LAMPIRAN A

Program Utama Pada Arduino Ide

```
#include <Fuzzy.h>
#define pin_alarm  D4
#define pin_heat1  D5
#define pin_heat2  D6
#define pin_heat3  D7
#define analogPin A0
float smoke;
float heat;
int alarm;
int notif;
int sensorValue = 0;
//=================================================
#include <ESP8266WiFi.h>
#include <WiFiClientSecure.h>
//=================================================
#define WIFI_SSID "Madrid"
#define WIFI_PASS "incredible90"
#define BOT_TOKEN
"6300631741:AAGSE_WILx9i6MD9dZtifQzDlZGVvwaoAAM"
#define CHAT_ID "6291182573"
//=================================================
#include <FastBot.h>
FastBot bot(BOT_TOKEN);
//=================================================
//-------------  FUZZY DAN SET NILAI TIAP VARIABEL -------------
Fuzzy *fuzzy = new Fuzzy();
//=================================================
// FuzzyInput heat = Mendeklarasikan Fuzzy set input sensor panas
FuzzySet *normal_suhu       = new FuzzySet(0, 0, 1, 2 );
FuzzySet *hangat            = new FuzzySet(1, 2, 2, 3);
FuzzySet *panas             = new FuzzySet(2, 3, 3, 3);
//=================================================
```

```
// FuzzyInput smoke = Mendeklarasikan Fuzzy set input sensor Asap
FuzzySet *bersih          = new FuzzySet(0, 1, 1, 2);
FuzzySet *sedang           = new FuzzySet(1, 2, 2, 3);
FuzzySet *pekat           = new FuzzySet(3, 4, 4, 15);
//================================================
// FuzzyOutput alarm = Mendeklarasikan Fuzzy set output bel alarm
FuzzySet *mati            = new FuzzySet(0, 0, 0, 0);
FuzzySet *hidup           = new FuzzySet(1, 1, 1, 1);
//================================================
// FuzzyOutput Notif Telegram = Mendeklarasikan Fuzzy set output
Notif Telegram
FuzzySet *aman            = new FuzzySet(0, 1, 1, 2);
FuzzySet *waspada          = new FuzzySet(2, 2, 3, 4);
FuzzySet *siaga           = new FuzzySet(3, 3, 4, 5);
FuzzySet *awas            = new FuzzySet(4, 4, 5, 5);
//================================================
//-------------  PANGGIL TAB LAIN -------------
#include "2_fuzzy_set.h"
#include "3_fuzzy_rule.h"
#include "heat_reading.h"
#include "smoke_reading.h"
#include "Telegram.h"
//-------------------------------------------------------
//                    VOID SETUP
//-------------------------------------------------------
void setup()
{
  Serial.begin(115200);
 connectWiFi();
 //================================================
  //---------  SET PINMODE ----------------------------------
  pinMode(pin_alarm , OUTPUT);
  pinMode(pin_heat1 , INPUT_PULLUP);
  pinMode(pin_heat2 , INPUT_PULLUP);
  pinMode(pin_heat3 , INPUT_PULLUP);
  digitalWrite(pin_alarm,HIGH);
```

```
  //---------  PANGGIL FUNGSI / FUNCTION FUZY DI TAB 2 DAN 3
//=================================================
  bot.attach(newMsg);
  digitalWrite(pin_alarm, LOW);
  fuzzySet ();
  fuzzyRule ();
}
  //---------------------------------------------------------------------
void newMsg(FB_msg& msg) {
  Serial.begin(115200);
  Serial.println(msg.toString());
  if(msg.text == "/alarmoff") {
     digitalWrite(pin_alarm, HIGH);
     bot.setChatID(CHAT_ID);
     bot.sendMessage("ALARM DIMATIKAN");
     delay(10000);
     digitalWrite(pin_alarm, LOW);
}
}
//================================================
void kirimpesan() {

  if (notif == 1 && alarm == 0) {
     bot.setChatID(CHAT_ID);
     bot.sendMessage("Defuzzifikasi = "+String(notif)+"\n Level Suhu =
"+String(heat)+"\n Level Smoke = "+String(smoke)+"\n KONDISI
AMAN ");
     Serial.print("Mengirim Pesan Kondisi Aman\n");
     delay(5000);
    }
  else if (notif == 2 && alarm == 0) {
     bot.setChatID(CHAT_ID);
     bot.sendMessage("Defuzzifikasi = "+String(notif)+"\n Level Suhu =
"+String(heat)+"\n Level Smoke = "+String(smoke)+"\n WASPADA
ADA INDIKASI KEBAKARAN ");
```

```
    //bot.sendMessage("WASPADA ADA INDIKASI KEBAKARAN");
