

SISTEM KOMUNIKASI NIRKABEL MODUL 5

SINGLE BOARD COMPUTER (SBC) INTERNET OF THINGS BERBASIS PACKET TRACER

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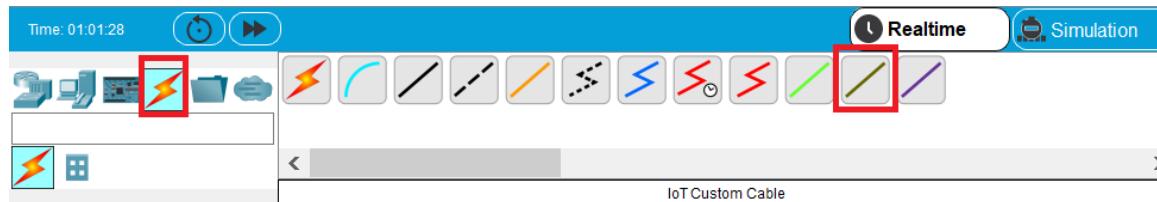
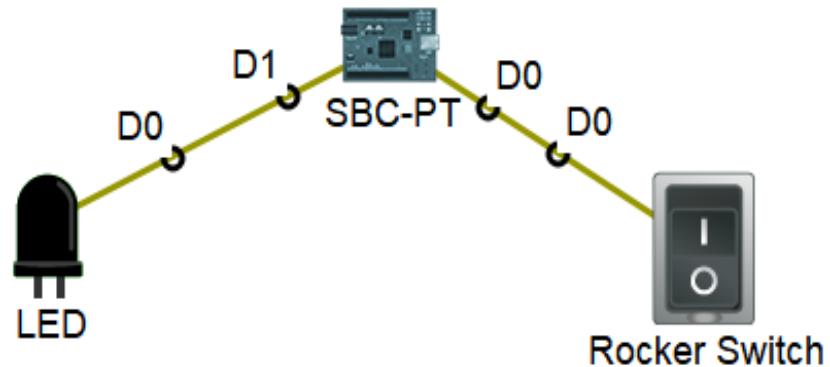
TOPIK BAHASAN

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

SBC LED

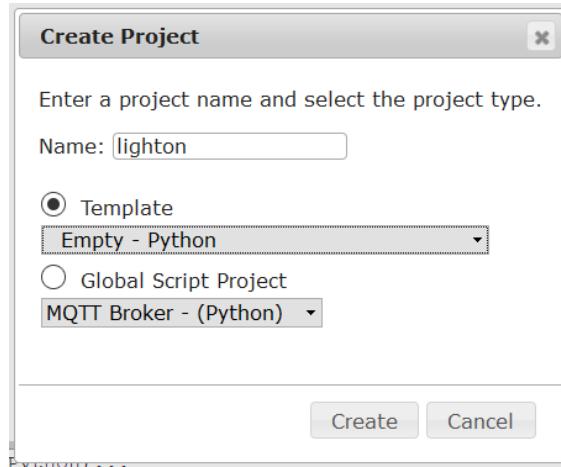
Topologi Jaringan

- Designlah jaringan seperti berikut:



Python Programming di SBC

Buat Project Baru



Jalankan Program

The interface shows a window titled 'SBC0' with tabs for 'Specifications', 'Physical', 'Config', 'Desktop', 'Programming' (which is selected), and 'Attributes'. In the 'Programming' tab, a file named 'lighton (Python) - main.py' is open. The code in the editor is:

```
from gpio import *
from time import *

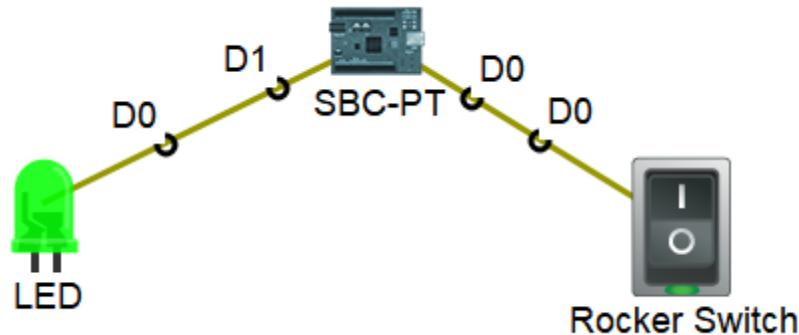
def main():
    pinMode (0, IN)
    pinMode (1, OUT)
    print ("light on")
    while True:
        if digitalRead(0) == HIGH:
            digitalWrite(1, HIGH)
        else:
            digitalWrite(1, LOW)

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

Below the editor, a terminal window shows the output: 'Starting lighton (Python)...' followed by 'light on'. A red box highlights the 'Stop' button in the toolbar above the terminal.

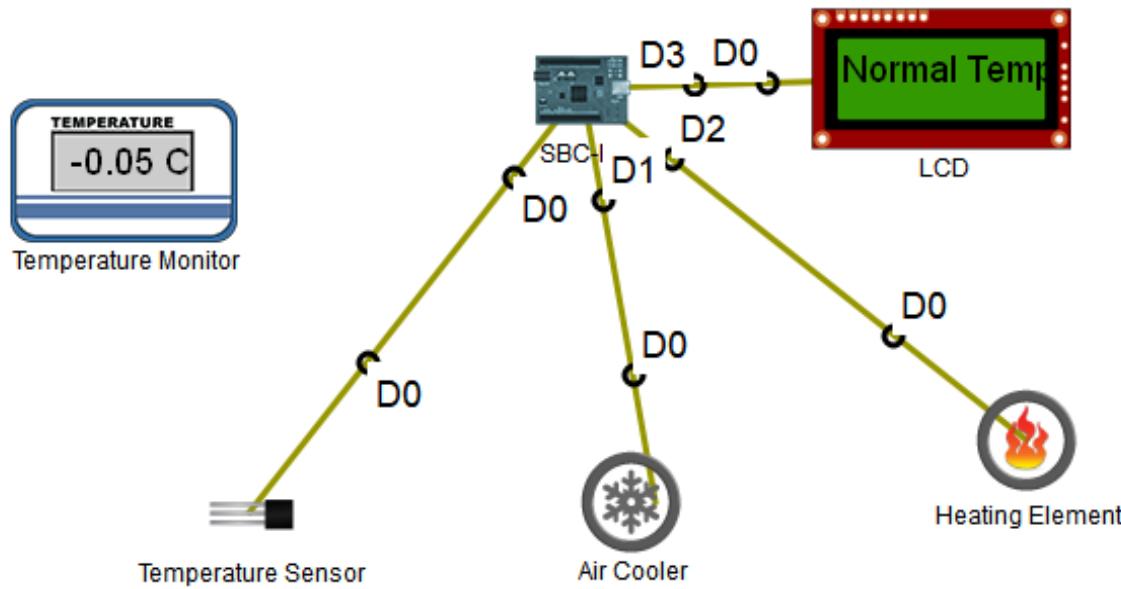
Pengujian SBC LED

Tekan ALT+Click pada Switch untuk menyalakan LED.

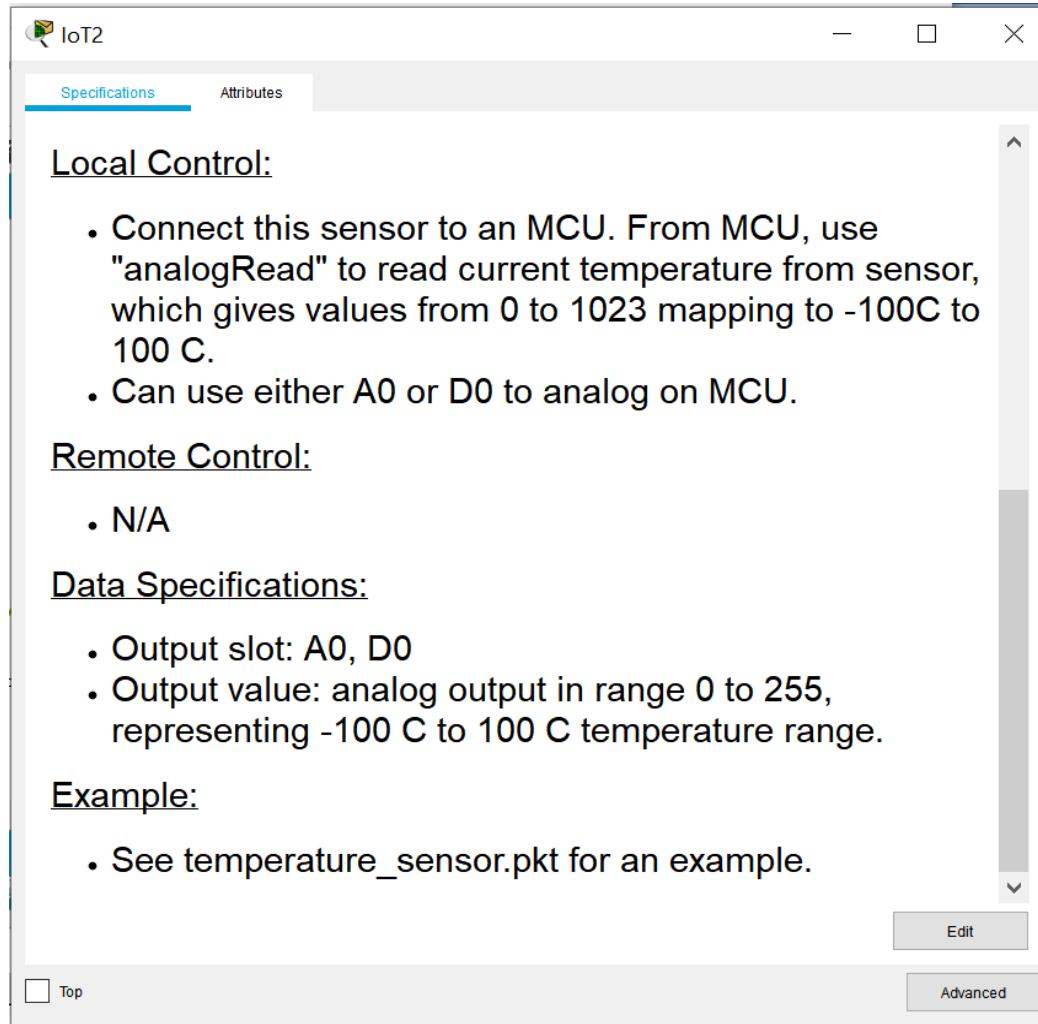


SMART TEMPERATURE

Topologi Jaringan



Setting Temperature Sensor



The screenshot shows a window titled "IoT2" with two tabs: "Specifications" (selected) and "Attributes". The "Specifications" tab contains the following content:

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 of the window are "Edit", "Top", and "Advanced" buttons.

Python Programming pada SBC

The screenshot shows the SBC0 software interface with the 'Programming' tab selected. A Python script named 'main.py' is open in the editor. The code implements a temperature control system based on sensor readings. It uses GPIO pins 0, 1, 2, and 3 for digital output and pin 0 for digital input. The script prints the current temperature and controls AC and heater operations based on the temperature value.

