

Experiment-2

Date of Conduction: January 18,2024

Date of Submission: January 25, 2024

Title: Automatic Light Switch using IR Sensor and Arduino

Aim:

The aim of this experiment is to create an automatic light switch using an IR sensor, Arduino, and an LED. The light should turn on when the IR sensor detects ambient light and turn off when the surroundings are dark.

Software and Hardware Required:

Software:

Arduino IDE

Hardware:

Arduino board (e.g., Arduino Uno),IR sensor module, LED.

Jumper wires, Breadboard, Power supply

Theory:

Functions Used:

`analogRead()`: Reads the analog value from the IR sensor.

`digitalWrite()`: Controls the LED based on the sensor reading.

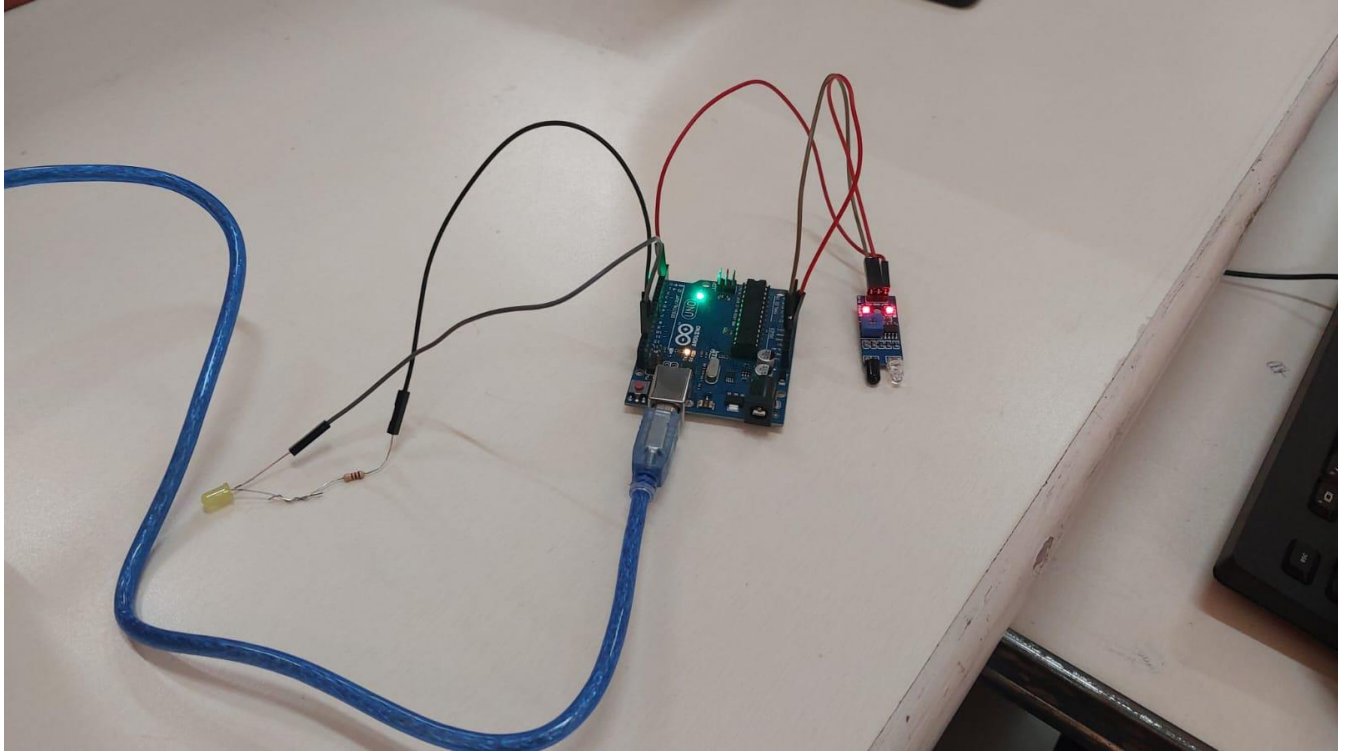
Sensor Information:

The IR sensor used in this experiment is a photoresistor-based module that outputs an analog voltage proportional to the ambient light level.

Code:

```
1 // Name: Arjunsingh Gautam
2 // Define IR sensor pin
3 int irSensorPin = 2;
4 // Define LED pin
5 int ledPin = 13;
6 void setup() {
7     // Initialize serial communication for debugging
8     Serial.begin(9600);
9
10    // Set IR sensor pin as input
11    pinMode(irSensorPin, INPUT);
12
13    // Set LED pin as output
14    pinMode(ledPin, OUTPUT);
15 }
16 void loop() {
17     // Read the state of the IR sensor
18     int irSensorState = digitalRead(irSensorPin);
19
20     // Print the sensor state to the Serial Monitor for debugging
21     Serial.println(irSensorState);
22
23     // If the IR sensor detects an obstacle (logical LOW)
24     if (irSensorState == LOW) {
25         // Turn on the LED
26         digitalWrite(ledPin, HIGH);
27     } else {
28         // Turn off the LED
29         digitalWrite(ledPin, LOW);
30     }
31 }
```

Picture of Output:



Conclusion:

In conclusion, the experiment successfully demonstrated the implementation of an automatic light switch using an IR sensor and Arduino. The system effectively turned on the LED when the IR sensor detected sufficient ambient light and turned it off in darker conditions. The threshold value in the code can be adjusted to adapt the system to different lighting environments. This experiment highlights the practical application of sensor-based control systems in energy-efficient lighting.