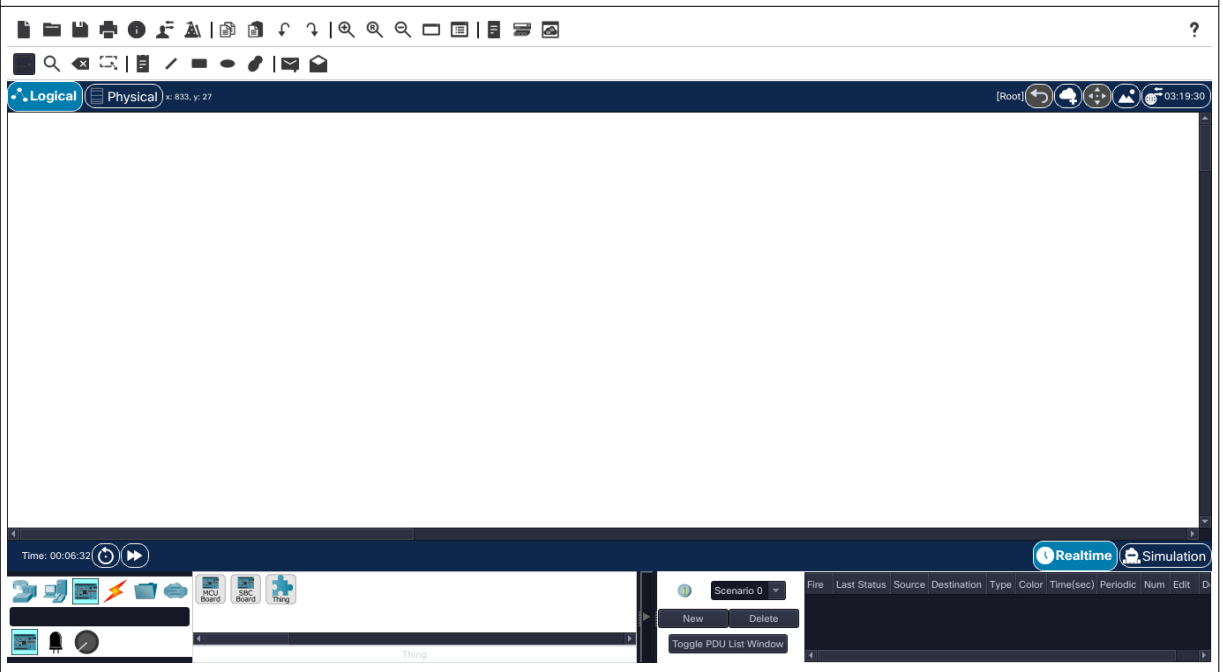
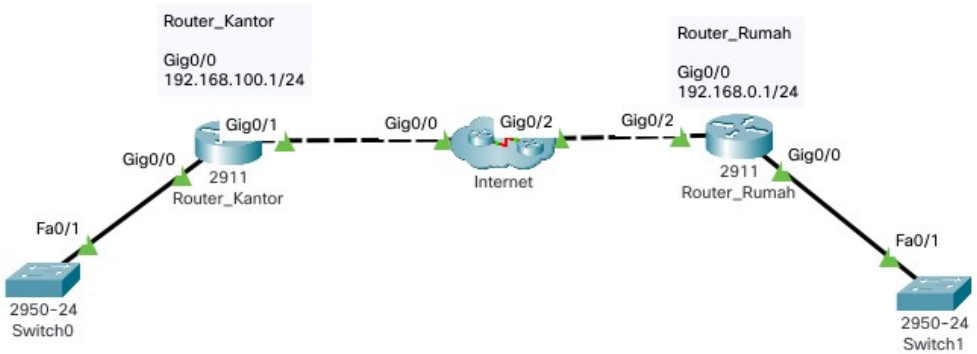
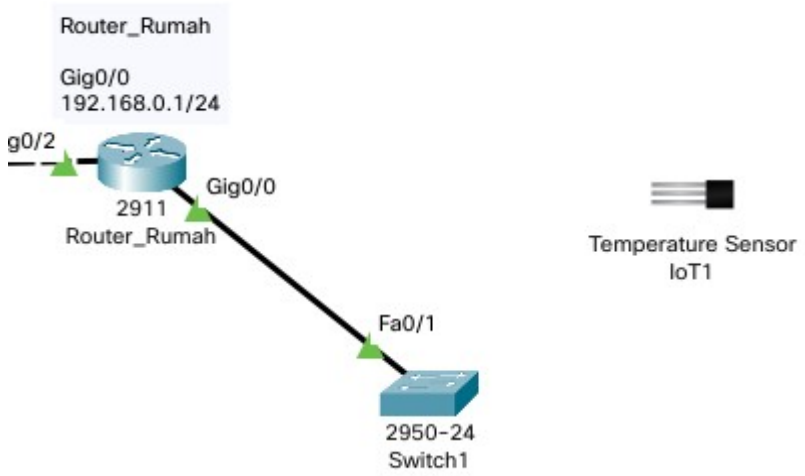
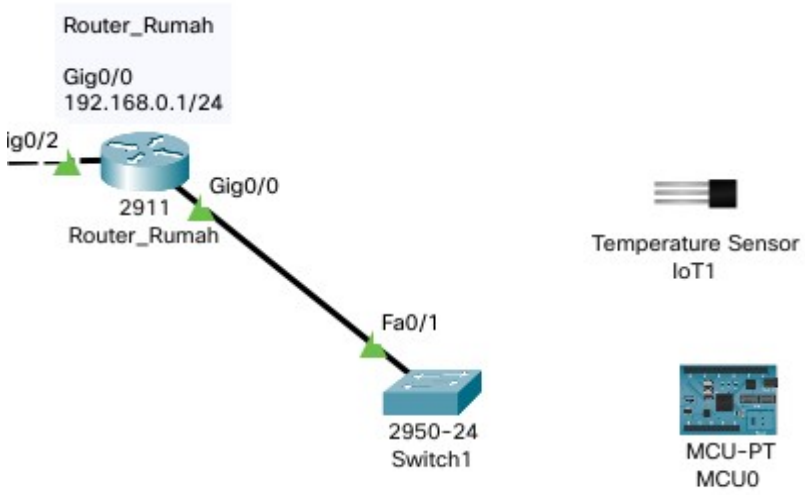
