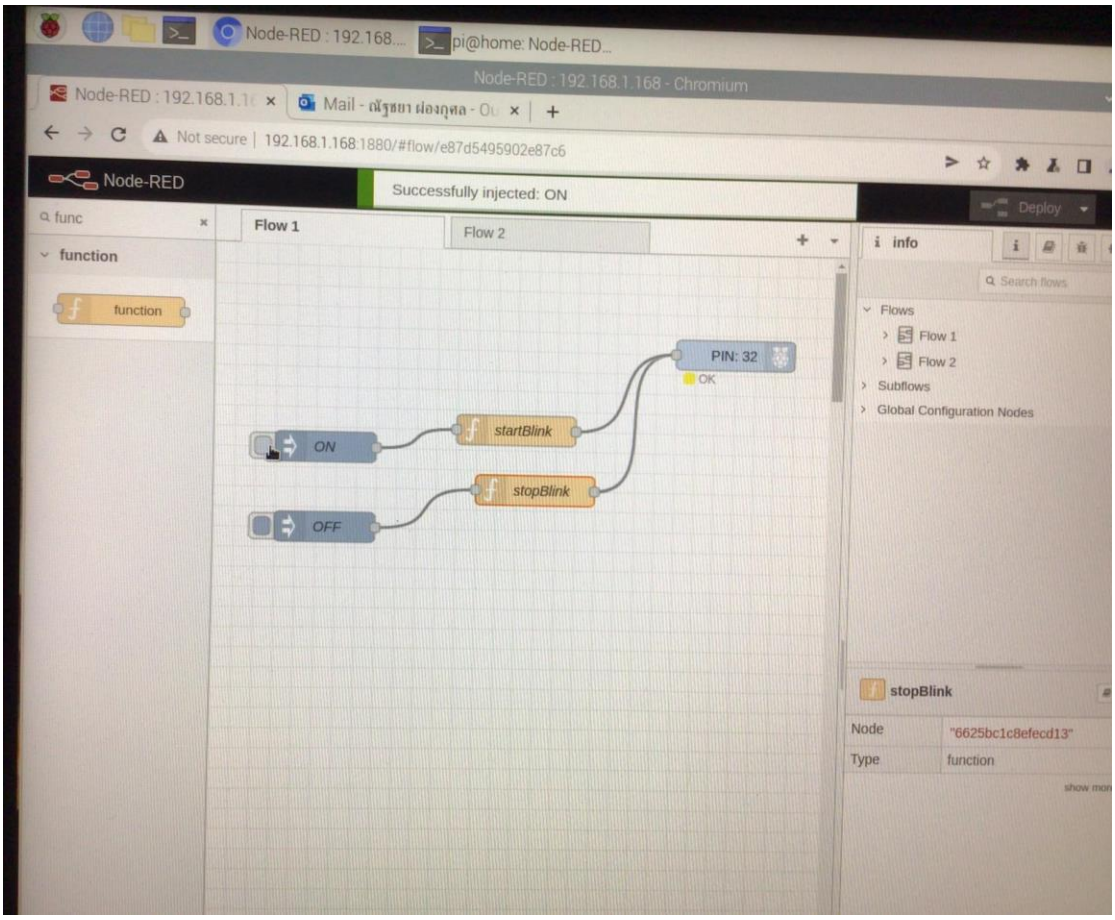
```
#Start Blink function

msg.payload = 1;

return;

#Stop Blink function

msg.payload = 0;

return msg;
```

