#include <LiquidCrystal.h>

#include <Wire.h>

#include "MAX30100\_PulseOximeter.h"

#include "SoftwareSerial.h"

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

SoftwareSerial gsm(9,10); //Rx, Tx

const int switchPin = 8;

int tempePin = A0;

int tempeValue = 0;

unsigned char switchvalue = 0;

unsigned char TempeHighBit = 0;

unsigned char TempeLowBit = 0;

unsigned char Message1SentBit = 0;

unsigned char Message2SentBit = 0;

unsigned char ReadHB\_Bit = 0;

unsigned char Count = 0;

#define REPORTING\_PERIOD\_MS     1000

PulseOximeter pox;

uint32\_t tsLastReport = 0;

void onBeatDetected()

{

  //Serial.println("Beat!");

}

void setup()

{

  Serial.begin(9600);

  gsm.begin(9600);

  pinMode(switchPin, INPUT);

  lcd.begin(16,2);

  lcd.print("Initializing....");

  lcd.setCursor(0,1);

  lcd.print("  IoT  &  GSM   ");

  delay(5000);

  delay(5000);

  lcd.clear();

  // Initialize the PulseOximeter instance

  // Failures are generally due to an improper I2C wiring, missing power supply

  // or wrong target chip

  if (!pox.begin())

  {

    //Serial.println("FAILED");

    for(;;);

  }

  else

  {

    //Serial.println("SUCCESS");

  }

  pox.setIRLedCurrent(MAX30100\_LED\_CURR\_7\_6MA);

  // Register a callback for the beat detection

  pox.setOnBeatDetectedCallback(onBeatDetected);

}

void loop()

{

  Start:

  ReadHB\_Bit = 1;

  delay(100);

  if (!pox.begin())

  {

    //Serial.println("FAILED");

    for(;;);

  }

  else

  {

   // Serial.println("SUCCESS");

  }

  pox.setIRLedCurrent(MAX30100\_LED\_CURR\_7\_6MA);

  // Register a callback for the beat detection

  pox.setOnBeatDetectedCallback(onBeatDetected);

  ReadHB:

  // Make sure to call update as fast as possible

  pox.update();

  if (millis() - tsLastReport > REPORTING\_PERIOD\_MS)

  {

    Count++;

    if(Count >= 20)

    {

      Count = 0;

      Serial.print("Heart rate:");

      Serial.print(pox.getHeartRate());

      Serial.print("bpm / SpO2:");

      Serial.print(pox.getSpO2());

      Serial.println("%");

    }

    lcd.clear();

    lcd.setCursor(0,0);

    lcd.print("BPM : ");

    lcd.print(pox.getHeartRate());

    lcd.setCursor(0,1);

    lcd.print("SpO2: ");

    lcd.print(pox.getSpO2());

    lcd.print("%");

    tsLastReport = millis();

  }

 Cont:

  switchvalue = digitalRead(switchPin);

  if((switchvalue == 0) && (ReadHB\_Bit == 0))

  {

    goto Start;

  }

  if((switchvalue == 0) && (ReadHB\_Bit == 1))

  {

    goto ReadHB;

  }

  if(switchvalue == 1)

  {

    ReadHB\_Bit = 0;

    lcd.clear();

    tempeValue = analogRead(tempePin);

    tempeValue = tempeValue / 2 ;

    tempeValue = (tempeValue \* (9/5)) + 32 ;

    delay(100);

    lcd.setCursor(0,0);

    lcd.print("BodyTemp:");

    lcd.print(tempeValue);

    lcd.print((char)223);

    lcd.print("F");

    delay(2000);

    Serial.print("BodyTemp.: ");

    Serial.print(tempeValue);

    Serial.println("Deg.F;");

    delay(5000);

    if(tempeValue > 100)

    {

      TempeHighBit = 1;

    }

    if(tempeValue < 95)

    {

      TempeLowBit = 1;

    }

    if((tempeValue < 100) && (tempeValue > 95))

    {

      TempeHighBit = 0;

      TempeLowBit = 0;

      Message1SentBit = 0;

      Message2SentBit = 0;

    }

    if((TempeHighBit) && (Message1SentBit == 0))

    {

      Message1SentBit = 1;

      if (gsm.available()>0)

      Serial.write(gsm.read());

      lcd.setCursor(0,1);

      lcd.print("Message Sending1");

      delay(1000);

      gsm.println("AT+CMGF=1");    //Sets the GSM Module in Text Mode

      delay(1000);  // Delay of 1000 milli seconds or 1 second

      gsm.println("AT+CMGS=\"+916369445959\"\r"); // Replace x with mobile number

      delay(1000);

      gsm.println("Body Temperature High; Please take necessary action immediately ; ");// The SMS text you want to send

      delay(100);

      gsm.println((char)26);// ASCII code of CTRL+Z

      delay(5000);

      lcd.setCursor(0,1);

      lcd.print("Message Sent....");

      delay(1000);

    }

    if((TempeLowBit) && (Message2SentBit == 0))

    {

      Message2SentBit = 1;

      if (gsm.available()>0)

      Serial.write(gsm.read());

      lcd.setCursor(0,1);

      lcd.print("Message Sending1");

      delay(1000);

      gsm.println("AT+CMGF=1");    //Sets the GSM Module in Text Mode

      delay(1000);  // Delay of 1000 milli seconds or 1 second

      gsm.println("AT+CMGS=\"+916369445959\"\r"); // Replace x with mobile number

      delay(1000);

      gsm.println("Body Temperature Low; Please take necessary action immediately ; ");// The SMS text you want to send

      delay(100);

      gsm.println((char)26);// ASCII code of CTRL+Z

      delay(5000);

      lcd.setCursor(0,1);

      lcd.print("Message Sent....");

      delay(1000);

    }

  }

 goto Cont;

}