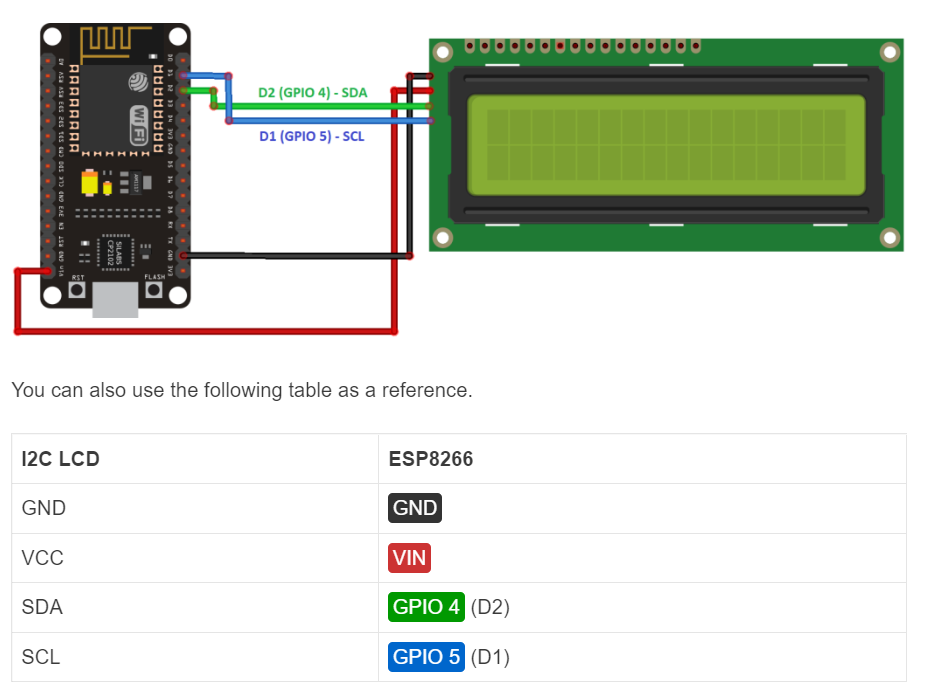
ESP8266 modul

1. **ESP8266 koneksi ke LCD I2C**
2. Wiring skema berikut:



1. pastikan polaritas tegangan tidak terbalik antara 5v dan GND, jika sudah download

library lcd i2c [disini](https://github.com/marcoschwartz/LiquidCrystal_I2C/archive/master.zip).

Link download library: https://github.com/marcoschwartz/LiquidCrystal\_I2C/archive/master.zip

1. ekstrak library yang sudah di download dan rename folder

LiquidCrystal\_I2C-master menjadi LiquidCrystal\_I2C

1. jika sudah, copy folder tersebut ke Document > Arduino > Libraries
2. buka software arduino dan tulis program seperti berikut:

#include <LiquidCrystal\_I2C.h>

// set the LCD number of columns and rows

int lcdColumns = 16;

int lcdRows = 2;

// set LCD address, number of columns and rows

// if you don't know your display address, run an I2C scanner sketch

LiquidCrystal\_I2C lcd(0x27, lcdColumns, lcdRows);

void setup(){

// initialize LCD

lcd.init();

// turn on LCD backlight

lcd.backlight();

}

void loop(){

// set cursor to first column, first row

lcd.setCursor(0, 0);

// print message

lcd.print("Hello, World!");

delay(1000);

// clears the display to print new message

lcd.clear();

// set cursor to first column, second row

lcd.setCursor(0,1);

lcd.print("Hello, World!");

delay(1000);

