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/*********
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  Complete project details at http://randomnerdtutorials.com
  Modified Deid Reimer 2017-08-28
*********/

#include <ESP8266WiFi.h>
#include <WiFiClient.h>
#include <ESP8266WebServer.h>
#include <RCSwitch.h>
#include <DHT.h>

#define DHTTYPE DHT22

// Instantiate an instance mySwitch of RCSwitch.
RCSwitch mySwitch = RCSwitch();

// Network credentials
const char* ssid = "Steele";
const char* password = "Piwehavelotsof.";

const char* id = "light";
const char* pw = "makeBright";

// Set up the DHT Device
const int DHTPin = 5;

// Initialize DHT sensor.
DHT dht(DHTPin, DHTTYPE);

// Instantiate and tell the web server to listen on port 8888
ESP8266WebServer server(888);

// Define the binary values for each of the sockets.

char sockets[20][25] = {
  "0101011010001101000011111",  // Set 1
  "0101011010001101000011110",
  "0101011010001101000011101",
  "0101011010001101000011100",
  "0101011010001101000011011",
  "0101011010001101000011010",
  "0101011010001101000000111",
  "0101011010001101000000110",
  "0101011010001101000000101",
  "0101011010001101000000100",
  "0100111010001101000011111",  // Set 2
  "0100111010001101000011110",
  "0100111010001101000011101",
  "0100111010001101000011100",
  "0100111010001101000011011",
  "0100111010001101000011010",
  "0100111010001101000000111",
  "0100111010001101000000110",
  "0100111010001101000000101",
  "0100111010001101000000100",
};


String webPage = "";  // We will build the web page in this variable
String yellow = "style=\"background-color: #FFFFCC\"";
String grey = "style=\"background-color: #CCCCCC\"";
String s[] = {grey, grey, grey, grey, grey, grey, grey, grey, grey, grey};

int i = 0;

// Function to build the web page.
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String makePage() {

    //String celsiusString;
    //String humidityString;

    // float to char goes in these vars.
    static char celsiusTemp[7];
    static char humidityTemp[7];

    // Read the humidity
     float h = dht.readHumidity();

    // Read temperature as Celsius (the default)
     float t = dht.readTemperature();

    // Check if we got a reading.  Error message if not.
    if (isnan(h) || isnan(t)) {
      Serial.println("Failed to read from DHT sensor!");
    } else {
      // Convert the values to characters
      dtostrf(t, 6, 2, celsiusTemp);
      dtostrf(h, 6, 2, humidityTemp);
    }

    //  And thenconvert the char vars to String for concatenation with final output.
    String cS = String(celsiusTemp);
    String hS = String(humidityTemp);

    String webPage01 = "<!-- Play nicer with mobile devices  --><meta name=viewport content=
\"width=device-width, initial-scale=1.5\">";
    String webPage0 = "<h2>Switches</h2>";


    String tempHum = "<b>Temperature: " + cS + "&deg;C <br>Humidity: " + hS + "%</b><br>";

