
PIR Motion Sensor Project with Arduino Uno

Objective:
Detect human motion using a PIR (Passive Infrared) sensor and respond with an output like lighting an LED or activating a buzzer.

Components Required:

- Arduino Uno
- PIR Motion Sensor (HC-SR501 or similar)
- 1 LED (optional)
- 1 Resistor (220Ω–330Ω, for LED)
- Jumper wires & breadboard

Circuit Overview:

- The **PIR sensor** has 3 pins:
  - **VCC** → 5V on Arduino
  - **GND** → GND on Arduino
  - **OUT** → Digital pin (e.g., D2)
- (Optional) Connect an LED with a resistor to another digital pin (e.g., D13), with the cathode to GND.

Working Principle:

- The PIR sensor detects infrared radiation changes caused by human movement.
- When motion is detected, the **OUT** pin goes **HIGH**.
- The Arduino can read this signal and respond, such as turning on an LED or sounding a buzzer.
- The sensor has knobs to adjust **sensitivity** and **delay time**.

Use Cases:

- Security systems
- Automatic lighting

- Motion-activated alarms
