

Lab_Day_9_Simulation

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Micro-python code:

```
import time
import machine
import utime
import dht

# Initialize DHT22
dht_pin = machine.Pin(5)
dht_sensor = dht.DHT22(dht_pin)

# Initialize PIR Motion Sensor
pir_pin = machine.Pin(17, machine.Pin.IN)

# Initialize Servo Motor
servo_pin = machine.Pin(18)
servo = machine.PWM(servo_pin)
servo.freq(50)

def set_servo_angle(angle):
    # Duty cycle for servo is between 2.5% and 12.5% for 0 to 180 degrees
    duty = angle / 18 + 2.5
    servo.duty_u16(int(duty * 65535 / 100))

def read_dht22():
    dht_sensor.measure()
    temp = dht_sensor.temperature()
    humidity = dht_sensor.humidity()
    return temp, humidity

def main():
    while True:
        if pir_pin.value() == 1:
            print("Motion detected!")
            temp, humidity = read_dht22()
            print(f"Temperature: {temp}C, Humidity: {humidity}%")

            # Move the servo to 90 degrees
            set_servo_angle(90)
            utime.sleep(1)

            # Return the servo to 0 degrees
            set_servo_angle(0)
```

```

        utime.sleep(1)
    else:
        print("No motion")

    utime.sleep(2)

if __name__ == "__main__":
    main()

```

Simulation Diagram and Result

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main.py

diagram.json

```

1 import time
2 import machine
3 import utime
4 import dht
5
6 # Initialize DHT22
7 dht_pin = machine.Pin(5)
8 dht_sensor = dht.DHT22(dht_pin)
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10 # Initialize PIR Motion Sensor
11 pir_pin = machine.Pin(17, machine.Pin.IN)
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13 # Initialize Servo Motor
14 servo_pin = machine.Pin(18)
15 servo = machine.PWM(servo_pin)
16 servo.freq(50)
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18 def set_servo_angle(angle):
19     # Duty cycle for servo is between 2.5% and 12.5% for 0 to 180 degree
20     duty = angle / 18 + 2.5
21     servo.duty_u16(int(duty * 65535 / 100))
22
23 def read_dht22():
24     dht_sensor.measure()
25     temp = dht_sensor.temperature()
26     humidity = dht_sensor.humidity()

```

Simulation

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05:13.929

100%

No motion

No motion

No motion

Motion detected!

Temperature: 26.5C, Humidity: 64.5%

Motion detected!