    Serial.print("Mengirim Pesan Kondisi Waspada ada indikasi
kebakaran");
    delay(3000);
  }
 else if (notif == 3 && alarm == 0) {
    bot.setChatID(CHAT_ID);
    bot.sendMessage("Defuzzifikasi = "+String(notif)+"\n Level Suhu =
"+String(heat)+"\n Level Smoke = "+String(smoke)+"\n SIAGA ADA
INDIKASI KEBAKARAN!! ");
    //bot.sendMessage("SIAGA ADA INDIKASI KEBAKARAN!!");
    Serial.print("Mengirim Pesan Siaga!!!ada indikasi kebakaran
Kebakaran");
    delay(2000);
 }
 else if (notif == 4 && alarm == 1) {
    bot.setChatID(CHAT_ID);
    bot.sendMessage("Defuzzifikasi = "+String(notif)+"\n Level Suhu =
"+String(heat)+"\n Level Smoke = "+String(smoke)+"\n AWAS!!!
KEBAKARAN ");
Serial.print("Mengirim Pesan Awas!!! Kebakaran");
delay(1000);
}
}

//================================================
==============================
void loop()
  {
 baca_panas();
 baca_smoke();
 telegram();

  Serial.print("Level_Suhu ");
  Serial.print(heat);
  Serial.println("");
```

```
  Serial.print("Level_Smoke ");
  Serial.print(smoke);
  Serial.println("");

  fuzzy->setInput(1, heat);
  fuzzy->setInput(2, smoke);

  fuzzy->fuzzify();
  alarm = fuzzy->defuzzify(1);
  notif = fuzzy->defuzzify(2);

  Serial.println("HASIL: ");
  Serial.print("       1.Alarm: ");
  Serial.println(alarm);
  if (alarm == 1)
  {
  digitalWrite(pin_alarm,LOW);
  }
  else if (alarm == 0)
  {
  digitalWrite(pin_alarm,HIGH);
  }
  Serial.print("       2.Notif: ");
  Serial.print(notif);
  Serial.println("");
  Serial.println("");
  delay(500);
  kirimpesan();
}
void connectWiFi() {
  delay(2000);
  Serial.begin(115200);
  Serial.println();
//================================================
  WiFi.begin(WIFI_SSID, WIFI_PASS);
  while (WiFi.status() != WL_CONNECTED) {
```

```
    delay(500);
    Serial.print(".");
    if (millis() > 15000) ESP.restart();
   }
   Serial.println("Connected");
}
//=================================================
void fuzzySet () {
 // FuzzyInput SUHU
  FuzzyInput *heat = new FuzzyInput(1);

  heat->addFuzzySet(normal_suhu);
  heat->addFuzzySet(hangat);
  heat->addFuzzySet(panas);

  fuzzy->addFuzzyInput(heat);
//=================================================
  // FuzzyInput ASAP
  FuzzyInput *smoke = new FuzzyInput(2);

  smoke->addFuzzySet(bersih);
  smoke->addFuzzySet(sedang);
  smoke->addFuzzySet(pekat);
  fuzzy->addFuzzyInput(smoke);
//=================================================
  // FuzzyOutput ALARM
  FuzzyOutput *alarm = new FuzzyOutput(1);
  alarm->addFuzzySet(mati);
  alarm->addFuzzySet(hidup);;
  fuzzy->addFuzzyOutput(alarm);
//=================================================
 // FuzzyOutput NOTIF
  FuzzyOutput *notif = new FuzzyOutput(2);
  notif->addFuzzySet(aman);
  notif->addFuzzySet(waspada);
  notif->addFuzzySet(siaga);
```

```
  notif->addFuzzySet(awas);
  fuzzy->addFuzzyOutput(notif);
}
//================================================

void fuzzyRule () {

  // Building FuzzyRule 1
  FuzzyRuleAntecedent *normal_bersih_1 = new
FuzzyRuleAntecedent();
  normal_bersih_1->joinWithAND(normal_suhu, bersih);

  FuzzyRuleConsequent *a_1 = new FuzzyRuleConsequent();
  a_1->addOutput(mati);

  FuzzyRule *fuzzyRule1 = new FuzzyRule(1, normal_bersih_1, a_1);
  fuzzy->addFuzzyRule(fuzzyRule1);

//================================================
  // Building FuzzyRule 2
  FuzzyRuleAntecedent *normal_sedang_2 = new
FuzzyRuleAntecedent();
  normal_sedang_2->joinWithAND(normal_suhu, sedang);

  FuzzyRuleConsequent *a_2 = new FuzzyRuleConsequent();
  a_2->addOutput(mati);
  a_2->addOutput(aman);

  FuzzyRule *fuzzyRule2 = new FuzzyRule(2, normal_sedang_2, a_2);
  fuzzy->addFuzzyRule(fuzzyRule2);
//================================================
  // Building FuzzyRule 3
  FuzzyRuleAntecedent *normal_pekat_3 = new
FuzzyRuleAntecedent();
  normal_pekat_3->joinWithAND(normal_suhu, pekat);
```

