Basic IoT Project Development (Python/Node RED)
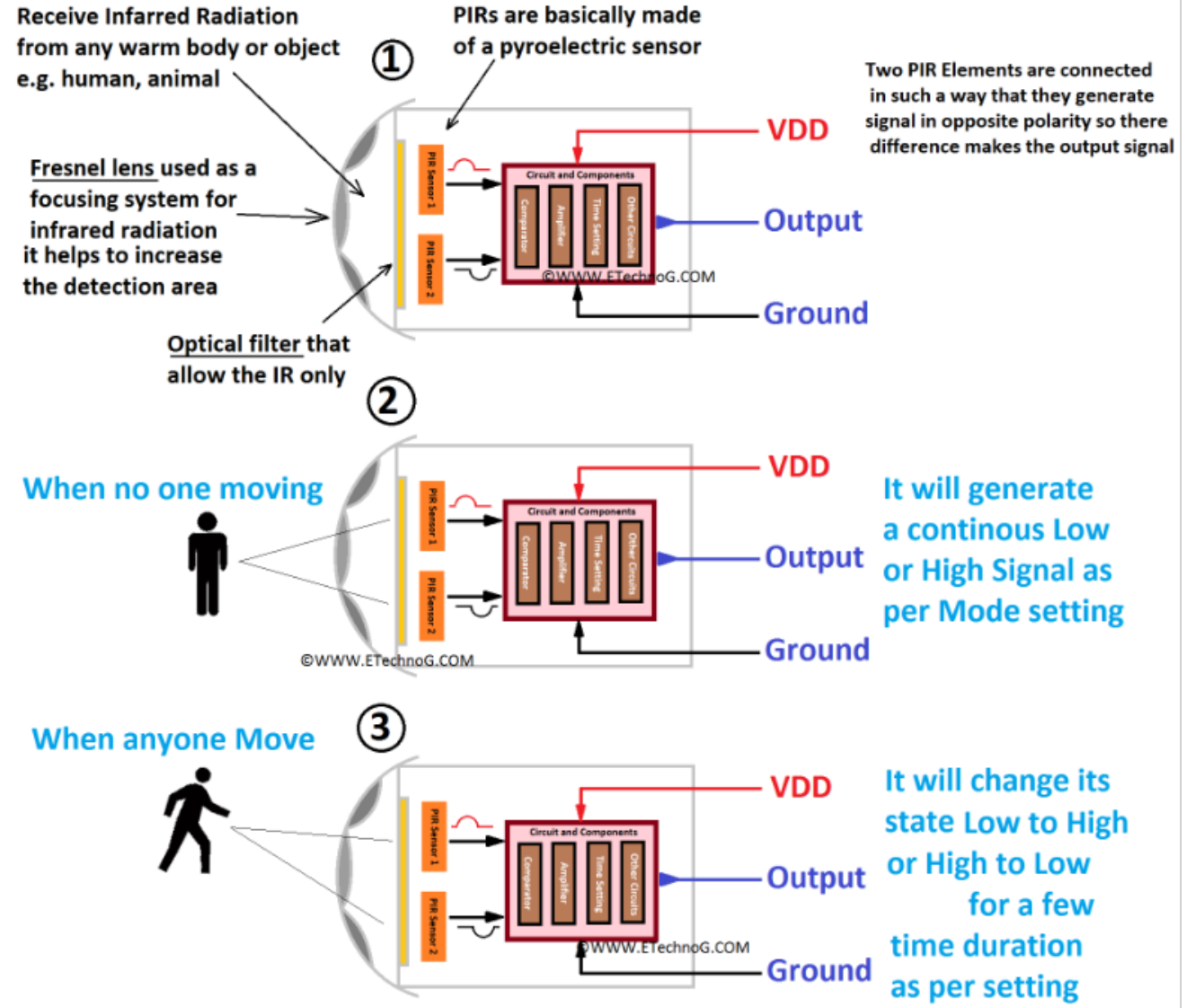
Ts.Dr. Norharyati Harum

Outline

- **Hands-on 1**: Reading values from sensor using python
- **Hands-on 2**: Reading values from sensor using node-RED

Passive Infrared (PIR) sensor

- Motion by measuring changes in infrared radiation (heat) emitted by objects in its field of view.

- Commonly used in motion detection systems for security, lighting, and automation.

