

MINOR PROJECT

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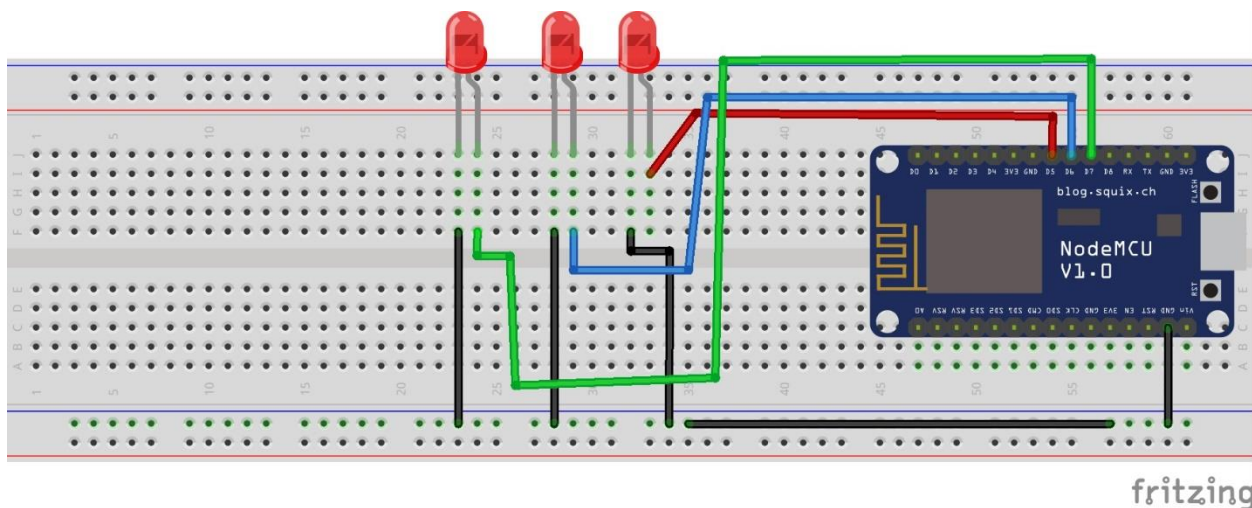
Aim:

Design a lightweight web server to control three LEDs on Local Network.

Components Required:

1. 3 Led's
2. Nodemcu(ESP8266)

Circuit Diagram:



Working:

First of All we are using NodeMcu(ESP8266) as Controller Part and as a Local Webserver for controlling our led's .The concept behind this-

When you type a URL in a web browser and hit ENTER, the browser sends a HTTP request (a.k.a. GET request) to a web server. It's a job of web server to handle this request by doing something. You might have figured it out by now that we are going to control things by accessing a specific URL. For example, suppose we entered a URL like `http://192.168.1.1/ledon` in a browser. The browser then sends a HTTP request to ESP8266 to handle this request. When ESP8266 reads this request, it knows that user wants to turn the LED ON. So, it turns the LED ON and sends a dynamic webpage to a browser showing LED status : ON

Code:

```
#include <ESP8266WiFi.h>

#include <ESP8266WebServer.h>

/* Put your SSID & Password */

const char* ssid = "MAHENDRA"; // Enter SSID here

const char* password = "9456944904"; //Enter Password here

/* Put IP Address details */

//IPAddress local_ip(192,168,1,1);

//IPAddress gateway(192,168,1,1);

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

ESP8266WebServer server(80);


uint8_t LED1pin = D7;

bool LED1status = LOW;


uint8_t LED2pin = D6;

bool LED2status = LOW;


uint8_t LED3pin = D5;

bool LED3status = LOW;


WiFiClient client;


void setup() {

  Serial.begin(9600);

  pinMode(LED1pin, OUTPUT);

  pinMode(LED2pin, OUTPUT);

  pinMode(LED3pin, OUTPUT);

  //WiFi.softAP(ssid, password);

  //WiFi.softAPConfig(local_ip, gateway, subnet);
```

```

//delay(100);

WiFi.begin(ssid, password);
    while (WiFi.status() != WL_CONNECTED)
    {
        delay(500);
        Serial.print(".");
    }
server.on("/", handle_OnConnect);
server.on("/led1on", handle_led1on);
server.on("/led1off", handle_led1off);
server.on("/led2on", handle_led2on);
server.on("/led2off", handle_led2off);
server.on("/led3on", handle_led3on);
server.on("/led3off", handle_led3off);
server.onNotFound(handle_NotFound);

server.begin();
Serial.println("HTTP server started");
Serial.print("Use This Web Address to use the web server:");
Serial.println(WiFi.localIP());
}

void loop() {
    server.handleClient();

    if(LED1status)
    {digitalWrite(LED1pin, HIGH);}
    else
    {digitalWrite(LED1pin, LOW);}

    if(LED2status)