```
from gpio import *
from time import *

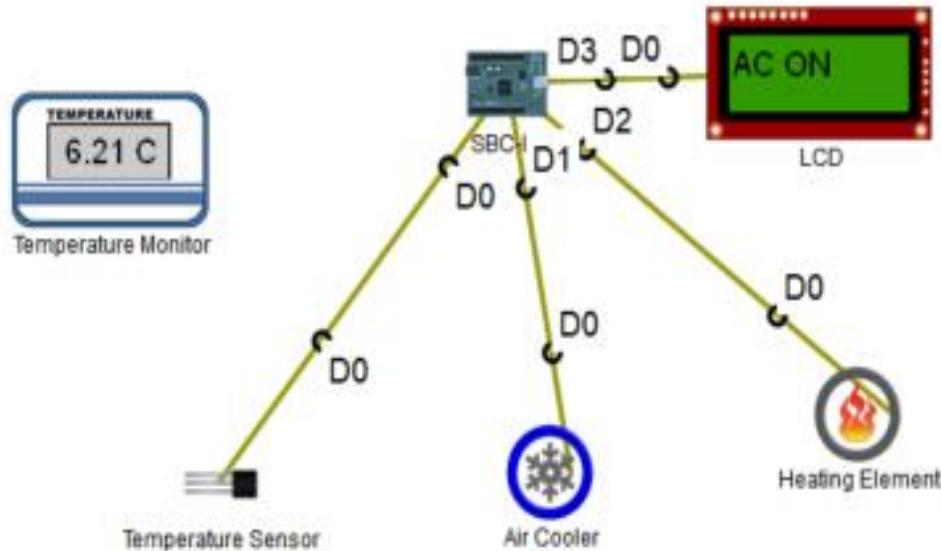
def main():
    pinMode(0, INPUT)
    pinMode(1, OUT)
    pinMode(2, OUT)
    pinMode(3, OUT)
    print("SMART ROOM TEMPERATURE")
    while True:
        temp = digitalRead(0);
        print("Temperature", temp);
        if (temp>=520):
            digitalWrite(1,HIGH);
            digitalWrite(2,LOW);
            customWrite(3,"AC ON");
        elif (temp<480):
            digitalWrite(1,LOW);
            digitalWrite(2,HIGH);
            customWrite(3,"HEATER ON");
        else:
            digitalWrite(1,LOW);
            digitalWrite(1,LOW);
            customWrite(3,"Normal Temp");
        delay(1000);

