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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

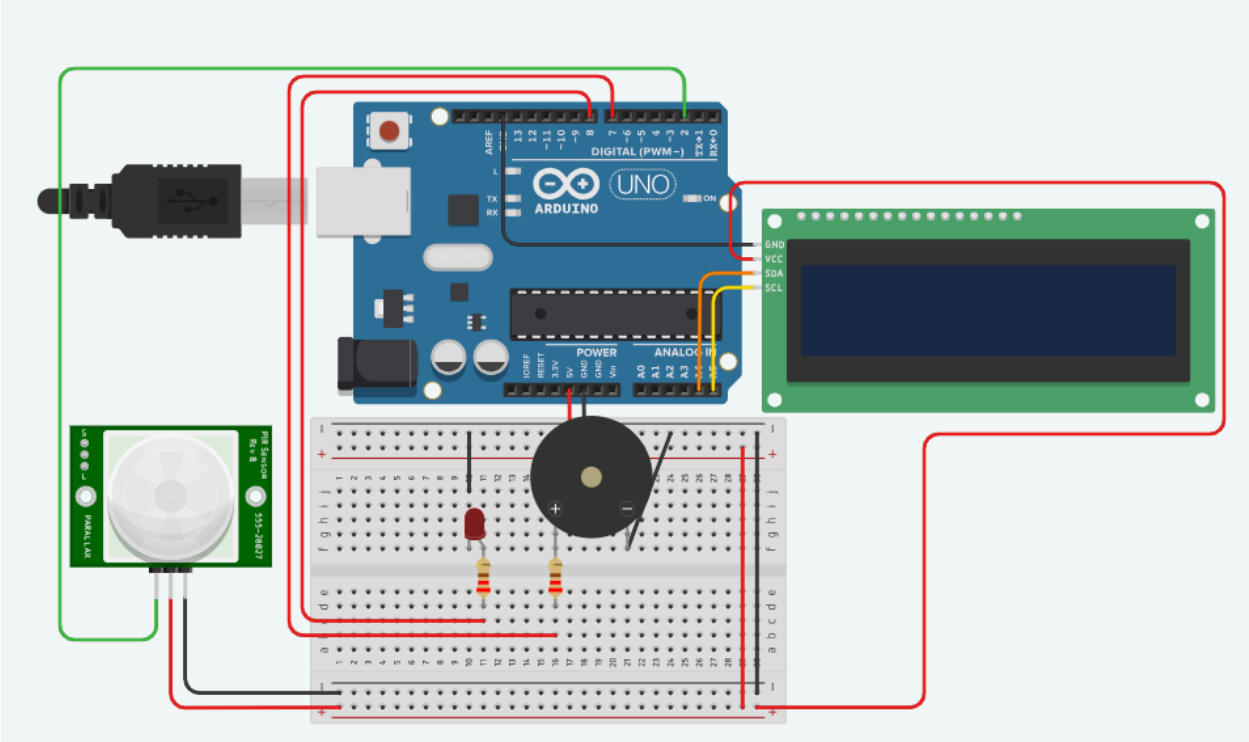
- Anode (+) → Pin 8 on Arduino (with 220Ω resistor in series)
- Cathode (–) → GND

4. I2C LCD (16x2)

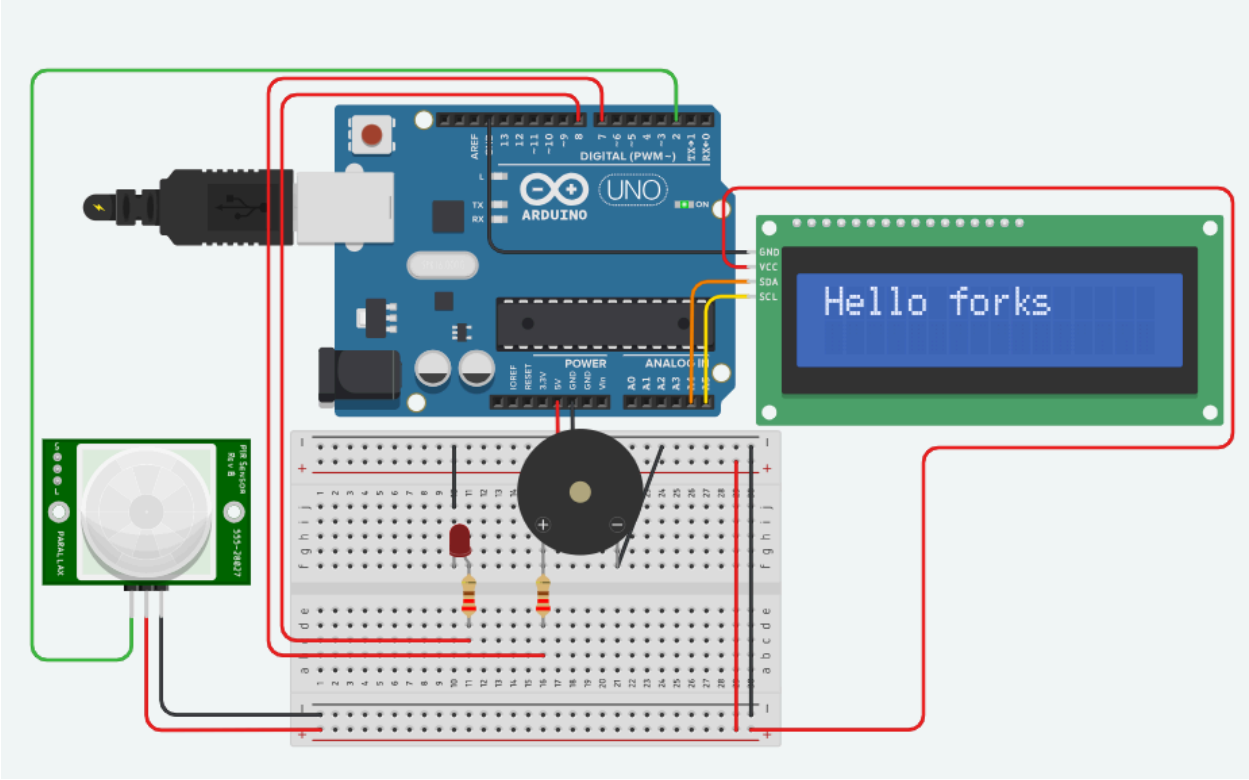
- GND → GND
- VCC → 5V
- SDA → A4 on Arduino
- SCL → A5 on Arduino

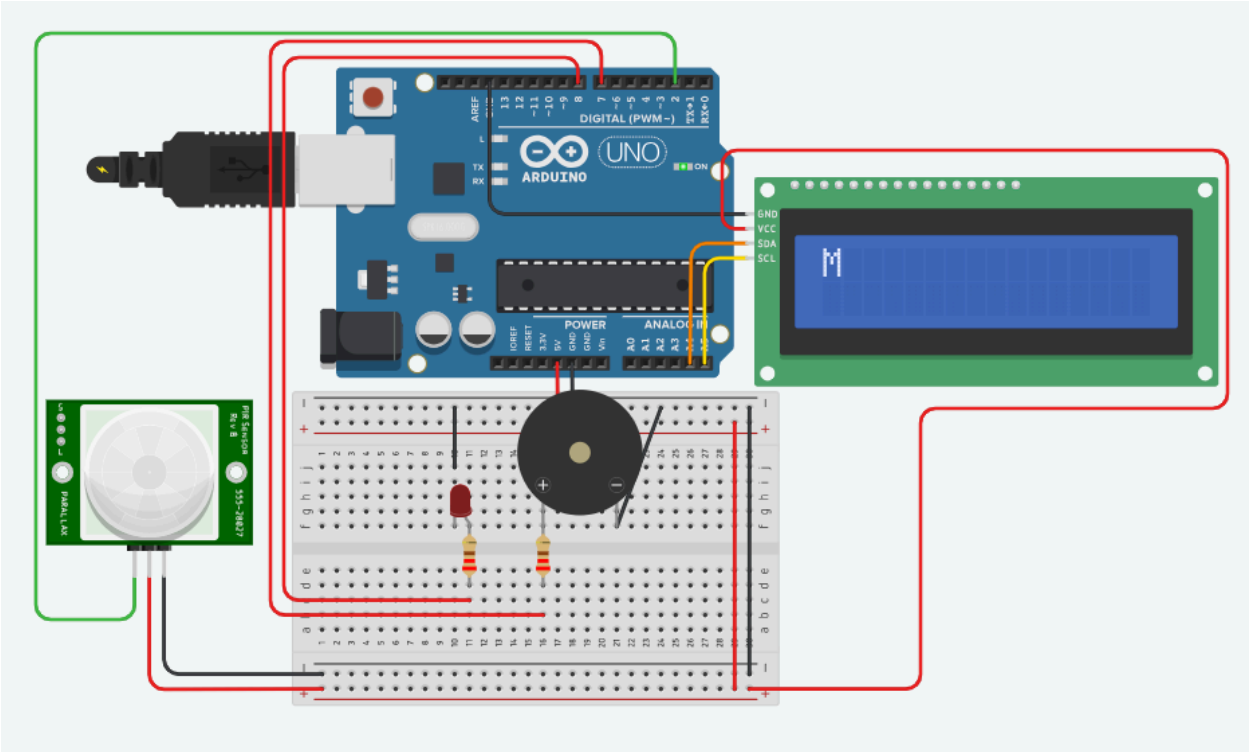
➔ PIR detects motion → sends HIGH to **pin 2**
➔ Arduino turns ON **LED (pin 8)** and **Buzzer (pin 7)**
➔ LCD (via I2C at A4/A5) displays the status

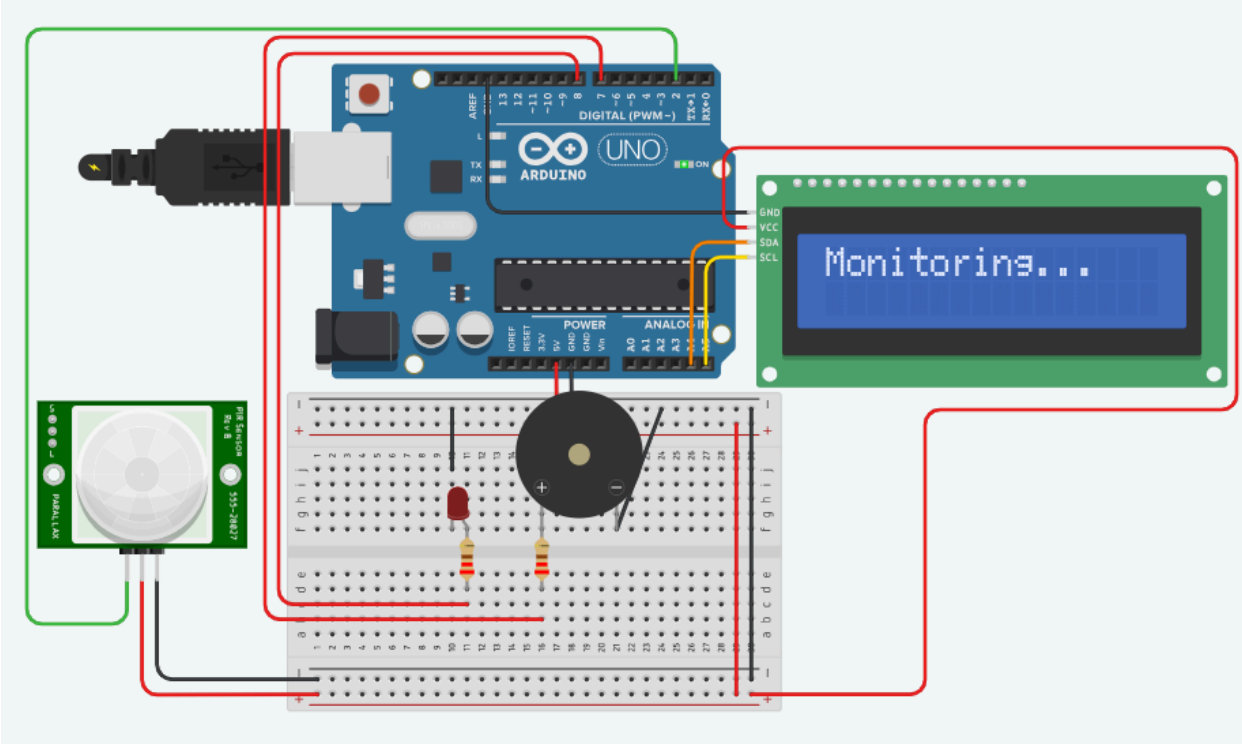
Schematic screenshot

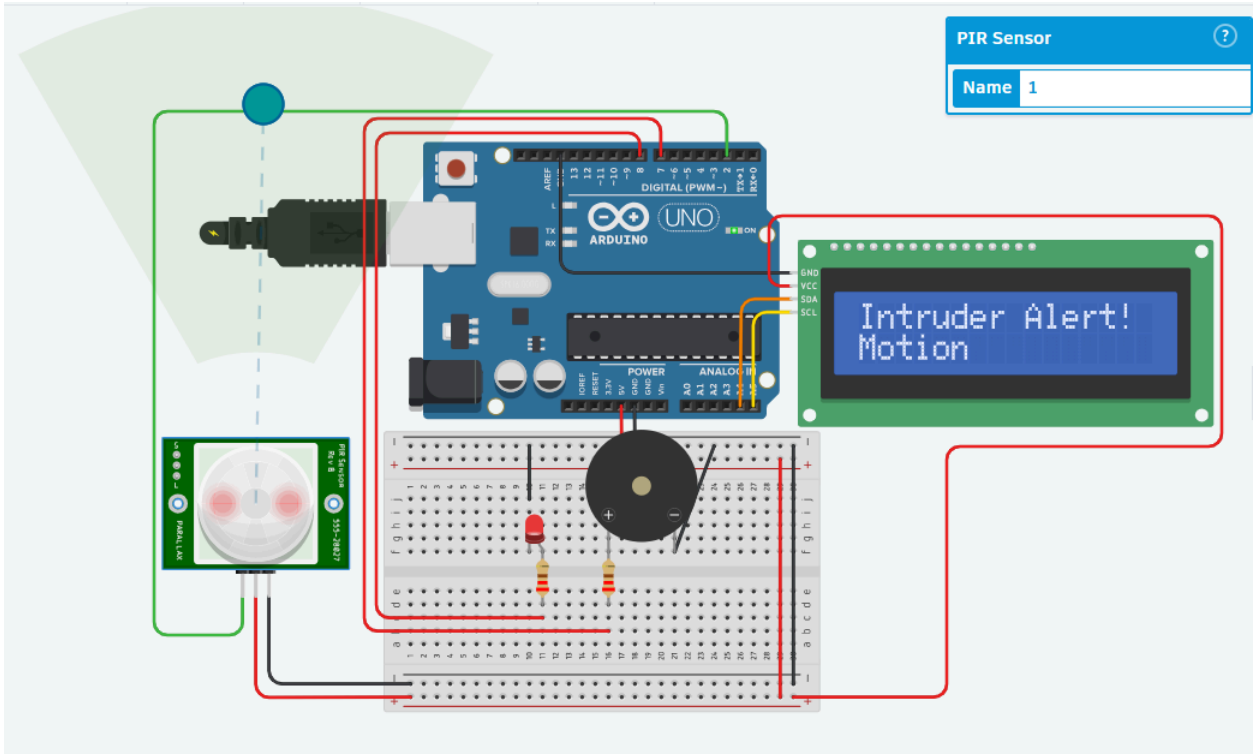


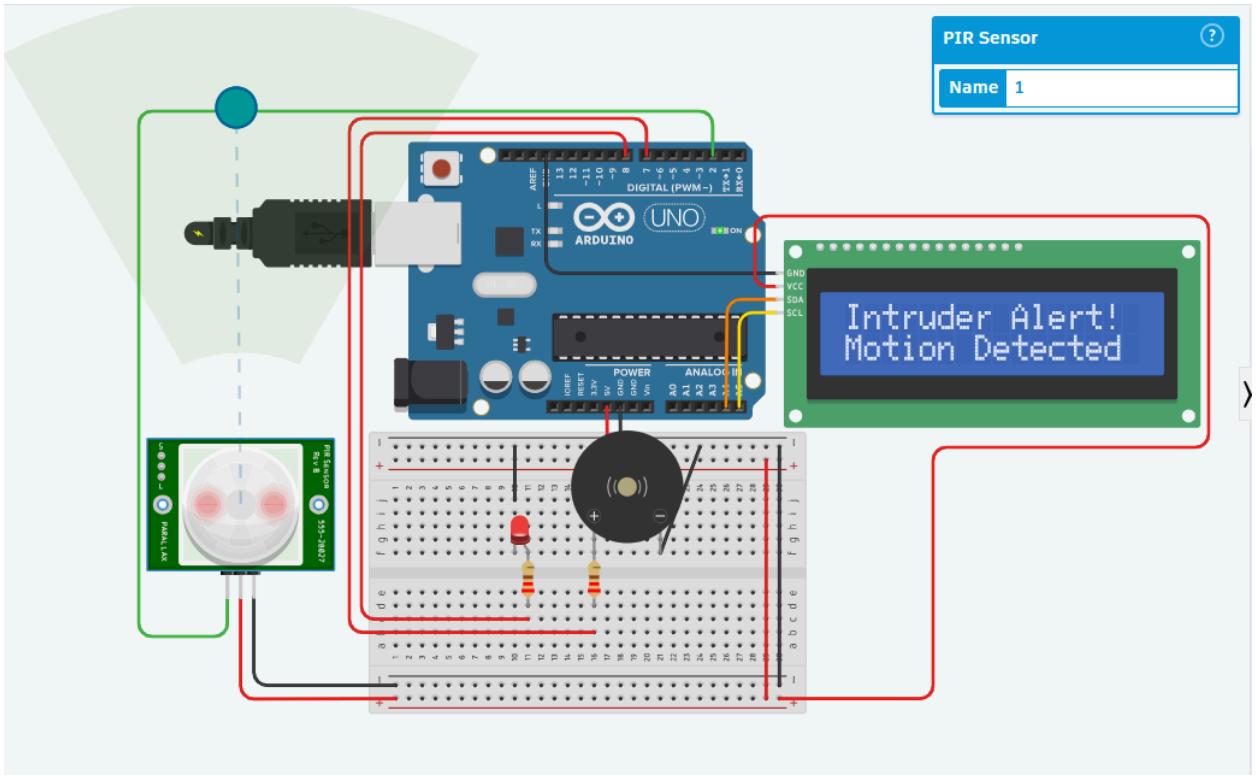
Working (Running)




DIGITAL (PWM~)
UNO
ARDUINO
POWER
ANALOG IN
GND
VCC
SDA
SCL
M
PARALLAX


DIGITAL (PWM~)
UNO
ARDUINO
POWER
ANALOG IN
GND
VCC
SDA
SCL
Monitoring...
PARALLAX


PIR Sensor
Name 1
Intruder Alert!
Motion


PIR Sensor
Name 1
Intruder Alert!
Motion Detected

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 gave false alarms sometimes.
- Power supply caused flickering when buzzer and LCD worked together.