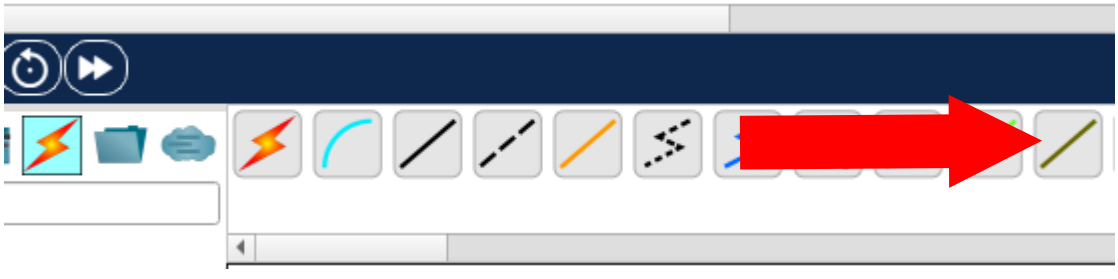
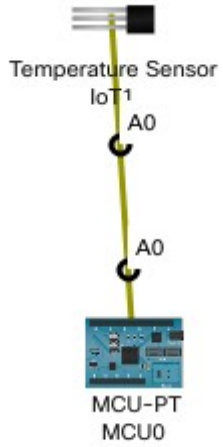
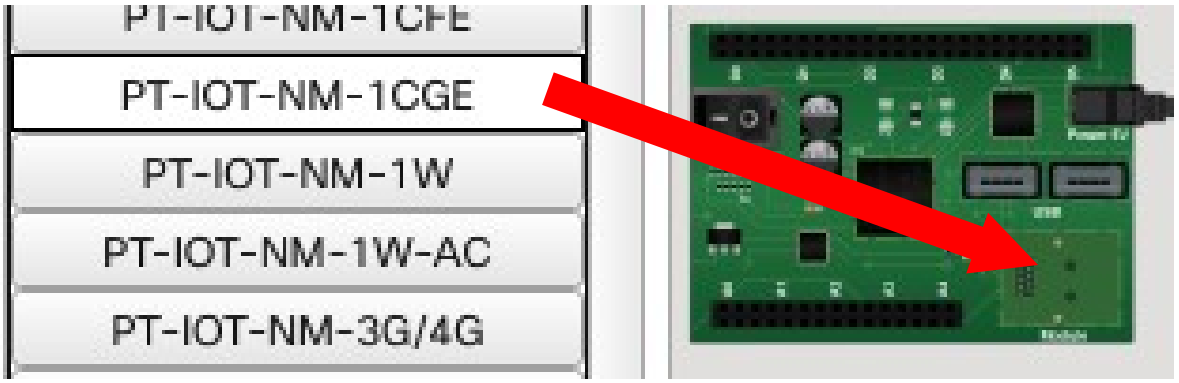
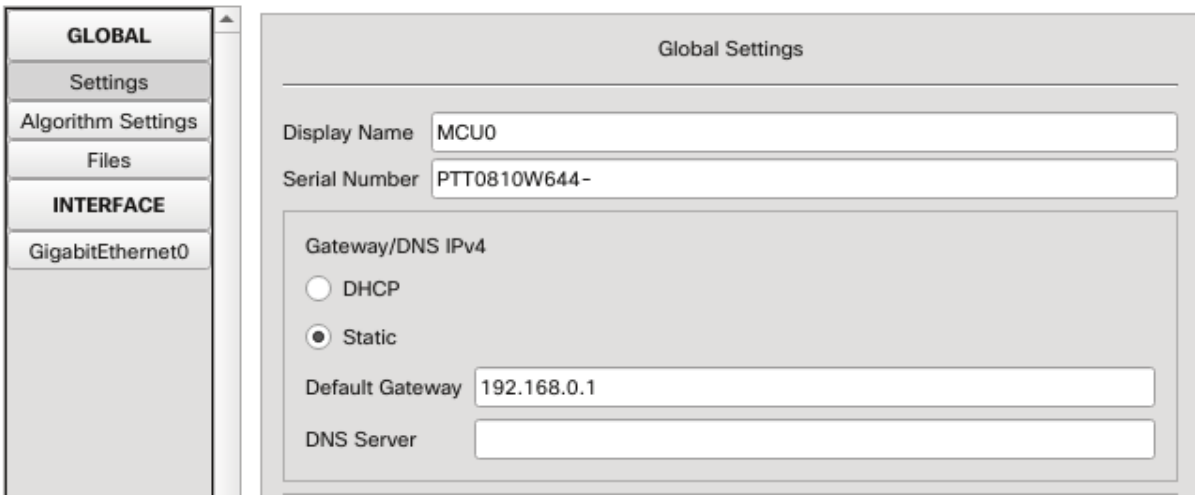
Praktikum 3 – Internet of Things

