

**SISTEM KOMUNIKASI NIRKABEL**  
**MODUL 5**  
**SINGLE BOARD COMPUTER (SBC)**  
**INTERNET OF THINGS**  
**BERBASIS PACKET TRACER**

---

Mochammad Zen Samsono Hadi, ST. MSc. Ph.D

# TOPIK BAHASAN

---

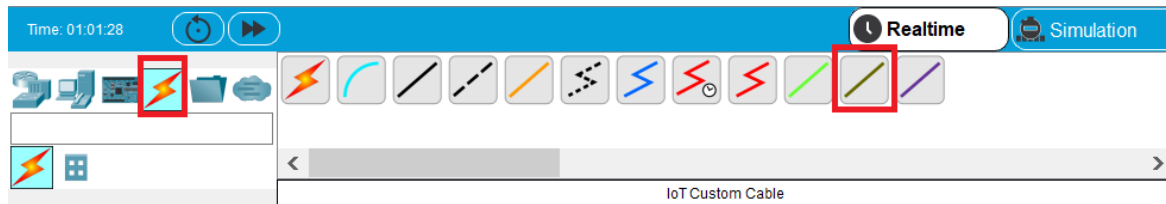
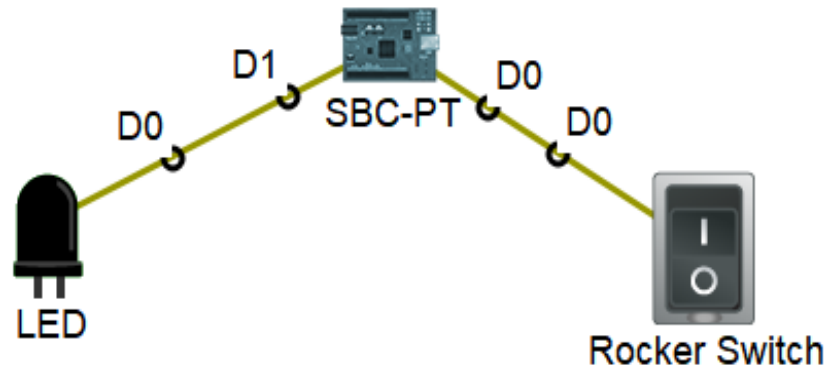
- SBC LED
- SBC Smart Temperature
- SBC Smart Door System

---

# SBC LED

# Topologi Jaringan

- Designlah jaringan seperti berikut:



# Python Programming di SBC

## Buat Project Baru

Create Project

Enter a project name and select the project type.

Name:

Template  
Empty - Python

Global Script Project  
MQTT Broker - (Python)

Create Cancel

## Jalankan Program

SBC0

Specifications Physical Config Desktop Programming Attributes

lighton (Python) - main.py

Open New Delete Rename Import Install to Desktop Stop Clear Outputs Help

Reload Copy Paste Undo Redo Find Replace Zoom: + -

```
1 from gpio import *
2 from time import *
3
4 def main():
5     pinMode (0, IN)
6     pinMode (1, OUT)
7     print ("light on")
8     while True:
9         if digitalRead(0) == HIGH:
10            digitalWrite(1, HIGH)
11        else:
12            digitalWrite(1, LOW)
13
14 if __name__ == '__main__':
15     main()
16
```