- **PIR sensor pins:**

1. **VCC (Power Supply)**
   - **Purpose:** Supplies power to the PIR sensor.
   - **Voltage:** Typically requires 5V or 3.3V, depending on the sensor model.

2. **GND (Ground)**
   - **Purpose:** Provides the ground connection for the PIR sensor.

3. **OUT (Output)**
   - **Purpose:** Sends the motion detection signal.
   - **Signal:** Outputs a digital signal that goes HIGH when motion is detected and LOW when no motion is detected.

PIR Sensor: How it works

Receive Infarred Radiation from any warm body or object e.g. human, animal

PIRs are basically made of a pyroelectric sensor

Two PIR Elements are connected in such a way that they generate signal in opposite polarity so there difference makes the output signal

VDD

Output

Fresnel lens used as a focusing system for infrared radiation it helps to increase the detection area

Ground

Optical filter that allow the IR only

When no one moving

VDD

Output

It will generate a continous Low or High Signal as per Mode setting

Ground

©WWW.ETechnoG.COM

When anyone Move

VDD

Output

Ground

It will change its state Low to High or High to Low for a few time duration as per setting

©WWW.ETechnoG.COM

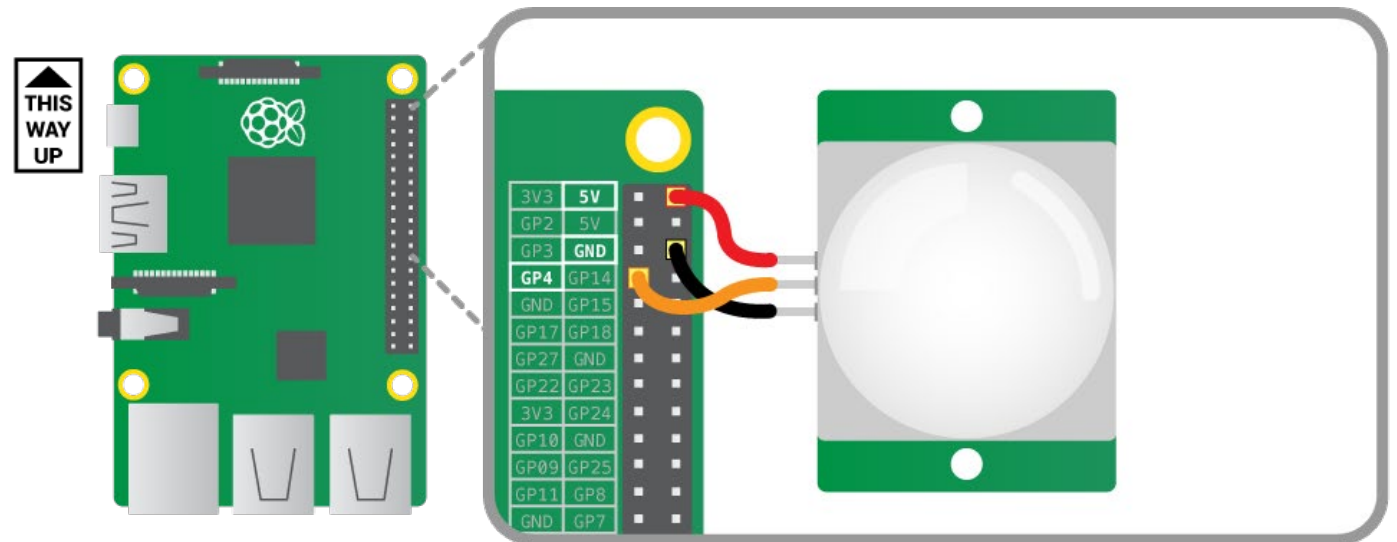# **Hands-on 1**: Reading values from sensor
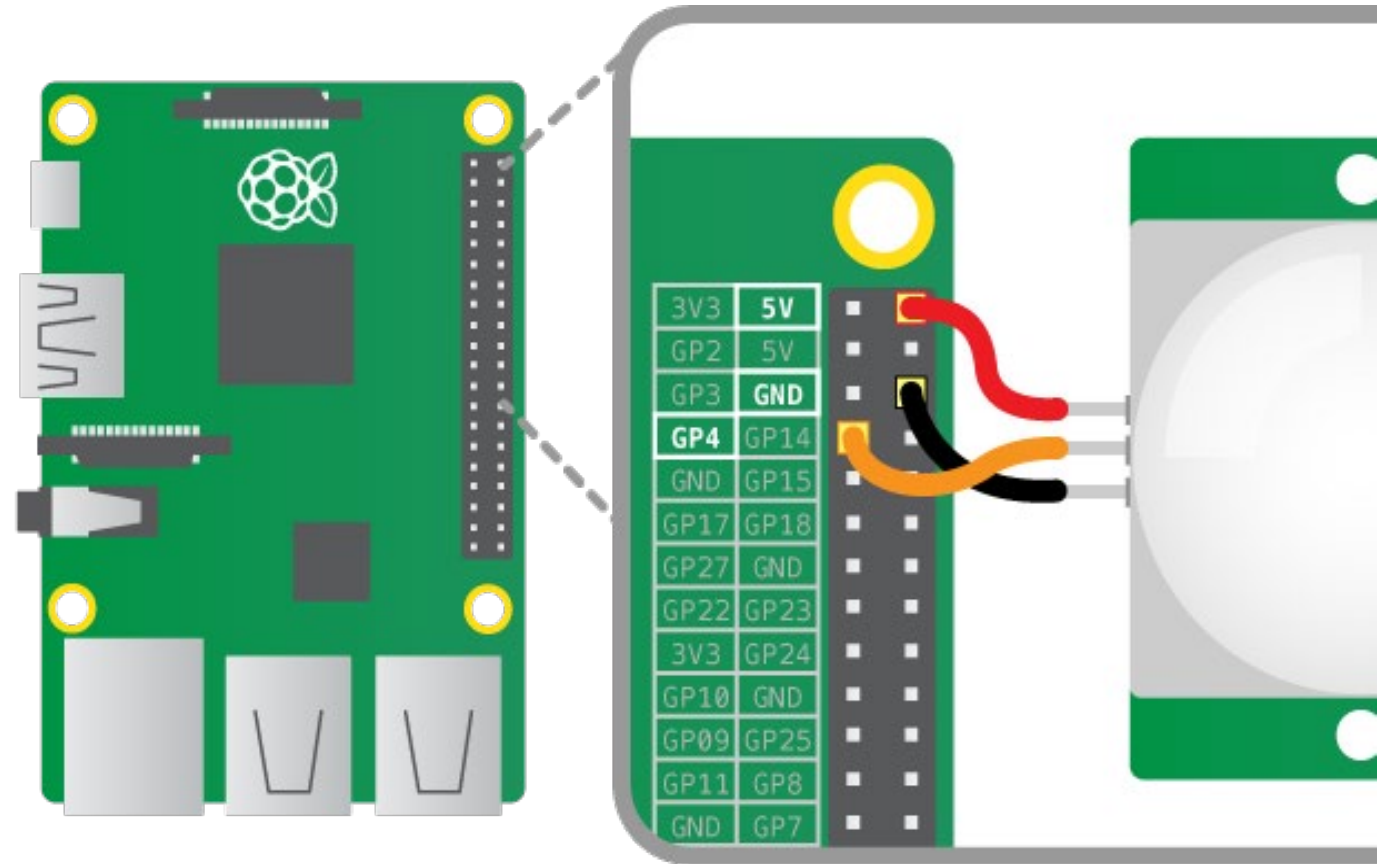
Hands-on 1: Read GPIO pin with Python

