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Project title: Intruder Alarm System, Group7

Evaluation: PIR accuracy, buzzer response.

Introduction

This project is about making a simple security system using Arduino. It uses a PIR sensor to detect movement. When someone enters, the system turns on a buzzer, lights an LED, and shows a warning message on an LCD.

Components

- Arduino Uno
- PIR sensor
- Buzzer
- Red LED
- LCD 16x2 (I2C)
- Breadboard + jumper wires

Objective

Trigger an alarm when unauthorized entry is detected.

- Detect intruders using a PIR sensor.
- Trigger buzzer and LED as alarm.
- Show "Intruder Alert!" on LCD.

Circuit

1. PIR Sensor

- VCC → 5V on Arduino
- GND → GND on Arduino
- OUT → Pin 2 on Arduino

2. Buzzer

- Positive (+) → Pin 7 on Arduino
- Negative (−) → GND (with optional series resistor)

3. Red LED

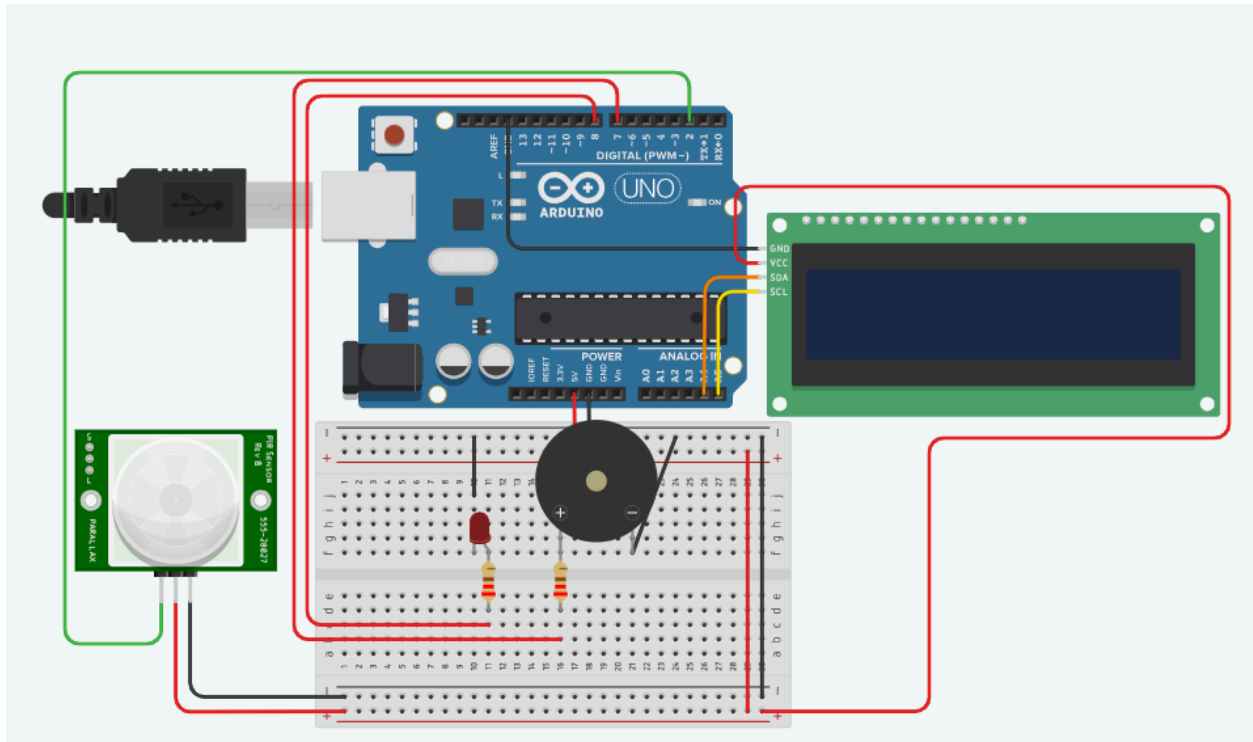
- Anode (+) → Pin 8 on Arduino (with 220Ω resistor in series)
- Cathode (−) → GND

