

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 stepberbalik(){
    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);
```

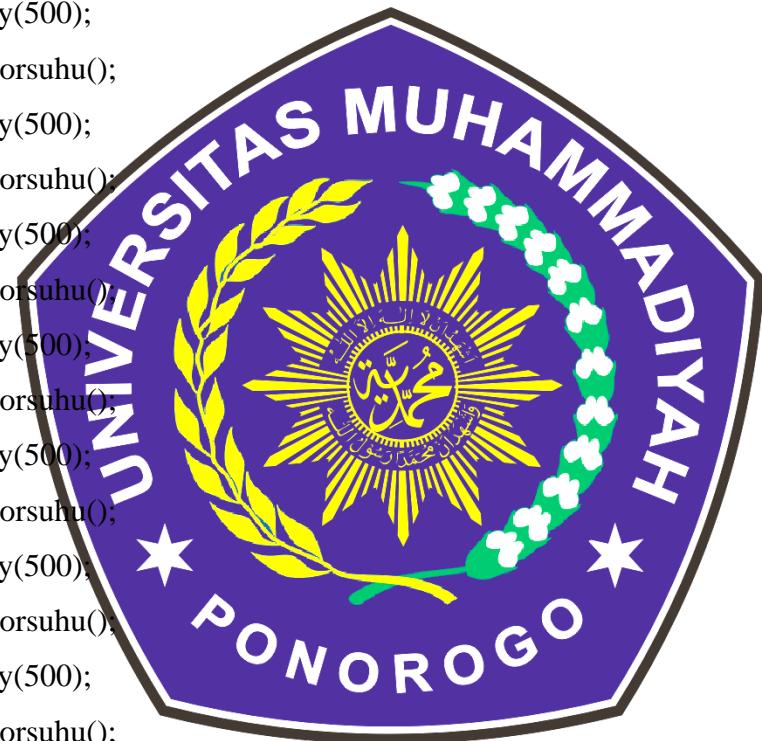
```
    sensorsuhu();
```

```
    delay(500); 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

```

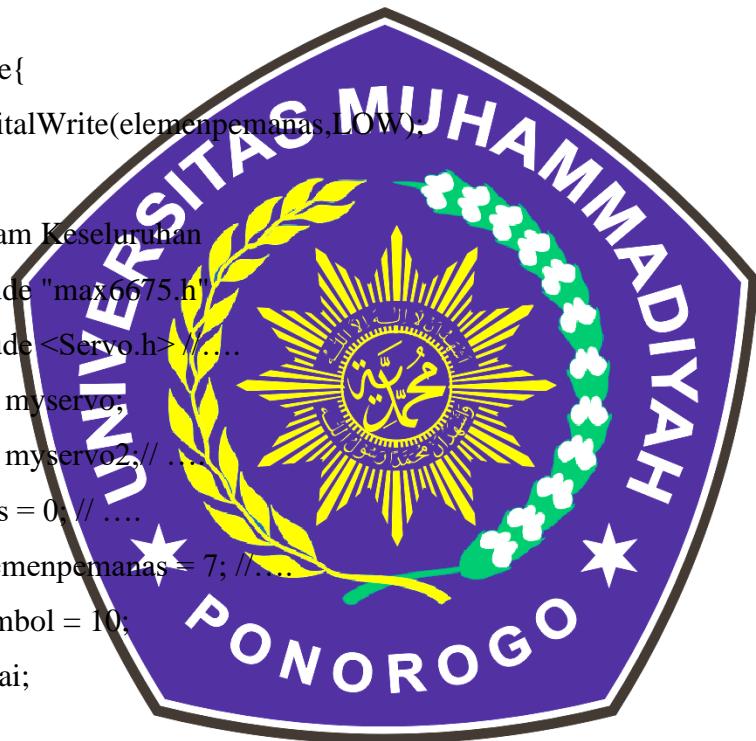
#include "max6675.h"
#include <Servo.h> //....
Servo myservo;
Servo myservo2;// ....
int pos = 0; // ....
int elemenpemanas = 7; //....
int tombol = 10;
int nilai;

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); // ....
}
```