Read pin status from PIR sensor:

- Attach 1 PIR sensor on **GPIO**

- Create new **Python** File

- Write and run the code.

Hands-on 1: Read GPIO pin with Python

- Create new **Python** File

- Write and run the code.

```python
import RPi.GPIO as GPIO
import time
# Set up GPIO
PIR_PIN = 17  # Connect the PIR sensor output to GPIO 17
GPIO.setmode(GPIO.BCM)
GPIO.setup(PIR_PIN, GPIO.IN)
print("PIR Sensor Test (Press Ctrl+C to exit)")
try:
    while True:
        if GPIO.input(PIR_PIN):
            print("Motion Detected!")
        else:
            print("No motion")
        time.sleep(1)  # Adjust this delay as necessary
except KeyboardInterrupt:
    print("Exiting Program")
finally:
    GPIO.cleanup()
```
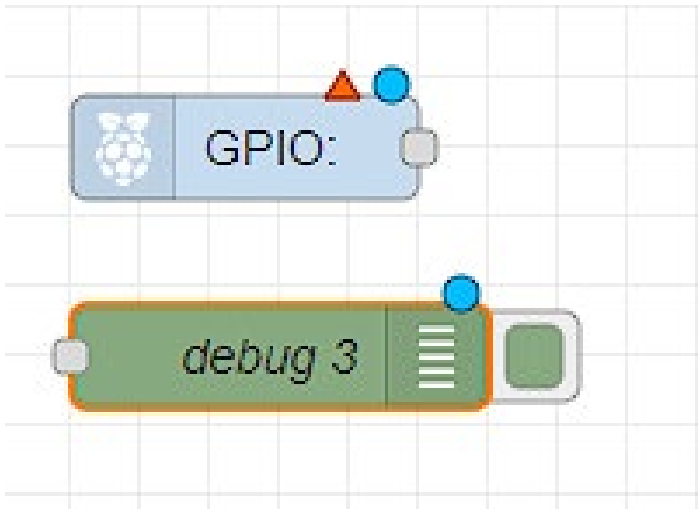
Hands-on 2: Read GPIO pin with Node RED

Read pin status from PIR sensor:

- Attach 1 PIR sensor on **GPIO**

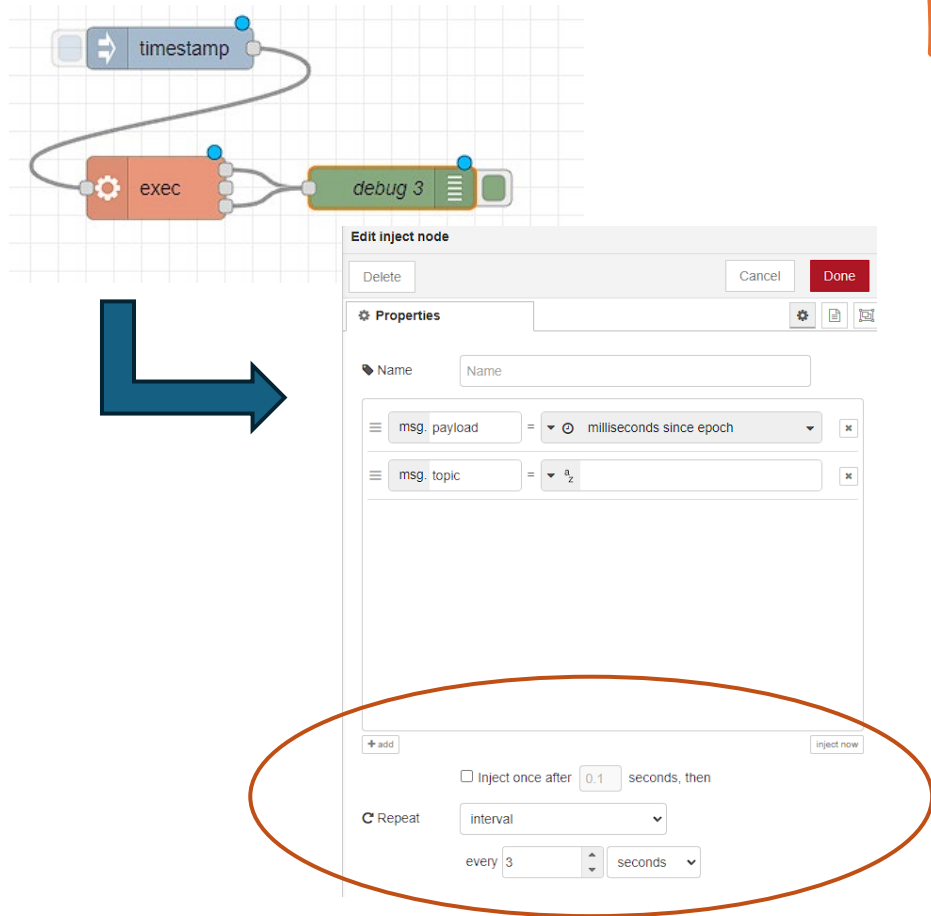- Create new **Flow** in Node RED

- Configure and deploy.
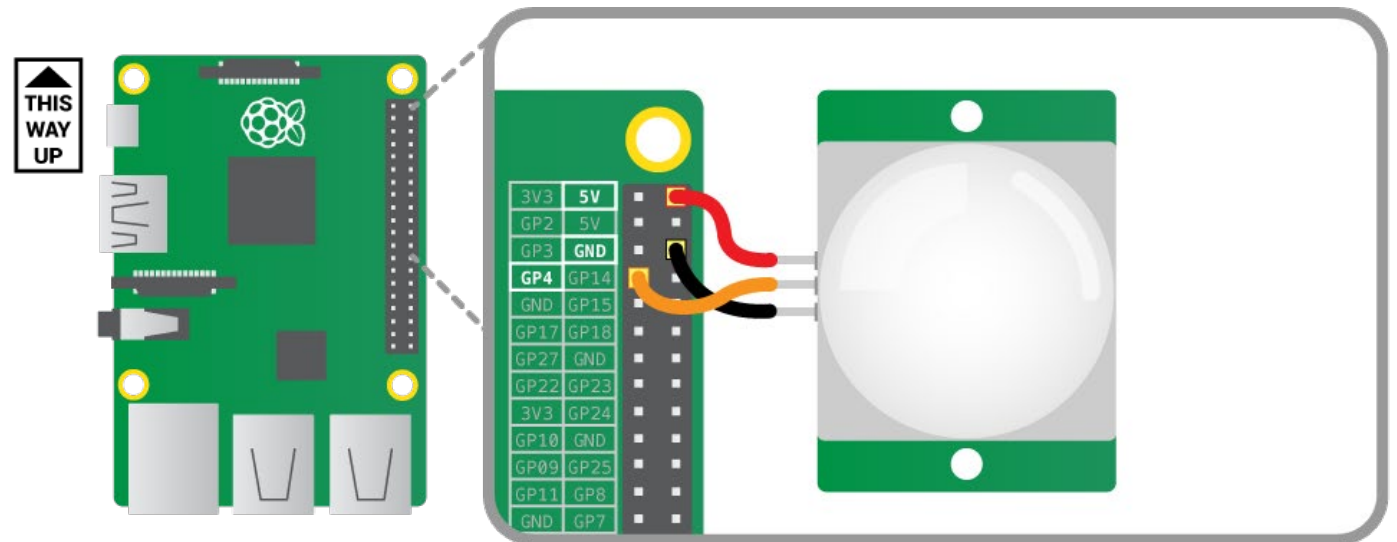
Hands-on 2: Read GPIO pin with Node RED