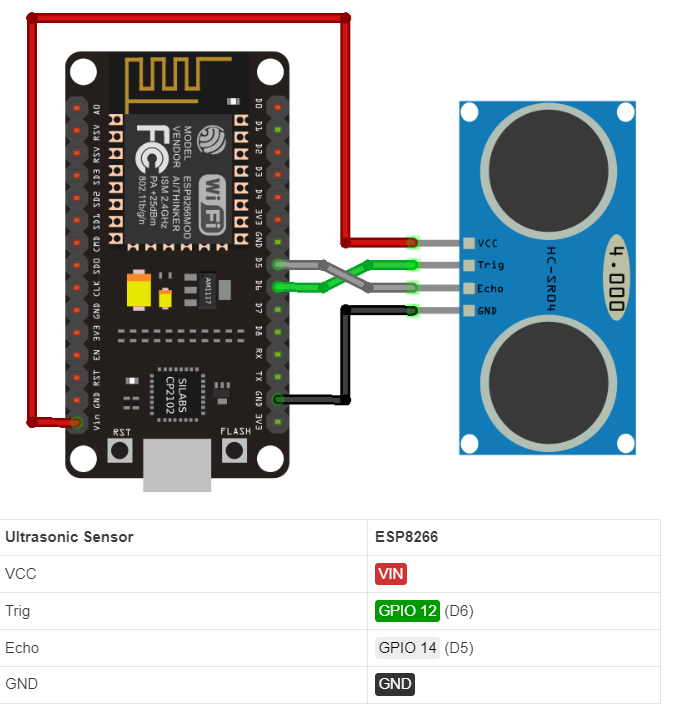
lcd.clear();

}

1. Hubungkan kabel USB dengan esp8266 dan upload program.

**2. Sensor ultrasonic**

1. Wiring diagram sebagai berikut:



1. pastikan polaritas tegangan 5V dan GND tidak terbalik
2. buka software arduino dan tulis program berikut ini

const int trigPin = 12;

const int echoPin = 14;

//define sound velocity in cm/uS

#define SOUND\_VELOCITY 0.034

#define CM\_TO\_INCH 0.393701

long duration;

float distanceCm;

float distanceInch;

void setup() {

Serial.begin(115200); // Starts the serial communication

pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output

pinMode(echoPin, INPUT); // Sets the echoPin as an Input

}

void loop() {

// Clears the trigPin

digitalWrite(trigPin, LOW);

delayMicroseconds(2);

// Sets the trigPin on HIGH state for 10 micro seconds

digitalWrite(trigPin, HIGH);

delayMicroseconds(10);

digitalWrite(trigPin, LOW);

// Reads the echoPin, returns the sound wave travel time in microseconds

duration = pulseIn(echoPin, HIGH);

// Calculate the distance

distanceCm = duration \* SOUND\_VELOCITY/2;

// Convert to inches

distanceInch = distanceCm \* CM\_TO\_INCH;

// Prints the distance on the Serial Monitor

Serial.print("Distance (cm): ");

Serial.println(distanceCm);

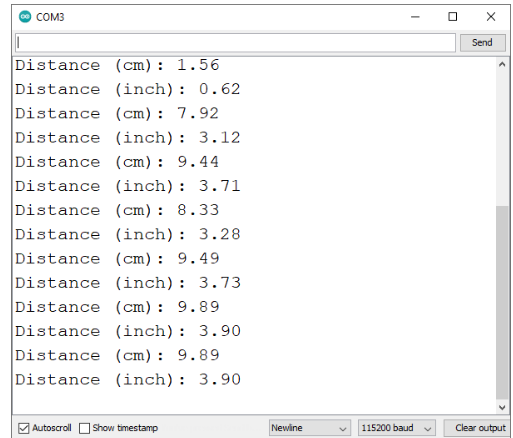
Serial.print("Distance (inch): ");

Serial.println(distanceInch);

delay(1000);