if __name__ == "__main__":
    main()

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

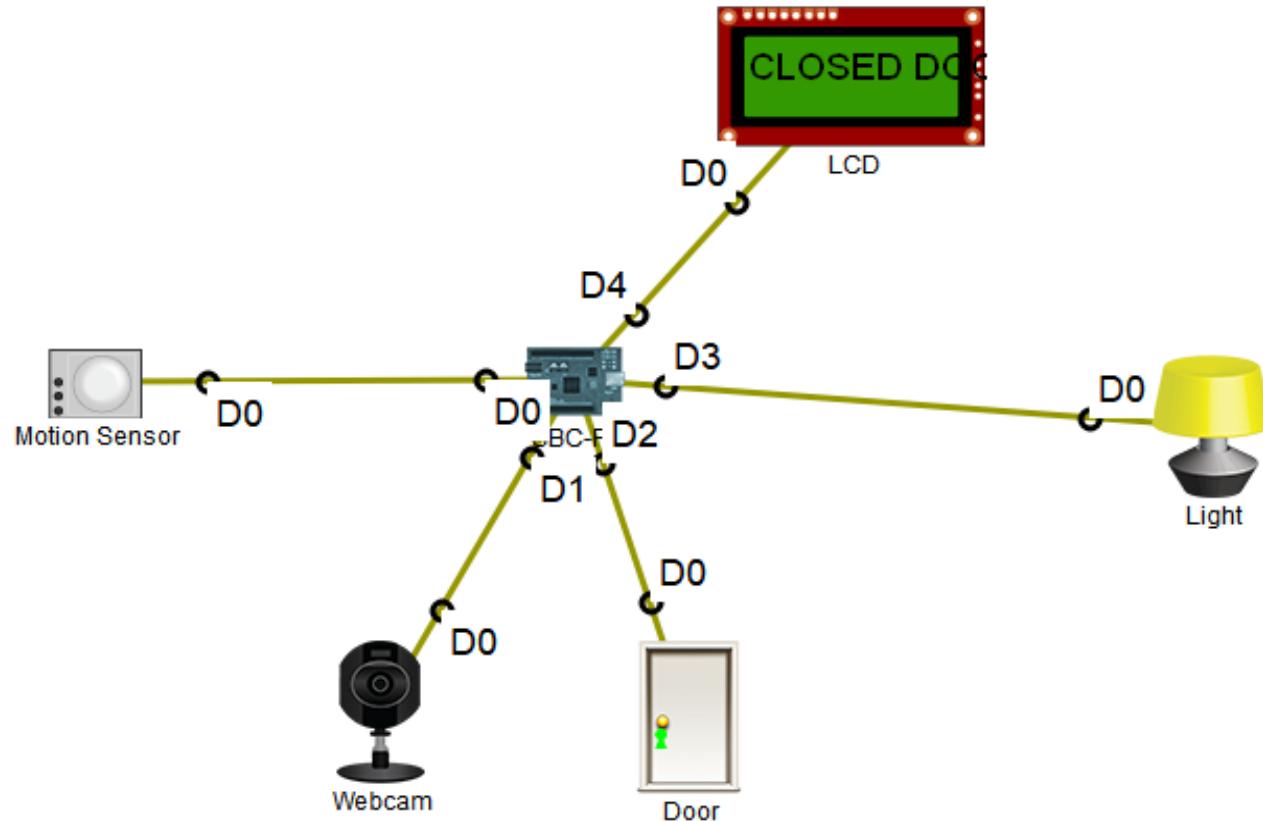
Pengujian

Amati perubahan pada **TEMPERATURE MONITOR**.

