

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
```