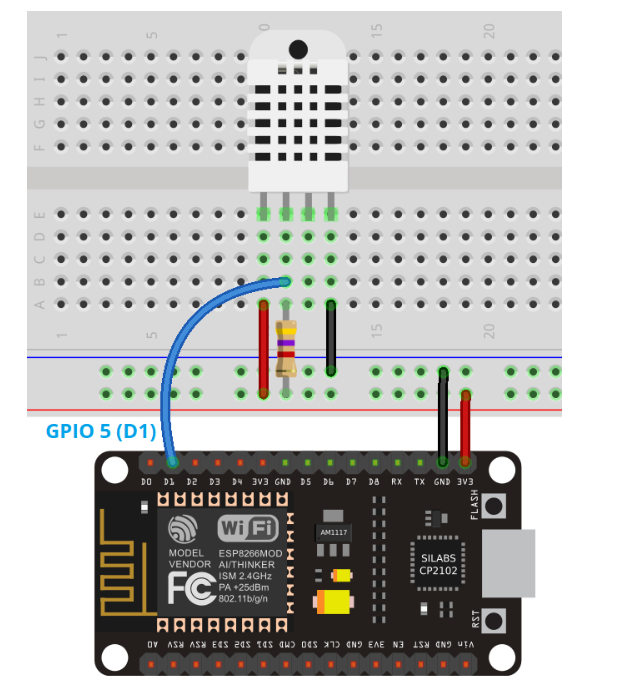
}

1. Upload program dan buka serial monitor, hasil akan seperti dibawah ini.



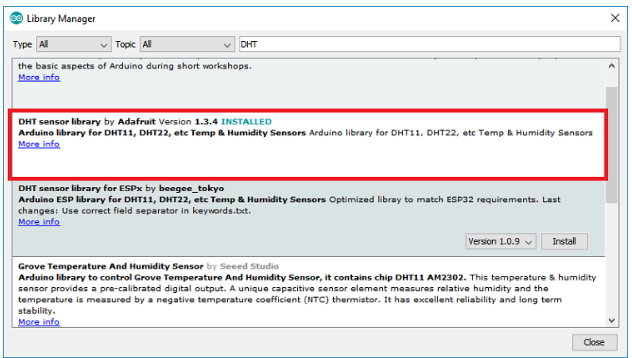
**3. Sensor DHT 11**

1. Buat skema kabel sebagai berikut:

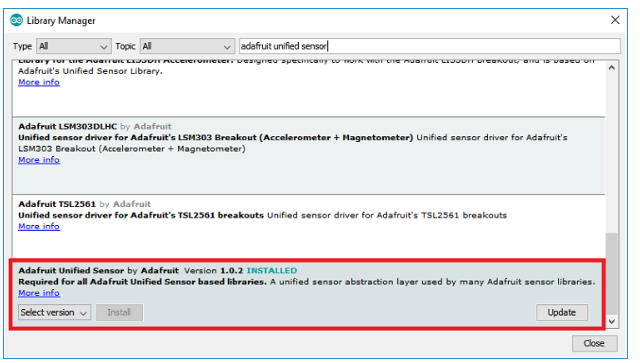


1. jika sudah, buka software arduino dan install library dengan cara klik Sketch >

include library > manage library > search DHT sensor library



1. install juga library adafruit unified sensor



Setelah itu restart arduino program.

1. Tulis program arduino sebagai berikut

#include "DHT.h"

#define DHTPIN 5 // pin GPIO 5

#define DHTTYPE DHT11 // DHT 11

DHT dht(DHTPIN, DHTTYPE);

void setup() {

Serial.begin(9600);

Serial.println("DHTxx test!");

dht.begin();

}

void loop() {

delay(2000);

float h = dht.readHumidity();

float t = dht.readTemperature();

float f = dht.readTemperature(true);

if (isnan(h) || isnan(t) || isnan(f)) {

Serial.println("Failed to read from DHT sensor!");

return;

}

float hif = dht.computeHeatIndex(f, h);

float hic = dht.computeHeatIndex(t, h, false);

Serial.print(F("Humidity: "));

Serial.print(h);