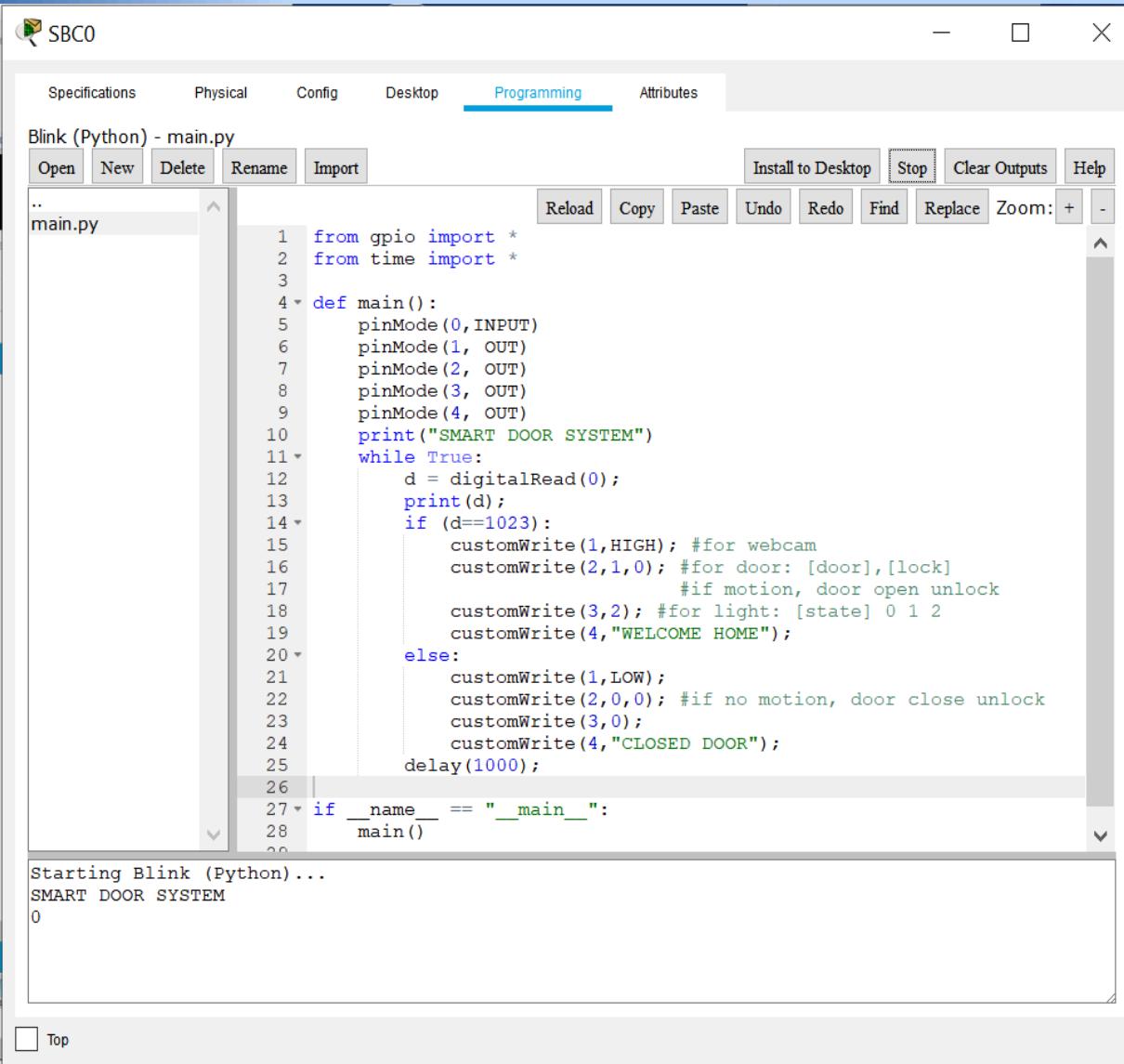


SMART DOOR SYSTEM

Topologi Jaringan



Python Programming



The screenshot shows the SBC0 software interface with the 'Programming' tab selected. The main window displays a Python script named 'main.py' for a 'Blink (Python) - main.py' project. The code implements a simple control system for a smart door system using GPIO pins 0 through 4. It initializes pins as inputs or outputs, prints a welcome message, and enters a loop to read pin 0. If pin 0 is high (1023), it triggers a sequence of custom writes to pins 1, 2, and 3, followed by a welcome message to pin 4. Otherwise, it triggers a sequence of custom writes to pins 1, 2, and 3, followed by a closed door message to pin 4. A delay of 1000 milliseconds is included after each sequence. The script concludes with a check for the main module name.

