TASK- 3

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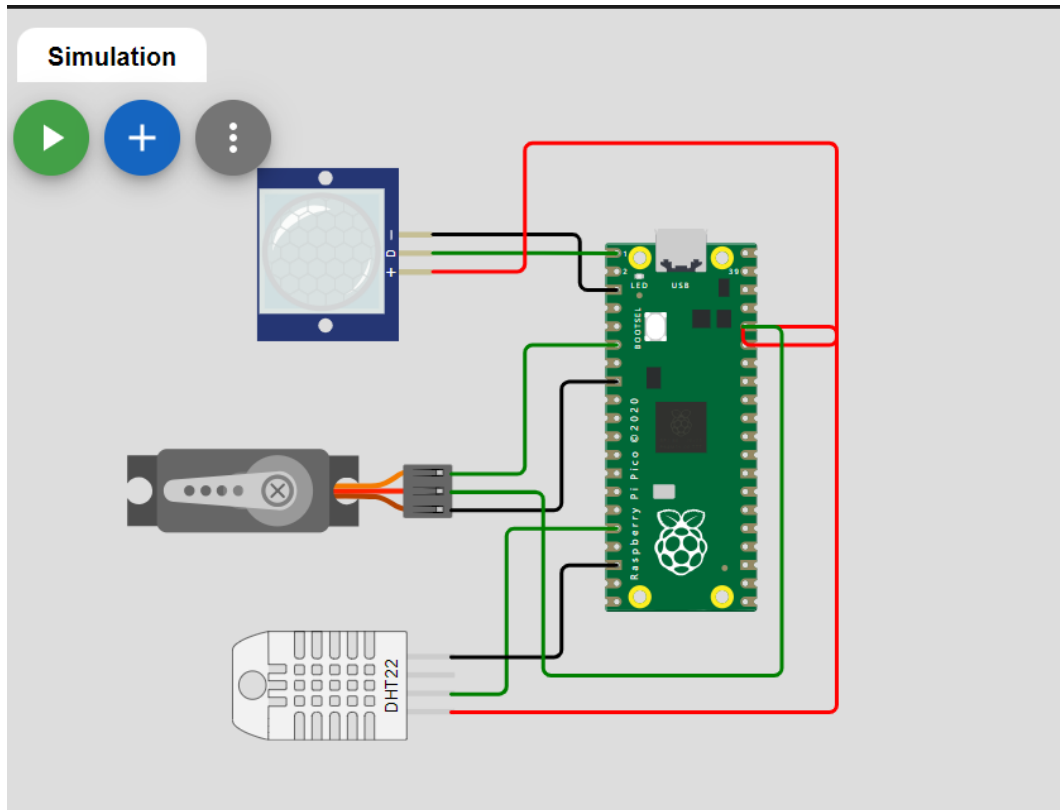**Figure 1 Schematic**

```
Temperature: 24.0°C, Humidity: 40.0%
Motion detected: 0
No motion or high humidity, setting fan to low.
Temperature: 24.0°C, Humidity: 40.0%
Motion detected: 0
No motion or high humidity, setting fan to low.
Temperature: 24.0°C, Humidity: 40.0%
Motion detected: 1
Motion detected, setting fan to high.
```

Code:

```python
import machine

import dht

import time


# Setup DHT22 sensor on GPIO 15

dht_sensor = dht.DHT22(machine.Pin(12))


# Setup PIR sensor on GPIO 14
```

```python
pir_sensor = machine.Pin(0, machine.Pin.IN)


# Setup Servo motor on GPIO 16

servo = machine.PWM(machine.Pin(4))

servo.freq(50)  # Servo motors typically use a 50Hz frequency


def set_servo_angle(angle):

    # Convert angle to duty cycle (assuming 0-180 degrees range)

    min_duty = 1000  # Min pulse width in microseconds

    max_duty = 9000  # Max pulse width in microseconds

    duty = min_duty + (max_duty - min_duty) * (angle / 180)

    servo.duty_u16(int(duty))


while True:

    try:

        # Measure temperature and humidity

        time.sleep(2)  # Ensure delay before reading the sensor

        dht_sensor.measure()

        temp = dht_sensor.temperature()

        hum = dht_sensor.humidity()

        print(f'Temperature: {temp}°C, Humidity: {hum}%')


        # Check motion detection

        motion_detected = pir_sensor.value()

        print(f'Motion detected: {motion_detected}')


        # Control logic for the fan based on sensor data

        if motion_detected:
```

```python
            print("Motion detected, setting fan to high.")

            set_servo_angle(180)  # Set fan to high position

        elif hum > 60:

            print("High humidity detected, setting fan to medium.")

            set_servo_angle(90)   # Set fan to medium position

        else:

            print("No motion or high humidity, setting fan to low.")

            set_servo_angle(0)    # Set fan to low or off position


    except OSError as e:

        print('Sensor error:', e)

        # Retry reading the sensor after a short delay

        time.sleep(2)
```