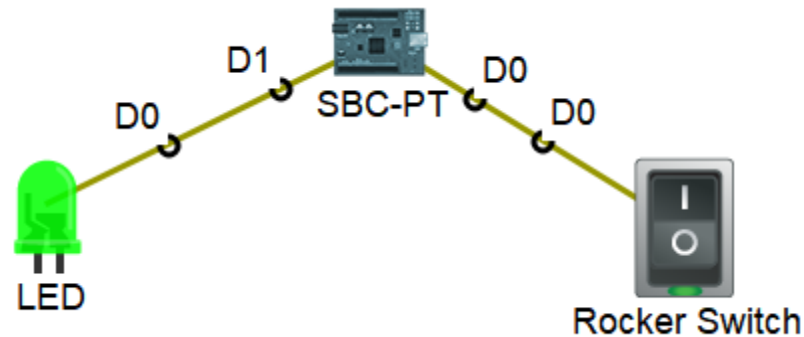
Starting lighton (Python)...  
light on

Top

# Pengujian SBC LED

---

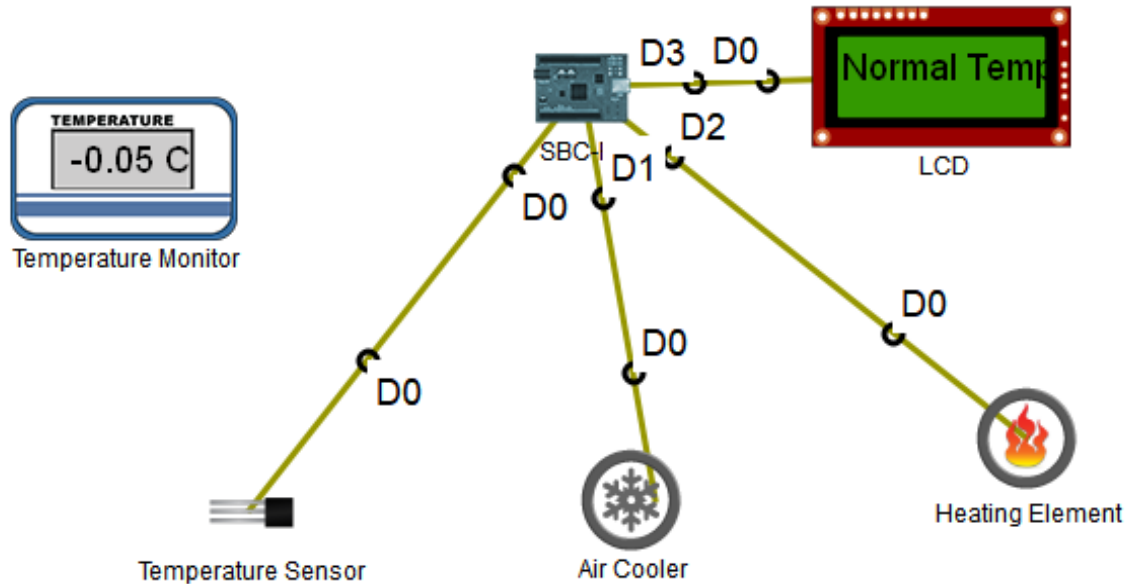
Tekan ALT+Click pada Switch untuk menyalakan LED.