No	Langkah-langkah
1	Buka **Cisco Packet Tracer.** Jika memiliki akun silahkan login. Jika tidak, **Packet Tracer** hanya akan menyediakan 3 kali opsi penyimpanan.
	
2	Buka file **Template.pkt** yang akan kita gunakan seterusnya untuk praktikum. Berisikan simulasi konektivitas melalui **Internet** dari jaringan **Kantor** ke jaringan **Rumah.** Pastikan **RouterKantor** dapat berkomunikasi dengan **RouterRumah**
	
3	Tambahkan sensor baru dengan jenis **Temperature Sensor** ke jaringan rumah

	
4	Tambahkan **MCU-PT** ke jaringan Rumah
	
5	Sambungkan **MCU-PT** dengan **Temperature Sensor** dengan menggunakan **IoT Custom Cable**
	
6	Tancapkan ke **A0 (Temperature Sensor)** dan A**0 (MCU-PT)**

<table>
<tr><td></td><td> 
</td></tr>
<tr><td>7</td><td>Sebelum menghubungkan MCU-PT ke Switch, tambahkan module Gigabit. Jangan lupa Matikan perangkat sebelum memasang</td></tr>
<tr><td></td><td> 
</td></tr>
<tr><td>8</td><td>Hubungkan MCU ke Switch. Dan Berikan IP: 192.168.0.2/24, dan GW: 192.168.0.1.</td></tr>
<tr><td></td><td> 
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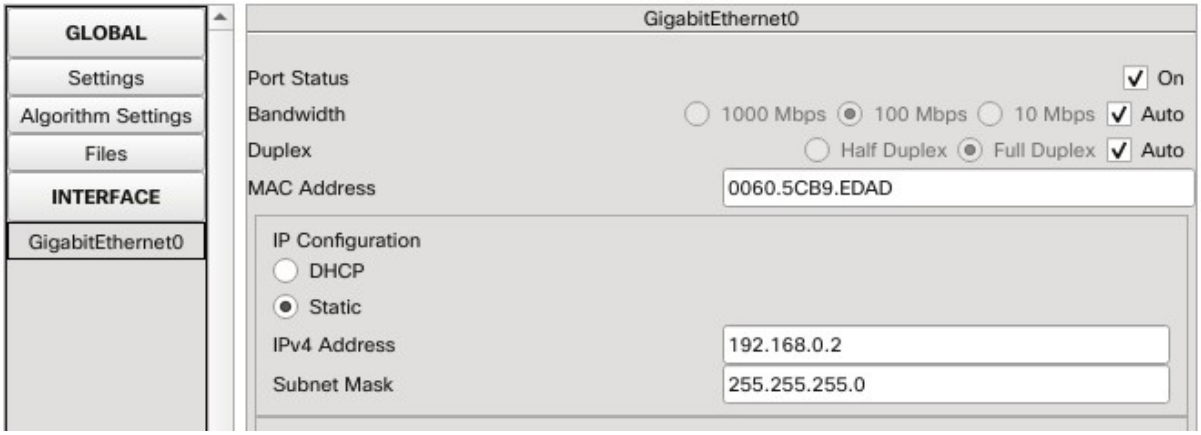
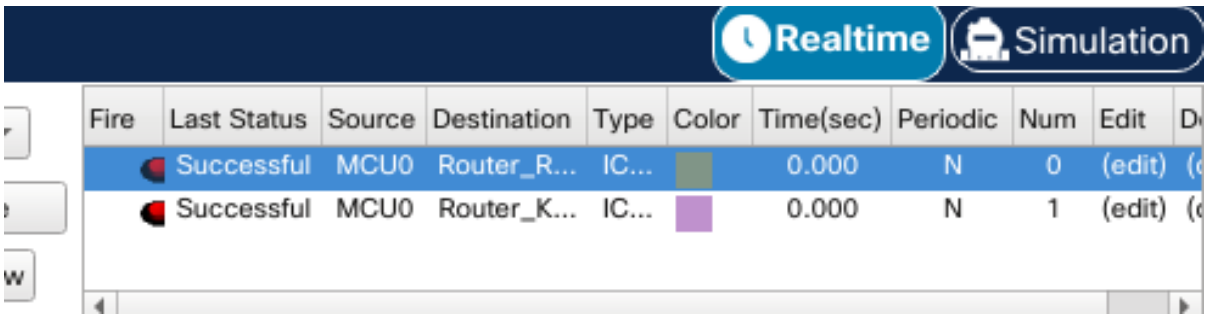
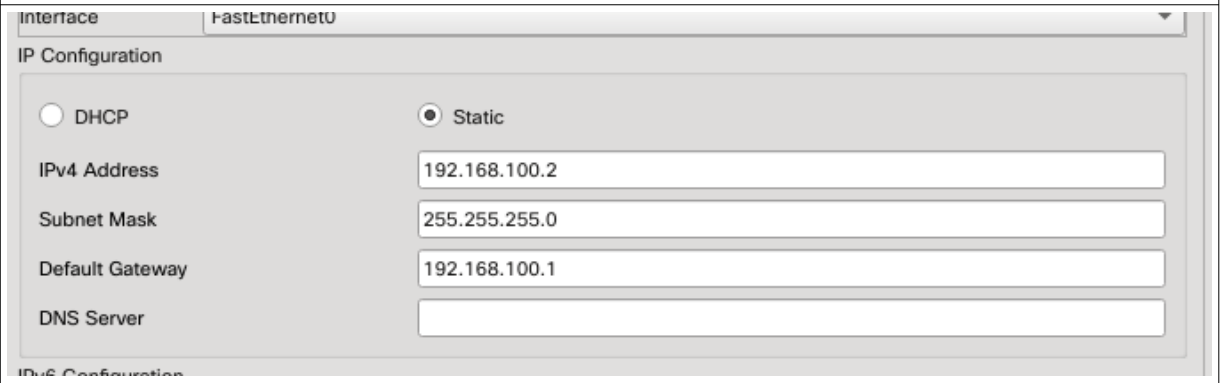
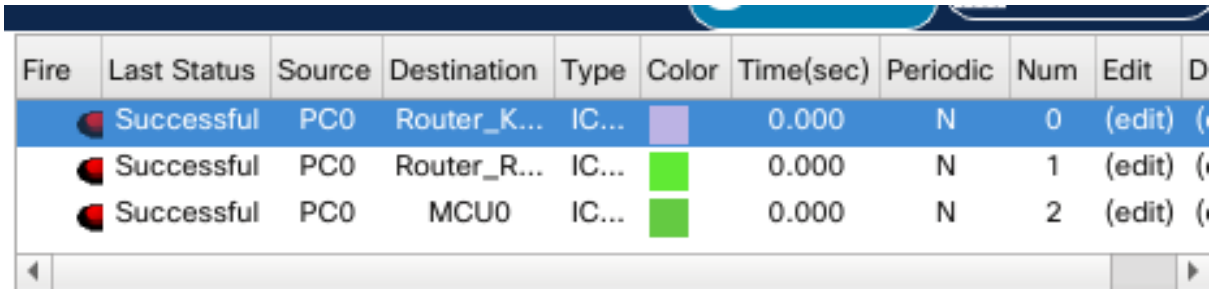
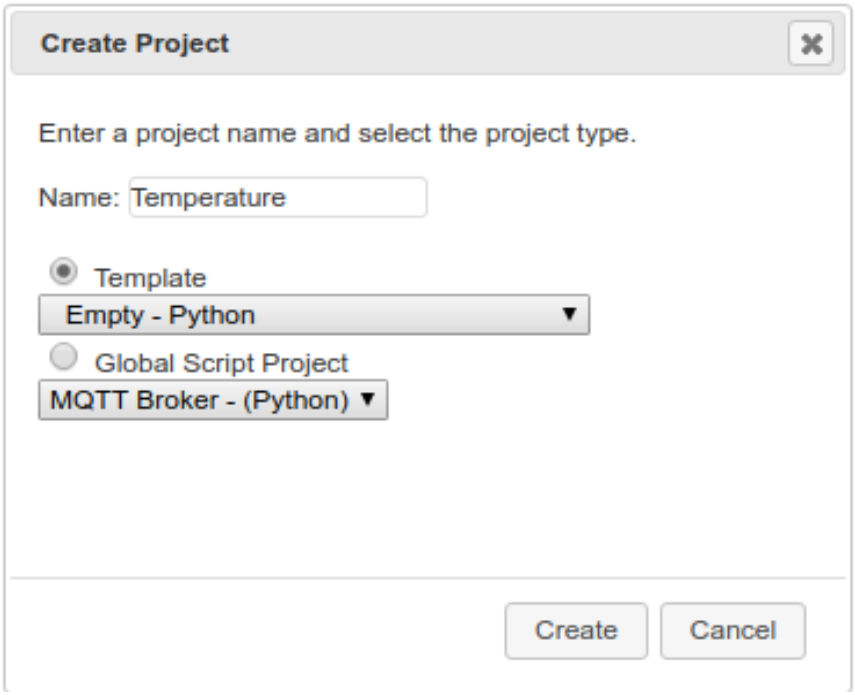
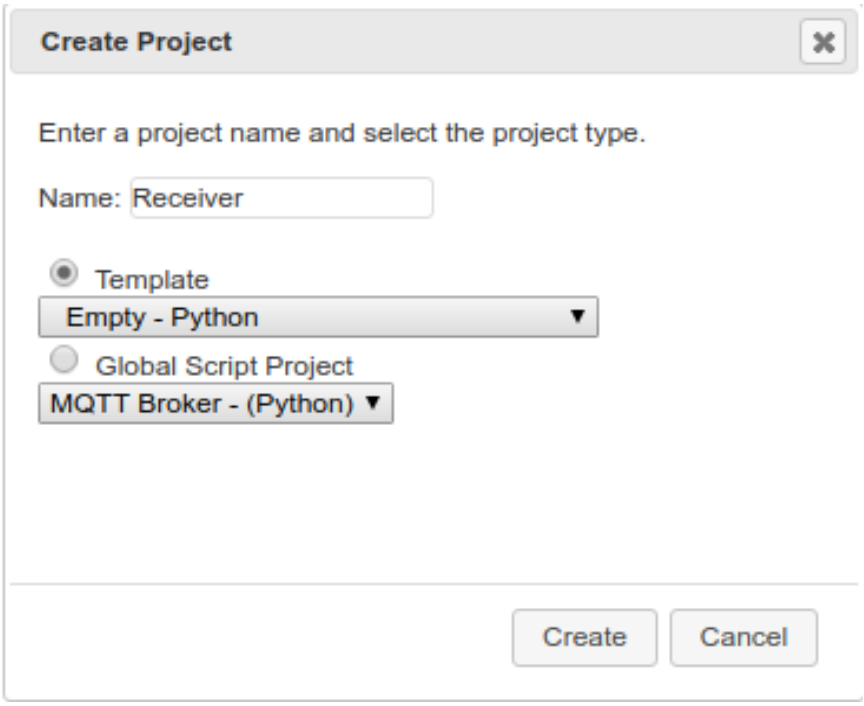
	
