Lampiran Program

```
#include <PWM.h>
#include <LiquidCrystal_I2C.h>
#include <Wire.h>
#include <OneWire.h>
#include <DallasTemperature.h>
#define ONE_WIRE_BUS 2
LiquidCrystal_I2C lcd (0x27, 16, 2);
OneWire oneWire (ONE_WIRE_BUS);
DallasTemperature sensorSuhu (&oneWire);
float suhuSekarang;
int pin = 9;
int32_t frequency = 13;// LED di pin 9
 float Kd = 0.00;
 float Sett = 0.00;
 float Ki = 0;
 float Kp= 255.00;
 float akhir;
 float T = 0.00;
 float hasil = 0;
 int waktu = 0;
 int waktu1 = 0;
 int waktu2 = 0;
 int star = 0;
 int Reset = 0;
 int jalan = -1;
 int g = 1;
 int h = 1;
 int i = 1;
 int j = 1;
 int l = 1;
 float k = 0;
 int mode1 = 3;
 int mode2 = 4;
 int mulai = 5;
 int ulang = 6;
 int kipas = 11;
 int limit = 10;
 int buzzer = 12;
 int durasi = 0;
 int detik = 60;
 int alarm = 0;
 int jam = 0;
 int timer = -1;
 int selesai = 0;
 int ya = 0;
void setup() {
  Serial.begin(9600);
  pinMode(pin, OUTPUT);
  InitTimersSafe();
  bool success = SetPinFrequencySafe(pin,
frequency);
  lcd.init();
  lcd.backlight();
   pinMode (kipas, OUTPUT);
```

```
  pinMode (limit, INPUT);
  pinMode (buzzer, OUTPUT);
  pinMode (mode1, INPUT);
  pinMode (mode2, INPUT);
  pinMode (mulai, INPUT);
  pinMode (ulang, INPUT);
 sensorSuhu.begin();

 // put your setup code here, to run once:
 lcd.setCursor(2,0);
 lcd.print("TUGAS AKHIR");
 delay(2000);
 lcd.clear();
 lcd.setCursor(3,0);
 lcd.print("INKUBATOR");
   lcd.setCursor(4,1);
 lcd.print("BAKTERI");
 delay(2000);
   lcd.clear();
 lcd.setCursor(1,0);
 lcd.print("BAMBANG ABD R M");
   lcd.setCursor(1,1);
 lcd.print("NIM_20163010018");
 delay(2000);
}
void loop() {
 jalan=-1;
digitalWrite (buzzer, LOW);
lcd.clear();
   lcd.setCursor(2,0);
lcd.print("SETING WAKTU");
lcd.setCursor(4,1);
lcd.print(jam);
lcd.print(" JAM");
alarm = digitalRead (limit);
if (alarm != l){
 if (alarm == LOW){
   digitalWrite (buzzer, HIGH);
   delay (1000);
 }
 l=alarm;}
 waktu1 = digitalRead (mode1);
if (waktu1 != g){
 if (waktu1 == LOW){
   jam = 1;
   waktu = 1;
 }
 g=waktu1;}
    waktu2 = digitalRead (mode2);
if (waktu2 != h){
 if (waktu2 == LOW){
   jam = 6;
   waktu = 60;
 }
```

```
h=waktu2;}
star = digitalRead (mulai);
if (star != i){
if (star == LOW){
 jalan = waktu - 1;
 timer = jam - 1;
  }
 i=star;
 lcd.clear();
 lcd.setCursor(2,1);
 lcd.print(jam);
 lcd.print(":");
 lcd.print(waktu);
 lcd.print(":");
 lcd.print("00");
 lcd.print(" JAM");
}
 pwmWrite(pin, hasil);
 digitalWrite (kipas, HIGH);
 waktu=0;
 T = suhuSekarang*100;
 Kp= T/37.70;
 Ki = 255*Sett;
 Kd = Sett /100;
 Ka = 255-Kd;
 if (Sett>=39)
 {
Ka = akhir;
  }
  if (Sett>=100)
  {
   hasil = 0;
  }
  if (Sett <= 40){
   hasil = 255;
}
  while(timer>=0){
  alarm = == HIGH){
  lcd.clear();
  lcd.setCursor(2,0);
  lcd.print("TUTUP PINTU ");
  delay (100);
   }
   if (aldigitalRead (limit);
  if (alarm arm == LOW){
  pwmWrite(pin, hasil);
  digitalWrite (kipas, HIGH);
  waktu=0;
  T = suhuSekarang*100;
  Kp = T/37.70;
  Ki = 255*Sett;
  Kd = Sett /100;
  Ka= 255-Kd;
  if (Sett>=39)
```

```
  {
   Ka = akhir;
  }
  if (Sett>=100)
  {
   akhir = 0;
  }
  durasi = durasi +1;
  }
  if (Sett<= 40){
   akhir = 255;
 }
  if (durasi == 2){
  durasi =0;
  lcd.clear();
  lcd.setCursor(1,0);
  lcd.print("suhu = ");
  lcd.print(suhuSekarang);
  lcd.print("^C");
  lcd.setCursor(4,1);
  lcd.print(":");
   lcd.setCursor(7,1);
  lcd.print(":");
  Serial.print ("akhir ");
  Serial.println (akhir);
    if (jalan>=10){
     lcd.setCursor(5,1);
lcd.print(jalan);
   }
       if (jalan<=9){
    lcd.setCursor(5,1);
    lcd.print("0");
lcd.print(jalan);
   }
      if (timer>=10){
    lcd.setCursor(2,1);
lcd.print(timer);
   }
       if (timer<=9){
    lcd.setCursor(2,1);
    lcd.print("0");
lcd.print(timer);
   }
   if(detik>=10){
lcd.setCursor(8,1);
lcd.print(detik);
lcd.print(" JAM");
   }
   if(detik<=9){
lcd.setCursor(8,1);
lcd.print("0");
lcd.print(detik);
lcd.print(" JAM");
   }
```

```
  if (ya>=35){
detik --;
  }
if (detik<=-1){
 jalan=jalan-1;
 detik = 59;
}
 if (jalan<=-1){
 timer=timer-1;
 jalan = 59;
}
if (timer<=-1){
selesai = 1;
while (selesai == 1){
digitalWrite (kipas, LOW);
pwmWrite(pin, 0);
lcd.clear();
lcd.setCursor(1,0);
lcd.print("WAKTU INKUBASI");
lcd.setCursor(4,1);
lcd.print("SELESAI");
digitalWrite (buzzer, HIGH);
delay (50);
digitalWrite (buzzer, LOW);
delay (50);
Reset = digitalRead (ulang);
if (Reset != j){
 if (Reset == LOW){
  timer =-1;
  detik = 59;
  selesai = 0;
  jam = 0;
  setup();
 }}
  }
}
// print out the value you read:
 Reset = digitalRead (ulang);
if (Reset != j){
 if (Reset == LOW){
  timer =-1;
  detik = 59;
  jam = 0;
    lcd.clear();
  lcd.setCursor(5,0);
lcd.print("RESET");
delay (50);
setup();
 }}
 j = Reset;
suhuSekarang = ambilSuhu();
ya = suhuSekarang;
}
}
```

```
  suhuSekarang = ambilSuhu();}

  float ambilSuhu()

  {

    sensorSuhu.requestTemperatures();

    float suhu = sensorSuhu.getTempCByIndex
(0);

    return suhu;

}
```