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Materi : Menyelesaikan Penambahan Logika Fuzzy pada Device

Nama Anggota Kelompok 4:

1. M. Iqbal Nahdliansyah\_2210171031

2. Fadillah Hendy Febriansyah\_2210171039

3. Rohmad Rifai\_2210171041

4. M. Rizqi Hasan Al Banna\_2210171049

5. Muhammad Alan Nur\_2210171059

Ini Nama Dosen

Ini Tanggal Pengumpulan

Ini Matkul

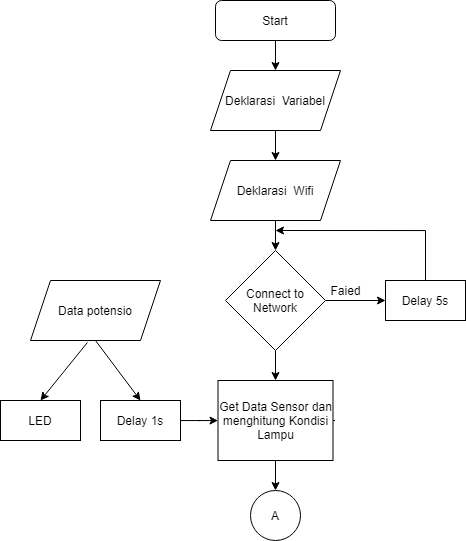
Ini Nama

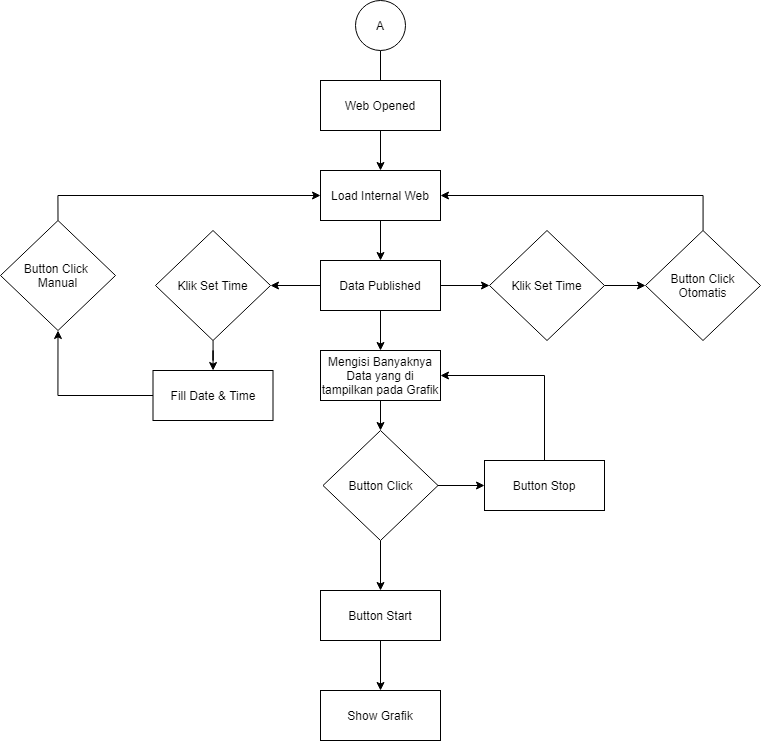
Ini NRP

**Laporan Akhir Workshop Kompilasi**

Pada minggu ke-15 ini, kami telah menambahkan logika fuzzy pada device sebelumnya, yaitu monitoring lampu rumah dengan menggunakan satu device yaitu NODEMCU esp32.

1. Diagram Sistem





1. Fuzzy Rule Set

Kondisi cahaya

di dalam ruangan

Kondisi cahaya di luar ruangan

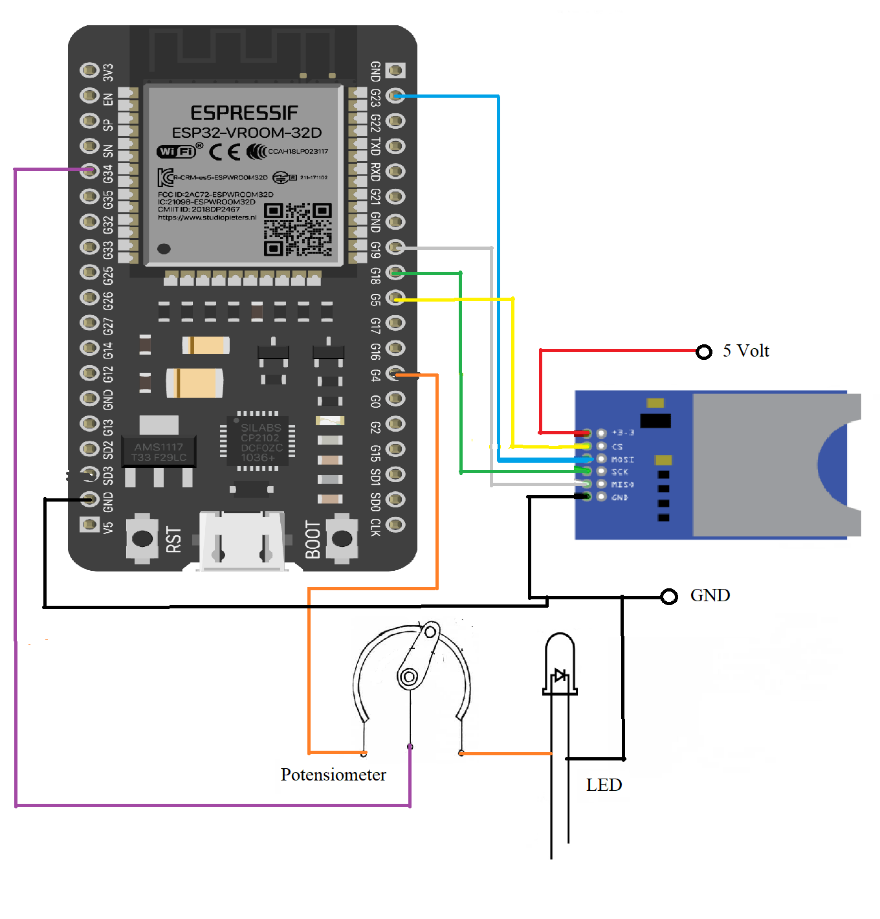
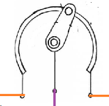
|  |  |  |  |
| --- | --- | --- | --- |
|  | Gelap | Redup | Terang |
| Gelap | Nyala | Redup | Nyala |
| Redup | Nyala | Redup | Redup |
| Terang | Redup | Mati | Mati |

