

## Raspberry Pi Pico W exercise on WOKWI

### Code:

```
from machine import Pin, PWM
import time
import dht

# Initialize PIR sensor
pir = Pin(7, Pin.IN)

# Initialize DHT22 sensor
dht_sensor = dht.DHT22(Pin(0))

# Initialize Servo motor
servo = PWM(Pin(20))
servo.freq(50) # Typical servo frequency

# Function to set servo angle
def set_servo_angle(angle):
    # Servo expects pulse width between 0.5ms to 2.5ms
    pulse_width = int((angle / 180) * 2000 + 500)
    duty = pulse_width * (65535 // 20000)
    servo.duty_u16(duty)

try:
    while True:
        # Check for motion
        if pir.value() == 1:
            print("Motion detected!")
            # Turn servo to 90 degrees
            set_servo_angle(90)
        else:
            # Turn servo back to 0 degrees
            set_servo_angle(0)

        # Read temperature and humidity from DHT22
        dht_sensor.measure()
        temp = dht_sensor.temperature()
        hum = dht_sensor.humidity()
        print(f"Temperature: {temp}°C, Humidity: {hum}%")
        if temp > 30 or hum > 50:
            print("Temperature is high")
            set_servo_angle(90)
        else:
            set_servo_angle(0)
        # Wait a bit before the next read
        time.sleep(2)
except KeyboardInterrupt:
    print("Program stopped by user")
```

WOKWI

main.py

```
1 from machine import Pin, PWM
2 import time
3 import dht
4
5 # Initialize PIR sensor
6 pir = Pin(7, Pin.IN)
7
8 # Initialize DHT22 sensor
9 dht_sensor = dht.DHT22(Pin(0))
10
11 # Initialize Servo motor
12 servo = PWM(Pin(20))
13 servo.freq(50) # Typical servo frequency
14
15 # Function to set servo angle
16 def set_servo_angle(angle):
17     # Servo expects pulse width between 0.5ms to 2.5ms
18     pulse_width = int((angle / 180) * 2000 + 500)
19     duty = pulse_width * (65535 // 20000)
20     servo.duty_u16(duty)
21
22 try:
23     while True:
24         # Check for motion
25         if pir.value() == 1:
26             print("Motion detected!")
27             # Turn servo to 90 degrees
28             set_servo_angle(90)
29         else:
```

Simulation

00:19.154 100%

Temperature: 24.0°C, Humidity: 40.0%

Motion detected!

WOKWI

main.py

```
1 from machine import Pin, PWM
2 import time
3 import dht
4
5 # Initialize PIR sensor
6 pir = Pin(7, Pin.IN)
7
8 # Initialize DHT22 sensor
9 dht_sensor = dht.DHT22(Pin(0))
10
11 # Initialize Servo motor
12 servo = PWM(Pin(20))
13 servo.freq(50) # Typical servo frequency
14
15 # Function to set servo angle
16 def set_servo_angle(angle):
17     # Servo expects pulse width between 0.5ms to 2.5ms
18     pulse_width = int((angle / 180) * 2000 + 500)
19     duty = pulse_width * (65535 // 20000)
20     servo.duty_u16(duty)
21
22 try:
23     while True:
24         # Check for motion
25         if pir.value() == 1:
26             print("Motion detected!")
27             # Turn servo to 90 degrees
28             set_servo_angle(90)
29         else:
```

Simulation

01:19.485 100%

Editing DHT22

Temperature: 55.9°C

Humidity: 40.0%

Temperature is high

Motion detected!

Temperature: 55.9°C, Humidity: 40.0%

Temperature is high

Motion detected!

Temperature: 55.9°C, Humidity: 40.0%

Temperature is high

Temperature: 55.9°C, Humidity: 40.0%

Temperature is high

Temperature: 55.9°C, Humidity: 40.0%

Temperature is high

No new notifications

WOKWI

main.py

```
1 from machine import Pin, PWM
2 import time
3 import dht
4
5 # Initialize PIR sensor
6 pir = Pin(7, Pin.IN)
7
8 # Initialize DHT22 sensor
9 dht_sensor = dht.DHT22(Pin(0))
10
11 # Initialize Servo motor
12 servo = PWM(Pin(20))
13 servo.freq(50) # Typical servo frequency
14
15 # Function to set servo angle
16 def set_servo_angle(angle):
17     # Servo expects pulse width between 0.5ms to 2.5ms
18     pulse_width = int((angle / 180) * 2000 + 500)
19     duty = pulse_width * (65535 // 20000)
20     servo.duty_u16(duty)
21
22 try:
23     while True:
24         # Check for motion
25         if pir.value() == 1:
26             print("Motion detected!")
27             # Turn servo to 90 degrees
28             set_servo_angle(90)
29         else:
```

Simulation

01:29.387 99%

Editing DHT22

Temperature: 6.0°C

Humidity: 40.0%

Temperature: 55.9°C, Humidity: 40.0%

Temperature is high

Temperature: 55.9°C, Humidity: 40.0%

Temperature is high

Temperature: 55.9°C, Humidity: 40.0%

Temperature is high

Temperature: 55.9°C, Humidity: 40.0%

Temperature is high

Temperature: 6.0°C, Humidity: 40.0%

Temperature: 6.0°C, Humidity: 40.0%

Temperature: 6.0°C, Humidity: 40.0%