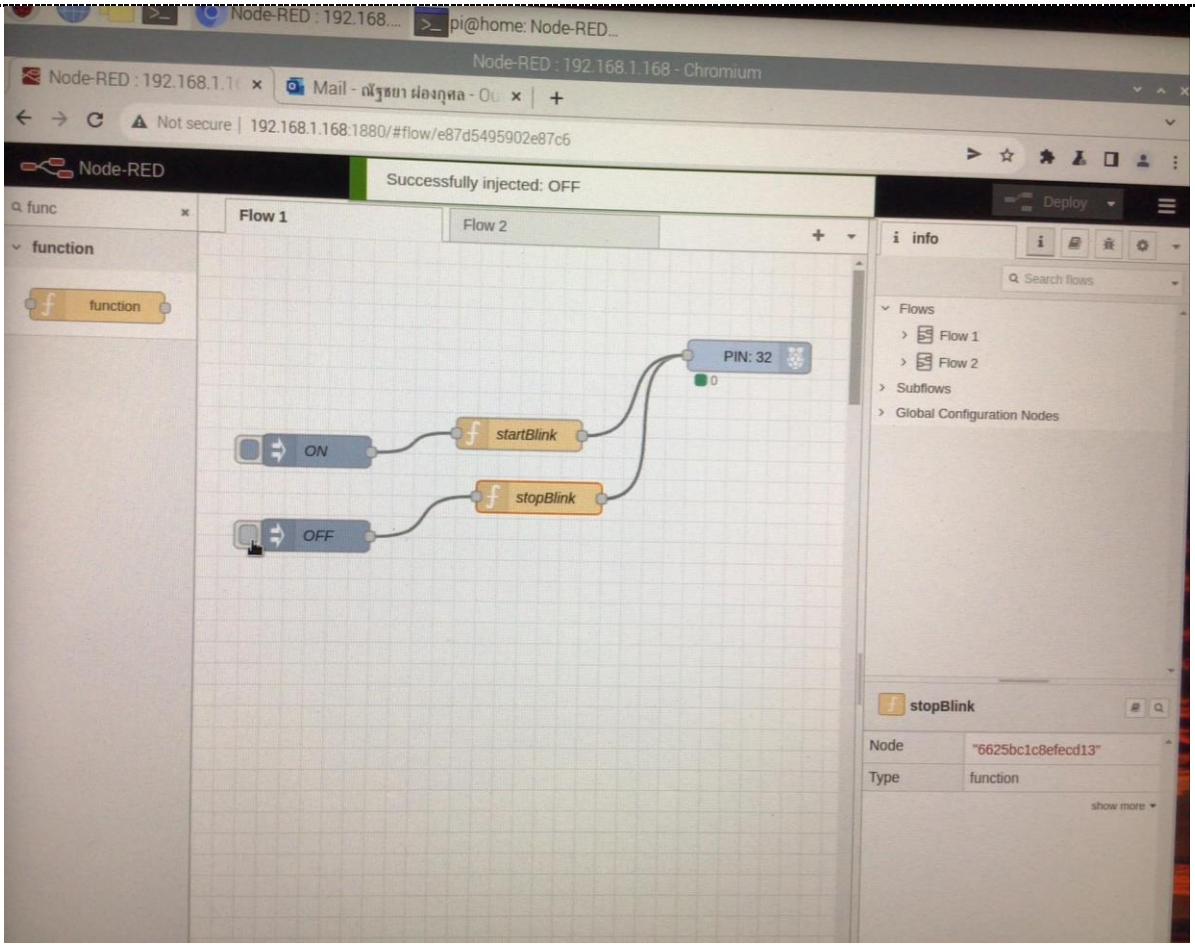

Not secure | 192.168.1.168:1880/#flow/e87d5495902e87c6
Node-RED
Deploy
Edit rpi-gpio out node
Delete
Cancel
Done
Properties
Pin
3.3V Power - 1
2 - 5V Power
SDA1 - GPIO02 - 3
4 - 5V Power
SCL1 - GPIO03 - 5
6 - Ground
GPIO04 - 7
8 - GPIO14 - TxD
Ground - 9
10 - GPIO15 - RxD
GPIO17 - 11
12 - GPIO18
GPIO27 - 13
14 - Ground
GPIO22 - 15
16 - GPIO23
3.3V Power - 17
18 - GPIO24
MOSI - GPIO10 - 19
20 - Ground
MISO - GPIO09 - 21
22 - GPIO25
SCLK - GPIO11 - 23
24 - GPIO8 - CE0
Ground - 25
26 - GPIO7 - CE1
SD - 27
28 - SC
GPIO05 - 29
30 - Ground
GPIO06 - 31
32 - GPIO12
GPIO13 - 33
34 - Ground
GPIO19 - 35
36 - GPIO16
GPIO26 - 37
38 - GPIO20
Ground - 39
40 - GPIO21
BCM GPIO
12
Type
Digital output
Initialise pin state?
Name
Name
Pins in Use: 12
Enabled
info
Search flows
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
PIN: 32
Node
"f73eef4a37b08d71"
Type
rpi-gpio out
show more
Pins in use : 12
Export the selected nodes, or the
current tab with ctrl-e

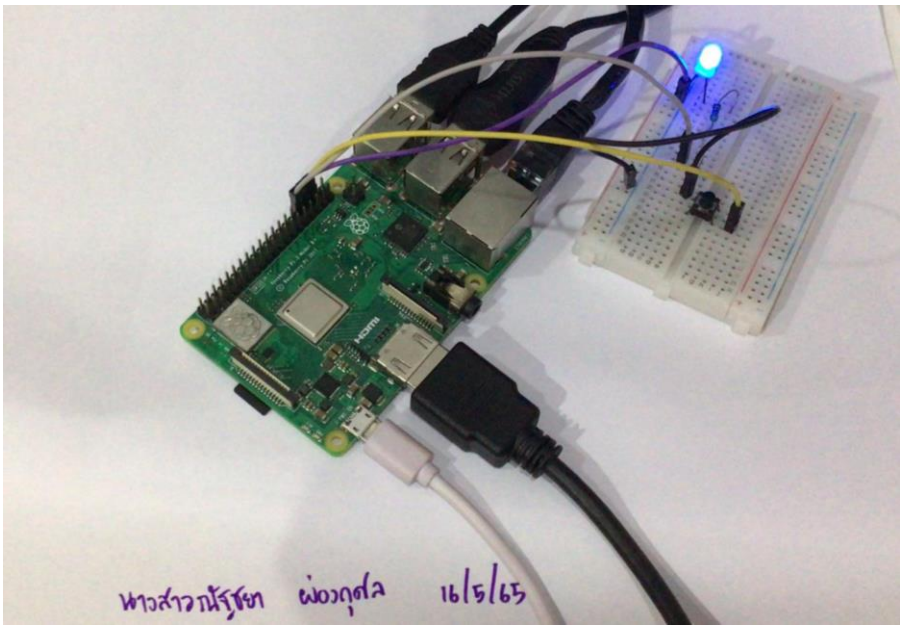

Delete
Cancel
Done
Properties
Name
startBlink
Setup
On Start
On Message
On Stop
1 //var BLINKDELAY = 250;
2 //var light = true;
3 //var blinker = setInterval(blink, BLINKDELAY); global.set("blinker", blink
4 //function blink () { if (light) {
5 msg.payload = 1;
6 //light = false; }
7 //else {
8 //msg.payload = 0;
9 //light = true; }
10 //node.send(msg); }
11 return;

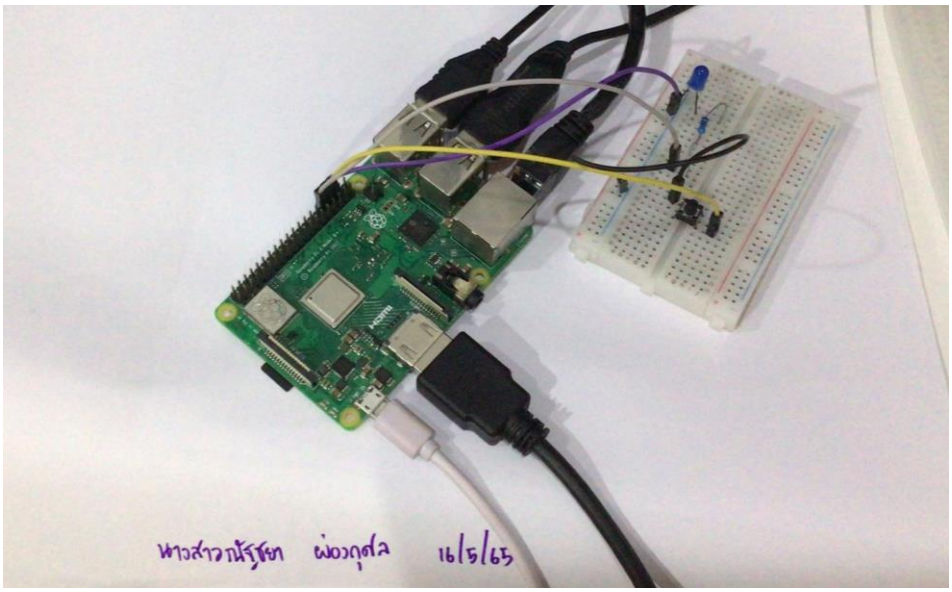

Node-RED : 192.168.1.1
Not secure | 192.168.1.168:1880/#flow/e87d5495902e87c6
Node-RED
Deploy
Edit function node
Delete
Cancel
Done
Properties
Name
stopBlink
Setup
On Start
On Message
On Stop
//clearInterval(global.get("blinker"));
msg.payload = 0;
return msg;
info
Search flows
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes


Not secure | 192.168.1.168:1880/#flow/e87d5495902e87c6
Node-RED
Deploy
Edit inject node
Delete
Cancel
Done
Properties
Name
OFF
msg. payload
false
msg. topic
info
Search flows
Flows
Flow 1
Subflows
Global Configuration Nodes


