

**Ministry of Education**  
**University of Jeddah**  
**Collage of Computer Science and Engineering**



***Motion Detection ( IR Sensor )***  
**Project Report**  
**C8**

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# 1 Introduction

Sensors are devices that can detect and respond to changes in their environment. They can be found in a wide variety of applications, from monitoring temperature and humidity in a room to detecting motion in security systems, and even in measuring air quality in smart cities.

Sensors work by converting physical or chemical changes in the environment into an electrical or digital signal. This signal can then be processed by a computer or other device to provide information about the environment being monitored.

There are many different types of sensors, each designed to detect different types of changes in the environment. Some common types of sensors include temperature sensors, humidity sensors, pressure sensors, light sensors, motion sensors, and gas sensors.

Overall, sensors play a critical role in many modern technologies and are essential for monitoring and controlling a wide range of systems and processes.

# 2 Problem Definition

All individuals possess valuable possessions that require safeguarding and preservation, such as jewelry, houses, cars, and stores. The costs associated with hiring protection for these valuable assets can be exorbitant and not practical for most people. so the perfect solution is ( ir sensor)

# 3 Solution

To protect and preserve important things while minimizing cost, utilizing sensors is the optimal solution. Motion detection sensors can be employed to safeguard belongings by programming them to identify any suspicious activity. Upon detection of motion, the sensor is designed to illuminate an LED

## **4 Hardware Tools**

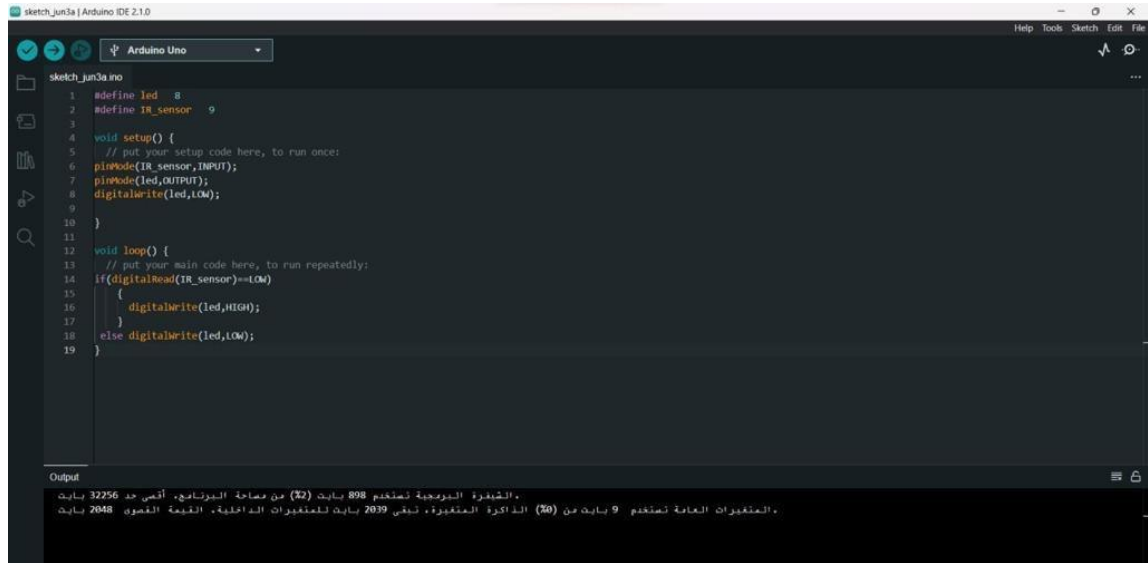
- 1- IR sensor module
- 2- Arduino uno
- 3- Breadboard
- 4- Jumper wires
- 5- LED
- 6- 330-ohm resistor
- 7- USB cable

## 5 Components Connection

### Steps:

1. Connect the IR sensor to the breadboard, with the VCC pin connected to the positive rail, the GND pin connected to the negative rail, and the OUT pin connected to the digital pin 2 on the Arduino.
2. Connect the LED to the breadboard, with the longer leg connected to a resistor (220 Ohms) and then to the positive rail, and the shorter leg connected to the negative rail.
3. Connect a jumper wire from digital pin 13 on the Arduino to the same row on the breadboard as the resistor connected to the LED.
4. Connect another jumper wire from the same row on the breadboard as the LED to the negative rail.
5. Connect the USB cable to the Arduino and your computer to power up the board.
6. Upload the code to the Arduino Uno:
7. Open the Serial Monitor in the Arduino IDE to see the output from the IR sensor. The LED should also turn on when the sensor detects an object.