Serial.print(F("% Temperature: "));

Serial.print(t);

Serial.print(F("°C "));

Serial.print(f);

Serial.print(F("°F Heat index: "));

Serial.print(hic);

Serial.print(F("°C "));

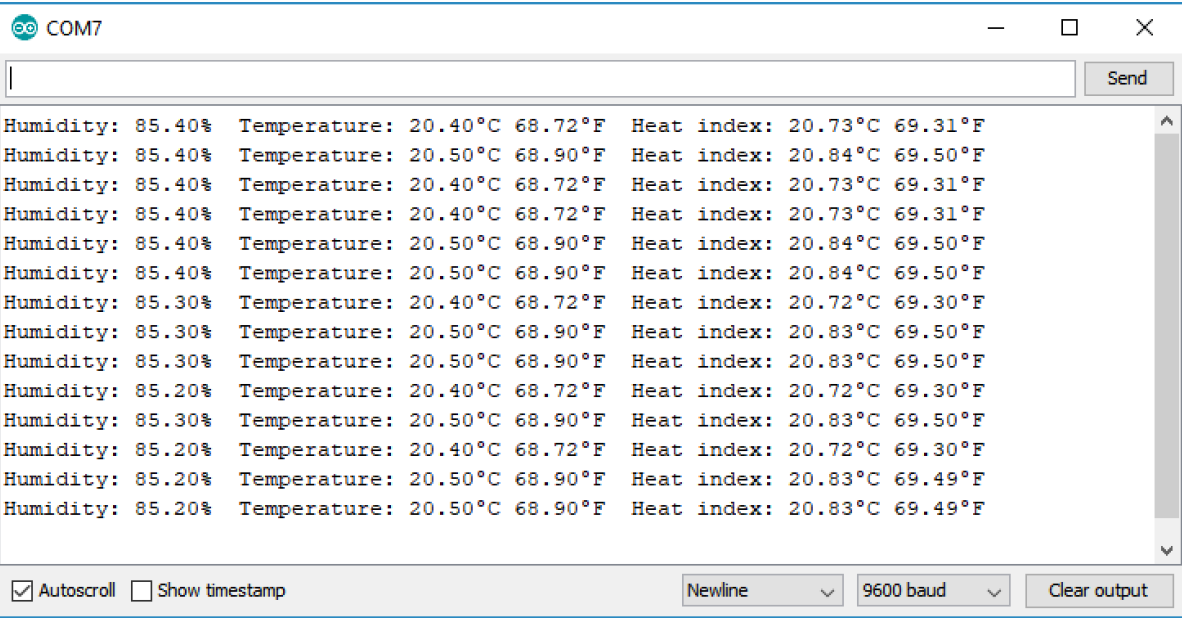
Serial.print(hif);

Serial.println(F("°F"));

