Automated Street Lighting System – Group 4

- Project Title: Automated Street Lighting System
- Group: Group 4
- Date: [28/09/2025]
- Members: [Ernestine ISINGIZWE]

1. Abstract

This project focuses on designing an automated street lighting system that turns ON during nighttime and OFF during daytime using an LDR (Light Dependent Resistor) and Arduino Uno. The system demonstrates practical sensor-based automation, providing a solution for energy-efficient street lighting.

2. Objective

To design and implement a streetlight system that automatically switches ON at night and OFF during the day based on ambient light using a light sensor and Arduino.

3. Introduction

Streetlights consume a significant amount of energy when left on unnecessarily during the day. By implementing an automated street lighting system, energy consumption can be reduced, and maintenance becomes easier. The system uses an LDR to measure light intensity and Arduino to control the LEDs simulating streetlights, turning them ON or OFF automatically depending on the surrounding light.

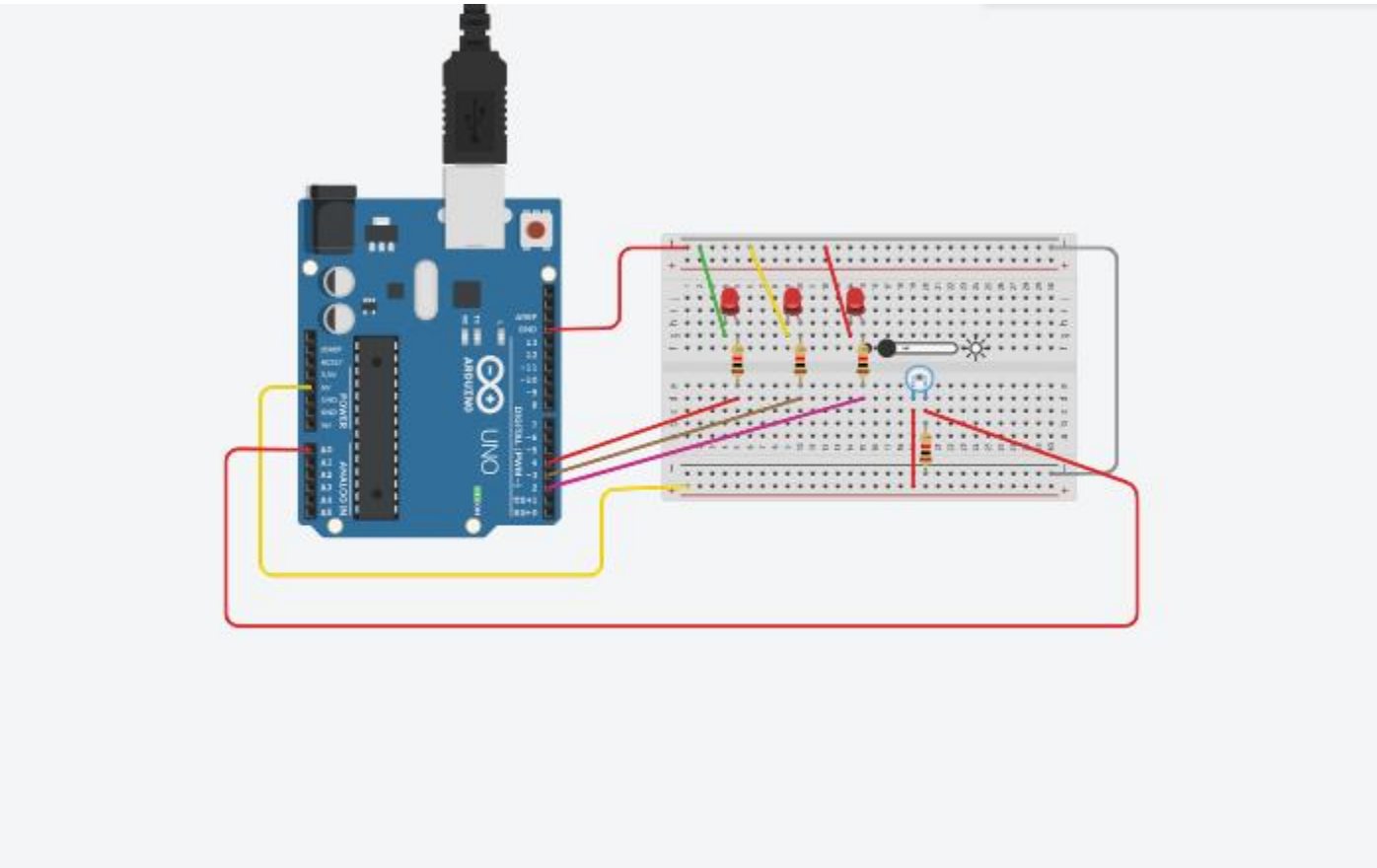
7. Arduino Code

```
int ldrPin = A0;

int led1 = 2, led2 = 3, led3 = 4;

int threshold = 200;


void setup() {
```

