#include <Arduino.h>

#include <GSM.h> // Include GSM library for SMS communication

#include <GPS.h> // Include GPS library for location tracking

// Define pins for sensors and output

const int ldrPin = A0; // Analog pin for LDR sensor

const int relayPin = 12; // Digital pin for relay control

const int gpsTxPin = 2; // GPS receiver TX pin

const int gpsRxPin = 3; // GPS receiver RX pin

// Define variables for fault detection

int ldrValue = 0; // Stores LDR sensor reading

int faultStatus = 0; // Flag for fault detection (0: No fault, 1: Fault detected)

// Define variables for location tracking

GPS gps(gpsRxPin, false); // GPS object with RX pin and auto-detect baud rate

double latitude = 0.0; // Stores latitude value

double longitude = 0.0; // Stores longitude value

// Initialize GSM module

GSM gsm(SIM800); // GSM object with SIM800 modem

void setup() {

// Initialize serial communication

Serial.begin(9600);

// Initialize LDR sensor

pinMode(ldrPin, INPUT);

// Initialize relay pin as output

pinMode(relayPin, OUTPUT);

// Initialize GPS receiver

gps.begin(115200);

gps.sendCommand(PMTK\_SET\_NMEA\_OUTPUT, PMTK\_NMEA\_ONLY\_GLL); // Set GPS output to GLL format

}

void loop() {

// Read LDR sensor value

ldrValue = analogRead(ldrPin);

// Check for fault condition (LDR value significantly low)

if (ldrValue < 100) {

faultStatus = 1;

} else {

faultStatus = 0;

}

// Control street light based on fault status

if (faultStatus == 0) {

digitalWrite(relayPin, HIGH); // Turn on street light

} else {

digitalWrite(relayPin, LOW); // Turn off street light

}

// If fault detected, send SMS alert with location information

if (faultStatus == 1) {

// Get GPS coordinates

while (!gps.available()) {

delay(100);

}

gps.parse(gps.read());

latitude = gps.latitude();

longitude = gps.longitude();

// Send SMS alert

gsm.BeginSMS("+919876543210"); // Replace with recipient's phone number

gsm.SendMessage("Street light fault detected at location: ");

gsm.SendMessageString("Latitude: ");

gsm.SendFloat(latitude, 6);

gsm.SendMessageString(" Longitude: ");

gsm.SendFloat(longitude, 6);

gsm.EndSMS();

// Delay before next fault detection check

delay(300000); // Check for faults every 5 minutes

}

}