---

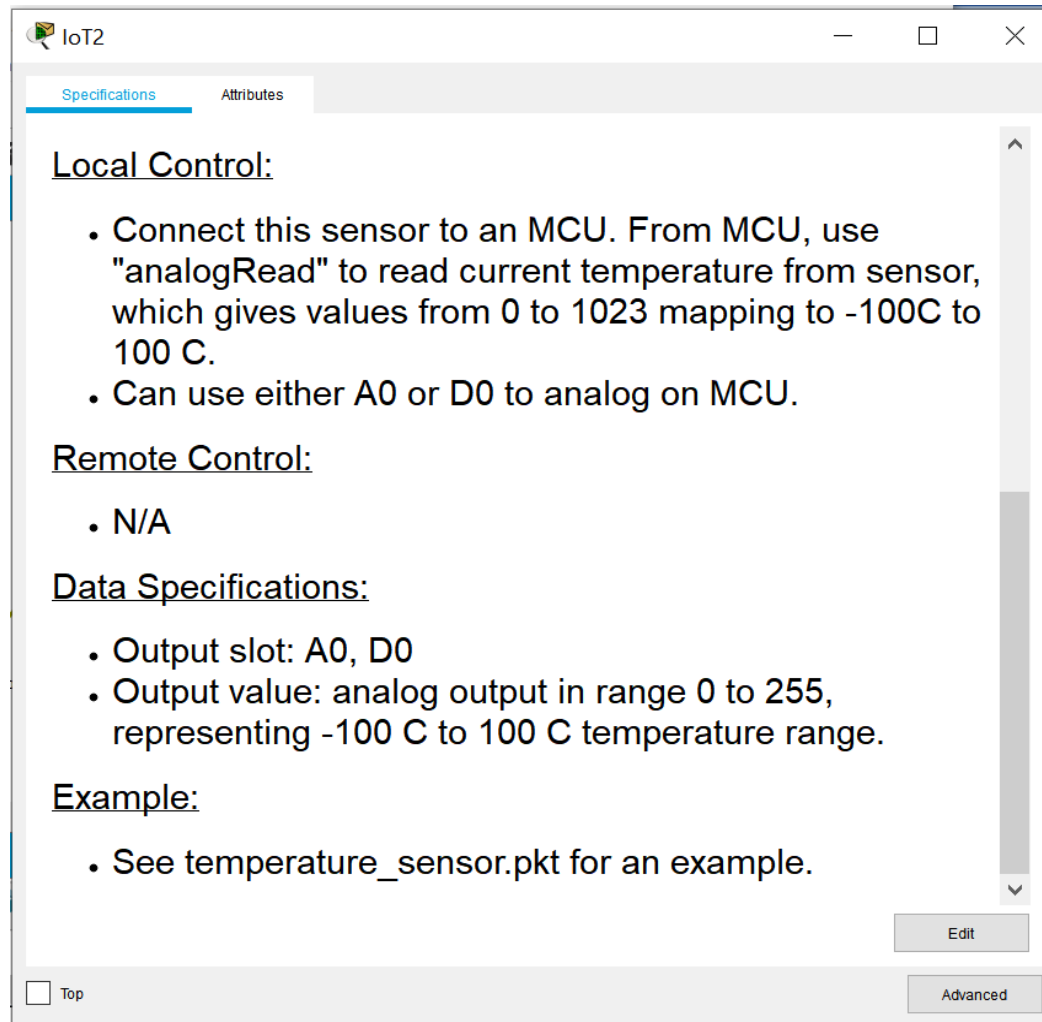
# SMART TEMPERATURE

# Topologi Jaringan





# Setting Temperature Sensor

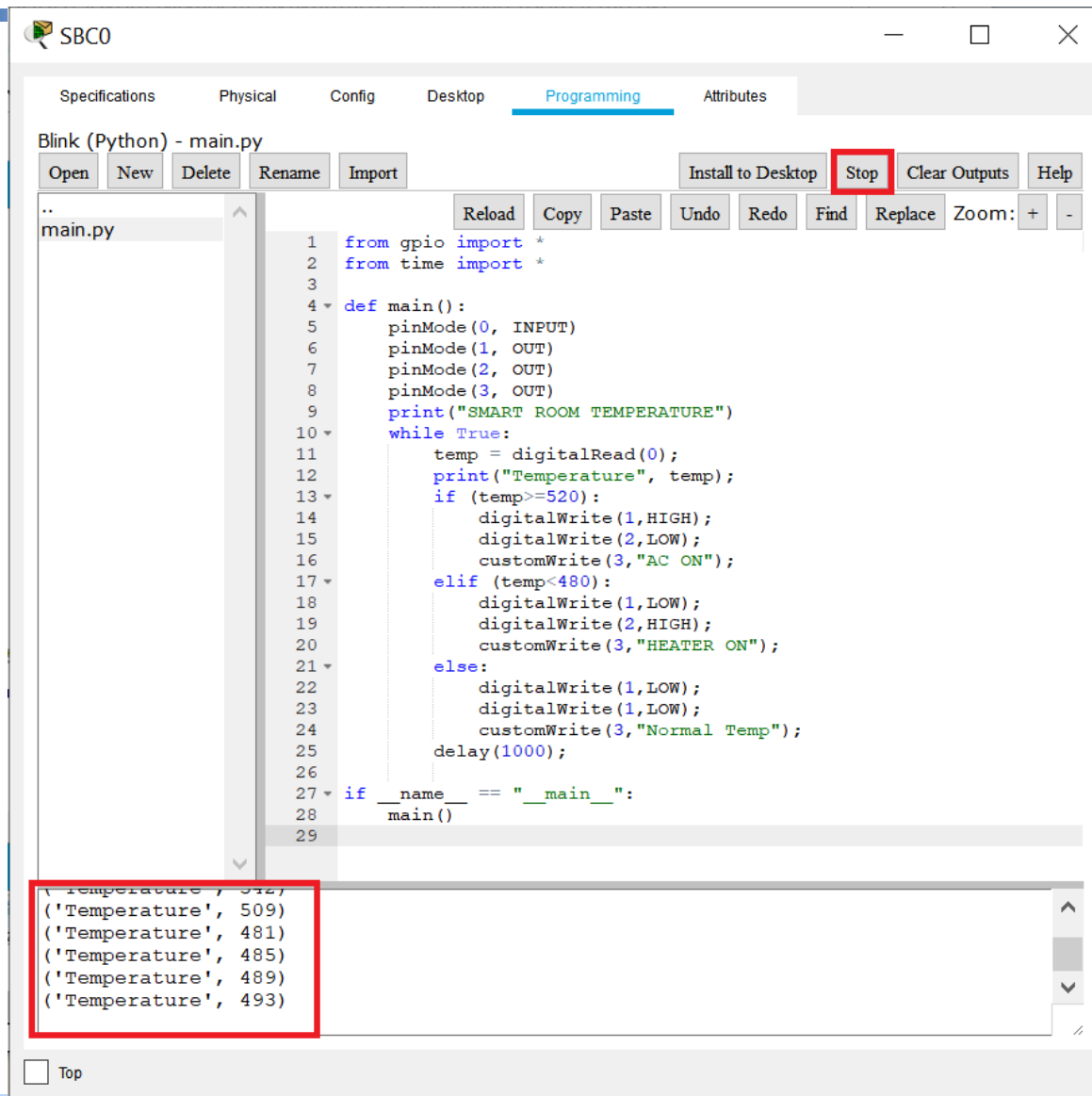


The screenshot shows a web interface for an IoT2 device. The window title is "IoT2". There are two tabs: "Specifications" (active) and "Attributes". The content is organized into sections:

- Local Control:**
  - Connect this sensor to an MCU. From MCU, use "analogRead" to read current temperature from sensor, which gives values from 0 to 1023 mapping to -100C to 100 C.
  - Can use either A0 or D0 to analog on MCU.
- Remote Control:**
  - N/A
- Data Specifications:**
  - Output slot: A0, D0
  - Output value: analog output in range 0 to 255, representing -100 C to 100 C temperature range.
- Example:**
  - See temperature\_sensor.pkt for an example.

At the bottom right, there are "Edit" and "Advanced" buttons. At the bottom left, there is a "Top" button with a small square icon next to it.