Node-RED : 192.168....
pi@home: Node-RED...
Node-RED : 192.168.1.168 - Chromium
Node-RED : 192.168.1.1
Mail - ณัฐชยา ผ่องกุศล - Ou
Not secure | 192.168.1.168:1880/#flow/e87d5495902e87c6
Node-RED
Successfully injected: ON
Deploy
func
function
function
Flow 1
Flow 2
ON
OFF
startBlink
stopBlink
PIN: 32
OK
info
Search flows
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
stopBlink
Node
"6625bc1c8efecd13"
Type
function


Node-RED : 192.168....
pi@home: Node-RED...
Node-RED : 192.168.1.168 - Chromium
Mail - ณัฐชยา ผ่องกุศล - Ou
Not secure | 192.168.1.168:1880/#flow/e87d5495902e87c6
Node-RED
Successfully injected: OFF
Deploy
func
function
function
Flow 1
Flow 2
info
Search flows
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
PIN: 32
0
ON
startBlink
stopBlink
OFF
stopBlink
Node
"6625bc1c8efecd13"
Type
function
show more


นางสาวณัฐชยา ผ่องกุศล 16/5/65



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

#Start Blink function

msg.payload = 1;

return;

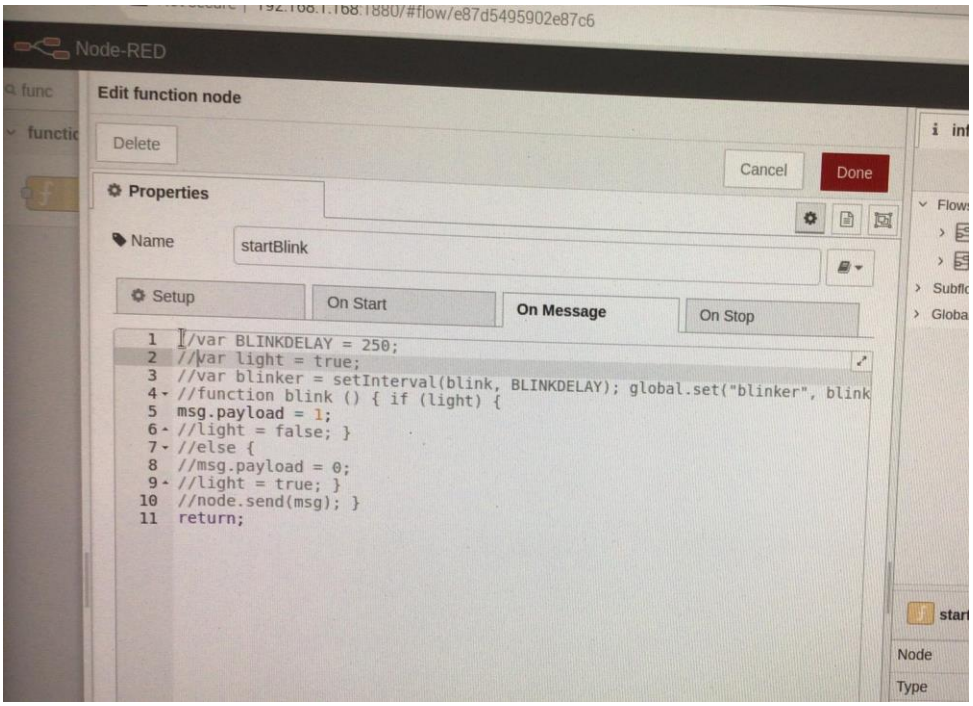
#Stop Blink function

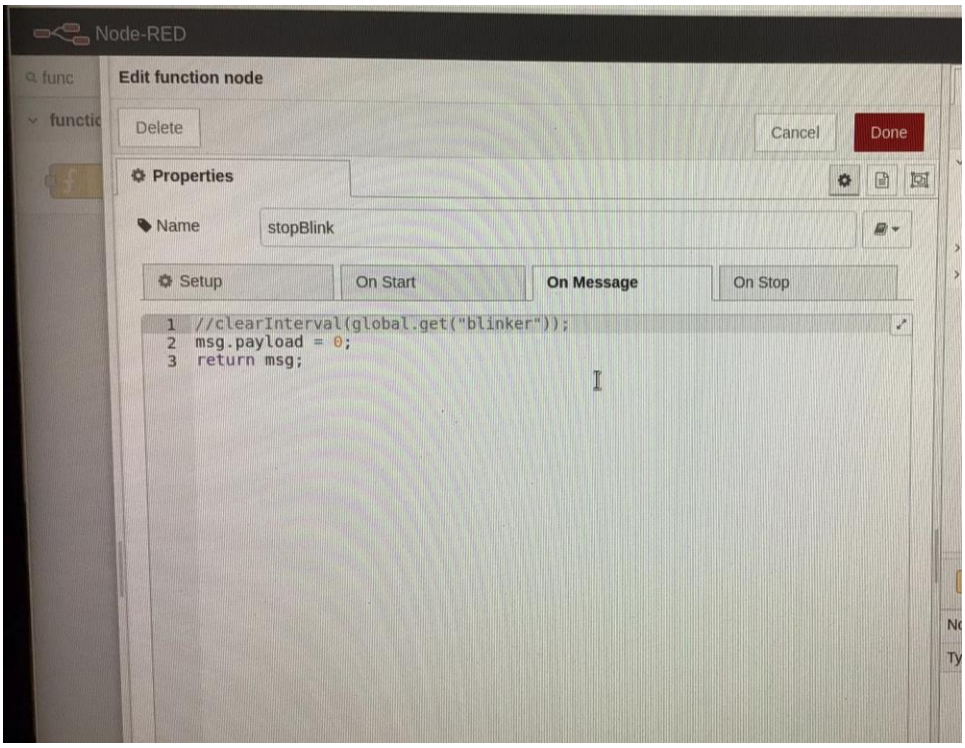
msg.payload = 0;