1. Fungsi Keanggotaan

Kondisi cahaya di luar dan di dalam ruangan ruangan

1. Alat dan Bahan
2. NodeMCU esp32
3. Kabel micro USB
4. White board
5. Potensio 20K
6. Resistor 330 ohm
7. Kabel jumper
8. LED
9. SD Card + SD Card Adapter
10. Skema Rangkaian

Pada Skematik rangkaian dibawah ini, SD Card Adaptor terdapat Pin yang dihubungkan pada NodeMCU esp32, MISO Disambungkan pada Pin D19 , MOSI disambung pada Pin D23, SCK disambungkan pada Pin D18, CS disambung pada Pin D5. Kemudian data masing masing potensiometer dihubungkan pada pin D34 dan D35 pada NodeMCU esp32 dan pin LED ditaruh pada pin D4 pada NodeMCU esp32. Pada ujung resistor yang terhubung dengan LED kita sambungkan ke Ground supaya LED yang dihasilkan adalah activehigh.



Gambar Rangkaian

1. Source Code

**Arduino**

#include <WiFi.h>

#include <WiFiClient.h>

#include <WebServer.h>

#include <NTPClient.h>

#include <analogWrite.h>

#include <SD.h>

#include <math.h>

//file html

#include "html.h"

//update\_time per detik

#define update\_time 1000

//pin

#define CS\_PIN 5

#define pin\_potensio1 34

#define pin\_potensio2 35

#define pin\_led 4

//define IP static but will make the internet close

IPAddress ip(192, 168, 43, 26); //sesuaikan dengan ip wifi

IPAddress gateway(192, 168, 43, 1); //sesuaikan dengan ip diatas

IPAddress subnet(255,255,255,0);

//variable

int data\_potensio1=0,data\_potensio2=0;

String kondisi\_lampu = "";

String data\_lama\_lampu = "";

String data\_baru\_lampu = "";

String dataString;

int data\_baru\_suhu = 0;

File dataFile;

String sdCardMode;

//variable fuzzy

float cahayaLuarGelap, cahayaLuarRedup, cahayaLuarTerang, cahayaDalamGelap, cahayaDalamRedup, cahayaDalamTerang;

float minR1, minR2, minR3, minR4, minR5, minR6, minR7, minR8, minR9;

float lampuR1,lampuR2,lampuR3,lampuR4, lampuR5, lampuR6, lampuR7, lampuR8, lampuR9;

float hasil\_COA;

//variable waktu

String data\_hari, data\_tanggal, data\_jam;

String waktuManual = "20/10/1998 00:00:00";

int tahun,bulan,tanggal,jam,menit,detik;

int jumlah\_tanggal = 30;

//variable sampling time

unsigned long real\_time,flag\_reset,real\_time\_before;

//kondisi button Start Stop

String Button = "Auto",lastButton;

//define wifi

const char\* username = "Redmi Note 9";

const char\* password = "12345678";

//sesuai dengan flash frequency yang di set

WebServer server(80);

//define NTP client

WiFiUDP ntpUDP;

NTPClient timeClient(ntpUDP);

//--------------------Fuction For all--------------------------------//

//\_\_Fuction for Setup\_\_\_\_//

void get\_time\_manual(){

waktuManual = server.arg("Manual");

//Serial.println(waktuManual);

tahun = waktuManual.substring(0,4).toInt();

//Serial.println(tahun);

bulan = waktuManual.substring(5,7).toInt();

//Serial.println(bulan);

tanggal = waktuManual.substring(8,10).toInt();

//Serial.println(tanggal);

jam = waktuManual.substring(11,13).toInt();

//Serial.println(tanggal);

menit = waktuManual.substring(14,16).toInt();

//Serial.println(tanggal);

detik = waktuManual.substring(17,19).toInt();

//Serial.println(tanggal);

}

//waktu auto membutuhkan internet untuk awalannya setelah itu akan di counting oleh millis()

void get\_time\_auto(){

if(!timeClient.update()){

timeClient.forceUpdate();

}

data\_hari = timeClient.getFormattedDate();

Serial.println(data\_hari);

//get data tahun bulan tanggal

int flag = data\_hari.indexOf("T");

data\_tanggal = data\_hari.substring(0,flag);

tahun = data\_tanggal.substring(0,4).toInt();

bulan = data\_tanggal.substring(5,7).toInt();

tanggal = data\_tanggal.substring(8,10).toInt();