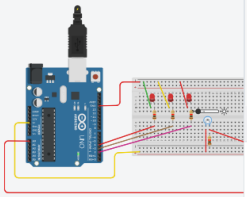
```
  pinMode(led1, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int ldrValue = analogRead(ldrPin);
  Serial.print("LDR Value: ");
  Serial.println(ldrValue);

  if (ldrValue < threshold) {
    // Dark → LEDs ON
    digitalWrite(led1, HIGH);
    digitalWrite(led2, HIGH);
    digitalWrite(led3, HIGH);
  } else {
    // Bright → LEDs OFF
    digitalWrite(led1, LOW);
    digitalWrite(led2, LOW);
    digitalWrite(led3, LOW);
  }

  delay(200);
}
```

8. Working / Results

- LEDs automatically turn ON when ambient light decreases below the threshold (nighttime).
- LEDs turn OFF when ambient light increases above the threshold (daytime).
- Serial Monitor displays changing LDR values in real time.



It’s serial monitor

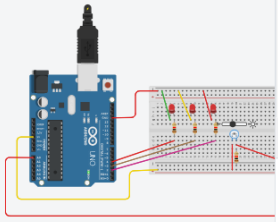


```
int threshold = 200;   // LOWER this until it works

void setup() {
  pinMode(led1, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int ldrValue = analogRead(ldrPin);
  Serial.print("LDR Value: ");
  Serial.println(ldrValue);
```

Serial Monitor

```
LDR Value: 0
LDR Value: 0
LDR Value: 0
LDR Value: 0
LDR Value: 0
LDR Value: 0
LDR Value: 0
```

Send Clear

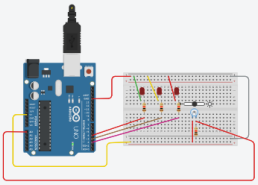


```
void setup() {
  pinMode(led1, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int ldrValue = analogRead(ldrPin);
  Serial.print("LDR Value: ");
  Serial.println(ldrValue);
```

Serial Monitor

```
LDR Value: 198
LDR Value: 198
LDR Value: 198
LDR Value: 198
LDR Value: 198
LDR Value: 198
LDR Value: 198
```

Send Clear

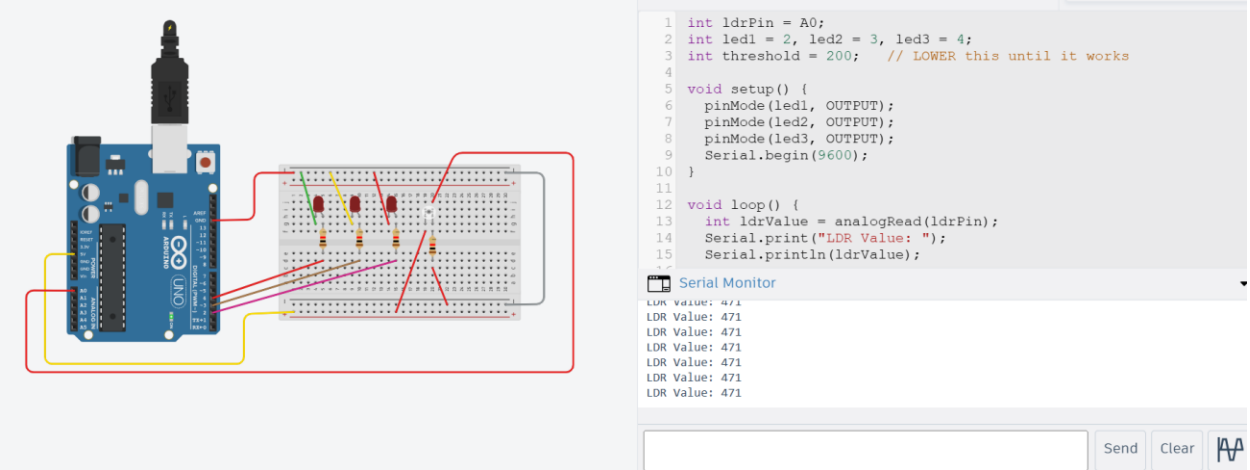


```
void setup() {
  pinMode(led1, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int ldrValue = analogRead(ldrPin);
  Serial.print("LDR Value: ");
  Serial.println(ldrValue);
```

Serial Monitor

```
LDR Value: 245
LDR Value: 245
LDR Value: 245
LDR Value: 245
LDR Value: 245
LDR Value: 245
LDR Value: 245
```

Send Clear



11. Conclusion

The project successfully demonstrates an automated street lighting system controlled by light intensity. It highlights how sensors and microcontrollers can be used for energy efficiency in real-world applications. Future improvements could include using real street lamps and wireless control.