# Python Programming pada SBC



The screenshot displays the SBC0 IDE interface. The main window shows a Python script named 'main.py' with the following code:

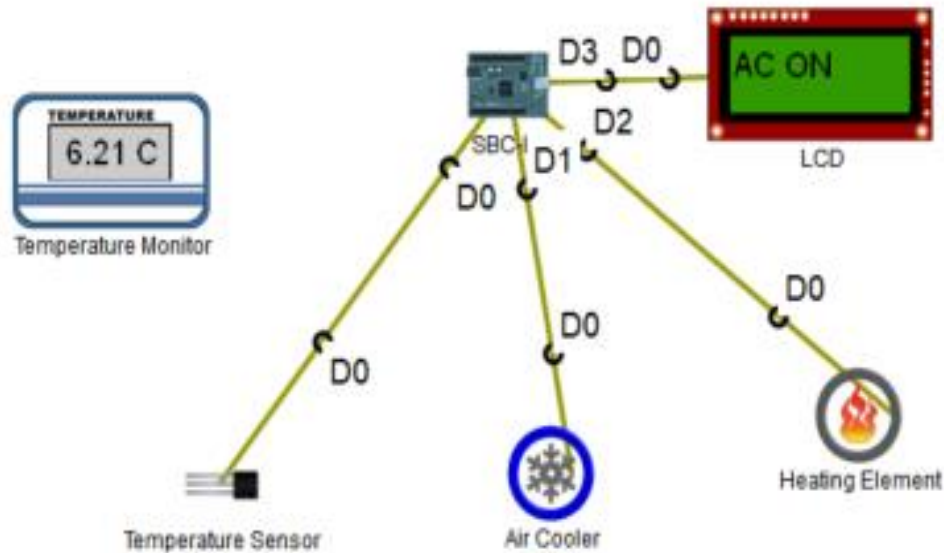
```
1 from gpio import *
2 from time import *
3
4 def main():
5     pinMode(0, INPUT)
6     pinMode(1, OUT)
7     pinMode(2, OUT)
8     pinMode(3, OUT)
9     print("SMART ROOM TEMPERATURE")
10    while True:
11        temp = digitalRead(0);
12        print("Temperature", temp);
13        if (temp >= 520):
14            digitalWrite(1, HIGH);
15            digitalWrite(2, LOW);
16            customWrite(3, "AC ON");
17        elif (temp < 480):
18            digitalWrite(1, LOW);
19            digitalWrite(2, HIGH);
20            customWrite(3, "HEATER ON");
21        else:
22            digitalWrite(1, LOW);
23            digitalWrite(1, LOW);
24            customWrite(3, "Normal Temp");
25        delay(1000);
26
27 if __name__ == "__main__":
28     main()
29
```