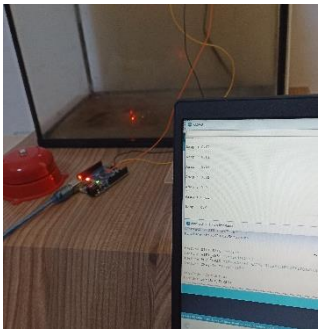
```
  FuzzyRuleConsequent *a_3 = new FuzzyRuleConsequent();
  a_3->addOutput(mati);
  a_3->addOutput(siaga);

  FuzzyRule *fuzzyRule3 = new FuzzyRule(3, normal_pekat_3, a_3);
  fuzzy->addFuzzyRule(fuzzyRule3);
//================================================
  // Building FuzzyRule 4
  FuzzyRuleAntecedent *hangat_bersih_4 = new
FuzzyRuleAntecedent();
  hangat_bersih_4->joinWithAND(hangat, bersih);

  FuzzyRuleConsequent *a_4 = new FuzzyRuleConsequent();
  a_4->addOutput(mati);
  a_4->addOutput(aman);

  FuzzyRule *fuzzyRule4 = new FuzzyRule(4, hangat_bersih_4, a_4);
  fuzzy->addFuzzyRule(fuzzyRule4);
//================================================
  // Building FuzzyRule 5
  FuzzyRuleAntecedent *hangat_sedang_5 = new
FuzzyRuleAntecedent();
  hangat_sedang_5->joinWithAND(hangat, sedang);


  FuzzyRuleConsequent *a_5 = new FuzzyRuleConsequent();
  a_5->addOutput(mati);
  a_5->addOutput(waspada);

  FuzzyRule *fuzzyRule5 = new FuzzyRule(5, hangat_sedang_5, a_5);
  fuzzy->addFuzzyRule(fuzzyRule5);
//================================================
  // Building FuzzyRule 6
  FuzzyRuleAntecedent *hangat_pekat_6 = new
FuzzyRuleAntecedent();
  hangat_pekat_6->joinWithAND(hangat, pekat);
```

```
  FuzzyRuleConsequent *a_6 = new FuzzyRuleConsequent();
  a_6->addOutput(mati);
  a_6->addOutput(siaga);

  FuzzyRule *fuzzyRule6 = new FuzzyRule(6, hangat_pekat_6, a_6);
  fuzzy->addFuzzyRule(fuzzyRule6);
//=================================================
  // Building FuzzyRule 7
  FuzzyRuleAntecedent *panas_bersih_7 = new FuzzyRuleAntecedent();
  panas_bersih_7->joinWithAND(panas, bersih);


  FuzzyRuleConsequent *a_7 = new FuzzyRuleConsequent();
  a_7->addOutput(mati);
  a_7->addOutput(waspada);

  FuzzyRule *fuzzyRule7 = new FuzzyRule(7, panas_bersih_7, a_7);
  fuzzy->addFuzzyRule(fuzzyRule7);
//=================================================

  // Building FuzzyRule 8
  FuzzyRuleAntecedent *panas_sedang_8 = new
FuzzyRuleAntecedent();
  panas_sedang_8->joinWithAND(panas, sedang);


  FuzzyRuleConsequent *a_8 = new FuzzyRuleConsequent();
  a_8->addOutput(mati);
  a_8->addOutput(siaga);

  FuzzyRule *fuzzyRule8 = new FuzzyRule(8, panas_sedang_8, a_8);
  fuzzy->addFuzzyRule(fuzzyRule8);
//=================================================