//get data jam menit detik

data\_jam = data\_hari.substring(flag+1, data\_hari.length()-1);

jam = data\_jam.substring(0,2).toInt();

menit = data\_jam.substring(3,5).toInt();

detik = data\_jam.substring(6,8).toInt();

}

//fungsi yang dipanggil untuk load html

void panggil\_html() {

Button = "Start";

flag\_reset = real\_time;

String call = MAIN\_page;

//mencari nama yang tertera pada html

if( server.hasArg("Manual") ) {

get\_time\_manual();

server.send(200, "text/html", call);

}else if(server.hasArg("Auto")){

get\_time\_auto();

server.send(200, "text/html", call);

}else {

tanggal = waktuManual.substring(0,2).toInt();

bulan = waktuManual.substring(3,5).toInt();

tahun = waktuManual.substring(6,10).toInt();

jam = waktuManual.substring(11,13).toInt();

menit = waktuManual.substring(14,16).toInt();

detik = waktuManual.substring(17,19).toInt();

server.send(200, "text/html", call);

}

}

void Start() {

Button = "Auto";

String json = "{\"Tanggal\":\""+String(data\_tanggal)+"\",\"Waktu\":\""+String(data\_jam)+"\",\"Kondisi\_lampu\":\""+kondisi\_lampu+"\", \"Data\_potensio\":\""+ String(hasil\_COA) +"\"}";

server.send(200, "text/plane", json);

}

void Manual\_ON(){

Button = "Manual\_ON";

String json = "{\"Tanggal\":\""+String(data\_tanggal)+"\",\"Waktu\":\""+String(data\_jam)+"\",\"Kondisi\_lampu\":\""+kondisi\_lampu+"\", \"Data\_potensio\":\""+ String(hasil\_COA) +"\"}";

server.send(200, "text/plane", json);

}

void Manual\_OFF(){

Button = "Manual\_OFF";

String json = "{\"Tanggal\":\""+String(data\_tanggal)+"\",\"Waktu\":\""+String(data\_jam)+"\",\"Kondisi\_lampu\":\""+kondisi\_lampu+"\", \"Data\_potensio\":\""+ String(hasil\_COA) +"\"}";

server.send(200, "text/plane", json);

}

//\_\_END of Fuction for Setup\_\_\_\_//

//\_\_\_Fuction for loop\_\_\_\_//

//menghitung jumlah hari dalam 1 bulan

void check\_jumlah\_tanggal\_dalam\_1\_bulan(int bulan){

switch(bulan){

case 2:

if(tahun%4==0){

if(tahun%100==0){

if(tahun%400==0){

jumlah\_tanggal = 29;

}else{

jumlah\_tanggal = 28;

}

}else{

jumlah\_tanggal=29;

}

}else{

jumlah\_tanggal=28;

}

break;

case 1:

case 3:

case 5:

case 7:

case 8:

case 10:

case 12: jumlah\_tanggal = 31; break;

case 4:

case 6:

case 9:

case 11: jumlah\_tanggal = 30;break;

default: jumlah\_tanggal = 30;

}

}

//counting waktu

void counting\_time(){

detik ++;

if(detik >= 60){

detik = 0;

menit ++;

if(menit >= 60){

menit = 0;

jam ++;

if(jam >= 24){

jam = 0;

tanggal ++;

if(tanggal >= 28){

check\_jumlah\_tanggal\_dalam\_1\_bulan(bulan);

}

if(tanggal > jumlah\_tanggal){

tanggal = 1;

bulan ++;

if(bulan > 12){

bulan = 1;

tahun ++;

}

}

}

}

}

}

//add sensor in here

/\*void sensor(){

if(Current > Speed ) Speed ++ ;

if(Voltage > Current )Current ++ ;

Voltage ++;

}\*/

//write in sdcard

int SDCARD(String target) {

if(target == "setup"){

Serial.print("SD CARD...");

if (!SD.begin(CS\_PIN))

Serial.println("Failed.");

else

Serial.println("Ready");

}

dataFile = SD.open("DATA\_LOGER.txt", FILE\_WRITE);

Serial.println(dataFile);

//jika file dibuka dengan benar, data ditulis

if (dataFile) {

Serial.println("File Berhasil diBuka");

if(target == "setup"){

dataString += "Kondisi Lampu" ;

dataString += "t\t" ;

dataString += "Nilai Intensitas" ;

dataString += "\t" ;

dataString += "Waktu" ;

dataString += "\t" ;

dataFile.println(dataString);

}else if(target == "data"){

dataFile.print(kondisi\_lampu);

dataFile.print("\t");

dataFile.print(hasil\_COA);

dataFile.print("\t");

dataFile.println(data\_jam);

}

dataFile.close();

}

else {

//jika file tidak dapat dibuka, data tidak akan ditulis

//Serial.println("Gagal membuka file LOG.txt");

}

//menunggu interval untuk pembacaan data baru

dataString = " " ;

}

//fuzzy logic

float Cahaya(float a, float b, float c, float z){

float hasil;

if((z>=a)&&(z<b)) hasil = (z-a)/(b-a);

if((z>=b)&&(z<c)) hasil = (c-z)/(c-b);

if(z<=a){

if(a == 0) hasil = 1;

else hasil = 0;

}

if(z>=c){

if(c == 255) hasil = 1;

else hasil = 0;

}

return hasil;

}

float Min(float a,float b){

float hasil\_min;

if(a<b)

hasil\_min=a;

else

hasil\_min=b;

return hasil\_min;

}

void fuzzy(float intensitasCahayaLuar,float intensitasCahayaDalam){

// Fuzzyfikasi

cahayaLuarGelap = Cahaya(0, 62, 127, intensitasCahayaLuar);