    String webPage02 = "<table>";
    String webPage1 = "<tr><td>1 - Guest Room  </td><td><a href=\"socket?s=2\"><button " + s[0]  + ">ON</
button></span></a></td><td><a href=\"socket?s=3\"><button>OFF</button></a></td></tr>";
    String webPage2 = "<tr><td>2 - Living Room </td><td><a href=\"socket?s=4\"><button " + s[1]  + ">ON</
button></span></a></td><td><a href=\"socket?s=5\"><button>OFF</button></a></td></tr>";
    String webPage3 = "<tr><td>3 - Family Room </td><td><a href=\"socket?s=6\"><button " + s[2]  + ">ON</
button></span></a></td><td><a href=\"socket?s=7\"><button>OFF</button></a></td></tr>";
    String webPage4 = "<tr><td>4 - Landing     </td><td><a href=\"socket?s=8\"><button " + s[3]  + ">ON</
button></span></a></td><td><a href=\"socket?s=9\"><button>OFF</button></a></td></tr>";
    String webPage5 = "<tr><td>5 - SB Bedroom  </td><td><a href=\"socket?s=10\"><button " + s[4] + ">ON</
button></span></a></td><td><a href=\"socket?s=11\"><button>OFF</button></a></td></tr>";
    String webPage6 = "<tr><td>6 - Car Tent    </td><td><a href=\"socket?s=12\"><button " + s[5] + ">ON</
button></span></a></td><td><a href=\"socket?s=13\"><button>OFF</button></a></td></tr>";
    String webPage7 = "<tr><td>7 - Tube Led    </td><td><a href=\"socket?s=14\"><button " + s[6] + ">ON</
button></span></a></td><td><a href=\"socket?s=15\"><button>OFF</button></a></td></tr>";
    String webPage8 = "<tr><td>8 - Pond Pump   </td><td><a href=\"socket?s=16\"><button " + s[7] + ">ON</
button></span></a></td><td><a href=\"socket?s=17\"><button>OFF</button></a></td></tr>";
    String webPage9 = "<tr><td>9 - Radio   </td><td><a href=\"socket?s=18\"><button " + s[8] + ">ON</
button></span></a></td><td><a href=\"socket?s=19\"><button>OFF</button></a></td></tr>";
    String webPage10 = "<tr><td>10 - Fan       </td><td><a href=\"socket?s=20\"><button " + s[9] + ">ON</
button></span></a></td><td><a href=\"socket?s=21\"><button>OFF</button></a></td></tr></table>";

    return webPage01 + webPage0 + tempHum + webPage02 + webPage1 + webPage2 + webPage3 + webPage4 +
webPage5 + webPage6 + webPage7 + webPage8 + webPage9+ webPage10;
  }

// Function to check for proper credentials
void checkCreds () {
  if(!server.authenticate(id, pw)) {
      return server.requestAuthentication();
  }
}
```

```
// Function to display the web page and respond to clicks on the page.
void displayPage() {

  // Get the cmd number  Valid numbers are 2 - 21.  Even are on, odd are off.
  if (server.args() == 1) {
    String m = server.arg("s");
    int n = m.toInt();
    if(n < 2 or n >21) {
      Serial.println(m);
      server.send(200, "text/html", makePage());
      return;
    }

    // Set the number back to 0 base.  We started at 2 so that toInt returning 0 on fail can be caught.
    n -= 2;
    // Set the appropriate button colour.
    s[n/2] = yellow;
    if (n%2 > 0) {
      s[n/2] = grey;
    }

    // Send the command to the RF switch
    mySwitch.send(sockets[n]);

    // Build the new web page.
    server.send(200, "text/html", makePage());
    delay(500);

  // number of arguments not equal to 1.
  } else {
    Serial.println(server.args());
    server.send(200, "text/html", makePage());
    return;
  }
}

void setup(void){

  // Setup to transmit on gpio 4 (D2)
  mySwitch.enableTransmit(4);
  mySwitch.setPulseLength(309);
  mySwitch.setRepeatTransmit(20);
  delay(1000);

  // Start the dht library.
  dht.begin();

  // Set up serial port
  Serial.begin(9600);
  Serial.println("");

  // Connect to wifi and wait for connection
  //if (WiFi.status() != WL_CONNECTED) {
  WiFi.begin(ssid, password);
  //}
  while (WiFi.status() != WL_CONNECTED) {
    delay(1000);
    Serial.print(".");
    if (i++ > 10) {
      Serial.println("WiFi Connect Failed.");
    }
  }

  // Display the connection information
  Serial.println("");
  Serial.print("Connected to ");
  Serial.println(ssid);
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  Serial.print("IP address: ");
  Serial.println(WiFi.localIP());

  // Set up the responder functions for the possible web requests.
  // If no command just serve the web page.  This structure is a embedded function.
  server.on("/", [](){
    checkCreds();
    server.send(200, "text/html", makePage());
  });

  // There is a command.  Serve the web page again and execute the command.
  server.on("/socket", displayPage);

  // Start the web server.
  server.begin();
  Serial.println("HTTP server started");
}

// Loop responding to web requests.
void loop(void){
  server.handleClient();
}
```