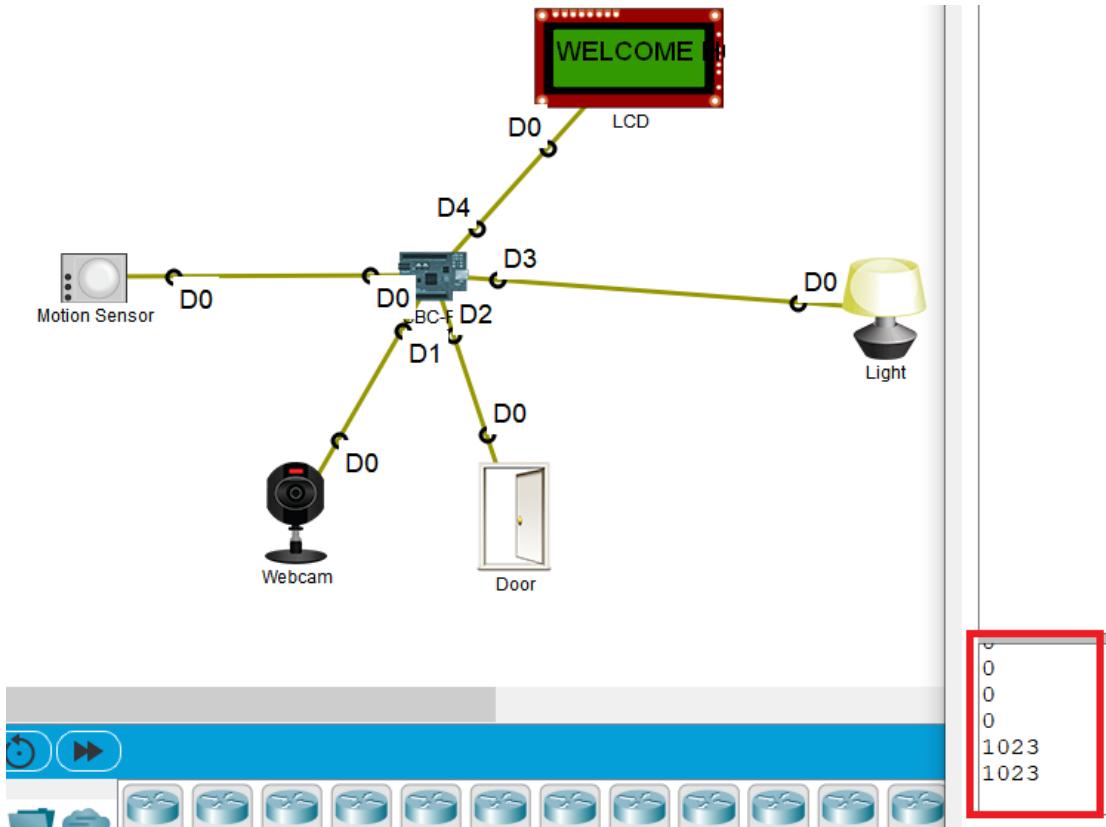
```
from gpio import *
from time import *

def main():
    pinMode(0,INPUT)
    pinMode(1, OUT)
    pinMode(2, OUT)
    pinMode(3, OUT)
    pinMode(4, OUT)
    print("SMART DOOR SYSTEM")
    while True:
        d = digitalRead(0);
        print(d);
        if (d==1023):
            customWrite(1,HIGH); #for webcam
            customWrite(2,1,0); #for door: [door],[lock]
                                #if motion, door open unlock
            customWrite(3,2); #for light: [state] 0 1 2
            customWrite(4,"WELCOME HOME");
        else:
            customWrite(1,LOW);
            customWrite(2,0,0); #if no motion, door close unlock
            customWrite(3,0);
            customWrite(4,"CLOSED DOOR");
        delay(1000);
    if __name__ == "__main__":
        main()

Starting Blink (Python)...
SMART DOOR SYSTEM
0
```

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