Lampiran 1 Listing program

a. Program motor stepper

```
void steper1(){
  digitalWrite(dirPin, LOW); // ….
 for (int i = 0; i < 560; i++) {
  digitalWrite(stepPin, HIGH);
  delayMicroseconds(1000); // ….
  digitalWrite(stepPin, LOW);
  delayMicroseconds(1000); // ….
   }
 delay(1000);
 digitalWrite(dirPin, HIGH); // ….
 for (int i = 0; i < 570; i++) {
  digitalWrite(stepPin, HIGH);
  delayMicroseconds(1000); // …
  digitalWrite(stepPin, LOW);
  delayMicroseconds(1000); // ….
 }}

void steperawal(){
  digitalWrite(dirPin, LOW); // ….
 for (int i = 0; i < 200; i++) {
  digitalWrite(stepPin, HIGH);
  delayMicroseconds(1000); // …
  digitalWrite(stepPin, LOW);
  delayMicroseconds(1000); // ….
 }}

void steperakhir(){
 digitalWrite(dirPin, LOW);
 for (int i = 0; i < 460; i++) {
```

```
  digitalWrite(stepPin, HIGH);
  delayMicroseconds(1000);
  digitalWrite(stepPin, LOW);
  delayMicroseconds(1000);
 }
 delay(2000);

digitalWrite(dirPin, HIGH); // ….
 for (int i = 0; i < 560; i++) {
  digitalWrite(stepPin, HIGH);
  delayMicroseconds(1000); // ….
  digitalWrite(stepPin, LOW);
  delayMicroseconds(1000); // ….
 }}

void steperbalik(){
 digitalWrite(dirPin, HIGH); // ….
 for (int i = 0; i < 200; i++) {
  digitalWrite(stepPin, HIGH);
  delayMicroseconds(1000); // ….
  digitalWrite(stepPin, LOW);
  delayMicroseconds(1000); // ….
 }}
```

b. Program motor servo

```
void servo180(){
 myservo.write(180);
  myservo2.write(180);
  delay(100);
 }

void servo0(){
```

```
 myservo.write(0);
 myservo2.write(0);
 delay(100);
 }
```

c. Program sensor suhu dan relay aktif elemen pemanas

```
void wsensorsuhu(){
 sensorsuhu();
 delay(500);
 sensorsuhu();
 sensorsuhu();
 delay(500);
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  delay(500);
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  delay(500);
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  delay(500);
  sensorsuhu();
  delay(500);
}
```

```
void sensorsuhu()
  {
  float a=thermocouple.readCelsius();
  Serial.print(" Suhu Tungku =  ");
  Serial.print(a);
   delay (10);
  if (a>=60){
  digitalWrite(elemenpemanas,HIGH);
  }
   else{
   digitalWrite(elemenpemanas,LOW);
  }}
```