The 'Stop' button in the top toolbar is highlighted with a red box. The output window at the bottom shows the following output:

```
( 'Temperature', 512)
('Temperature', 509)
('Temperature', 481)
('Temperature', 485)
('Temperature', 489)
('Temperature', 493)
```

# Pengujian

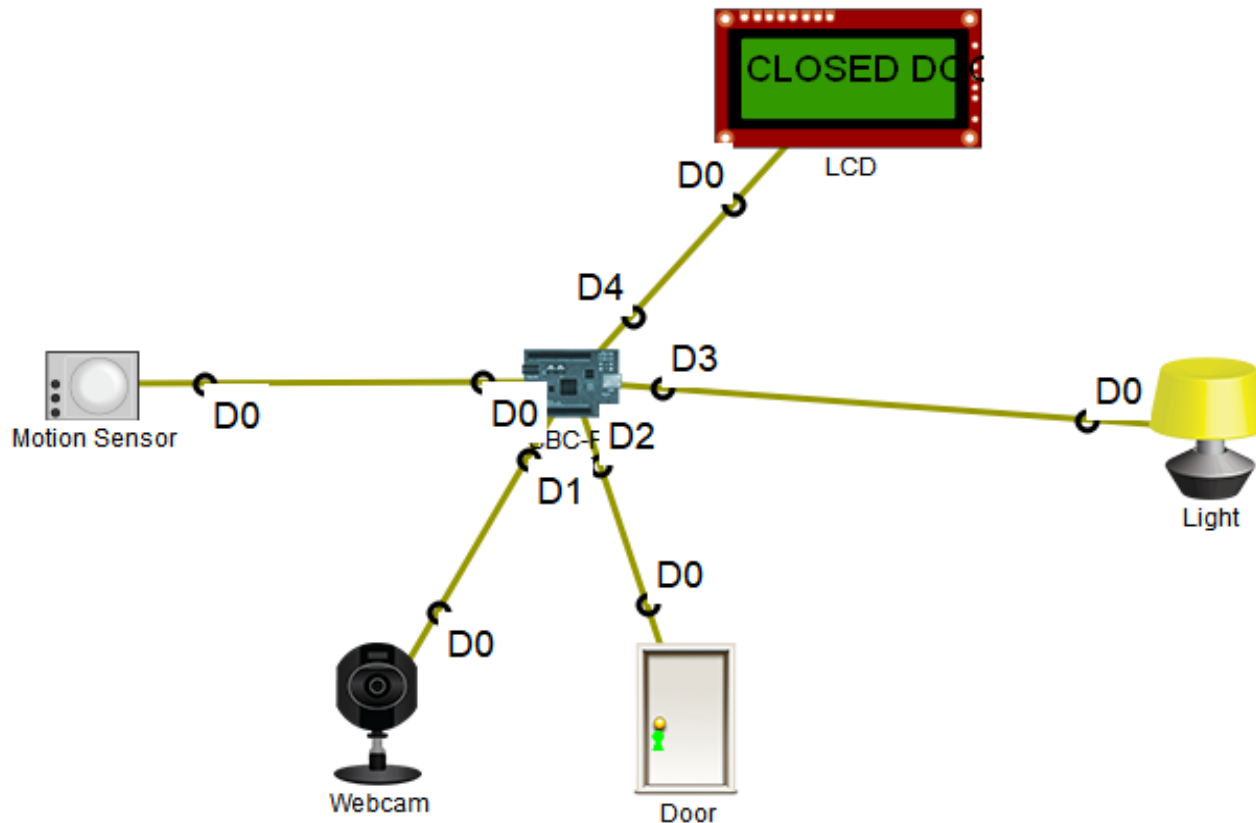
Amati perubahan pada **TEMPERATURE MONITOR**.