## 6 Coding

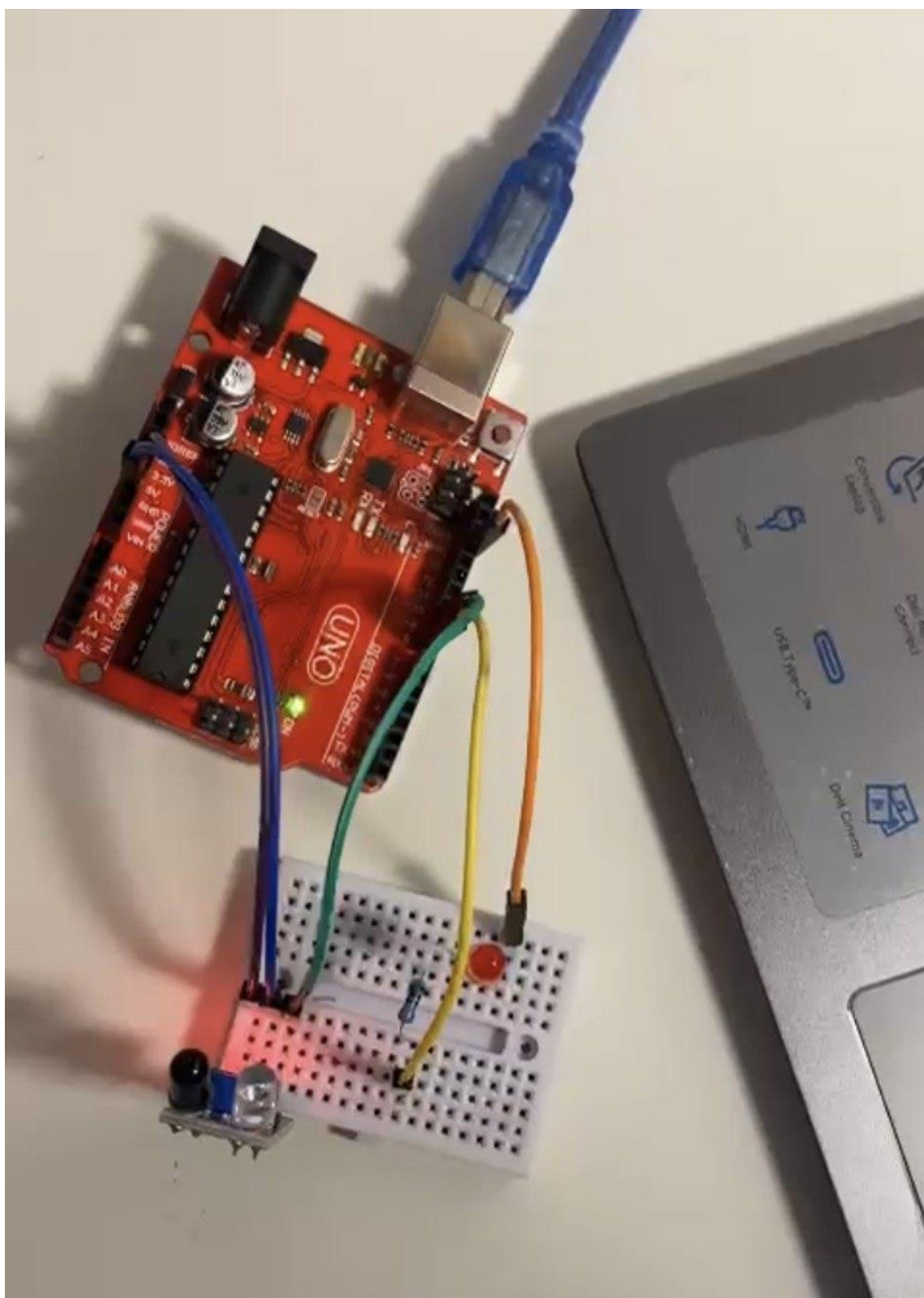


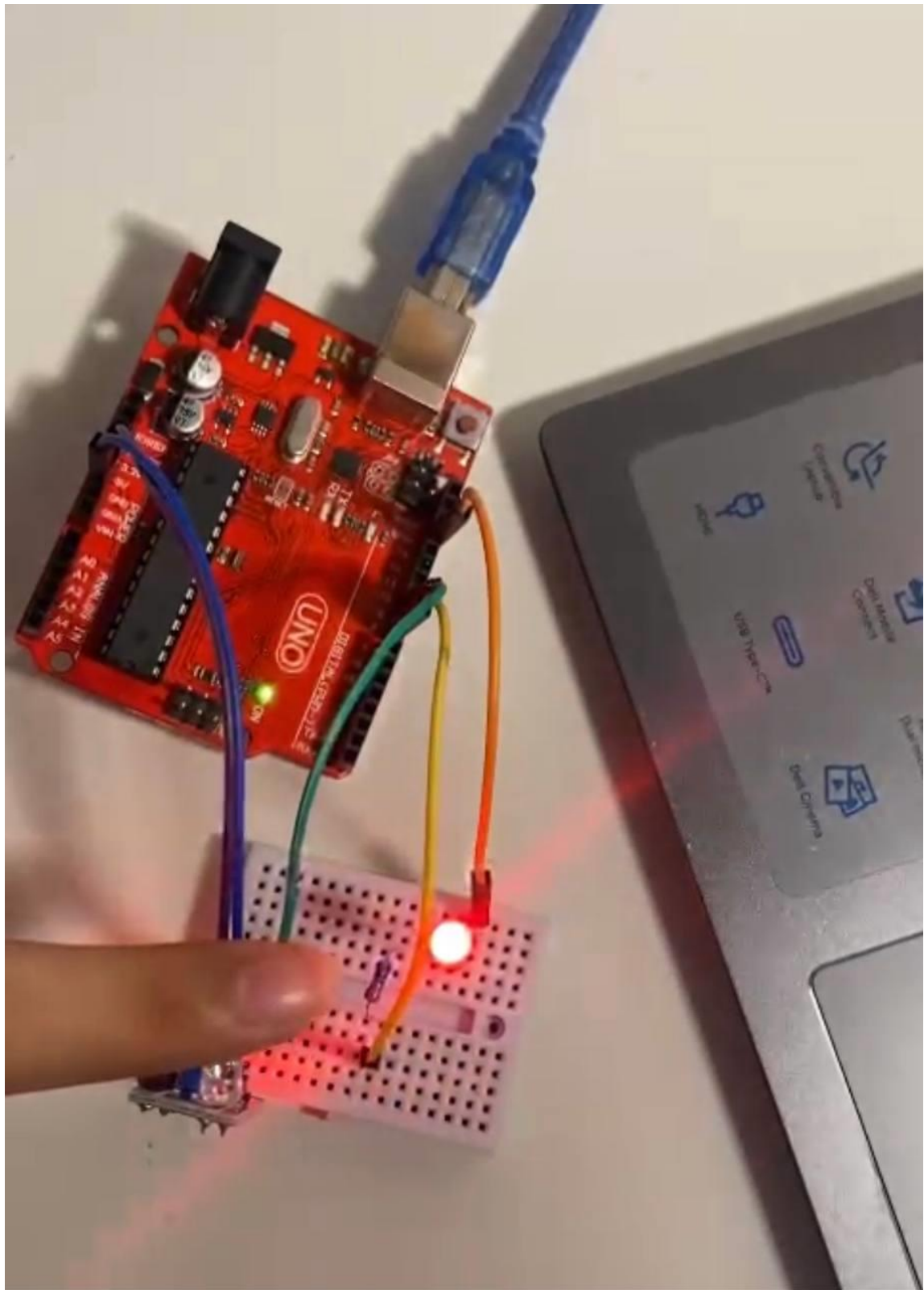
```
1 #define led 8
2 #define IR_sensor 9
3
4 void setup() {
5   // put your setup code here, to run once:
6   pinMode(IR_sensor,INPUT);
7   pinMode(led,OUTPUT);
8   digitalWrite(led,LOW);
9 }
10
11
12 void loop() {
13   // put your main code here, to run repeatedly:
14   if(digitalRead(IR_sensor)==LOW)
15   {
16     digitalWrite(led,HIGH);
17   }
18   else digitalWrite(led,LOW);
19 }
```

Output

الشفرة المبرمجة تستخدم 898 بايت (32) من مساحة البرنامج. أقصى حد 32256 بايت.  
المتغيرات العامة تستخدم 9 بايت من (30) الذاكرة المتغيرة. تبقى 2039 بايت للمتغيرات الداخلية. القيمة الفسوي 2048 بايت.

## 7 CIRCUIT





## USING BATTARY