//printf("Fungsi keanggotaan cahaya di luar ruangan gelap : %.2f\n", cahayaLuarGelap);

cahayaLuarRedup = Cahaya(62, 127, 192, intensitasCahayaLuar);

//printf("Fungsi keanggotaan cahaya di luar ruangan redup : %.2f\n", cahayaLuarRedup);

cahayaLuarTerang = Cahaya(127, 192, 255, intensitasCahayaLuar);

//printf("Fungsi keanggotaan cahaya di luar ruangan terang : %.2f\n", cahayaLuarTerang);

cahayaDalamGelap = Cahaya(0, 62, 127, intensitasCahayaDalam);

//printf("Fungsi keanggotaan cahaya di dalam ruangan gelap : %.2f\n", cahayaDalamGelap);

cahayaDalamRedup = Cahaya(62, 127, 192, intensitasCahayaDalam);

//printf("Fungsi keanggotaan cahaya di dalam ruangan redup : %.2f\n", cahayaDalamRedup);

cahayaDalamTerang = Cahaya(127, 192, 255, intensitasCahayaDalam);

//printf("Fungsi keanggotaan cahaya di dalam ruangan terang : %.2f\n", cahayaDalamTerang);

// rule 1 : IF Cahaya Luar GELAP And Cahaya Dalam GELAP THEN Lampu NYALA

minR1=Min(cahayaLuarGelap, cahayaDalamGelap);

//printf("Minimum Cahaya Luar GELAP And Cahaya Dalam GELAP : %.2f\n",minR1);

lampuR1 = 255;

// rule 2 : IF Cahaya Luar GELAP And Cahaya Dalam REDUP THEN Lampu REDUP

minR2=Min(cahayaLuarGelap, cahayaDalamRedup);

//printf("Minimum Cahaya Luar GELAP And Cahaya Dalam REDUP : %.2f\n",minR2);

lampuR2 = 255;

// rule 3 : IF Cahaya Luar GELAP And Cahaya Dalam TERANG THEN Lampu NYALA

minR3=Min(cahayaLuarGelap, cahayaDalamTerang);

//printf("Minimum Cahaya Luar GELAP And Cahaya Dalam TERANG : %.2f\n",minR3);

lampuR3 = 127;

// rule 4 : IF Cahaya Luar REDUP And Cahaya Dalam GELAP THEN Lampu NYALA

minR4=Min(cahayaLuarRedup, cahayaDalamGelap);

//printf("Minimum Cahaya Luar REDUP And Cahaya Dalam GELAP : %.2f\n",minR4);

lampuR4 = 127;

// rule 5 : IF Cahaya Luar REDUP And Cahaya Dalam REDUP THEN Lampu REDUP

minR5=Min(cahayaLuarRedup, cahayaDalamRedup);

//printf("Minimum Cahaya Luar REDUP And Cahaya Dalam REDUP : %.2f\n",minR5);

lampuR5 = 127;

// rule 6 : IF Cahaya Luar REDUP And Cahaya Dalam TERANG THEN Lampu REDUP

minR6=Min(cahayaLuarRedup, cahayaDalamTerang);

//printf("Minimum Cahaya Luar REDUP And Cahaya Dalam TERANG : %.2f\n",minR6);

lampuR6 = 0;

// rule 7 : IF Cahaya Luar TERANG And Cahaya Dalam GELAP THEN Lampu REDUP

minR7=Min(cahayaLuarTerang, cahayaDalamGelap);

//printf("Minimum Cahaya Luar TERANG And Cahaya Dalam GELAP : %.2f\n",minR7);

lampuR7 = 255;

// rule 8 : IF Cahaya Luar TERANG And Cahaya Dalam REDUP THEN Lampu MATI

minR8=Min(cahayaLuarTerang, cahayaDalamRedup);

//printf("Minimum Cahaya Luar TERANG And Cahaya Dalam REDUP : %.2f\n",minR8);

lampuR8 = 127;

// rule 9 : IF Cahaya Luar TERANG And Cahaya Dalam TERANG THEN Lampu MATI

minR9=Min(cahayaLuarTerang, cahayaDalamTerang);

//printf("Minimum Cahaya Luar TERANG And Cahaya Dalam TERANG : %.2f\n",minR9);

lampuR9 = 0;

// Defuzzyfikasi

float pembilang = minR1 \* lampuR1 + minR2 \* lampuR2 + minR3 \* lampuR3 + minR4 \* lampuR4 + minR5 \* lampuR5 + minR6 \* lampuR6 + minR7 \* lampuR7 + minR8 \* lampuR8 + minR9 \* lampuR9;

float penyebut = minR1 + minR2 + minR3 + minR4 + minR5 + minR6 + minR7 + minR8 + minR9;

hasil\_COA = pembilang/penyebut;

Serial.print("Nilai value Lampu atau LED : ");

Serial.println(hasil\_COA);

}

//actuator and sensor process

void actuator\_sensor(){

data\_potensio1 = analogRead(pin\_potensio1)/16;

Serial.print("Nilai value Lampu atau LED luar : ");

Serial.println(data\_potensio1);

data\_potensio2 = analogRead(pin\_potensio2)/16;

Serial.print("Nilai value Lampu atau LED dalam : ");

Serial.println(data\_potensio2);

fuzzy(data\_potensio1,data\_potensio2);

if(Button == "Auto"){

analogWrite(pin\_led,hasil\_COA);

if (hasil\_COA == 0)

{

kondisi\_lampu = "mati";

// Serial.println("Lampu Mati");