}

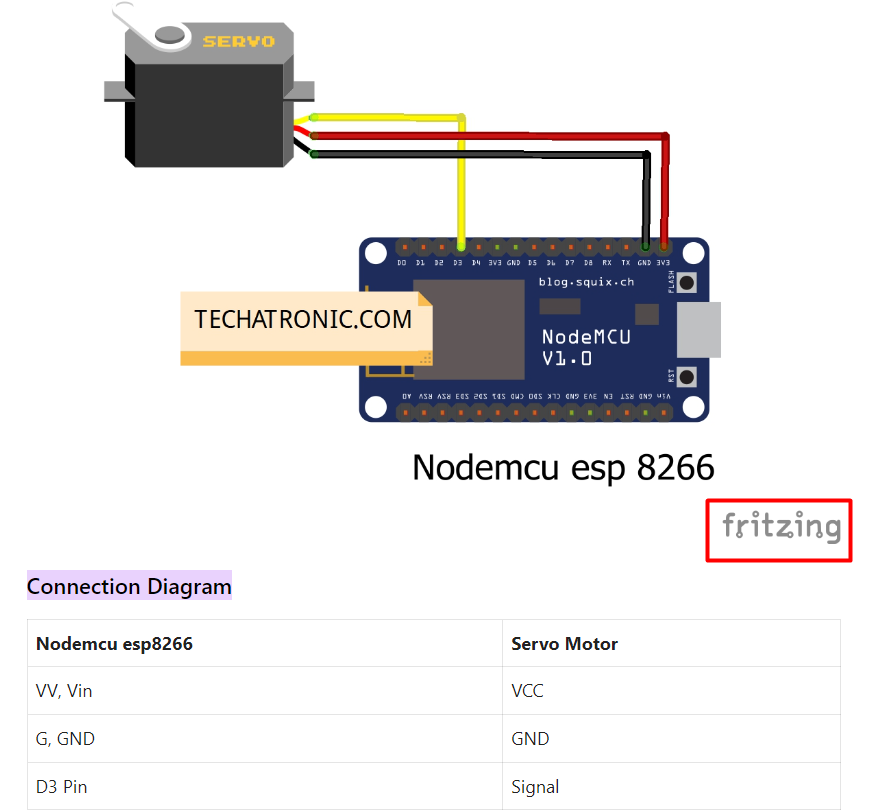
e. hubungkan esp dengan kabel usb dan tekan upload pada arduino, setelah selesai

buka serial monitor dan hasilnya akan seperti dibawah ini



**4. Servo motor**

1. Buat rangkaian kabel sebagai berikut



1. Download library servo disini: <https://github.com/arduino-libraries/Servo>. Setelah itu install library servo di folder arduino.
2. Buat program ini dan upload.

#include <Servo.h> // servo library

Servo s1;

void setup()

{

s1.attach(0); // servo attach D3 pin of arduino

}

void loop()

{

s1.write(0);

delay(1000);

s1.write(90);

delay(1000);

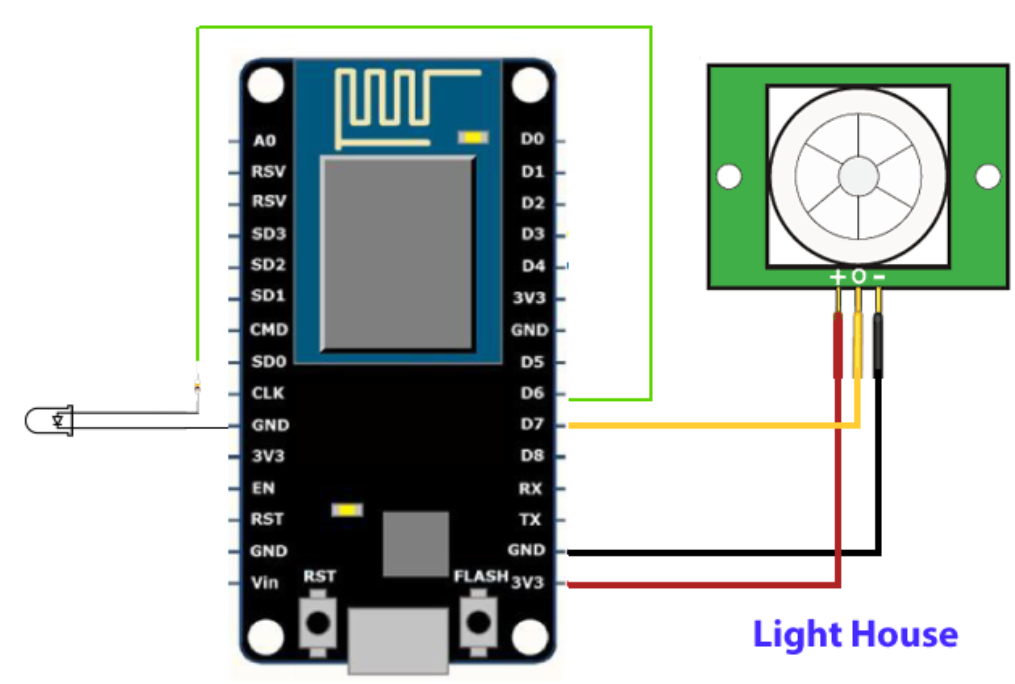
s1.write(180);

delay(1000);

