LAMPIRAN

Foto-foto Alat

Listing Program Keseluruhan

```
// timer library
#include <TimerOne.h>
// i2c library
#include <Wire.h>//library komunikasi i2c ke lcd
// lcd library
#include <LiquidCrystal_I2C.h>
// GY-906 library
#include <Adafruit_MLX90614.h>
Adafruit_MLX90614 mlx = Adafruit_MLX90614();
// Set the LCD address to 0x27 for a 16 chars and 4 line display
LiquidCrystal_I2C lcd(0x3F, 16, 4);
#include <SPI.h>
#include <SD.h>
// pendefinisian pin / nama alias
#define button    7
#define led_R     4
#define led_Y     3
#define led_G     5
#define buzzer    6
// mosi 11, miso 12, sck 13, cs 10
#define cs        10
#define sensordenyut 2
// variable
  float suhu;
  int denyut;
  int timer=0,time=10;
  int counter=0;
  int str=0;
  int nomor=1;
  File myFile;
 void led(byte h){
  switch (h){
    case 0:
digitalWrite(led_R,HIGH);digitalWrite(led_Y,LOW);digitalWrite(led_
G,LOW);break;
    case 1:
digitalWrite(led_R,LOW);digitalWrite(led_Y,HIGH);digitalWrite(led_
G,LOW);break;
    case 2:
digitalWrite(led_R,LOW);digitalWrite(led_Y,LOW);digitalWrite(led_G
,HIGH);break;
    case 3:
digitalWrite(led_R,LOW);digitalWrite(led_Y,LOW);digitalWrite(led_G
,LOW);break;
    }
  }
long int cnt_dnyt[20];
  // timer
void timerIsr()
{
  if(str==1)timer++;
}
// counter
void extIsr()
```

```
{
  if(str==1&&timer<time)
  {counter++;
 cnt_dnyt[counter]=millis();
  }
}
float hitung_denyut(int cnt){
  int i;
  long int jml=0;
  float ret=0;
   if (cnt>5){
   // for (i=cnt;i>1;i--){
    jml=(cnt_dnyt[cnt]-cnt_dnyt[cnt-1]);
    //}
    ret=60000.0/(float)jml ;
    }
   else ret= 0;
return ret;
  }

// fungsi setup
void setup() {
  // port serial terbuka
  Serial.begin(9600);
  mlx.begin();
  delay(500);
  lcd.init(); // lcd inisialisasi
  lcd.backlight();
  // gy-906 inisialisasi
  // pengaturan pin
  pinMode(led_R, OUTPUT);
  pinMode(led_Y, OUTPUT);
  pinMode(led_G, OUTPUT);
  pinMode(buzzer, OUTPUT);
  pinMode(button, INPUT_PULLUP);
  led(0);
  pinMode(cs, OUTPUT);
  digitalWrite (buzzer,HIGH);
  if (!SD.begin(10)) {
  lcd.clear();
  lcd.print("MicroSD Error!");
  delay(1000);
  }
  else{
  lcd.clear();
  lcd.print("MicroSD OK!");
  delay(1000);
}
  Timer1.initialize(1000000); // interval 1000000 = 1 detik
  Timer1.attachInterrupt( timerIsr ); // attach the service
routine here
  attachInterrupt(digitalPinToInterrupt(sensordenyut), extIsr,
RISING);
digitalWrite (buzzer,LOW);
lcd.clear();
lcd.setCursor(0,0);
```

```
lcd.print("   Welcome To   ");
lcd.setCursor(0,1);
lcd.print("Medical Healthy ");
lcd.setCursor(-4,2);
lcd.print("   Detection    ");
lcd.setCursor(-4,3);
lcd.print("================");
delay(5000);
nomor=0;
}
// program keseluruhan
void loop() {
  lcd.clear();
while(digitalRead(button)==1){
  led(0);
  lcd.setCursor(0,0);
  lcd.print("1.Pasang Finger ");
  lcd.setCursor(0,1);
  lcd.print("2.Berdiri dg Bnr");
  lcd.setCursor(-4,2);
  lcd.print("3.Atur Sens Suhu");
  lcd.setCursor(-4,3);
  lcd.print("4.Tekan Start   ");
  delay(100);
  }
  delay(1000);
//test_sensor();
 led(1);
 timer=0;
 counter=0;
 str=1;
 while(timer<10){
 suhu = mlx.readObjectTempC();
 denyut = hitung_denyut(counter);
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("===Pengukuran===");
  lcd.setCursor(-4,2);
  lcd.print("Suhu:");
  lcd.print(suhu,1);
  lcd.write(0xdf);
  lcd.print("C");
  lcd.setCursor(-4,3);
  lcd.print("BPM:");
  lcd.print(denyut);
  delay(200);
 }
   led(2);
 while(cek_berat>10){
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("=====HASIL======");
  lcd.setCursor(-4,2);
  lcd.print("Suhu:");
  lcd.print(suhu,1);
  lcd.write(0xdf);
```

```
lcd.print("C");
lcd.setCursor(-4,3);
lcd.print("BPM:");
lcd.print(denyut);
delay(2000);

lcd.clear();
lcd.setCursor(0,0);
lcd.print("=====HASIL======");
lcd.setCursor(-4,2);
if (denyut<60){
  lcd.print("Bradycardia");}
else if (denyut>59&&denyut<100){
  lcd.print("Denyut Normal");
}
else if (denyut>100){
  lcd.print("Tacycardia");}
 lcd.setCursor(-4,3);
if (suhu<36.5){
  lcd.print("Hipothermia");}
else if (suhu>36.4&&suhu<37.6){
  lcd.print("Suhu Normal");
}
else if (suhu>37.5&&suhu<40.0){
  lcd.print("Demam ");
  }
 else if (suhu>40.0){
  lcd.print("Hyperthermia");
  //led(0);
  digitalWrite(led_R,HIGH);
  }
  delay(2000);
  digitalWrite(led_R,LOW);
}

//detachInterrupt(digitalPinToInterrupt(sensordenyut));
//Timer1.detachInterrupt();

myFile = SD.open("LOG.TXT", FILE_WRITE);  // buat file

// jika file terbuka
if (myFile) {
myFile.print("---------------------- ");
myFile.print(nomor);
myFile.println(" ----------------------");

myFile.print("Suhu: ");
myFile.print(suhu,1);
myFile.println(" C");
if (suhu<36.5){
  myFile.println("Hipothermia");}
else if (suhu>36.4&&suhu<37.6){
  myFile.println("Suhu Normal");
}
else if (suhu>37.5&&suhu<40.0){
  myFile.println("Demam ");
```

```
    }
  else if (suhu>40.0){
    myFile.println("Hyperthermia");
    }
  myFile.print("BPM: ");
  myFile.println(denyut);
  if (denyut<60){
    myFile.println("Bradycardia");}
  else if (denyut>59&&denyut<100){
    myFile.println("Denyut Normal");
  }
  else if (denyut>100){
    myFile.println("Tacycardia");}
  myFile.close();

  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("Save To MicroSD");
  delay(1000);
 // Timer1.initialize(1000000); // interval 1000000 = 1 detik
  //Timer1.attachInterrupt( timerIsr ); // attach the service
routine here
  //attachInterrupt(digitalPinToInterrupt(sensordenyut), extIsr,
RISING);
  str=0;
  timer=0;
  counter=0;
  nomor++;
// program_all();
 //kalibrasi();
 //coba_load();
}
}
```

Rangkaian Keseluruhan