}

else if ((hasil\_COA >= 1) && (hasil\_COA <= 400))

{

kondisi\_lampu = "redup";

// Serial.println("Lampu Redup");

}

else if ( (hasil\_COA >400) && (hasil\_COA <= 1024))

{

kondisi\_lampu = "terang";

// Serial.println("Lampu Terang");

}

}else if (Button == "Manual\_ON"){

kondisi\_lampu = "terang";

analogWrite(pin\_led,255);

}else if (Button == "Manual\_OFF"){

kondisi\_lampu = "mati";

analogWrite(pin\_led,0);

}

data\_baru\_suhu = hasil\_COA;

data\_baru\_lampu = kondisi\_lampu;

if ( data\_lama\_lampu != data\_baru\_lampu)

{

sdCardMode="data";

SDCARD(sdCardMode);

Serial.println("data telah tersimpan");

data\_lama\_lampu = data\_baru\_lampu;

}

}

//millis untuk flag 1 detik

void Update\_data(){

real\_time = millis() - flag\_reset;

if(real\_time - real\_time\_before >= update\_time){

counting\_time();

real\_time\_before = real\_time;

/\*if(Button == "Start"){

sensor();

}\*/

data\_jam = String(jam) + ":" +String(menit)+":"+String(detik);

data\_tanggal = String(tanggal) + "/" +String(bulan) + "/" + String(tahun) + " " + String(jam) + ":" + String(menit) + ":" + String(detik);

actuator\_sensor();

//Serial.println(data\_tanggal);

}

}

//\_\_\_END of Fuction for loop\_\_\_\_//

//--------------------End of Fuction For all--------------------------------//

void setup()

{

Serial.begin(115200);

pinMode(pin\_potensio1, INPUT);

pinMode(pin\_potensio2, INPUT);

pinMode(pin\_led, OUTPUT);

sdCardMode = "setup";

SDCARD(sdCardMode);

//if u want to make ip static like u want

//WiFi.config(ip,gateway,subnet);

//mulai untuk menghubungkan kepada wifi yang ingin diconnectkan

WiFi.begin(username, password);

//hanya sebagai tanda

while (WiFi.status() != WL\_CONNECTED) {

delay(500);

Serial.print(".");

}

Serial.print("Connected to ");

Serial.println(username);

Serial.print("IP address: ");

Serial.println(WiFi.localIP());

//untuk load html ketika ada

server.on("/", panggil\_html);

//untuk load data using xmlhttp untuk update data ke javacript dan tergantung

//hal apa yang di request oleh client pada java script

server.on("/Manual\_ON", Manual\_ON);

server.on("/Manual\_OFF", Manual\_OFF);

server.on("/Start", Start);

//setting for using network time protocol (NTP) for update time from internet

timeClient.begin();

//3600 dikali dengan GMT yang berlaku di daerahmu misal GMT +7 maka : 3600 \* +7 = +25200

timeClient.setTimeOffset(25200);

server.begin();

Serial.println("Bismillah sukses dengan cara yang baik");

}

void loop()

{

//Handle client requests

server.handleClient();

//update data

Update\_data();

//untuk mengecek state benar apa tidak

//Serial.println(Voltage);

if(Button != lastButton){

Serial.println(Button);

lastButton = Button;

}

}

**Html.h**

const char MAIN\_page[] PROGMEM = R"=====(

<!DOCTYPE html>

<html>

<head>

<meta charset="utf-8">

<meta name="viewport" content="width=device-width, initial-scale=1.0, shrink-to-fit=no">

<title>Kelompok 4</title>

<script src="https://cdnjs.cloudflare.com/ajax/libs/Chart.js/2.7.3/Chart.min.js"></script>

<script src="https://kit.fontawesome.com/2e3ce63ccb.js" crossorigin="anonymous"></script>

<link rel="stylesheet" href="https://maxcdn.bootstrapcdn.com/bootstrap/4.4.1/css/bootstrap.min.css">

<link href="https://fonts.googleapis.com/css2?family=Quicksand:wght@500&display=swap" rel="stylesheet">

<link rel="stylesheet" href="assets/css/styles.css">

<style>

.custom-control-label {

/\*added for alignment with the switch \*/

padding-top: 0.5rem;

padding-left: 2rem;

padding-bottom: 0.1rem;

}

.custom-switch .custom-control-label::before {

left: -2.25rem;

height: 1.5rem;

width: 3.5rem;

/\* it was 1.75rem before. Sliding way is longer than before. \*/

pointer-events: all;

border-radius: 1rem;

}

.custom-switch .custom-control-label::after {

top: calc(0.25rem + 2px);

left: calc(-2.25rem + 2px);

width: calc(1.5rem - 4px);

/\*it was calc(1rem - 4px) before. Oval is bigger than before. \*/

height: calc(1.5rem - 4px);

/\* it was calc(1rem - 4px) before. Oval is bigger than before. \*/

background-color: #adb5bd;

border-radius: 2rem;

/\* it was 0.5rem before. Oval is bigger than before. \*/

transition: background-color 0.15s ease-in-out, border-color 0.15s ease-in-out, box-shadow 0.15s ease-in-out, -webkit-transform 0.15s ease-in-out;

transition: transform 0.15s ease-in-out, background-color 0.15s ease-in-out, border-color 0.15s ease-in-out, box-shadow 0.15s ease-in-out;

transition: transform 0.15s ease-in-out, background-color 0.15s ease-in-out, border-color 0.15s ease-in-out, box-shadow 0.15s ease-in-out, -webkit-transform 0.15s ease-in-out;