}

**5. PIR sensor**

1. Buat skema kabel sebagai berikut:



esp 8266=>PIR sensor

D6 = LED

D7 = data

3V3 = +

GND = -

1. Buat program sebagai berikut

int Status = 12; // Digital pin D6

int sensor = 13; // Digital pin D7

void setup() {

pinMode(sensor, INPUT); // declare sensor as input

pinMode(Status, OUTPUT); // declare LED as output

}

void loop() {

long state = digitalRead(sensor);

if(state == HIGH) {

digitalWrite (Status, HIGH);

Serial.println("Motion detected!");

delay(1000);

}

else {

digitalWrite (Status, LOW);

Serial.println("Motion absent!");

delay(1000);

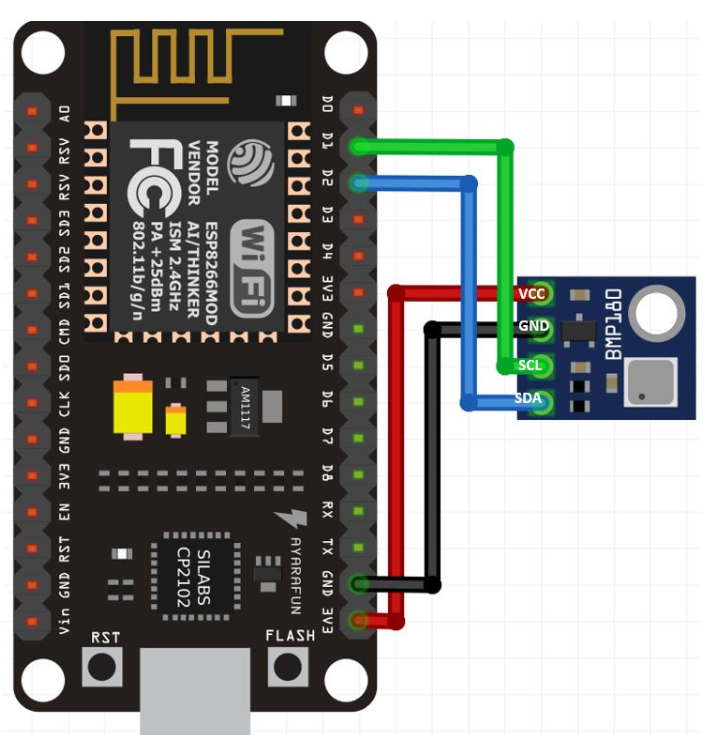
}

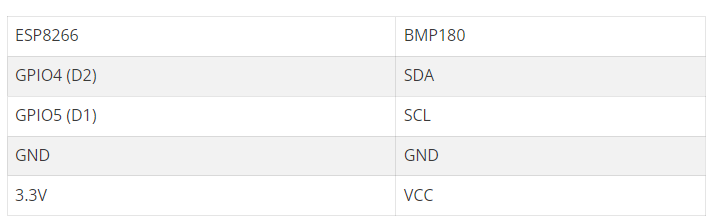
}

1. Upload program.

**6. BMP180 kontrol dengan esp8266**

1. Buat sambungan kabel sebagai berikut.





1. Install BMP library: buka Sketch > Include Libraries > Manage Libraries.



1. Tulisa program dan upload:

#include <Wire.h>

#include <Adafruit\_BMP085.h>

#define seaLevelPressure\_hPa 1013.25

Adafruit\_BMP085 bmp;

void setup() {

Serial.begin(115200);

if (!bmp.begin()) {

Serial.println("BMP180 Not Found. CHECK CIRCUIT!");

while (1) {}

}

}

void loop() {

Serial.print("Temperature = ");