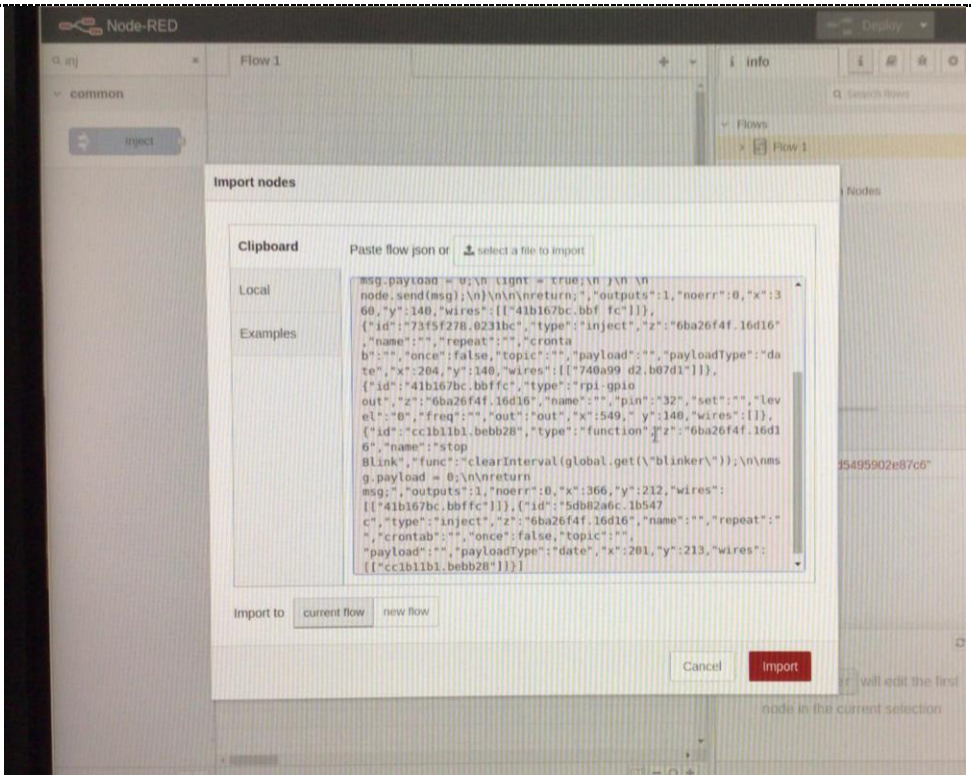
return msg;

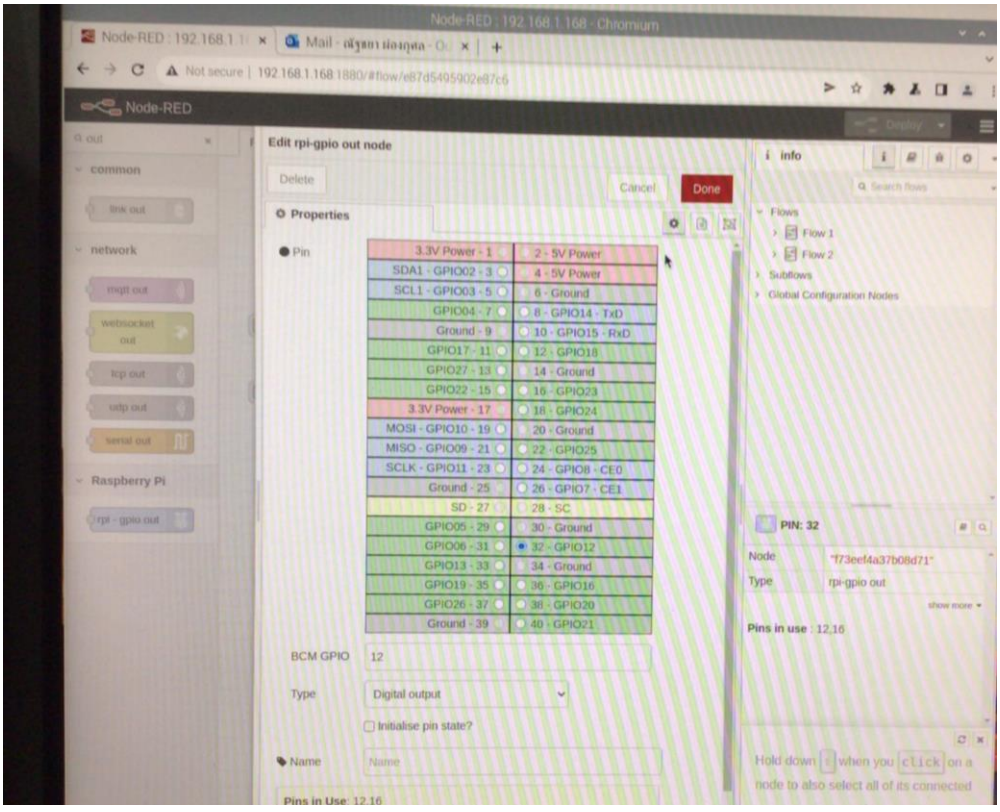
#Import

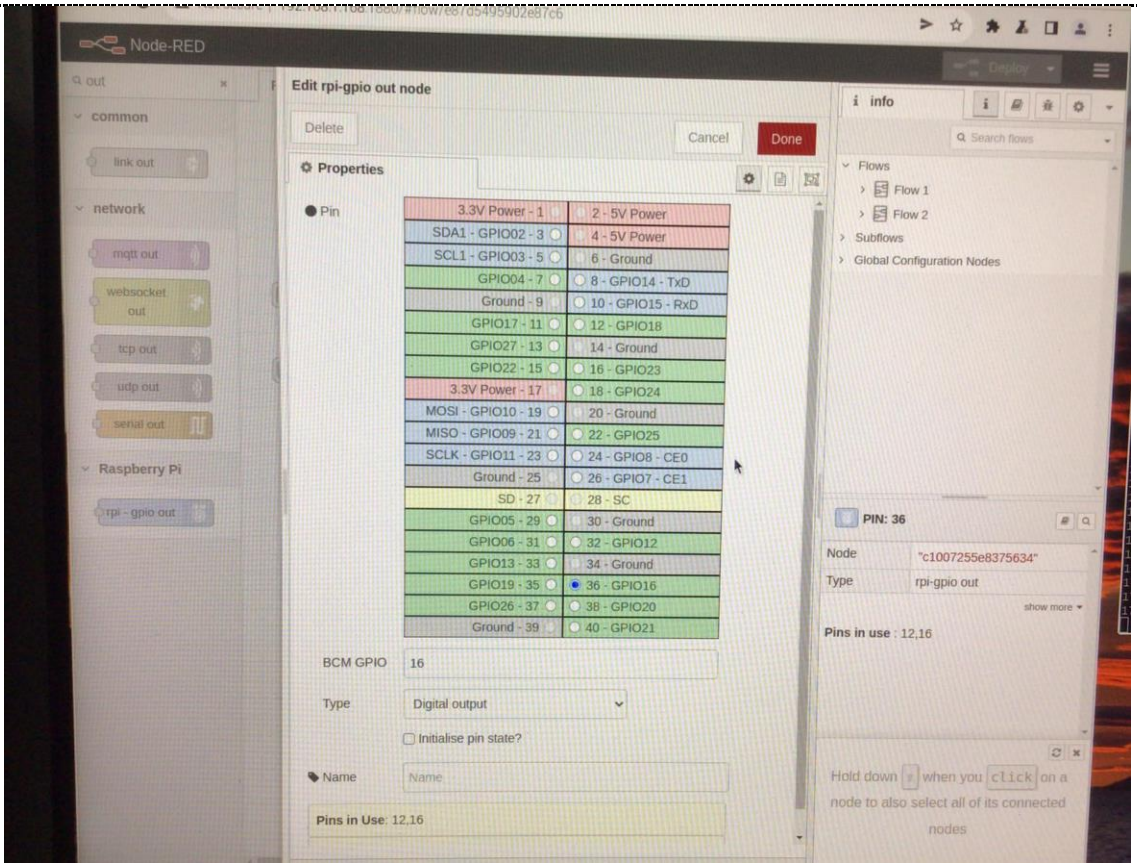
[{"id":"6ba26f4f.16d16","type":"tab","label":"Flow 2","disabled":false,"info":""},{"id":"740a99d2.b07d1","type":"function","z":"6ba26f4f.16d16","name":"startBlink","func":"var BLINKDELAY = 250;\n\nvar light = true;\n\n\nvar blinker = setInterval(blink, BLINKDELAY);\n\nglobal.set(\"blinker\", blinker);\n\nfunction blink () {\n \n if (light) {\n msg.payload = 1;\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.bbffc"]]},{"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.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":"stopBlink","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.1b547c","type":"inject","z":"6ba26f4f.16d16","name":"","repeat":"","crontab":"","once":false,"topic":"","payload":"","payloadType":"date","x":201,"y":213,"wires":[["cc1b11b1.bebb28"]]}]