}

@media (prefers-reduced-motion: reduce) {

.custom-switch .custom-control-label::after {

transition: none;

}

}

.custom-switch .custom-control-input:checked ~ .custom-control-label::after {

background-color: #fff;

-webkit-transform: translateX(2rem);

/\* translateX(0.75rem); \*/

transform: translateX(2rem);

/\* translateX(0.75rem); \*/

}

</style>

</head>

<body style="background-color: rgb(245,245,245);">

<h1 class="display-4 text-center"

style="font-size: 50px; color: rgb(101,101,101); font-family: 'Quicksand'; font-weight: 500; background-color: transparent; margin: 50px;">

<strong>Dashboard</strong></h1>

<div>

<div class="container">

<div class="row" style="background-color: transparent; justify-content: center;">

<div class="col-md-5" style="background-color: transparent; margin-bottom: 25px;">

<div class="card" style="box-shadow: 0 4px 8px 0 rgba(0, 0, 0, 0.2), 0 6px 20px 0 rgba(0, 0, 0, 0.19);">

<div class="card-body">

<div class="row align-items-center no-gutters mb-3" style="background-color: transparent;">

<div class="col-auto mr-1" style="background-color: transparent;"><i class="far fa-lightbulb fa-2x text-gray-300"

style="color: rgb(131,131,131);font-size: 30px;"></i></div>

<div class="col">

<div class="text-uppercase text-primary text-xs mb-1"><span

class="text-capitalize text-gray-300" style="color: rgb(131,131,131); font-size: 20px; font-family: 'Quicksand';">Lights</span>

</div>

</div>

</div>

<div class="card" style="background: linear-gradient(to right,#5b86e5, #36d1dc); margin-bottom: 8px;">

<div class="card-body">

<div class="row align-items-center no-gutters" style="background-color: transparent;">

<div class="col-auto" style="background-color: transparent; padding-right: 35px;"><i class="far fa-lightbulb fa-2x"

style="color: white;font-size: 60px;"></i></div>

<div class="col mr-2">

<div class="row" style="background-color: transparent; margin-top: 10px;">

<div class="text-uppercase text-primary text-xs"><span

class="text-capitalize text-white" style="font-size: 20px; font-family: 'Quicksand';">LED 1</span>

</div>

<div class="col ml-5" style="text-align: end;">

<div class="custom-control custom-switch">

<input type="checkbox" class="custom-control-input" id="customSwitch" onclick="functionSwitch()">

<label class="custom-control-label" for="customSwitch"></label>

</div>

</div>

</div>

<div class="row" style="background-color: transparent;">

<div class="text-uppercase text-xs"><span

class="text-capitalize text-white" style="font-size: 40px; font-family: 'Quicksand';" id="valueSwitch"></span>

</div>

</div>

</div>

</div>

</div>

</div><br>

</div>

</div>

</div>

<div class="col-md-4" style="justify-content: space-between;">

<div class="sub-row" style="margin-bottom: 25px;">

<div class="card" style="box-shadow: 0 4px 8px 0 rgba(0, 0, 0, 0.2), 0 6px 20px 0 rgba(0, 0, 0, 0.19);">

<div class="card-body">

<div class="row align-items-center no-gutters">

<div class="col mr-2" style="background-color: transparent;">

<div class="text-uppercase text-primary text-xs" style="background-color: transparent;"><span

class="text-capitalize text-gray-300" style="color: rgb(131,131,131); font-size: 20px; font-family: 'Quicksand';">Time</span></div>

<div class="text-dark font-weight-bold h5" style="margin: 0px; padding: 0px;"><span class="text-black-50"

style="font-size: 40px;" id="value1"></span></div>

</div>

<div class="col-auto"><i class="fas fa-clock fa-2x text-gray-300"

style="color: rgb(131,131,131);font-size: 40px;"></i></div>

</div>

</div>

</div>

</div>

<div class="sub-row" style="margin-bottom: 25px;">

<div class="card" style="box-shadow: 0 4px 8px 0 rgba(0, 0, 0, 0.2), 0 6px 20px 0 rgba(0, 0, 0, 0.19);">

<div class="card-body">

<div class="row align-items-center no-gutters">

<div class="col mr-2" style="background-color: transparent;">

<div class="text-uppercase text-primary text-xs" style="background-color: transparent;"><span

class="text-capitalize text-gray-300" style="color: rgb(131,131,131); font-size: 20px; font-family: 'Quicksand';">Data</span>

</div>

<div class="text-dark font-weight-bold h5" style="margin: 0px; padding: 0px;"><span class="text-black-50"

style="font-size: 40px;" id="value3"></span></div>

</div>

<div class="col-auto"><i class="far fa-chart-bar fa-2x text-gray-300"

style="color: rgb(131,131,131);font-size: 40px;"></i></div>

</div>

</div>

</div>

</div>

</div>

</div>

</div>

</div>

<div>

<div class="container" style="margin-bottom: 25px;">

<div class="row" style="justify-content: center; background-color: transparent;">

<div class="col-md-5">

<div class="card" style="box-shadow: 0 4px 8px 0 rgba(0, 0, 0, 0.2), 0 6px 20px 0 rgba(0, 0, 0, 0.19);">

<div class="card-body text-center shadow-sm">

<h6 style="font-size: 20px; color: rgb(131,131,131); font-family: 'Quicksand';">Current Time</h6>

<button class="btn btn-info btn-sm" type="button" id="Button\_set" onClick="get\_flag\_set()" style="font-size: 12px; height: 30px; width: 70px; margin-bottom: 10px;">Set Time</button>