Serial.print(bmp.readTemperature());

Serial.println(" \*C");

Serial.print("Pressure = ");

Serial.print(bmp.readPressure());

Serial.println(" Pa");

Serial.print("Pressure at sealevel (calculated) = ");

Serial.print(bmp.readSealevelPressure());

Serial.println(" Pa");

Serial.print("Altitude = ");

Serial.print(bmp.readAltitude());

Serial.println(" meters");

Serial.print("Real altitude = ");

Serial.print(bmp.readAltitude(seaLevelPressure\_hPa \* 100));

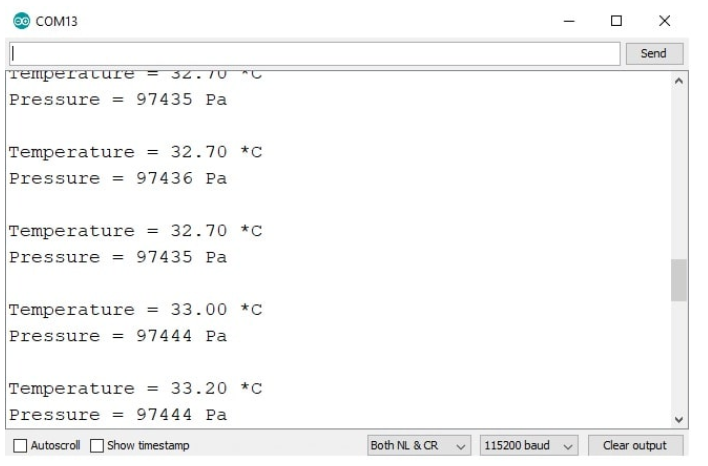
Serial.println(" meters");

Serial.println();

delay(1000);

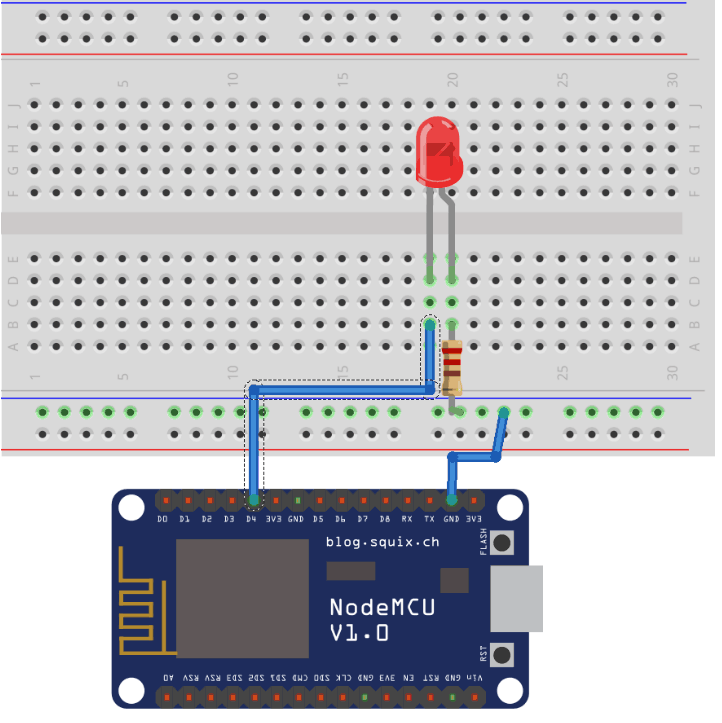
}

c. Buka monitor arduino.