- Use inject node, exec node and debug node to read gpio pin value
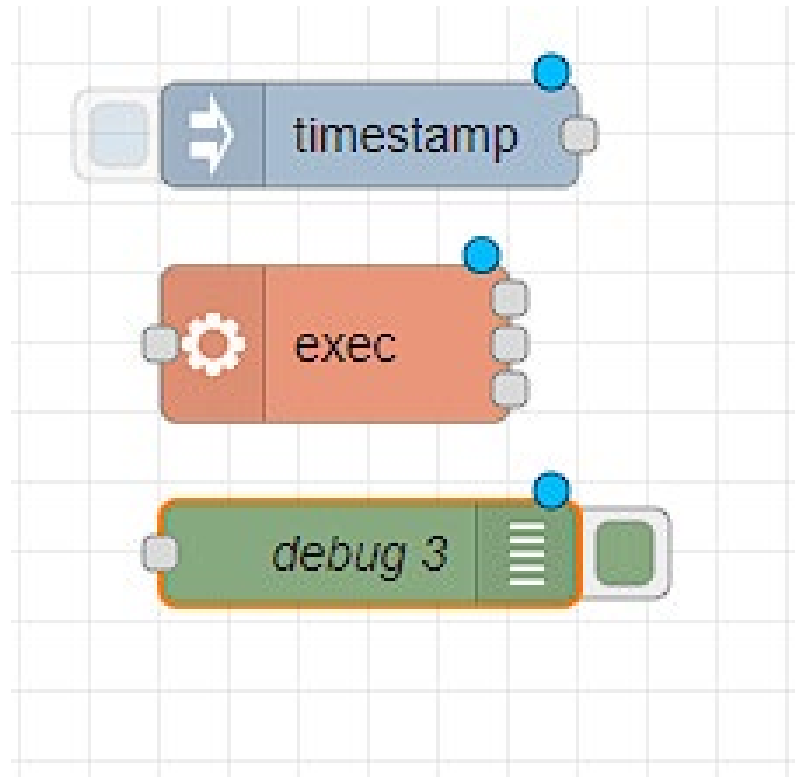
Hands-on 2: Read GPIO pin with Node RED

- Connect inject, exec and debug node.
- Configure interval inject and use command: gpioget gpiochip0 20