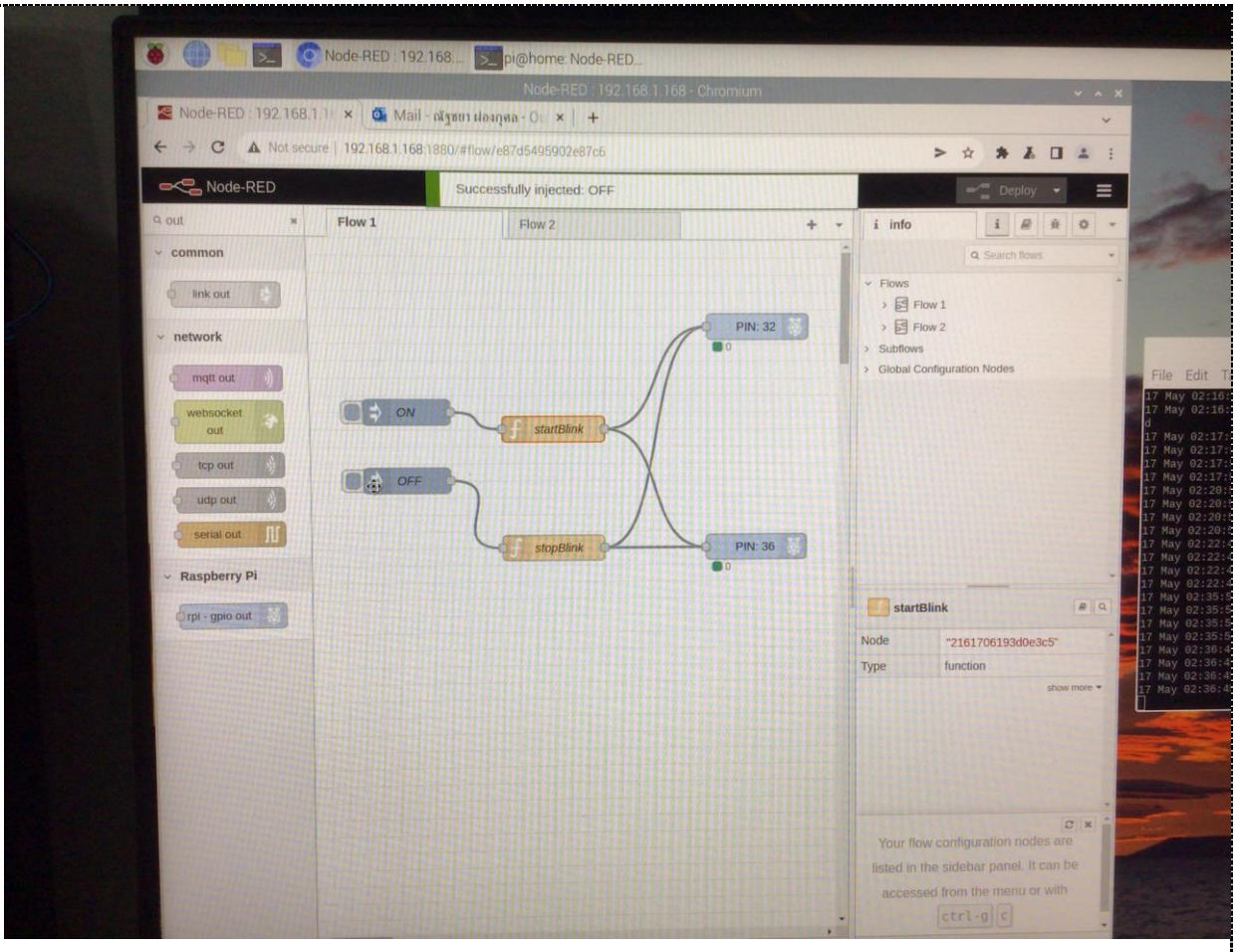

Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
startBlink
Setup
On Start
On Message
On Stop
//var BLINKDELAY = 250;
//var light = true;
//var blinker = setInterval(blink, BLINKDELAY); global.set("blinker", blink
//function blink () { if (light) {
msg.payload = 1;
//light = false; }
//else {
//msg.payload = 0;
//light = true; }
//node.send(msg); }
return;

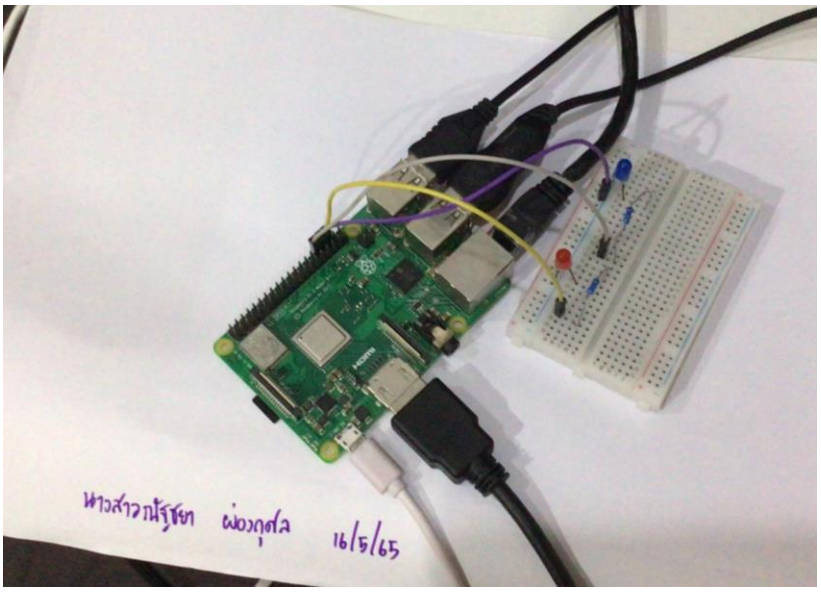

Node-RED
Edit function node
Delete
Cancel
Done
Properties
Name
stopBlink
Setup
On Start
On Message
On Stop
//clearInterval(global.get("blinker"));
msg.payload = 0;
return msg;