4. I2C LCD (16x2)

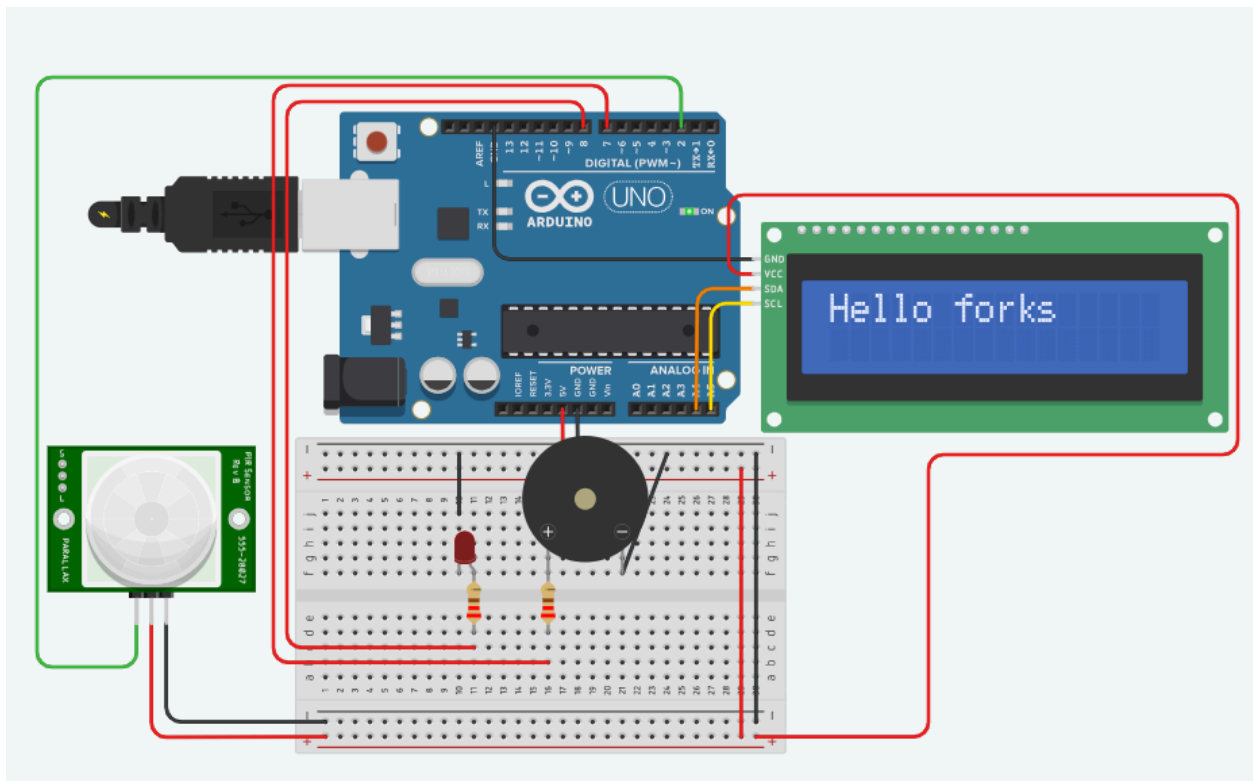
- GND → GND
- VCC → 5V
- SDA → A4 on Arduino
- SCL → A5 on Arduino

