SOURCE CODE

```
#include <WiFi.h>
#include <WiFiClientSecure.h>
#include <base64.h>
#include <LiquidCrystal.h>
#include <TinyGPS++.h>
#include <ArduinoIoTCloud.h>
#include <Arduino_ConnectionHandler.h>
// ====== Credentials ======
const char SSID[] = "projectiot";
const char PASS[] = "projectiot";
const char DEVICE_LOGIN_NAME[] = "8a37ebde-49e0-48f7-95b2-be1788fa5627";
const char DEVICE_KEY[]       = "a5DEVEQAPreZEO1LeengOr43J";
const char* twilio_account_sid = "AC001fddd6e9384e22b5169ac31716941f";
const char* twilio_auth_token  = "3124f114dc36f2259e9abffd7b01a181";
const char* twilio_phone_number = "+18164272876";
const char* to_phone_number     = "+918870547977";
// ====== Hardware ======
LiquidCrystal lcd(2, 15, 19, 18, 5, 4);
#define RXD2 16
#define TXD2 17
TinyGPSPlus gps;
const int buttonPin = 14;
```

```
const int BuzzPin   = 13;
// ====== Variables ======
String  status;
float   lat = 0.0;
float   lng = 0.0;
bool    emerg = false;
bool    emergency = false;
bool    smsSuccess = false;   // NEW FLAG
WiFiClientSecure client;
unsigned long lastLCDUpdate = 0;
// ====== Cloud Setup ======
void onStatusChange() {}
void onLatChange() {}
void onLngChange() {}
void onEmergChange() {}
void initProperties() {
  ArduinoCloud.setBoardId(DEVICE_LOGIN_NAME);
  ArduinoCloud.setSecretDeviceKey(DEVICE_KEY);
  ArduinoCloud.addProperty(status, READWRITE, ON_CHANGE, onStatusChange);
  ArduinoCloud.addProperty(lat, READWRITE, ON_CHANGE, onLatChange);
  ArduinoCloud.addProperty(lng, READWRITE, ON_CHANGE, onLngChange);
  ArduinoCloud.addProperty(emerg, READWRITE, ON_CHANGE, onEmergChange);
}
WiFiConnectionHandler ArduinoIoTPreferredConnection(SSID, PASS);
```

```
// ===== NORMAL MODE DISPLAY =====
void showNormalMode() {
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Normal Safe");
  lcd.setCursor(0, 1);
  lcd.print("Happy Day");
}
// ===== EMERGENCY HEADER =====
void showEmergencyHeader() {
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Emergency");
}
// ===== EMERGENCY LCD UPDATES =====
void updateEmergencyLCD() {
  lcd.setCursor(0, 1);
  lcd.print("                "); // clear row 1

  if (!gps.location.isValid()) {
    lcd.setCursor(0,1);
    lcd.print("GPS Searching...");
    return;   // IMPORTANT: prevents showing S
  }
```

```
  // Print GPS values
  lcd.setCursor(0, 1);
  lcd.print("L:");
  lcd.print(lat, 5);
  lcd.setCursor(9, 1);
  lcd.print("G:");
  lcd.print(lng, 5);
  // Show S ONLY when GPS FIX + SMS SUCCESS
  if (smsSuccess) {
    lcd.setCursor(15, 0);
    lcd.print("S");
  }
}
// ===== SETUP =====
void setup() {
  Serial.begin(115200);
  Serial2.begin(9600, SERIAL_8N1, RXD2, TXD2);

  lcd.begin(16, 2);
  lcd.clear();
  lcd.setCursor(0,0); lcd.print(" Women Safety ");
  lcd.setCursor(0,1); lcd.print(" Ring by IOT! ");
  delay(2000);
  lcd.clear();
```

```
  pinMode(buttonPin, INPUT_PULLUP);
  pinMode(BuzzPin, OUTPUT);
  digitalWrite(BuzzPin, LOW);
  client.setInsecure();
  initProperties();
  ArduinoCloud.begin(ArduinoIoTPreferredConnection);
  showNormalMode();
}
// ===== LOOP =====
void loop() {
  ArduinoCloud.update();
  handleEmergencyButton();
  readGPSData();

  if (gps.location.isUpdated()) {
    lat = gps.location.lat();
    lng = gps.location.lng();
  }
  if (emergency) {
    if (millis() - lastLCDUpdate >= 1000) {
      lastLCDUpdate = millis();
      updateEmergencyLCD();
    }
  } else {
```

```
    showNormalMode();
  }
}
// ===== BUTTON HANDLER =====
void handleEmergencyButton() {
  bool pressed = (digitalRead(buttonPin) == HIGH);
  if (pressed && !emergency) {
    emergency = true;
    smsSuccess = false;   // reset
    digitalWrite(BuzzPin, HIGH);
    status = "Emergency Need Help";
    emerg = false;
    showEmergencyHeader();
    lcd.setCursor(0,1);
    lcd.print("GPS Searching...");
    attemptEmergencyAlert();
  }
  else if (!pressed && emergency) {
    emergency = false;
    smsSuccess = false;
    digitalWrite(BuzzPin, LOW);
    status = "Normal";
    emerg = true;
    showNormalMode();
```

```
  }
}
// ===== GPS READ =====
void readGPSData() {
  while (Serial2.available()) {
    gps.encode(Serial2.read());
  }
}
// ===== SEND SMS =====
void attemptEmergencyAlert() {
  bool gpsFixed = false;
  unsigned long start = millis();
  while (millis() - start < 8000) {
    while (Serial2.available()) {
      if (gps.encode(Serial2.read()) && gps.location.isValid()) {
        lat = gps.location.lat();
        lng = gps.location.lng();
        gpsFixed = true;
        break;
      }
    }
    if (gpsFixed) break;
  }
  if (WiFi.status() == WL_CONNECTED) {
```

```
    sendSMS(gpsFixed ? lat : 0, gpsFixed ? lng : 0);
  }
  updateEmergencyLCD();
}
// ===== SEND SMS FUNCTION =====
void sendSMS(float latitude, float longitude) {
  String body;
  if (latitude == 0 && longitude == 0) {
    body = "EMERGENCY! WomenRing activated - GPS not available!";
  } else {
    body = "EMERGENCY! Location: https://maps.google.com/?q="
           + String(latitude,6) + "," + String(longitude,6);
  }
  String data = "To=" + String(to_phone_number) +
                "&From=" + String(twilio_phone_number) +
                "&Body=" + body;
  if (client.connect("api.twilio.com", 443)) {
    client.println("POST /2010-04-01/Accounts/" + String(twilio_account_sid) +
"/Messages.json HTTP/1.1");
    client.println("Host: api.twilio.com");
    client.println("Authorization: Basic " + base64::encode(
                   String(twilio_account_sid) + ":" + String(twilio_auth_token)));
    client.println("Content-Type: application/x-www-form-urlencoded");
    client.println("Content-Length: " + String(data.length()));
    client.println();
```

```
    client.print(data);
    delay(3000);
    String response = "";
    while (client.available()) {
      response += (char)client.read();
    }
    client.stop();
    // Show S ONLY if GPS VALID + SMS SUCCESS
    if (response.indexOf("sid") != -1 && gps.location.isValid()) {
      smsSuccess = true;
    }
  }
}
```