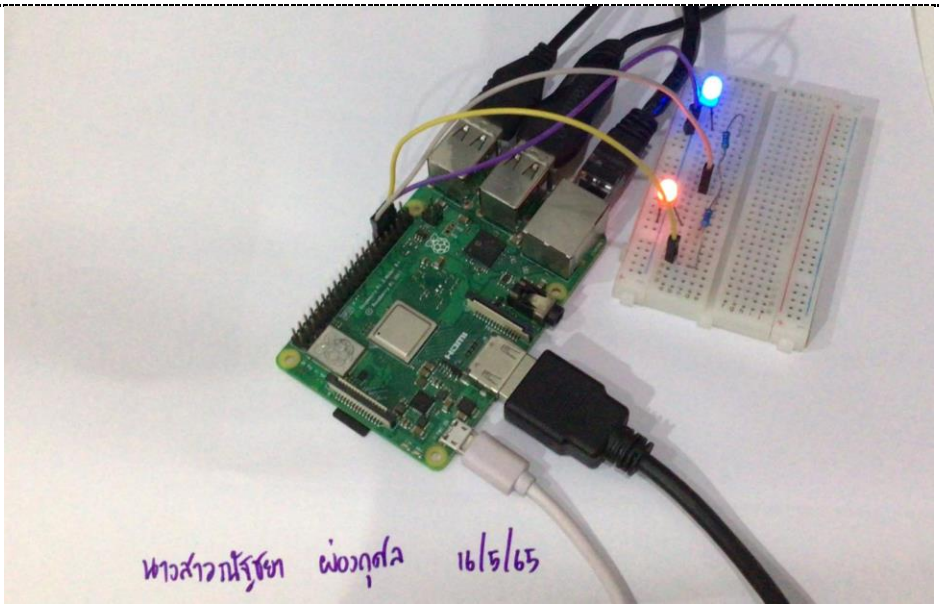

Node-RED
Flow 1
info
common
inject
Import nodes
Clipboard
Paste flow json or
select a file to import
Local
Examples
Import to
current flow
new flow
Cancel
Import


Node-RED : 192.168.1.168 - Chromium
Not secure | 192.168.1.168:1880/#flow/e87d5495902e87c6
Node-RED
Edit rpi-gpio out node
Delete
Cancel
Done
Properties
Pin
BCM GPIO
12
Type
Digital output
Initialise pin state?
Name
Pins in Use: 12,16
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
PIN: 32
Node
"f73eef4a37b08d71"
Type
rpi-gpio out
Pins in use : 12,16


Node-RED
Deploy
out
common
link out
network
mqtt out
websocket out
tcp out
udp out
serial out
Raspberry Pi
rpi - gpio out
Edit rpi-gpio out node
Delete
Cancel
Done
Properties
Pin
3.3V Power - 1
2 - 5V Power
SDA1 - GPIO02 - 3
4 - 5V Power
SCL1 - GPIO03 - 5
6 - Ground
GPIO04 - 7
8 - GPIO14 - TxD
Ground - 9
10 - GPIO15 - RxD
GPIO17 - 11
12 - GPIO18
GPIO27 - 13
14 - Ground
GPIO22 - 15
16 - GPIO23
3.3V Power - 17
18 - GPIO24
MOSI - GPIO10 - 19
20 - Ground
MISO - GPIO09 - 21
22 - GPIO25
SCLK - GPIO11 - 23
24 - GPIO8 - CE0
Ground - 25
26 - GPIO7 - CE1
SD - 27
28 - SC
GPIO05 - 29
30 - Ground
GPIO06 - 31
32 - GPIO12
GPIO13 - 33
34 - Ground
GPIO19 - 35
36 - GPIO16
GPIO26 - 37
38 - GPIO20
Ground - 39
40 - GPIO21
BCM GPIO
16
Type
Digital output
Initialise pin state?
Name
Name
Pins in Use: 12,16
info
Search flows
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
PIN: 36
Node
"c1007255e8375634"
Type
rpi-gpio out
show more
Pins in use : 12,16
Hold down x when you click on a node to also select all of its connected nodes

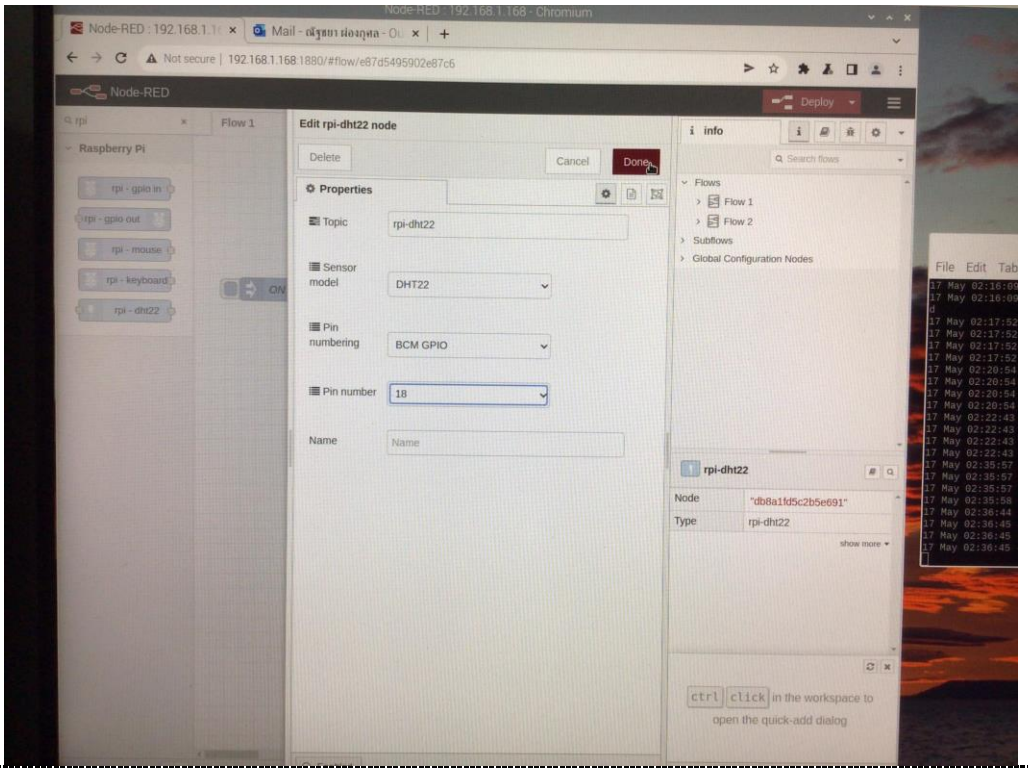

Node-RED : 192.168.1.168 - Chromium
Node-RED
Successfully injected: OFF
Deploy
Flow 1
Flow 2
common
link out
network
mqtt out
websocket out
tcp out
udp out
serial out
Raspberry Pi
rpi - gpio out
ON
OFF
startBlink
stopBlink
PIN: 32
PIN: 36
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
Node
"2161706193d0e3c5"
Type
function
Your flow configuration nodes are listed in the sidebar panel. It can be accessed from the menu or with
ctrl-g c

