
PIR Sensor + 3-Color LED (RGB LED) with Arduino

Objective:
Detect human motion using a **PIR motion sensor**, and change the **color of an RGB LED** based on detection status.

Components Required:

- Arduino Uno
- PIR motion sensor
- Common cathode or common anode RGB LED
- 3 current-limiting resistors (e.g., 220Ω)
- Breadboard & jumper wires

Circuit Overview:

- The **PIR sensor** detects infrared radiation from moving objects (like a person) and outputs a **HIGH signal** when motion is detected.
- The **RGB LED** has three pins for red, green, and blue channels (and one for common ground or VCC depending on type).
- Each LED pin connects to a PWM-capable pin on Arduino through a resistor.

Working Principle:

- When no motion is detected, the RGB LED stays **off** or glows a base color.
- When motion is detected, Arduino triggers the RGB LED to light up in a different color (e.g., red for alert).
- Optionally, it can change colors gradually or blink to indicate ongoing motion.

Use Cases:

- Motion-triggered lighting with color indicators
- Security or presence alert system
- Mood lighting that reacts to people

Bonus Idea:
Add a **buzzer** or **delay timer** for smarter response behavior.