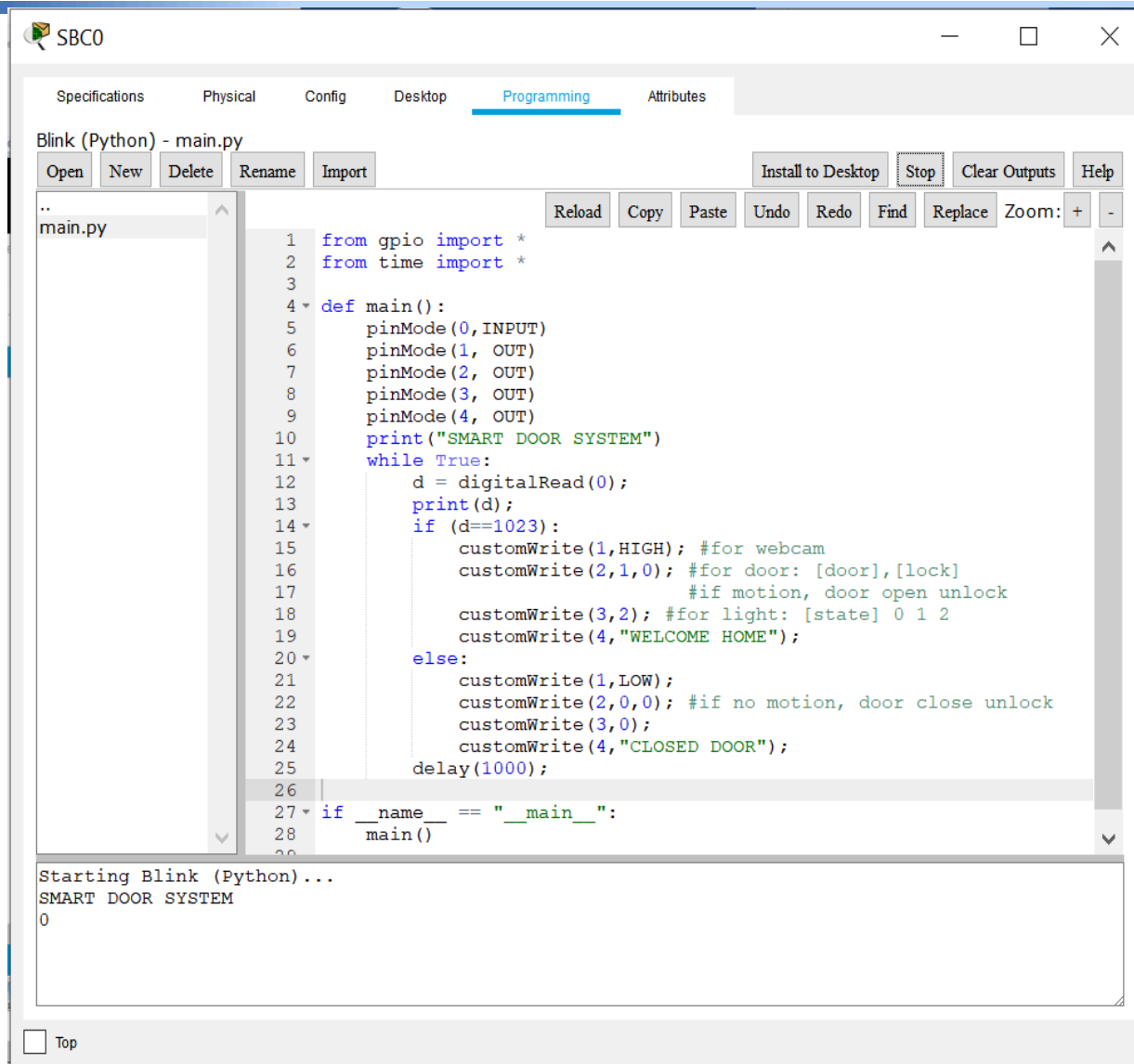
---

# SMART DOOR SYSTEM

# Topologi Jaringan



# Python Programming



SBCO

Specifications Physical Config Desktop **Programming** Attributes

Blink (Python) - main.py

Open New Delete Rename Import Install to Desktop Stop Clear Outputs Help

```
1 from gpio import *
2 from time import *
3
4 def main():
5     pinMode(0, INPUT)
6     pinMode(1, OUTPUT)
7     pinMode(2, OUTPUT)
8     pinMode(3, OUTPUT)
9     pinMode(4, OUTPUT)
10    print("SMART DOOR SYSTEM")
11    while True:
12        d = digitalRead(0);
13        print(d);
14        if (d==1023):
15            customWrite(1, HIGH); #for webcam
16            customWrite(2, 1, 0); #for door: [door], [lock]
17                                #if motion, door open unlock