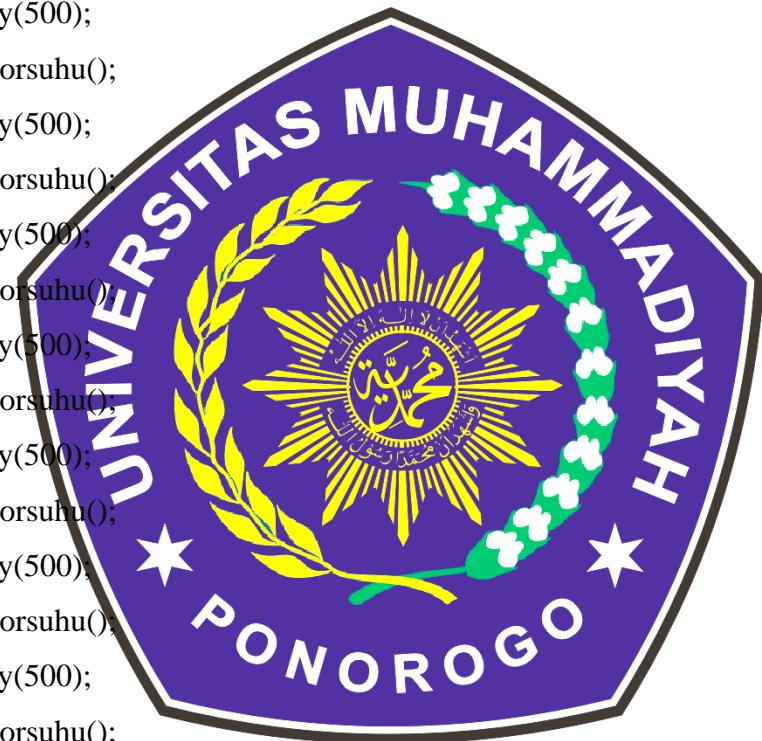
```
void stepperbalik(){
    digitalWrite(dirPin, HIGH); // ....
    for (int i = 0; i < 200; i++) {
        digitalWrite(stepPin, HIGH);
        delayMicroseconds(1000); // ....
        digitalWrite(stepPin, LOW);
        delayMicroseconds(1000); // ....
    }
}
```

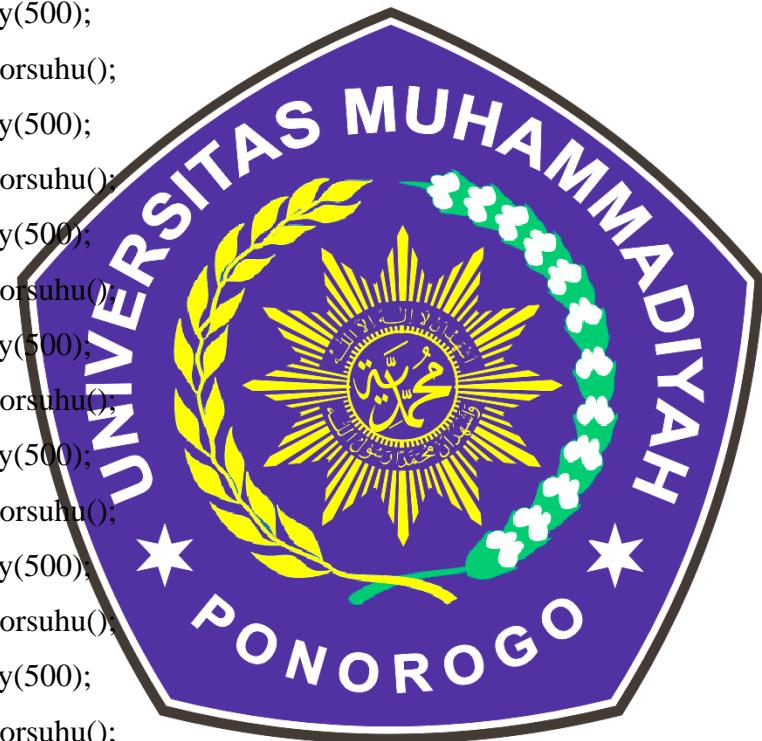
```
void servo180(){
    myservo.write(180);
    myservo2.write(180);
    delay(100);
}
```

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











```
void sensorsuhu()
```

```
{
```

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

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

```
void setup() {
```

```
Serial.begin(9600);
```

```
myservo.write(0);
```

```
myservo2.write(0);
```

```
myservo.attach(8); //.....
```

```
myservo2.attach(9);
```

```
pinMode (elementpemanas,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);
wsensorstuhu();
delay(10);
delay (1000);
digitalWrite(clemenpemanas,HIGH);
exit(0);
```

```
}
```