<form class="set" action="/" method='POST'>

<input type="datetime-local" step="1" value="2020-10-20T19:30:02" style="height: 25px; font-size: 10px; width: 166px; margin-bottom: 10px;" name="Manual" id="Input">

<button class="btn btn-dark btn-sm" type="submit" value="Submit" id="Button\_manual" style="height: 30px;font-size: 12px;">Manual</button>

</form>

<div class="row" style="justify-content: center;">

<div class="col-md-2" style="background-color: transparent;">

<h5 style="font-size: 16px;height: 12px; color: rgb(131,131,131); font-family: 'Quicksand';">or</h5>

</div>

<div class="col-md-2 p-0" style="background-color: transparent;">

<form form class="set" action="/" method='POST' >

<button class="btn btn-dark btn-sm" type="submit" name="Auto" value="Auto" id="Button\_auto" style="font-size: 12px;height: 30px;">Auto</button>

</form>

</div>

</div>

</div>

</div>

</div>

<div class="col-md-4" style="background-color: transparent;">

<div class="card" style="box-shadow: 0 4px 8px 0 rgba(0, 0, 0, 0.2), 0 6px 20px 0 rgba(0, 0, 0, 0.19);">

<div class="card-body text-center">

<h1 style="font-size: 20px; color: rgb(131,131,131); font-family: 'Quicksand'; background-color: transparent;">Status</span></h1>

<h1 style="font-size: 12px; color: rgb(0,0,255); background-color: transparent; margin-top: 0px; margin-bottom: -5px;"> banyak data yang tampil dalam grafik:</h1>

<form class="set" style="background-color: transparent;">

<input type="number" value="0" min="1" max="120" id="banyak\_data"

style="height: 30px; font-size: 25px; width: 66px; margin: 15px;">

</form>

<div class="row" style="justify-content: space-evenly;">

<div class="col-md-2 p-0" style="background-color: transparent;">

<button class="btn btn-success" button class="btn btn-success" type="submit" value="Submit" id="Button\_start" onClick="get\_flag\_start()">Start</button>

</div>

<div class="col-md-2 p-0" style="background-color: transparent;">

<button class="btn btn-danger" type="button" id="Button\_stop" onClick="get\_flag\_stop()">Stop</button>

</div>

</div>

</div>

</div>

</div>

</div>

</div>

</div>

<div>

<div class="container">

<div class="row">

<div class="col-md-12 col-xl-12 offset-xl-0">

<div><canvas id="Chart" width="400" height="400"></canvas></div>

</div>

</div>

</div>

</div>

<footer style="font-size: 11px;" class="page-footer white pt-4">

<div class="footer-copyright text-center py-3">Â© 2020 Copyright: Kelompok 4 - Teknik Komputer PENS</div>

</footer>

<script>

var Current = [];

var Current\_max = 0;

var timeStamp = [];

var button\_start = document.getElementById("Button\_start");

var button\_stop = document.getElementById("Button\_stop");

var button\_manual = document.getElementById("Button\_manual");

var button\_auto = document.getElementById("Button\_auto");

var button\_set = document.getElementById("Button\_set");

//awalan

button\_manual.disabled = true;

button\_auto.disabled = true;

button\_start.disabled = false;

button\_set.disabled = false;

button\_stop.disabled = true;

//state awal

var flag = "Set";

var flag\_button = "start";

//counter

var counter = 0;

//banyak data yang tampil

var banyak\_data = 1;

var last\_banyak\_data = 0;

function functionSwitch() {

var checkSwitch = document.getElementById("valueSwitch");

if (checkSwitch.innerHTML === "OFF") {

valueSwitch.innerHTML = "ON";

flag\_button = "Manual\_ON";

} else {

valueSwitch.innerHTML = "OFF";

flag\_button = "Manual\_OFF";

}

}

function get\_flag\_start() {

banyak\_data = parseInt(document.getElementById("banyak\_data").value);

if (last\_banyak\_data > banyak\_data) {

Current = [];

timeStamp = [];

}

if (banyak\_data > 1 && banyak\_data < 120) {

button\_manual.disabled = true;

button\_auto.disabled = true;

button\_start.disabled = true;

button\_set.disabled = true;

button\_stop.disabled = false;

flag = "Start";

}

//document.getElementById("demo").innerHTML = flag;

}

function get\_flag\_stop() {

button\_manual.disabled = true;

button\_auto.disabled = true;

button\_start.disabled = false;

button\_set.disabled = false;

button\_stop.disabled = true;

flag = "Stop";

last\_banyak\_data = banyak\_data;

//document.getElementById("demo").innerHTML = data;

}

function get\_flag\_set() {

button\_manual.disabled = false;

button\_auto.disabled = false;

button\_start.disabled = true;

button\_stop.disabled = true;

button\_set.disabled = true;

//status

document.getElementById("Status").innerHTML = "Set Time";

// document.getElementById("Status\_tanggal").innerHTML = " ";

flag = "Set";

}

function showGraph() {

var ctx = document.getElementById("Chart").getContext('2d');

var Chart2 = new Chart(ctx, {

type: 'line',

data: {

labels: timeStamp, //Bottom Labeling

datasets: [{

label: "Current",

fill: false, //Try with true

backgroundColor: 'rgba( 243, 156, 18 , 1)', //Dot marker color

borderColor: 'rgba( 243, 156, 18 , 1)', //Graph Line Color

data: Current,

}],

},

options: {

animation: false,

title: {

display: true,

text: "Data Grafik"

},

maintainAspectRatio: false,

elements: {

line: {

tension: 0.5

}

},

scales: {

yAxes: [{

ticks: {

beginAtZero: false

}

}]