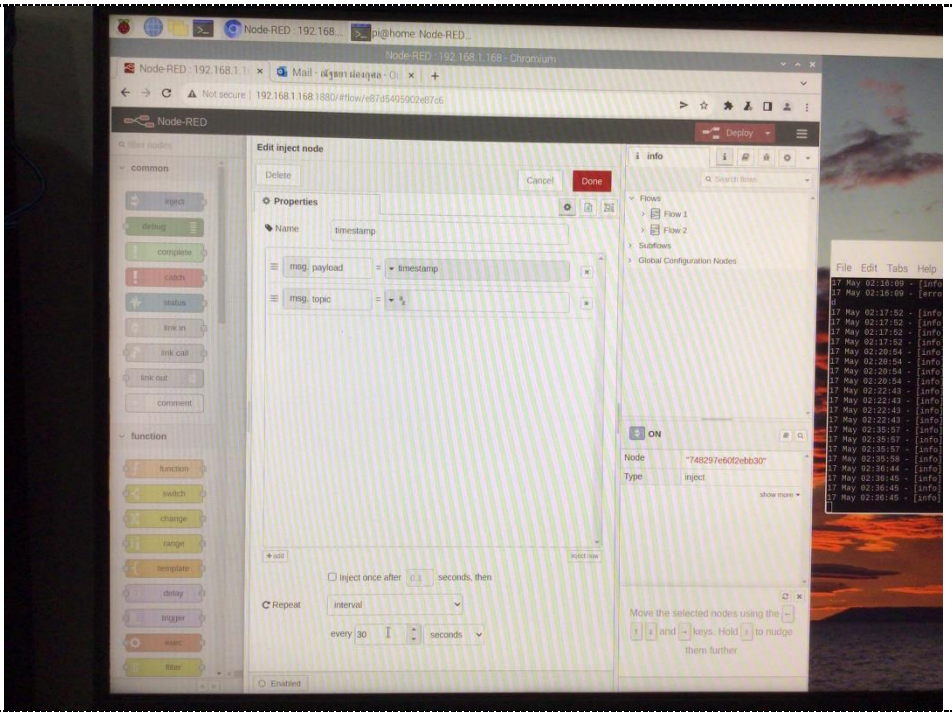

16/5/65

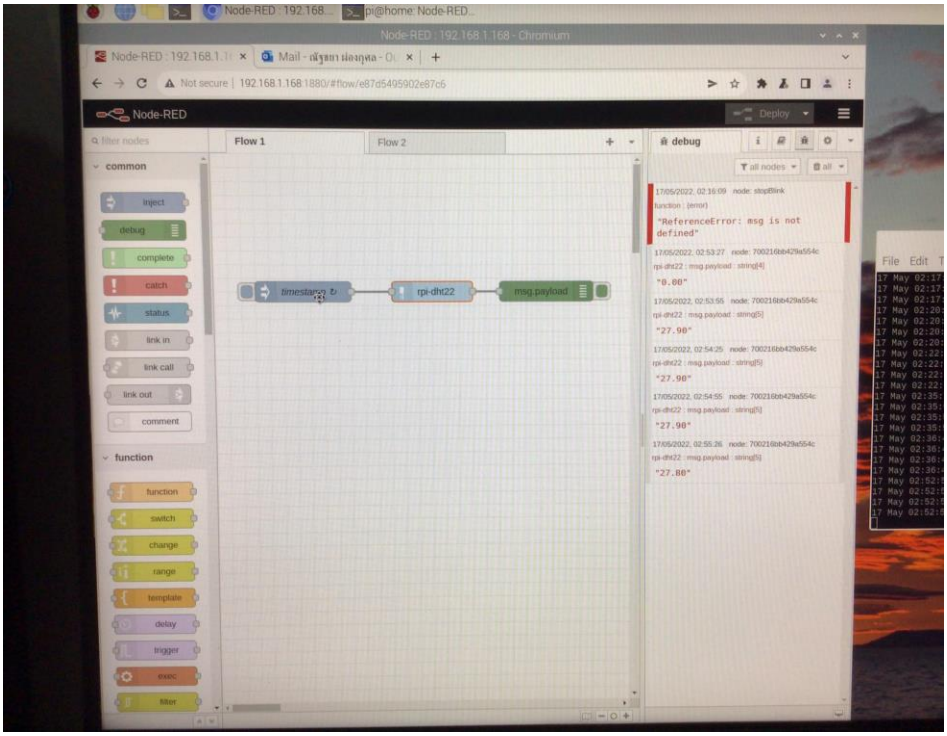


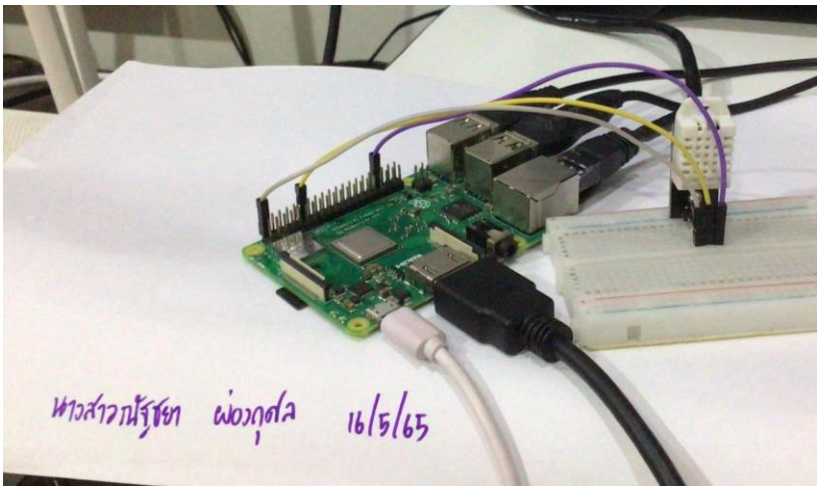
Node-RED.3 - Node-RED เพื่ออ่าน DHT-22 Sensor