d. Program Keseluruhan

```
#include "max6675.h"
#include <Servo.h> //….
Servo myservo;
Servo myservo2;// …
int pos = 0; // ….
int elemenpemanas = 7; //….
int tombol = 10;
int nilai;

int thermoDO = 4; //so
int thermoCS = 5; //cs
int thermoCLK = 6; //sck
MAX6675 thermocouple(thermoCLK, thermoCS, thermoDO);

int vccPin = 3;
int gndPin = 2;

#define dirPin 2
```

```
#define stepPin 3
#define stepsPerRevolution 800

void steper1(){
   digitalWrite(dirPin, LOW); // ….
  for (int i = 0; i < 560; i++) {
   digitalWrite(stepPin, HIGH);
   delayMicroseconds(1000); // ….
   digitalWrite(stepPin, LOW);
   delayMicroseconds(1000); // ….
     }
  delay(1000);
  digitalWrite(dirPin, HIGH); // ….
  for (int i = 0; i < 570; i++) {
   digitalWrite(stepPin, HIGH);
   delayMicroseconds(1000); // ….
   digitalWrite(stepPin, LOW);
   delayMicroseconds(1000); // ….
  }}

void steperawal(){
   digitalWrite(dirPin, LOW); // ….
  for (int i = 0; i < 200; i++) {
   digitalWrite(stepPin, HIGH);
   delayMicroseconds(1000); // ….
   digitalWrite(stepPin, LOW);
   delayMicroseconds(1000); // ….
  }}

void steperakhir(){
  digitalWrite(dirPin, LOW);
  for (int i = 0; i < 460; i++) {
```

```
    digitalWrite(stepPin, HIGH);
    delayMicroseconds(1000);
    digitalWrite(stepPin, LOW);
    delayMicroseconds(1000);
  }
  delay(2000);

digitalWrite(dirPin, HIGH); // ….
  for (int i = 0; i < 560; i++) {
    digitalWrite(stepPin, HIGH);
    delayMicroseconds(1000); // ….
    digitalWrite(stepPin, LOW);
    delayMicroseconds(1000); // ….
  }}

void steperbalik(){
  digitalWrite(dirPin, HIGH); // ….
  for (int i = 0; i < 200; i++) {
    digitalWrite(stepPin, HIGH);
    delayMicroseconds(1000); // ….
    digitalWrite(stepPin, LOW);
    delayMicroseconds(1000); // ….
  }}
void servo180(){
  myservo.write(180);
   myservo2.write(180);
   delay(100);
  }

void servo0(){
 myservo.write(0);
  myservo2.write(0);
```

```
  delay(100);
  }

void wsensorsuhu(){
  sensorsuhu();
  delay(500);
  sensorsuhu();
  sensorsuhu();
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  delay(500);  delay(500);

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  sensorsuhu();
  delay(500);
}


void sensorsuhu()
```

```
{


float a=thermocouple.readCelsius();
Serial.print(" Suhu Tungku =  ");
Serial.print(a);

delay (10);
if (a>=90){
digitalWrite(elemenpemanas,HIGH);
}
  else{
 digitalWrite(elemenpemanas,LOW);
}}


void setup() {
  Serial.begin(9600);

 myservo.write(0);
 myservo2.write(0);

  myservo.attach(8); //…..
  myservo2.attach(9);
  pinMode (elemenpemanas,OUTPUT);
  pinMode(stepPin,OUTPUT);
  pinMode(dirPin,OUTPUT);

  pinMode(tombol,INPUT);
```

```
}



 void loop(){
//myservo.detach();
//  myservo2.detach();

      delay(2000);
 myservo.write(0);
 millis();
 myservo2.write(0);
   delay(2000);
steper1();
delay(10);
wsensorsuhu();   //proses1
delay(10);

steperawal();   //proses2
 delay(2000);
 servo180();
     delay(2000);
   steperbalik();
     delay(10);
wsensorsuhu();
delay(10);


steperawal();  //proses3
    delay(2000);
  servo0();
    delay(2000);
```

```
  steperbalik();
 delay(10);
wsensorsuhu();
delay(10);


steperawal();   //proses4
    delay(2000);
  servo180();
      delay(2000);
   steperbalik();
    delay(10);
wsensorsuhu();
delay(10);

steperawal();  //proses5
    delay(100);
  servo0();
  delay(2000);
  steperbalik();
 delay(10);
wsensorsuhu();
delay(10);

steperawal();   //proses6
    delay(2000);
  servo180();
      delay(2000);
   steperbalik();
   delay(10);
wsensorsuhu();
delay(10);
```

```
steperawal();   //proses7
delay(2000);
servo0();
delay(2000);
 steperbalik();
    delay(10);
wsensorsuhu();
delay(10);

   steper1();
      delay(10);


steperawal();   //proses8
     delay(2000);
   servo180();
       delay(2000);
     steperbalik();
    delay(10);
wsensorsuhu();
delay(10);

 steperawal();  //proses9
     delay(2000);
   servo0();
       delay(2000);
   steperbalik();
 delay(10);
wsensorsuhu();
```

```
delay(10);

steperawal();   //proses10
    delay(100);
  servo180();
       delay(1000);
   steperbalik();
      delay(10);
wsensorsuhu();
delay(10);

steperawal();  //proses11
    delay(100);
  servo0();
     delay(2000);
  steperbalik();
  delay(10);
wsensorsuhu();
delay(10);

   delay (1000);
    digitalWrite(elemenpemanas,HIGH);
      exit(0);

 }
```