  // Building FuzzyRule 9
```

```
  FuzzyRuleAntecedent *panas_pekat_9 = new FuzzyRuleAntecedent();
  panas_pekat_9->joinWithAND(panas, pekat);


  FuzzyRuleConsequent *a_9 = new FuzzyRuleConsequent();
  a_9->addOutput(hidup);
  a_9->addOutput(awas);

  FuzzyRule *fuzzyRule9 = new FuzzyRule(9, panas_pekat_9, a_9);
  fuzzy->addFuzzyRule(fuzzyRule9);
}
//================================================
void telegram()
{
  Serial.begin(115200);
  bot.tick();
}
//================================================
void baca_panas()
{
  int heat1 = digitalRead(pin_heat1);
  int heat2 = digitalRead(pin_heat2);
  int heat3 = digitalRead(pin_heat3);

  if (heat1 == HIGH && heat2 == HIGH && heat3 == HIGH)
   {
     heat = 0;
   }
  else if (heat1 == LOW && heat2 == HIGH && heat3 == HIGH)
  {
     heat = 1;
     delay(2000);
  }
  else if (heat1 == HIGH && heat2 == LOW && heat3 == HIGH)
  {
     heat = 1;
```

```
      delay(2000);
   }
   else if (heat1 == HIGH && heat2 == HIGH && heat3 == LOW)
   {
     heat = 1;
      delay(2000);
   }
   else if (heat1 == LOW && heat2 == LOW && heat3 == HIGH)
   {
     heat = 2;
      delay(2000);
   }
   else if (heat1 == LOW && heat2 == HIGH && heat3 == LOW)
   {
     heat = 2;
      delay(2000);
   }
   else if (heat1 == HIGH && heat2 == LOW && heat3 == LOW)
   {
     heat = 2;
      delay(2000);
   }
   else if (heat1 == LOW && heat2 == LOW && heat3 == LOW)
   {
      heat = 3;
       delay(2000);
   }
  delay(100);
}
//=================================================
void baca_smoke()
{
  sensorValue = analogRead(analogPin);
  smoke = map(sensorValue, 965, 1023, 0, 15);
  delay(1000);
}
```

LAMPIRAN B

Pembuatan Mekanik dan *Wiring* Rangkaian Elektronik	
	
Pengujian Prototipe Sistem	
	

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Hobi	: Sepak Bola
Motto	: *They laugh at me cause I am Different, I laugh at Them cause They are all the same remember boys be different, fvck their opinion*.

Riwayat Pendidikan :

Sekolah / Institusi/ Universitas	Jurusan	Periode
MI Ma'arif NU 01 Pancasan	-	2008-2014
MTs Al-Ikhsan Beji	-	2014-2017
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Penulis telah mengikuti seminar Tugas Akhir pada tanggal 09 Agustus 2023 sebagai salah satu persyaratan untuk memperoleh gelar Ahli Madya (A.Md).