18            customWrite(3, 2); #for light: [state] 0 1 2
19            customWrite(4, "WELCOME HOME");
20        else:
21            customWrite(1, LOW);
22            customWrite(2, 0, 0); #if no motion, door close unlock
23            customWrite(3, 0);
24            customWrite(4, "CLOSED DOOR");
25        delay(1000);
26
27 if __name__ == "__main__":
28     main()
29
```

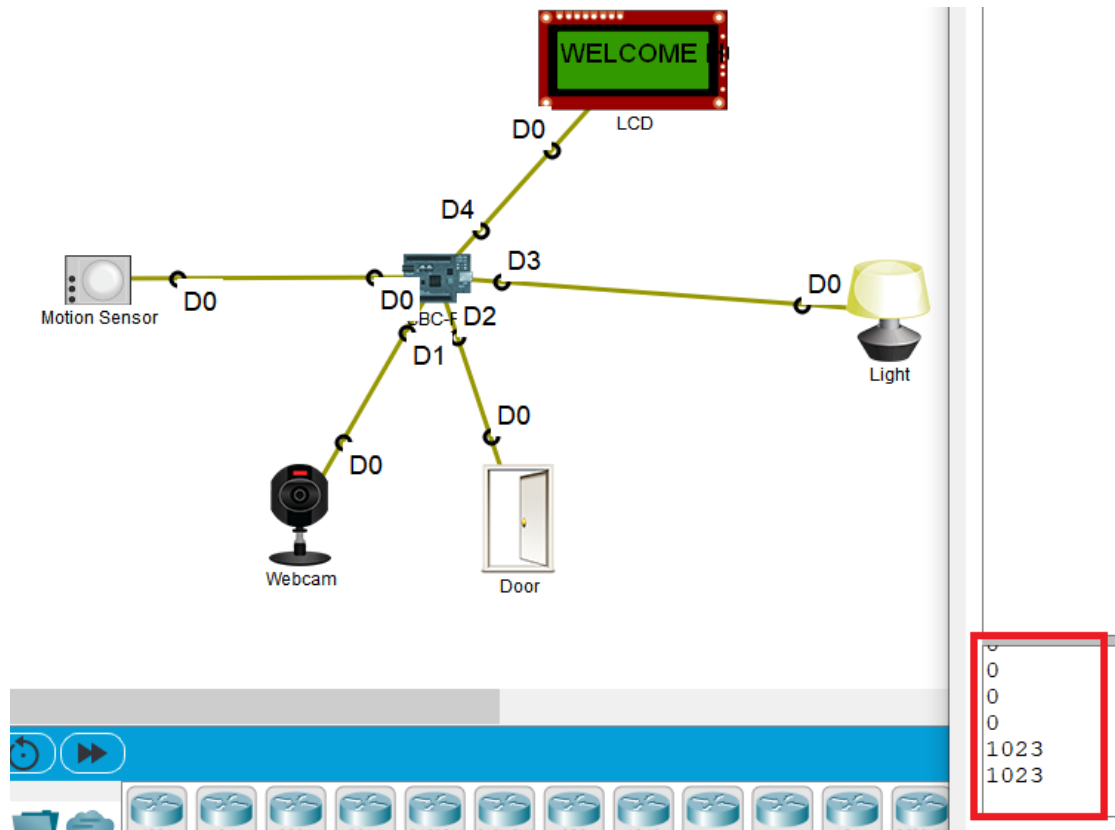
Starting Blink (Python)...

```
SMART DOOR SYSTEM
0
```

Top

# Pengujian

Tekan ALT+CLICK pada MOTION SENSOR.



# TUGAS

---

- Buatlah aplikasi lainnya berbasis SBC
- Buatlah laporan resmi dengan melampirkan:
  - Desain dan penjelasannya di file word
  - Desain di packet tracer
  - Terakhir pengumpulan: hari Sabtu jam 23.59
- Upload di google drive