9	Tes **PING** dari **MCU** ke **Router Kantor,** dan **Router Rumah**
	
10	Tambahkan **PC0** ke **Jaringan Kantor,** hubungkan ke **Switch** dan berikan IP: **192.168.10.2/24,** dan **GW: 192.168.100.1**
	
11	Tes **PING** dari **MCU** ke **Router Kantor, Router Rumah,** dan **MCU**
	
12	Buka **MCU0,** klik **Tab Programming,** klik **New,** dan pilih **Empty – Python.** Klik **Create**



13 Di dalam file **main.py** (cek file **Praktikum 3 – Client.py), Tempelkan** kode berikut:

```python
from gpio import *
from tcp import *
from time import *

serverIP = "192.168.100.2"
serverPort = 1234

client = TCPClient()

def onTCPConnectionChange(type):
    print("connection to " + client.remoteIP() + " changed to state " + str(type))

def onTCPReceive(data):
    print("received from " + client.remoteIP() + " with data: " + data)

def main():
    client.onConnectionChange(onTCPConnectionChange)
    print(client.connect(serverIP, serverPort))

    count = 0
    while True:
        count += 1
        # Membaca Suhu
        adc = analogRead(A0);
        volt = adc/float(1024)
        temp = 100-(volt*100)
        # Mengirim Suhu
        data = str(round(temp,2)) + " Celsius"
        print("sending to " + client.remoteIP() + " with data: " + data)
        client.send(data)
        sleep(5)

if __name__ == "__main__":
    main()
```

14 Buka **PC0,** dan buatlah kode **Python** dengan cara yang sama seperti di atas



15 Masukkan kode berikut ke file **main.py** (cek file **Praktikum 3 – Server.py)**

```python
from tcp import *
from time import *

port = 1234
server = TCPServer()

def onTCPNewClient(client):
    def onTCPConnectionChange(type):
        print("connection to " + client.remoteIP() + " changed to state " + str(type))

    def onTCPReceive(data):
        print("received from " + client.remoteIP() + " Suhu Rumah: " + data)
        client.send("Accepted")

    client.onConnectionChange(onTCPConnectionChange)
    client.onReceive(onTCPReceive)

def main():
    server.onNewClient(onTCPNewClient)
    print(server.listen(port))

    # don't let it finish
    while True:
        sleep(3600)

if __name__ == "__main__":
    main()
```

16 Tes **RUN** dimulai dari **PC0** baru **MCU-PT**

Client

```
Starting Temperature (Python)...
True
sending to 192.168.100.2 with data: 40.82 Celsius
connection to 192.168.100.2 changed to state 0
sending to 192.168.100.2 with data: 40.82 Celsius
sending to 192.168.100.2 with data: 40.82 Celsius
sending to 192.168.100.2 with data: 40.82 Celsius
sending to 192.168.100.2 with data: 40.82 Celsius
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sending to 192.168.100.2 with data: 40.82 Celsius
sending to 192.168.100.2 with data: 40.82 Celsius
```

Server

```
Starting Receiver (Python)...
True
received from 192.168.0.2 Suhu Rumah: 40.82 Celsius
received from 192.168.0.2 Suhu Rumah: 40.82 Celsius
received from 192.168.0.2 Suhu Rumah: 40.82 Celsius
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```

SELESAI