}

}

});

}

window.onload = function () {

console.log(new Date().toLocaleTimeString());

};

setInterval(function () {

getData();

}, 1000); //1000 = 1 s

function getData() {

var xhttp = new XMLHttpRequest();

xhttp.onreadystatechange = function () {

if (this.readyState == 4 && this.status == 200) {

var time = new Date().toLocaleTimeString();

var txt = this.responseText;

var obj = JSON.parse(txt);

var Waktu = obj.Waktu;

Waktu = Waktu[0]+Waktu[1];

var jam = parseInt(Waktu);

if(jam == 3){

flag\_button = "Start";

}

if(jam == 17){

flag\_button = "Start";

}

if (flag == "Start") {

//search data Max

if (Current\_max <= parseInt(obj.Data\_potensio)) {

Current\_max = obj.Data\_potensio;

}

//memunculkan data sebanyak request

if (counter >= banyak\_data) {

for (var i = 0; i < banyak\_data; i++) {

if (i == banyak\_data - 1) {

Current[i] = obj.Data\_potensio;

timeStamp[i] = obj.Waktu;

} else {

Current[i] = Current[i + 1];

timeStamp[i] = timeStamp[i + 1];

}

}

} else {

counter++;

Current.push(obj.Data\_potensio);

timeStamp.push(obj.Waktu);

}

//Update Graphs

showGraph();

//Update Data Table

var table1 = document.getElementById("value1");

// var table2 = document.getElementById("valueSwitch");

var table3 = document.getElementById("value3");

// var table4 = document.getElementById("value4");

table1.innerHTML = obj.Tanggal;

// table2.innerHTML = obj.Kondisi\_lampu;

table3.innerHTML = obj.Data\_potensio;

if(obj.Kondisi\_lampu == "mati") document.getElementById("valueSwitch").innerHTML = "OFF";

else document.getElementById("valueSwitch").innerHTML = "ON";

var box = document.getElementById("customSwitch");

if (document.getElementById("valueSwitch").innerHTML == "OFF") {

box.checked = false;

} else {

box.checked = true;

}

//status

document.getElementById("Status").innerHTML = "Start";

// document.getElementById("Status\_tanggal").innerHTML = obj.Tanggal;

// if(obj.Kondisi\_lampu === "terang") document.getElementById("valueSwitch").innerHTML = "ON";

// else document.getElementById("valueSwitch").innerHTML = "OFF";

} else {

//Update Data Table

var table1 = document.getElementById("value1");

// var table2 = document.getElementById("valueSwitch");

var table3 = document.getElementById("value3");

// var table4 = document.getElementById("value4");

table1.innerHTML = obj.Tanggal;

// table2.innerHTML = obj.Kondisi\_lampu;

table3.innerHTML = obj.Data\_potensio;

if(obj.Kondisi\_lampu == "mati") document.getElementById("valueSwitch").innerHTML = "OFF";

else document.getElementById("valueSwitch").innerHTML = "ON";

var box = document.getElementById("customSwitch");

if (document.getElementById("valueSwitch").innerHTML == "OFF") {

box.checked = false;

} else {

box.checked = true;

}

//status

document.getElementById("Status").innerHTML = "Stop";

// document.getElementById("Status\_tanggal").innerHTML = obj.Tanggal;

//document.getElementById("value1").innerHTML = obj.Waktu;

// if(obj.Kondisi\_lampu === "terang") document.getElementById("valueSwitch").innerHTML = "ON";

// else document.getElementById("valueSwitch").innerHTML = "OFF";

showGraph();

}

}

};

if (flag\_button == "Start"){

xhttp.open("GET", "Start", true);

xhttp.send();

}else if(flag\_button == "Manual\_ON"){

xhttp.open("GET", "Manual\_ON", true);

xhttp.send();

}else if(flag\_button == "Manual\_OFF"){

xhttp.open("GET", "Manual\_OFF", true);

xhttp.send();

}else{

xhttp.open("GET", "Start", true);

xhttp.send();

}

}

</script>

</body>

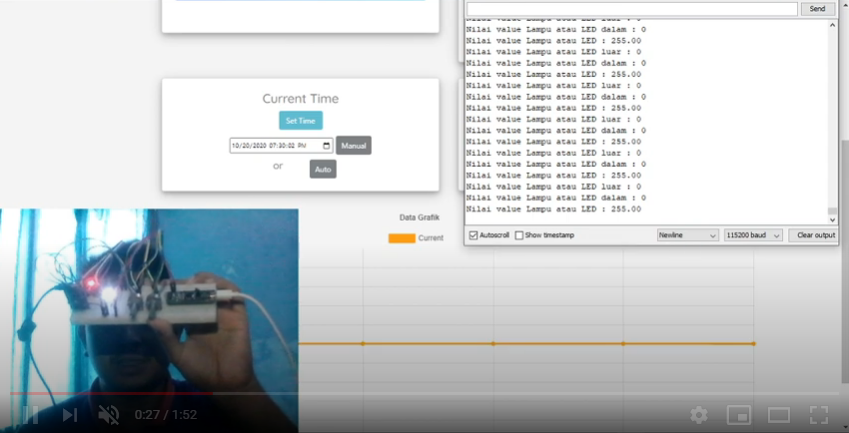
</html>

)=====";

1. Hasil

**Pada Lampiran Video**

Ketika kondisi luar dan dalam ruangan gelap, maka lampu akan nyala dengan terang



Ketika kondisi luar dan dalam ruangan redup, maka lampu akan nyala dengan redup