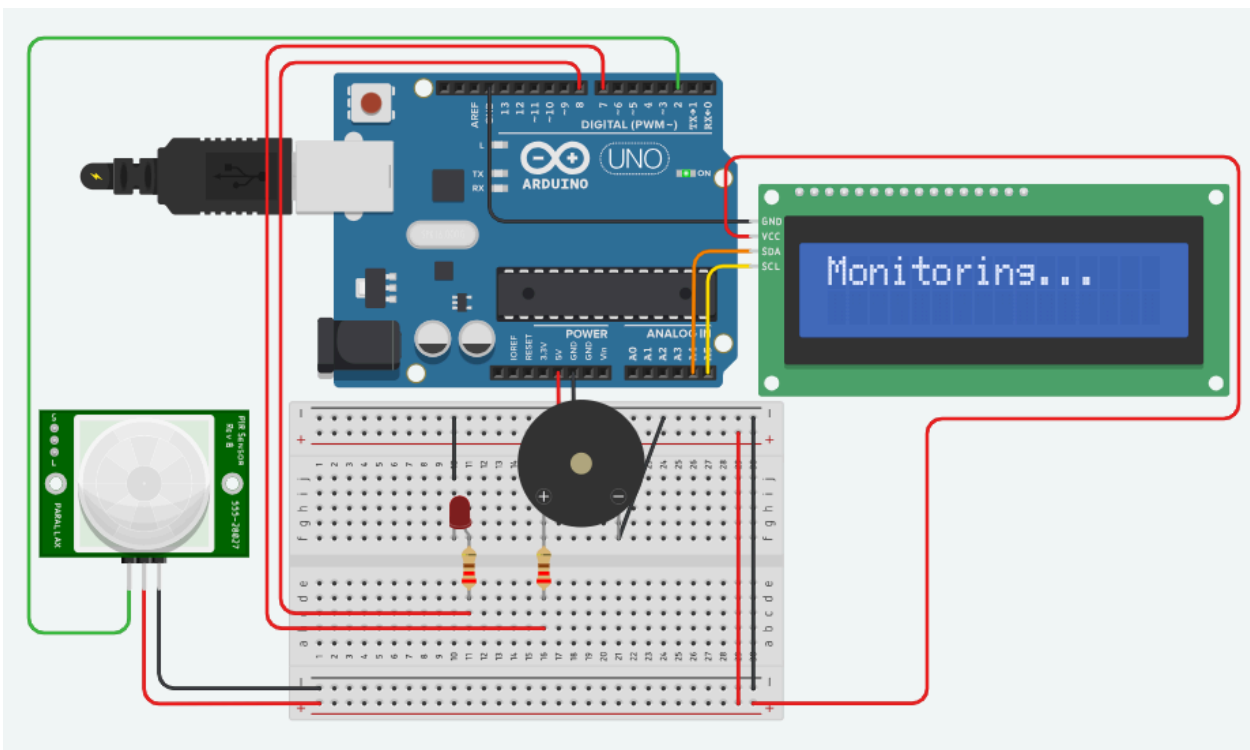
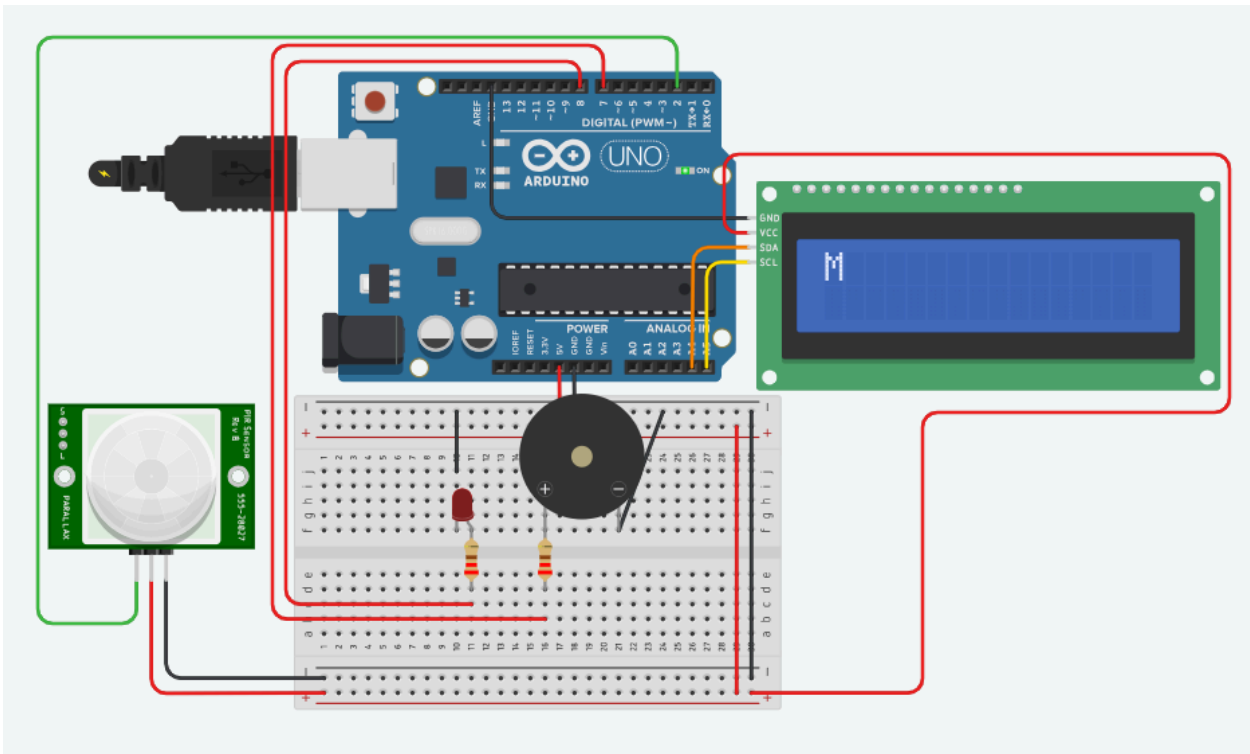
- PIR detects motion → sends HIGH to **pin 2**
- Arduino turns ON **LED (pin 8)** and **Buzzer (pin 7)**
- LCD (via I2C at A4/A5) displays the status

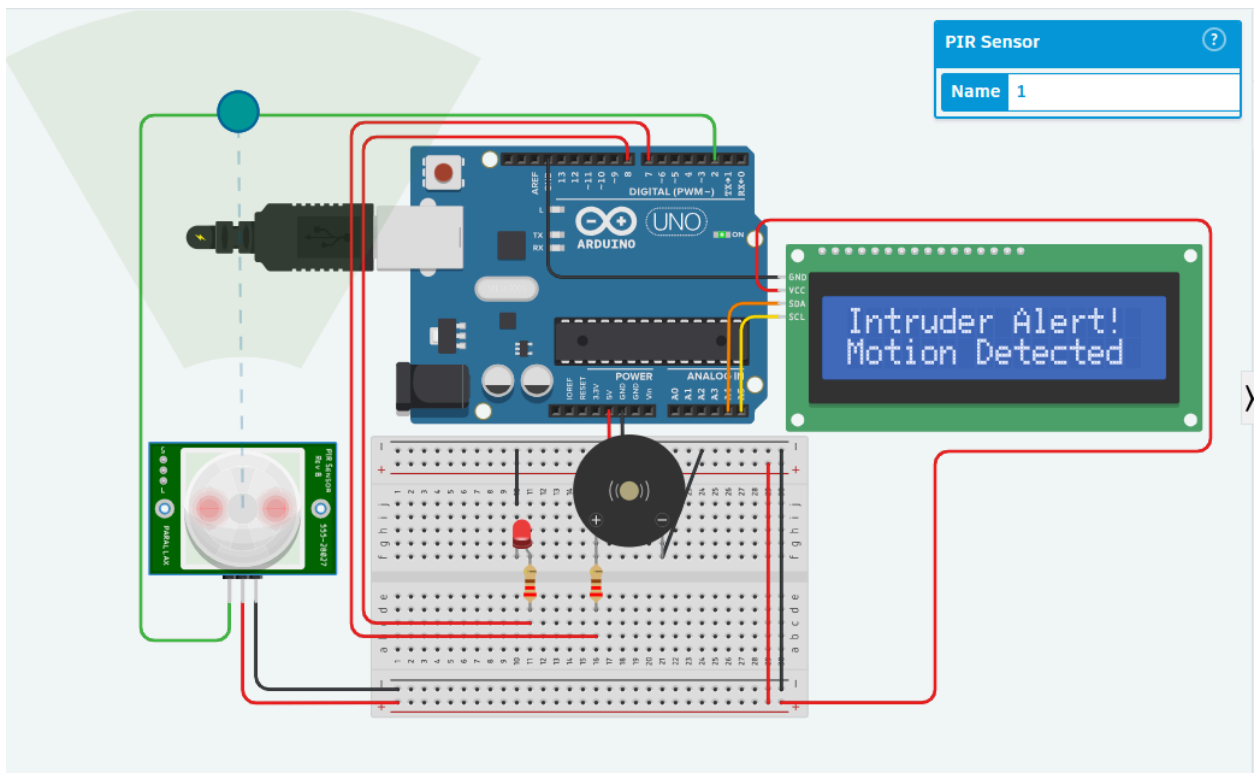
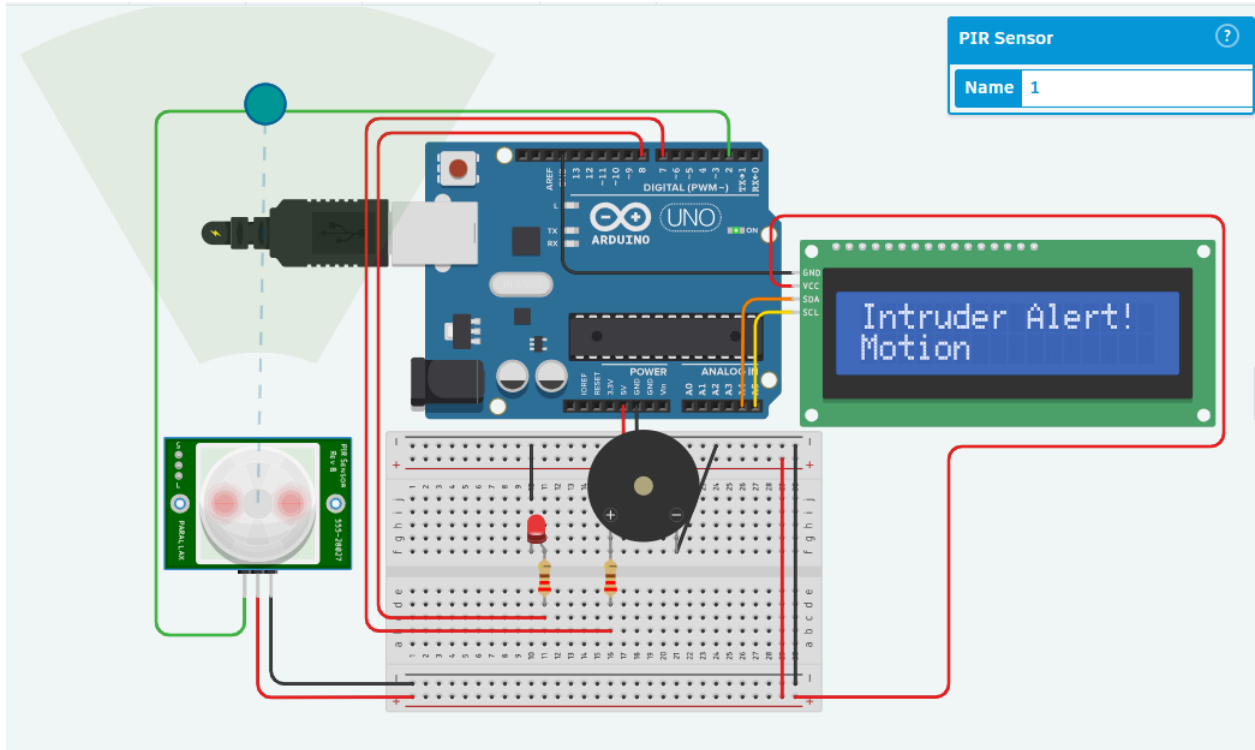
Schematic screenshot



Working (Running)







Codes:

```
#include <LiquidCrystal_I2C.h>

LiquidCrystal_I2C lcd_1(32, 16, 2);

int redLed = 8;
int buzzerPin = 7;
int pirPin = 2;

void setup() {
    // put your setup code here, to run once:
    lcd_1.init();
    lcd_1.setCursor(0, 0);
    lcd_1.backlight();
    lcd_1.display();
    lcd_1.print("Hello forks");
    delay(4000);
    lcd_1.clear();
    pinMode(redLed, OUTPUT);
    pinMode(buzzerPin, OUTPUT);
    pinMode(pirPin, INPUT);

    digitalWrite(redLed, LOW);
    digitalWrite(buzzerPin, LOW);
}

void loop() {
    // put your main code here, to run repeatedly:
    int pirState = digitalRead(pirPin);
    if (pirState == HIGH) {
        // Motion detected
        digitalWrite(redLed, HIGH);
        digitalWrite(buzzerPin, HIGH);

        lcd_1.clear();
        lcd_1.setCursor(0, 0);
        lcd_1.print("Intruder Alert!");
        lcd_1.setCursor(0, 1);
        lcd_1.print("Motion Detected");
        delay(1000);
    }
}
```

```
} else {  
    // No motion  
    digitalWrite(redLed, LOW);  
    digitalWrite(buzzerPin, LOW);  
  
    lcd_1.clear();  
    lcd_1.setCursor(0, 0);  
    lcd_1.print("Monitoring...");  
    delay(1000);  
}  
}
```

Conclusion

The system works well for detecting motion and alerting the user with sound, light, and display. It is a simple and low-cost security solution.

Problem faced

- LCD did not work until the correct I2C address was set.
- PIR sensor, is it Digital or Analog