

Project: Sanitation Worker Safety Monitoring System

Board: Arduino Mega 2560

*/

```
#include <SPI.h>
```

```
#include <LoRa.h>
```

```
#include <DHT.h>
```

```
#include <TinyGPS++.h>
```

```
#include <EEPROM.h>
```

```
#define DHT_PIN 7
```

```
#define DHT_TYPE DHT22
```

```
#define SNAKE_PIN 5
```

```
#define SOS_PIN 2
```

```
#define GPS_RX 19
```

```
#define GPS_TX 18
```

```
#define LORA_SS 10
```

```
#define LORA_RST 9
```

```
#define LORA_DIO0 3
```

```
#define LORA_FREQ 433E6
```

```
DHT dht(DHT_PIN, DHT_TYPE);
```

```
TinyGPSPlus gps;
```

```
struct WorkerProfile {
```

```
char id[12];
char name[20];
char contact[15];
char assignment[30];
};
```

```
struct SensorData {
    float temperature;
    double latitude;
    double longitude;
    bool snake;
    bool sos;
};
```

```
WorkerProfile worker;
SensorData data;
```

```
unsigned long lastRead = 0;
```

```
void setup() {
    Serial.begin(9600);
    Serial1.begin(9600);

    pinMode(SNAKE_PIN, INPUT);
    pinMode(SOS_PIN, INPUT_PULLUP);
    dht.begin();
```

```
LoRa.setPins(LORA_SS, LORA_RST, LORA_DIO0);

LoRa.begin(LORA_FREQ);

loadWorkerProfile();

}

void loop() {
    while (Serial1.available()) gps.encode(Serial1.read());

    if (millis() - lastRead > 3000) {
        lastRead = millis();
        readGPS();
        readTemperature();
        detectSnake();
        sendAlert();
    }
}

void readGPS() {
    if (gps.location.isValid()) {
        data.latitude = gps.location.lat();
        data.longitude = gps.location.lng();
    }
}

void readTemperature() {
    data.temperature = dht.readTemperature();
}
```

```
}
```

```
void detectSnake() {  
    data.snake = digitalRead(SNAKE_PIN);  
}
```

```
void loadWorkerProfile() {  
    strcpy(worker.id, "SMC-039");  
    strcpy(worker.name, "Worker");  
    strcpy(worker.contact, "9876543210");  
    strcpy(worker.assignment, "Zone-A");  
}
```

```
void sendAlert() {  
    String payload = "ID:" + String(worker.id) +  
        ",Temp:" + String(data.temperature) +  
        ",Lat:" + String(data.latitude,6) +  
        ",Lon:" + String(data.longitude,6) +  
        ",Snake:" + String(data.snake);
```

```
    LoRa.beginPacket();  
    LoRa.print(payload);  
    LoRa.endPacket();  
}
```

```
....
```

```
with open(arduino_dir / "worker_safety_system.ino", "w") as f:
```

```
f.write(arduino_code)

# README

readme = """"

# Sanitation Worker Safety Monitoring System
```

Arduino Mega based IoT system for worker safety using GPS, temperature sensor, snake detection and SOS alerts with LoRa communication.

Features

- GPS tracking
- Temperature monitoring
- Snake detection
- SOS alert
- LoRa communication

Board

Arduino Mega 2560

.....

```
with open(base_dir / "README.md", "w") as f:
    f.write(readme)

# Zip the project

zip_path = "/mnt/data/Sanitation-Worker-Safety-Monitoring-System.zip"
with zipfile.ZipFile(zip_path, "w", zipfile.ZIP_DEFLATED) as zipf:
    for foldername, subfolders, filenames in os.walk(base_dir):
```

```
for filename in filenames:  
    file_path = os.path.join(foldername, filename)  
  
    zipf.write(file_path, arcname=os.path.relpath(file_path, base_dir))  
  
zip_path
```