```

```
{digitalWrite(LED2pin, HIGH);}
```

```
else
```

```
{digitalWrite(LED2pin, LOW);}
```

```
if(LED3status)
```

```
{digitalWrite(LED3pin, HIGH);}
```

```
else
```

```
{digitalWrite(LED3pin, LOW);}
```

```
}
```

```
void handle_OnConnect() {
```

```
    LED1status = LOW;
```

```
    LED2status = LOW;
```

```
    LED3status = LOW;
```

```
    server.send(200, "text/html", SendHTML(LED1status,LED2status,LED3status));
```

```
}
```

```
void handle_led1on() {
```

```
    LED1status = HIGH;
```

```
    server.send(200, "text/html", SendHTML(true,LED2status,LED3status));
```

```
}
```

```
void handle_led1off() {
```

```
    LED1status = LOW;
```

```
    server.send(200, "text/html", SendHTML(false,LED2status,LED3status));
```

```
}
```

```
void handle_led2on() {
```

```
    LED2status = HIGH;
```

```
server.send(200, "text/html", SendHTML(LED1status,true,LED3status));  
}
```

```
void handle_led2off() {  
    LED2status = LOW;  
    server.send(200, "text/html", SendHTML(LED1status,false,LED3status));  
}
```

```
void handle_led3on() {  
    LED3status = HIGH;  
    server.send(200, "text/html", SendHTML(LED1status,LED2status,true));  
}
```

```
void handle_led3off() {  
    LED3status = LOW;  
    server.send(200, "text/html", SendHTML(LED1status,LED2status,false));  
}
```

```
void handle_NotFound(){  
    server.send(404, "text/plain", "Not found");  
}
```

```
String SendHTML(uint8_t led1stat,uint8_t led2stat,uint8_t led3stat){  
    String ptr = "<!DOCTYPE html> <html>\n";  
  
    ptr += "<head><meta  name=\"viewport\"  content=\"width=device-width,  initial-scale=1.0,  user-  
scalable=no\">\n";  
  
    ptr += "<title>LED Control</title>\n";  
  
    ptr += "<style>html { font-family: Helvetica; display: inline-block; margin: 0px auto; text-align: center;}\n";  
  
    ptr += "body{margin-top: 50px;} h1 {color: #444444;margin: 50px auto 30px;} h3 {color: #444444;margin-  
bottom: 50px;}\n";  
}
```

```
ptr += ".button {display: block; width: 80px; background-color: #1abc9c; border: none; color: white; padding: 13px 30px; text-decoration: none; font-size: 25px; margin: 0px auto 35px; cursor: pointer; border-radius: 4px; } \n";
```

```
ptr += ".button-on {background-color: #1abc9c;} \n";
```

```
ptr += ".button-on:active {background-color: #16a085;} \n";
```

```
ptr += ".button-off {background-color: #34495e;} \n";
```

```
ptr += ".button-off:active {background-color: #2c3e50;} \n";
```

```
ptr += "p {font-size: 14px; color: #888; margin-bottom: 10px;} \n";
```

```
ptr += "</style> \n";
```

```
ptr += "</head> \n";
```

```
ptr += "<body> \n";
```

```
ptr += "<h1>NODEMCU LED Web Server</h1> \n";
```

```
ptr += "<h3>CLICK ON BUTTON BELOW TO TURN LED ON AND OFF</h3> \n";
```

```
if(led1stat)
```

```
{ptr += "<p>LED1 Status: ON</p><a class=\"button button-off\" href=\"/led1off\">OFF</a> \n";}
```

```
else
```

```
{ptr += "<p>LED1 Status: OFF</p><a class=\"button button-on\" href=\"/led1on\">ON</a> \n";}
```

```
if(led2stat)
```

```
{ptr += "<p>LED2 Status: ON</p><a class=\"button button-off\" href=\"/led2off\">OFF</a> \n";}
```

```
else
```

```
{ptr += "<p>LED2 Status: OFF</p><a class=\"button button-on\" href=\"/led2on\">ON</a> \n";}
```

```
if(led3stat)
```

```
{ptr += "<p>LED3 Status: ON</p><a class=\"button button-off\" href=\"/led3off\">OFF</a> \n";}
```

```
else
```

```
{ptr += "<p>LED3 Status: OFF</p><a class=\"button button-on\" href=\"/led3on\">ON</a> \n";}
```

```
ptr += "</body> \n";
```

```
ptr += "</html> \n";
```

```
return ptr;  
}
```

WEBSERVER PAGE:

