University of Asia Pacific

Department of Computer Science and Engineering

CSE 316: Microprocessors and Microcontrollers Lab

LAB REPORT

Experiment Number: **05**

Experiment Title: **Mini Project 5: Wireless Theft Detection using Door Sensor and Buzzer**

Date of Submission: **24.09.2025**

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1. Experiment Name

Mini Project 5: Wireless Theft Detection using Door Sensor and Buzzer

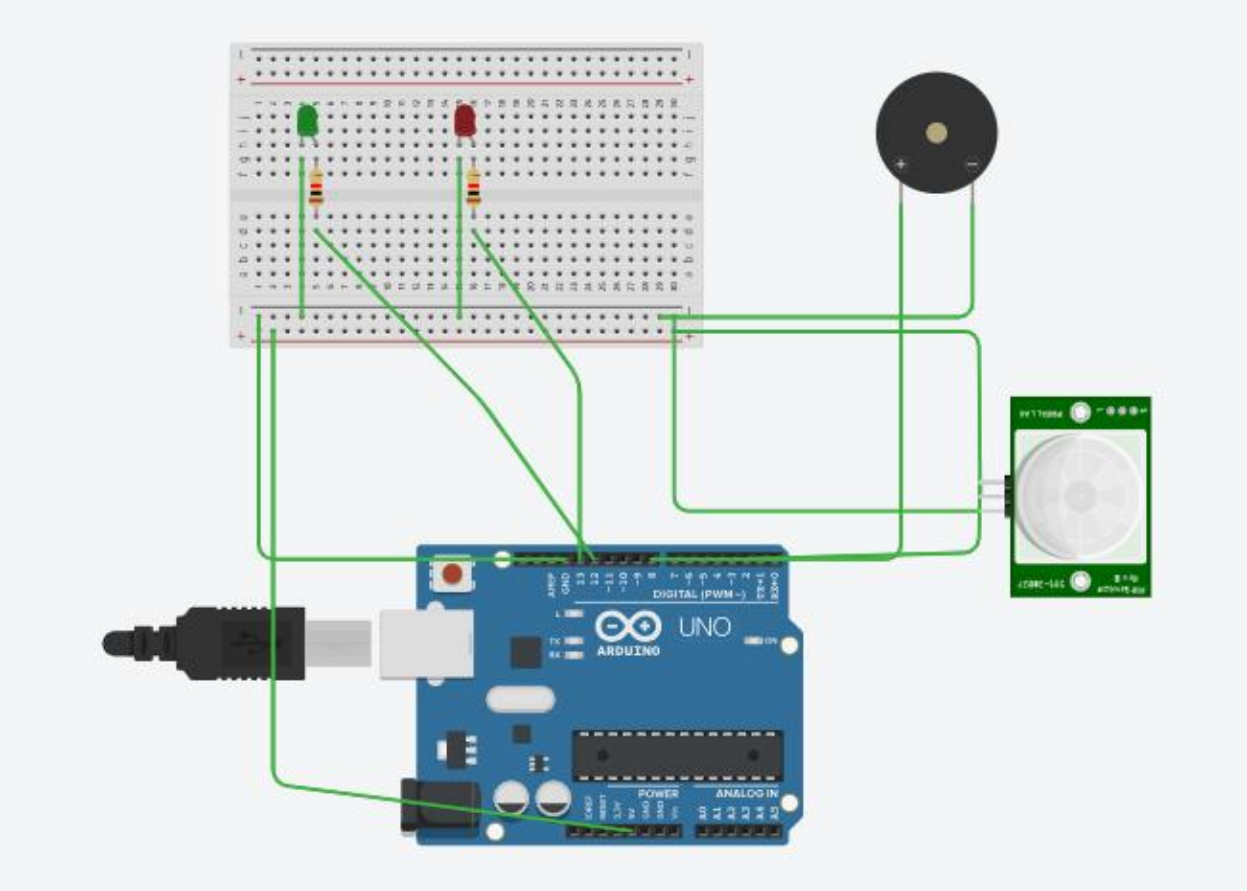
2. Objective

The objective of this project is to design and implement a theft detection system using a PIR motion sensor and Arduino Uno that can sense unauthorized movements near the door. The system will alert through a buzzer and LEDs, providing a simple and low-cost security solution.

3. Apparatus / Hardware & Software Requirements

- Trainer board
- LEDs (Green and Red)
- Piezo Buzzer
- Arduino Uno
- Resistors
- PIR sensor

4. Circuit Diagram / Schematic



5. Code / Assembly Program

```
const int pirPin = 2;
const int buzzerPin = 8;
const int greenLed = 12;
const int redLed = 13;

int pirState = LOW;
int val = 0;

void setup() {
   pinMode(pirPin, INPUT);
   pinMode(buzzerPin, OUTPUT);
   pinMode(greenLed, OUTPUT);
```

```
  pinMode(redLed, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  val = digitalRead(pirPin);

  if (val == HIGH) { // Motion detected
    digitalWrite(buzzerPin, HIGH);
    digitalWrite(redLed, HIGH);
    digitalWrite(greenLed, LOW);

    if (pirState == LOW) {
      Serial.println("Motion detected! Possible theft!");
      pirState = HIGH;
    }
  }
  else { // No motion
    digitalWrite(buzzerPin, LOW);
    digitalWrite(redLed, LOW);
    digitalWrite(greenLed, HIGH);

    if (pirState == HIGH) {
      Serial.println("Area clear. No motion.");
      pirState = LOW;
    }
  }
}
```

Output / Observations

When no motion is detected, the green LED remains ON, the red LED is OFF, and the buzzer is silent. The serial monitor shows:

Area clear. No motion.

When motion is detected, the red LED turns ON, the green LED turns OFF, and the buzzer produces sound as an alarm. The serial monitor shows:

Motion detected! Possible theft!

7. Result

The system successfully detects motion using the PIR sensor. Upon detecting motion, it activates the buzzer and red LED to alert about possible theft, and when the area is clear, it switches back to green LED indication.

8. Conclusion

The project demonstrates a simple yet effective theft detection system using Arduino, PIR sensor, buzzer, and LEDs. It can be used as a low-cost security system for doors, windows, or rooms to prevent unauthorized access. The wireless motion detection approach ensures real-time alerts, making it suitable for small-scale home and office security applications.