**7. Kontrol led melalui wifi**

1. Rangkai kabel sebagai berikut:



D4(GPIO2) → anode led

GND → GND

1. Install library:
   1. ESP8266WiFi.h, : https://github.com/esp8266/Arduino/tree/master/libraries/ESP8266WiFi
2. Tulis program dan upload:

#include <ESP8266WiFi.h>

#include <WiFiClient.h>

//ESP Web Server Library to host a web page

#include <ESP8266WebServer.h>

//---------------------------------------------------------------

//Our HTML webpage contents in program memory

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

<!DOCTYPE html>

<html>

<body>

<center>

<h1>WiFi LED on off demo: 1</h1><br>

Ciclk to turn <a href="ledOn">LED ON</a><br>

Ciclk to turn <a href="ledOff">LED OFF</a><br>

<hr>

<a href="https://circuits4you.com">circuits4you.com</a>

</center>

</body>

</html>

)=====";

//---------------------------------------------------------------

//On board LED Connected to GPIO2

#define LED 2

//SSID and Password of your WiFi router

const char\* ssid = "circuits4you.com"; —--> ssid wifi anda

const char\* password = "123456789";----> password wifi anda

//Declare a global object variable from the ESP8266WebServer class.

ESP8266WebServer server(80); //Server on port 80

//===============================================================

// This routine is executed when you open its IP in browser

//===============================================================

void handleRoot() {

Serial.println("You called root page");

String s = MAIN\_page; //Read HTML contents

server.send(200, "text/html", s); //Send web page

}

void handleLEDon() {

Serial.println("LED on page");

digitalWrite(LED,LOW); //LED is connected in reverse

server.send(200, "text/html", "LED is ON"); //Send ADC value only to client ajax request

}

void handleLEDoff() {

Serial.println("LED off page");

digitalWrite(LED,HIGH); //LED off

server.send(200, "text/html", "LED is OFF"); //Send ADC value only to client ajax request

}

//==============================================================

// SETUP

//==============================================================

void setup(void){

Serial.begin(115200);

WiFi.begin(ssid, password); //Connect to your WiFi router

Serial.println("");

//Onboard LED port Direction output

pinMode(LED,OUTPUT);

//Power on LED state off

digitalWrite(LED,HIGH);

// Wait for connection

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

delay(500);

Serial.print(".");

}

//If connection successful show IP address in serial monitor

Serial.println("");

Serial.print("Connected to ");

Serial.println(ssid);

Serial.print("IP address: ");

Serial.println(WiFi.localIP()); //IP address assigned to your ESP

server.on("/", handleRoot); //Which routine to handle at root location. This is display page

server.on("/ledOn", handleLEDon); //as Per <a href="ledOn">, Subroutine to be called

server.on("/ledOff", handleLEDoff);

server.begin(); //Start server

Serial.println("HTTP server started");

}

//==============================================================

// LOOP

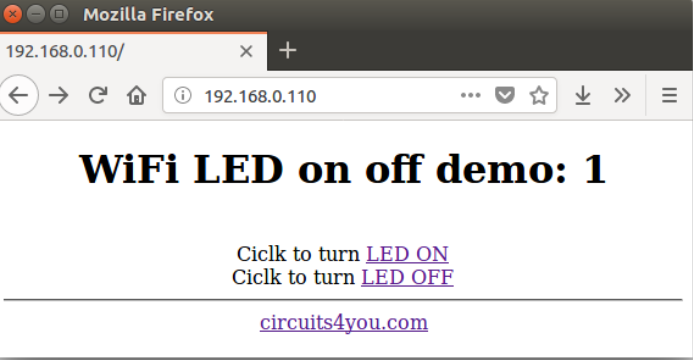
//==============================================================

void loop(void){

server.handleClient(); //Handle client requests

}

1. Cek di monitor akan keluar IP dan buka melalui HP atau PC pada jaringan anda.



*Kombinasikan sensor dan aktuator servo dengan menggunakan komunikasi lewat WIFI sebagai latihan. Apabila ada pertanyaan dapat ditanyakan melalui email:mrutu.iot@gmail.com.*