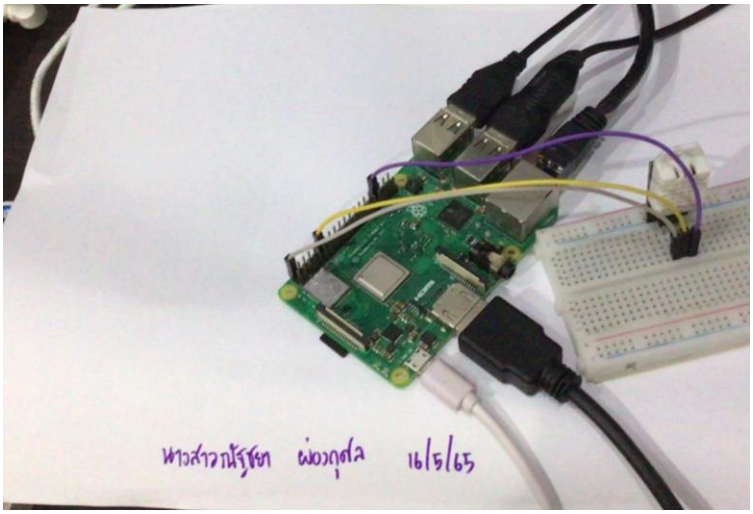
เซ็ตค่าต่างๆดังนี้




Node-RED : 192.168.1.168 - Chromium
Node-RED
Edit inject node
Delete
Cancel
Done
Properties
Name
timestamp
msg. payload
timestamp
msg. topic
Inject once after
seconds, then
Repeat
interval
every 30
seconds
common
function
Deploy
info
Flows
Flow 1
Flow 2
Subflows
Global Configuration Nodes
ON
Node
"748297e60f2ebb30"
Type
inject

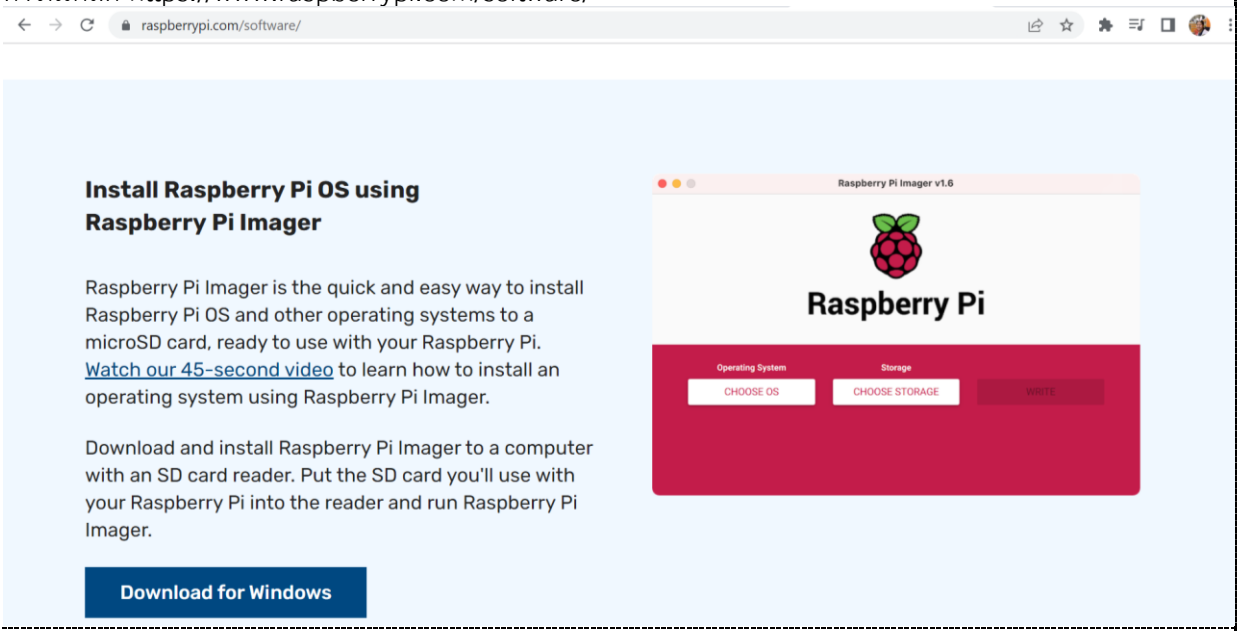

Node-RED : 192.168.1.168 - Chromium
Node-RED
Flow 1
Flow 2
debug
common
function
timestamp
rpi-dht22
msg.payload
"ReferenceError: msg is not defined"
"0.00"
"27.90"
"27.90"
"27.90"
"27.80"


นางสาวปรัชยา ผ่องกุศล 16/5/65

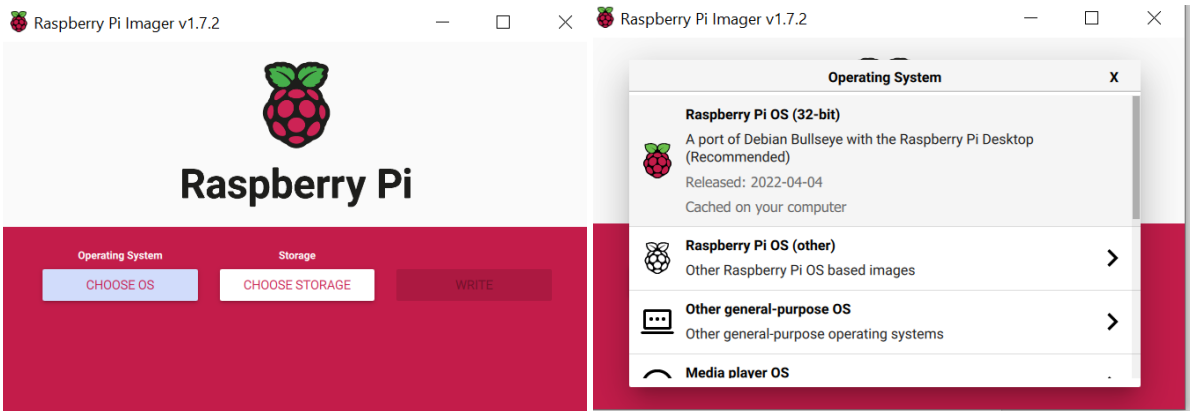

นางสาวปรัชยา ผ่องกุศล 16/5/65

แถมขั้นตอนการติดตั้ง raspi

ดาวน์โหลด https://www.raspberrypi.com/software/



เลือก CHOOSE OS -> Raspberry Pi OS



กด **ctrl+shift+x** แล้วกรอกค่าดังนี้ (ด้านล่างสุดให้เลือกทั้งสามอัน) -> save